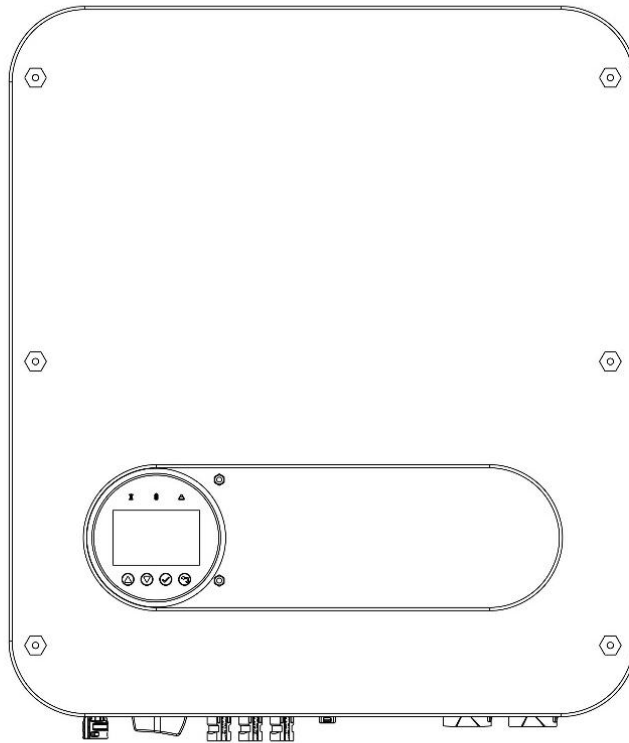




BHW-10/12/15

Three-phase Hybrid Inverter (High Voltage)

User Manual

Notes on This Manual

Overview

This user manual provides detailed information about the BoroChi BHW Series Hybrid Inverters, including product details, application scenarios, installation guide, electrical connections, communication settings, system commissioning, routine maintenance, troubleshooting, and technical specifications. Please read this manual carefully before installing and using the product to fully understand the safety information and become familiar with the product's functions and operating procedures, ensuring safe and efficient system operation.

This manual applies to the following product models:

BHW-10 (BRH010KH-B1)

BHW-12 (BRH012KH-B1)

BHW-15 (BRH015KH-B1)

Please refer to the relevant sections of this manual according to the specific model you are using to ensure correct installation and operation. If you have any questions, please contact official technical support or an authorized distributor for professional assistance.

Target Group

This manual is intended for end users as well as installation and maintenance personnel. Technical operations such as installation, electrical wiring, battery connection, and communication setup must be performed only by qualified electricians or trained professionals to ensure safe and reliable system operation. Please read this manual carefully before performing any operation, and strictly follow all instructions to avoid equipment damage or personal injury. If you have any questions, please contact BoroChi technical support or an authorized service provider.

Symbols Explanation

Symbol	Description
	Hazard warning information with a high risk level; if not avoided, it may result in death or serious injury.
	Hazard warning information with a medium risk level; if not avoided, it may result in death or serious injury.
	Hazard warning information with a low risk level; if not avoided, it may result in minor or moderate injury.
	Not involving personal injury; if not avoided, it may result in equipment damage, data loss, decreased device performance, or other unforeseeable consequences.
	Not involving personal injury or equipment damage; usually serves as a supplementary explanation to key information in the main text.

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1 Safety Instructions

1.1 Statement

Before transportation, storage, installation, commissioning, use, and maintenance of the equipment, please carefully read this manual and strictly follow the operating instructions and safety markings on the equipment. Also, comply with the warnings and notices such as "Danger," "Warning," "Caution," and "Notice" throughout this manual. Please ensure adherence to applicable international, national, regional standards, and industry regulations.

This equipment must be used in an environment that meets the design requirements. Equipment failures, functional abnormalities, or component damages caused by unsuitable environmental conditions are not covered by the warranty. Borochi Climate Solutions GmbH shall not be liable for any personal injury or property damage resulting therefrom. All transportation, storage, installation, operation, and maintenance work must strictly comply with relevant laws, regulations, and standards.

Reverse engineering, decompilation, disassembly, modification, implantation, or other derivative operations on the equipment software are strictly prohibited. It is forbidden to explore the internal implementation principles of the equipment, obtain the software source code, infringe intellectual property rights in any way, or disclose any software performance test results.

Furthermore, Borochi Climate Solutions GmbH shall not be held responsible for damages caused by force majeure events such as earthquakes, floods, fires, wars, typhoons, extreme weather, or damages caused by unqualified personnel installation, operational errors, unauthorized disassembly, product modification, or improper third-party transportation and storage. Please assess all related risks before operation and strictly follow this manual and relevant standards.

1.2 Personal Safety



Power Off During Installation: Ensure the power supply is completely turned off during installation. Do not disconnect or connect cables while the system is energized, as sudden contact between cable cores and conductors can cause arcs or sparks, potentially leading to fire or personal injury.

Risks of Operating Under Power: Improper or unsafe operation on live equipment may result in fire, electric shock, or explosion, causing property damage, personal injury, or even death.

Remove Conductive Items: Before operating, remove all conductive items such as watches, bracelets, bangles, rings, and necklaces to prevent electric shock.

Use Dedicated Insulated Tools: Always use insulated tools that comply with local laws, regulations, standards, and guidelines during operation to prevent electric shock or short circuits.



Personal Protective Equipment: When operating, wear appropriate personal protective equipment such as protective clothing, insulated shoes, safety goggles, safety helmet, and insulated gloves to ensure personal safety.

General Requirements

1. Never disable any protective devices. Always pay close attention to all warnings, cautions, and relevant safety measures in this manual and on the equipment.
2. If a situation arises that could cause personal injury or equipment damage, immediately shut down the equipment and report to the supervisor, while taking necessary protective actions.
3. Do not energize the equipment before installation is complete and confirmed by qualified personnel.
4. Do not directly touch live equipment or use wet objects to contact energized parts. Always measure voltage at contact points before touching any conductive surfaces or terminals to ensure no risk of electric shock.
5. Do not touch the equipment while it is running; the casing may be hot and cause burns.
6. In case of fire, evacuate the building or equipment area immediately, activate the fire alarm system or call emergency services. Under no circumstances should anyone enter the fire-affected area.

Personnel Requirements

1. Personnel responsible for installation, operation, and maintenance must be thoroughly trained, familiar with all procedures and safety precautions, and aware of applicable local standards.
2. Only certified professionals or specially trained personnel are authorized to install, operate, maintain, dismantle safety devices, or inspect the equipment.
3. Personnel performing electrical work, work at heights, or handling special equipment must hold the qualifications required by local regulations.
4. Replacement of equipment components (including software) must be carried out solely by authorized professionals.
5. Only personnel who need to operate the equipment are permitted to access it, to prevent unauthorized interference.

1.3 Electrical Safety



Equipment Integrity Check: Before connecting cables, ensure the equipment is intact and undamaged. Failure to do so may result in electric shock or fire.

Grounding Requirements: For equipment requiring grounding, the grounding cable must be connected first during installation and disconnected last during disassembly.

Operation Risks: Improper or incorrect operation may cause fire or electric shock.



Prevent Foreign Objects Entry: Prevent foreign objects from entering the equipment during operation. Otherwise, this may cause short circuits, equipment damage, reduced load capacity, power failures, or personal injury.

⚠ CAUTION

Cable Routing Location: Do not route cables near the equipment's air intake or exhaust vents.

NOTICE

Wiring Specifications: During the installation of PV strings and inverters, improper installation or routing of power cables may cause the positive or negative terminals of the PV strings to short circuit to ground. This may result in AC or DC short circuits and damage to the inverter. Such damage is not covered by warranty.

General Requirements

1. Installation, operation, and maintenance must be carried out in accordance with the procedures described in this document. Do not modify, alter, add components to the equipment, or change the installation sequence without authorization.
2. Approval from the relevant authorities or the power company must be obtained before connecting the equipment to the power grid.
3. Temporary barriers or warning tapes should be installed around the work area to prevent unauthorized access.
4. Before installing or removing power cables, ensure that the equipment switches and all upstream and downstream switches are turned off.
5. Inspect all tools to ensure they meet requirements before working on the equipment, and keep a record of them. After completing the work, collect and organize all tools to prevent them from being left inside the equipment.
6. Before installing power cables, verify that the cable labels are correct and that the cable terminals are properly insulated.
7. When installing the equipment, use torque tools with an appropriate range to tighten screws. When using a wrench, ensure it is properly aligned and that the torque deviation does not exceed 10% of the specified value.
8. If the equipment has multiple input sources, disconnect all input power sources and wait until the equipment is fully powered down before performing any work.
9. Before maintaining downstream electrical or distribution devices, switch off the output breakers on the power supply equipment.
10. During maintenance, attach "Do Not Close" tags or warning signs near upstream and downstream switches or circuit breakers to prevent accidental re-energizing. The equipment may only be powered on again after the fault has been fully resolved.
11. Do not open the equipment panels.
12. Regularly inspect all equipment connections to ensure that all screws are securely tightened.
13. Only certified professionals are permitted to replace damaged cables.
14. Do not write on, damage, or cover any labels or nameplates on the equipment. Replace worn or damaged labels promptly.
15. Do not clean electrical components inside or outside the equipment with water, alcohol, oil, or other solvents.

Grounding

1. Ensure the equipment's grounding impedance complies with local electrical standards.
2. Before operating the equipment, inspect to ensure reliable grounding.
3. Do not perform any work on the equipment unless the grounding conductor is properly installed.
4. Do not damage the grounding conductor.

Wiring Requirements

1. When selecting, installing, and routing cables, follow local safety regulations and rules.
2. When routing power cables, ensure that there is no coiling or twisting. Do not join or weld power cables. If necessary, use a longer cable.
3. Ensure that all cables are properly connected and insulated, and meet specifications.
4. Ensure that the slots and holes for routing cables are free from sharp edges, and that the positions where cables are routed through pipes or cable holes are equipped with cushion materials to prevent the cables from being damaged by sharp edges or burrs.
5. Ensure that cables of the same type are bound together neatly and straight and that the cable sheath is intact. When routing cables of different types, ensure that they are away from each other without entanglement and overlapping.
6. Secure buried cables using cable supports and cable clips. Ensure that the cables in the backfill area are in close contact with the ground to prevent cable deformation or damage during backfilling.
7. If the external conditions (such as the cable layout or ambient temperature) change, verify the cable usage in accordance with the IEC-60364-5-52 or local laws and regulations. For example, check that the current-carrying capacity meets requirements.
8. When routing cables, reserve at least 30 mm clearance between the cables and heat-generating components or areas. This prevents deterioration or damage to the cable insulation layer.

1.4 Environment Requirements



Do Not Operate in Hazardous Environments: Do not install, operate, or service the equipment in environments containing flammable or explosive gases or vapors. The equipment must not be exposed to such hazardous conditions.

Keep Away from Hazardous Materials: Do not store any flammable or explosive substances near the equipment.



Avoid Heat Sources Near the Equipment: Do not install or place the equipment near heat sources or open flames such as cigarettes, candles, electric heaters, or other heating devices. Overheating may damage the equipment or cause a fire.



Ensure Proper Ventilation: To prevent overheating, equipment damage, or fire, do not block or cover the equipment's ventilation openings during operation. Ensure unobstructed airflow is always

maintained.

Prevent Liquid Ingress: Install the equipment in areas away from liquids. Do not install the equipment near water pipes, exhaust vents, air conditioning outlets, ventilation ducts, or cable entry points where condensation or water leakage may occur. Ensure that no liquids enter the equipment to prevent short circuits or malfunctions.

General Requirements

1. Store the equipment properly according to the instructions in this manual. Damage caused by improper storage conditions is not covered under warranty.
2. The installation and operating environment must be maintained within the specified temperature and humidity ranges; otherwise, equipment performance and safety may be affected.
3. Do not install the equipment in environments containing dust, smoke, volatile or corrosive gases, infrared or other radiation, organic solvents, or salt-laden air.
4. Do not install the equipment in environments with conductive metallic dust or magnetic particles to prevent electrical faults or system interference.
5. Do not install the equipment in damp areas that promote the growth of mold, fungi, or other microorganisms.
6. Do not install the equipment in areas subject to strong vibration, loud noise, or electromagnetic interference.
7. The equipment must be installed on a firm and stable foundation; avoid soil types like soft or loamy soil that are prone to settling.
8. Do not install the equipment in low-lying areas where water or snow may accumulate, as this can cause moisture damage or freezing.
9. Do not install the equipment outdoors in areas affected by salt spray, as this may cause corrosion and damage.
10. During installation, operation, or maintenance, always clear any water, ice, snow, or foreign objects from the top of the equipment before opening it to prevent foreign material from entering the interior.
11. After installation is complete, promptly remove all packaging materials such as cartons, foam, plastic, and cable ties from the equipment area to maintain a clean and safe environment.

1.5 Mechanical Safety

WARNING

Handling Safety: Wear personal protective equipment (such as gloves and safety shoes) during handling. Arrange the number of personnel reasonably according to the weight. When using mechanical handling equipment, ensure the device is securely fixed, the forklift tines are properly positioned, and assign a dedicated person to supervise.

CAUTION

Preparation of Qualified Tools: Ensure all necessary tools are intact and have passed professional inspection. Do not use damaged tools, tools that fail inspection, or tools beyond their inspection validity period.

Prohibition of Drilling: Drilling on the equipment is strictly prohibited to avoid damaging the sealing and electromagnetic shielding, which may cause short circuits in internal components and circuit boards.

General Requirements

1. If paint is scratched during equipment transport or installation, repair the paint promptly. Equipment with scratches must not be exposed outdoors for extended periods.
2. Arc welding, cutting, or similar operations on the equipment are strictly prohibited without prior evaluation and approval by the company.
3. Installation of any additional devices on top of the equipment is forbidden without prior company evaluation.
4. Use appropriate tools and operate them according to the correct procedures.
5. Exercise caution when handling heavy objects to prevent injuries.
6. When moving heavy items, maintain balanced force and proceed at a steady, slow pace. Place objects down gently and steadily to avoid collisions, drops, surface scratches, or damage to components and cables.
7. Equipment transport may be conducted via sea, land, or air. Avoid tilting or excessive jolting during transport.
8. When performing elevated work on live equipment, use wooden or insulated ladders to ensure safety.
9. It is recommended to use platform ladders equipped with guardrails for elevated tasks.
10. Before using ladders, inspect their structural integrity and load capacity; overloading is strictly prohibited.
11. Lifting operations must be performed only by trained and certified personnel.
12. Temporary warning signs or barriers should be installed to isolate the lifting area and ensure safety.
13. The foundation at the lifting site must meet load-bearing requirements to guarantee the stability and safety of the equipment.

2 Introduction

2.1 Basic Information

The BoroChi BHW Series (BRH010~015KH-B1) is a three-phase high-voltage hybrid inverter that integrates both grid-connected and energy storage control functions. It supports efficient coordination among photovoltaic (PV) systems, energy storage, and the utility grid. Equipped with Emergency Power Supply (EPS) and Uninterruptible Power Supply (UPS) functions, the system can automatically switch to off-grid mode during a power outage and provide continuous power to inductive critical loads within less than 10 milliseconds, ensuring power stability and reliability. It is ideal for residential and small commercial applications, supporting diversified energy management needs such as self-consumption, surplus energy storage, and emergency power supply.

System Advantages

1. Integrated grid-tied and off-grid control with flexible multi-mode operation
2. Advanced Digital Signal Processor (DSP) technology for enhanced system response and control precision
3. High-efficiency power components, with maximum efficiency up to 98% and European efficiency up to 97.3%
4. Total Harmonic Distortion (THD) < 3%, ensuring high-quality power output
5. Transformerless design with comprehensive software and hardware protection for enhanced safety and reliability
6. Output power limiting supported (via smart meter or demand response mode 0)
7. Adjustable power factor to meet various load requirements
8. Fast EPS/UPS switching capability for uninterrupted supply to critical loads
9. IP66 protection rating, suitable for both indoor and outdoor installations
10. LED status indicators and an LCD screen with four touch buttons for intuitive human-machine interaction
11. Remote monitoring and system management via PC for improved operation and maintenance efficiency

2.2 Model Description

This document covers three product models, using BRH010KH-B1 as an example for illustration.

BR H 010K H – B 1

Character	Meaning	Description
BR	BoroChi	Brand
H	Hybrid	Inverter Type
010K	10kW	Power

H	High Voltage	Battery Voltage Type
B	Three-Phase	Phase Type
1	1st Generation	Generation

2.3 Label Descriptions

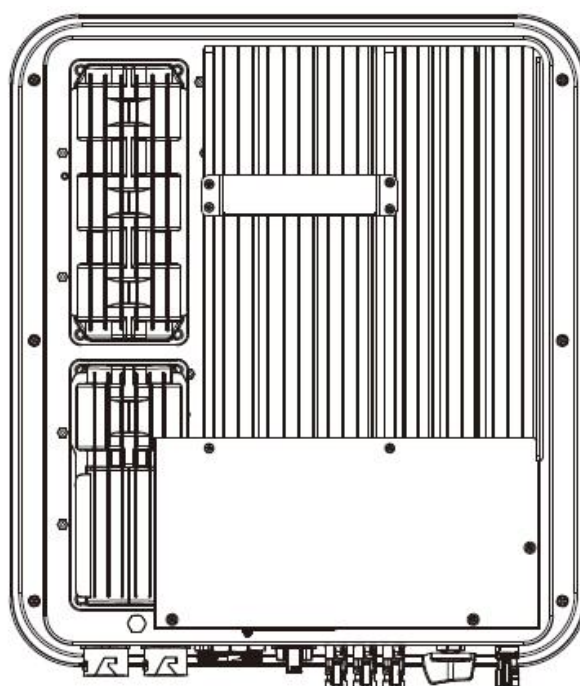
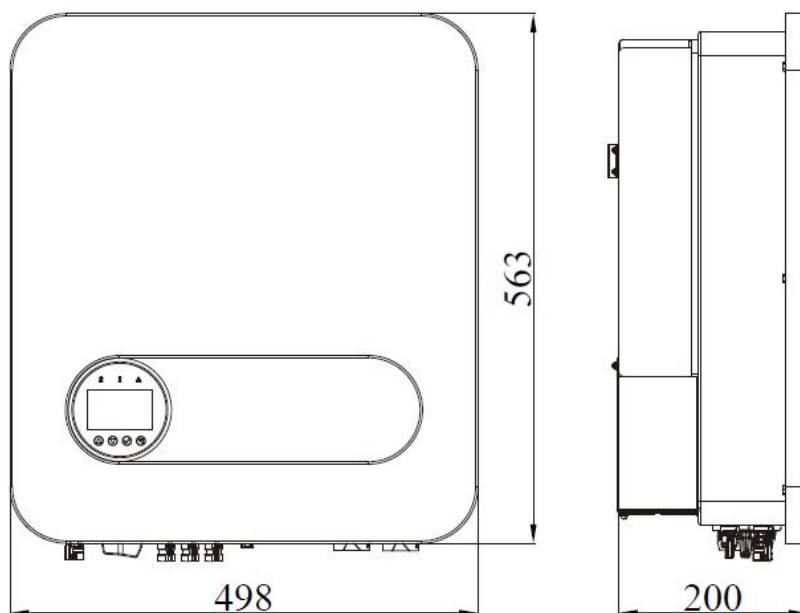
Please always pay close attention to the safety-related labels on the device. Carefully read and fully understand the meaning of these labels. Safety warning labels must not be removed. The symbols and their meanings are shown below:

Label	Description
	CE Mark: The product complies with the requirements of the CE Directives.
	UKCA Mark: The product complies with the requirements of the UKCA Directives.
	Beware of Hot Surface: The product may become hot during operation. Avoid contact while operating.
	High Voltage Danger: High voltage exists inside the inverter and may cause life-threatening hazards!
	Danger: Risk of electric shock!
	Residual Voltage Hazard: Residual voltage remains inside the inverter after shutdown; a 5-minute discharge period is required.
	Follow the instructions in the enclosed documentation.
	The inverter must not be disposed of with household waste. Disposal information can be found in the enclosed documentation.

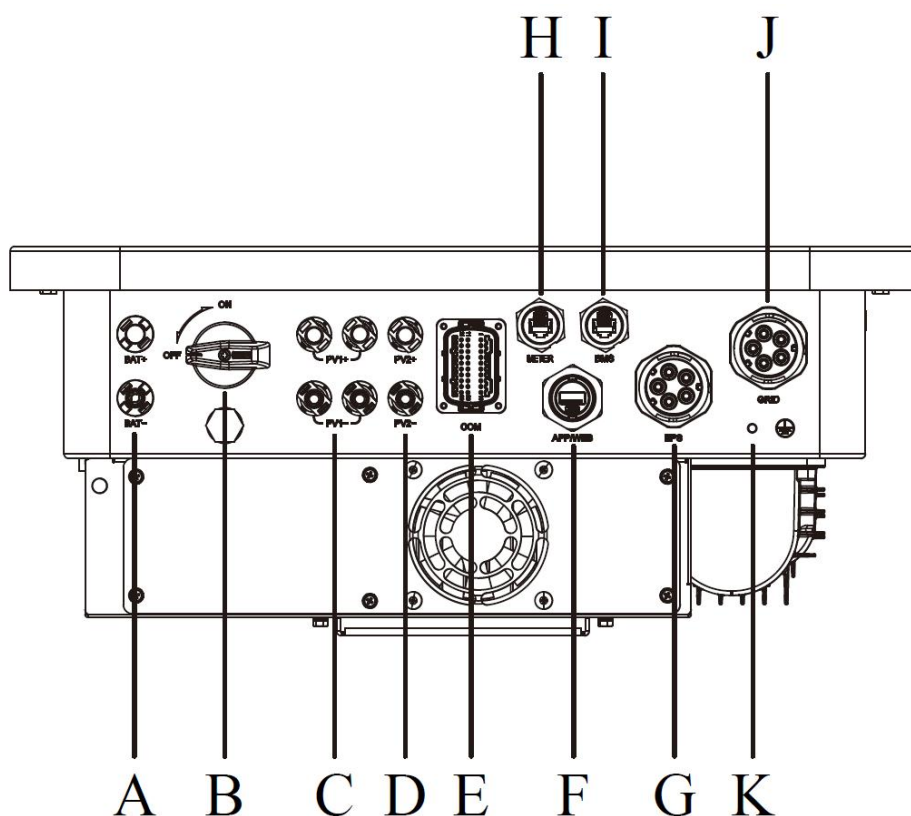
	PE conductor terminal
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2.4 Appearance

Dimensions



Terminals

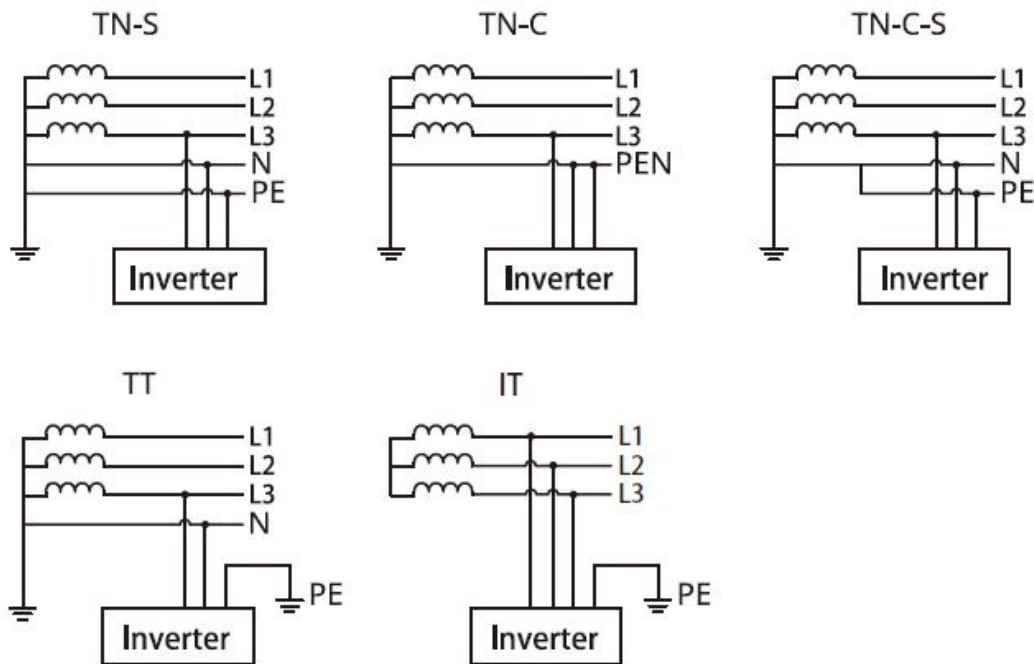


A	Battery connection port
C	DC switch
E	PV1 connection port
G	PV2 connection port
I	COM port
K	USB port

B	EPS port
D	Meter port
F	BATTERY BMS port
H	Grid port
J	Grounding port

2.5 Applicable Grid Types

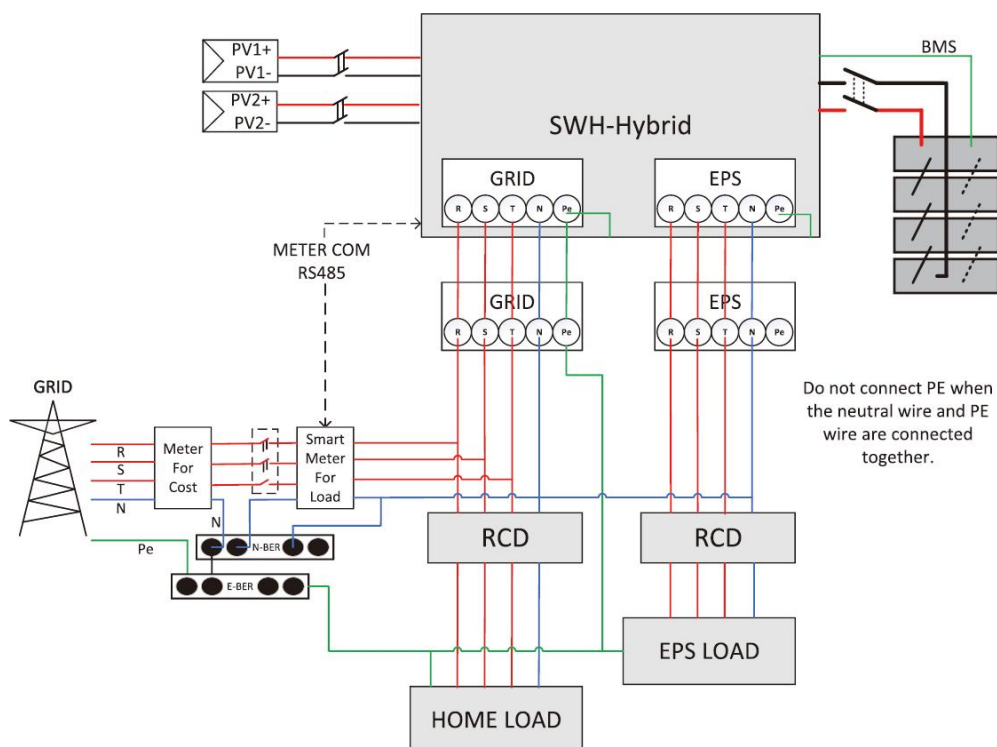
The Borochi BHW series hybrid inverters are compatible with the following grid types: TN-S, TN-C, TN-C-S, TT, and IT grounding systems.”



Australia, New Zealand, South Africa, and Other Countries

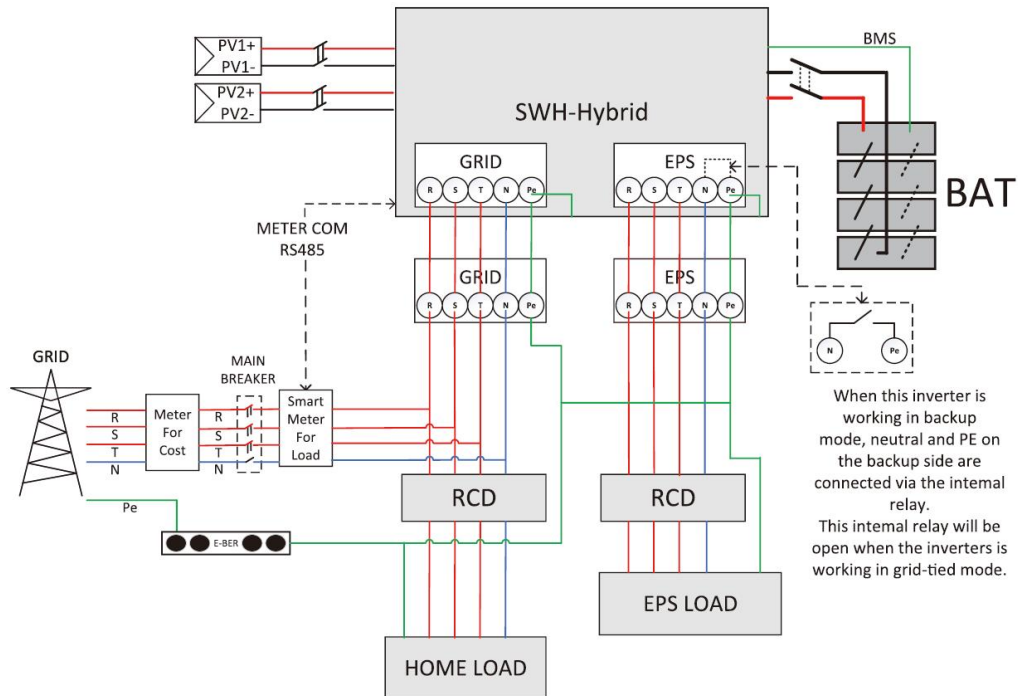
In countries such as Australia, New Zealand, and South Africa, it is typically required to connect the neutral line (N) to the protective earth (PE) within the distribution box.

Note: According to Australian safety standards, the neutral lines on both the grid side and the backup side must be connected together. Otherwise, the backup power function will not operate. Please comply with local wiring regulations.



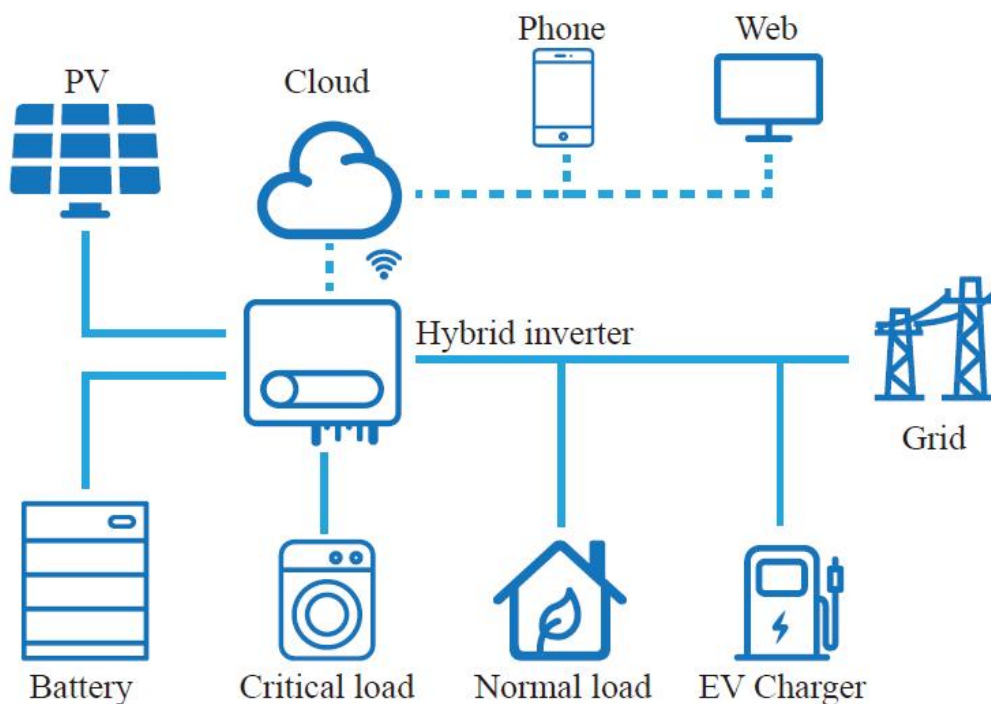
China, Germany, Czech Republic, Italy, and Other Countries

In countries such as China, Germany, the Czech Republic, and Italy, it is required that the neutral (N) and protective earth (PE) conductors be wired separately within the distribution box.



2.6 Work Modes

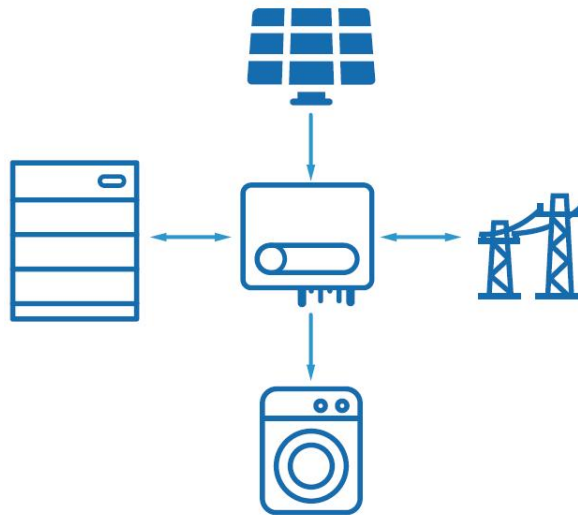
Overview Diagram



Mode 1: Self-Use Mode

Supply Priority: PV>Battery>Grid

Load Priority: Household Loads>Battery>Grid



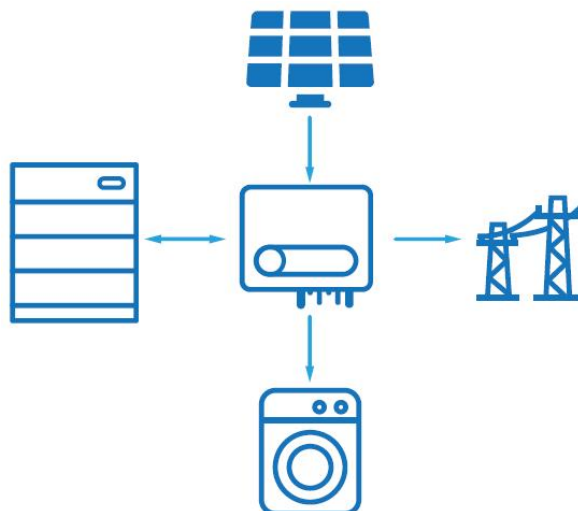
During daylight hours with sufficient sunlight (clear weather), solar photovoltaic (PV) power is first supplied to meet household loads. Any surplus PV energy is used to charge the battery. If there is excess electricity remaining, it is exported to the grid for power trading (with an export limit power value setting).

In the event of insufficient sunlight during the day (cloudy/rainy/snowy weather), electricity required beyond what the PV system can provide is primarily sourced from discharging the battery. If additional power is still needed, it is supplemented by purchasing electricity from the grid.

Mode 2: Feed-in Mode

Supply Priority: PV>Battery>Grid

Load Priority: Household Loads>Grid>Battery



During daytime with sufficient sunlight (clear weather), solar photovoltaic (PV) generation first supplies electricity to meet household loads. Any surplus PV energy is exported to the grid for power trading (with an anti-reverse power setting).

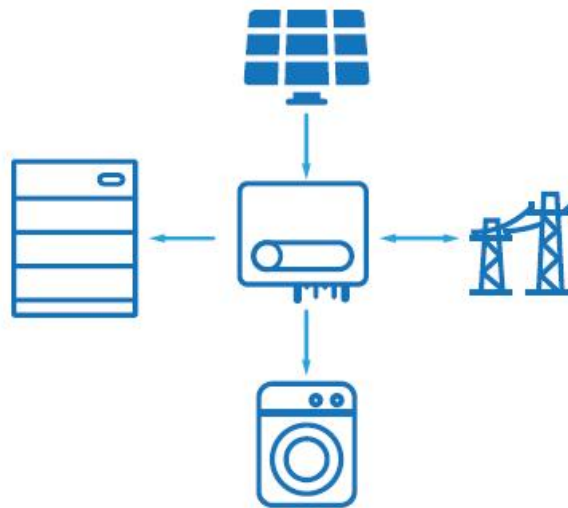
In case of insufficient sunlight during the day (cloudy/rainy/snowy weather) , electricity needed for household loads beyond what the PV system can provide is primarily sourced from discharging the battery. Surplus battery power is exported to the grid for power trading. If the battery discharge rate cannot meet load demands, electricity is then purchased from the grid to supplement.

The power generated by the PV system will first supply the loads. Any surplus will be fed into the grid, with the remaining power then used to charge the battery.

Mode 3: Back-Up Mode

Supply Priority: PV>Grid

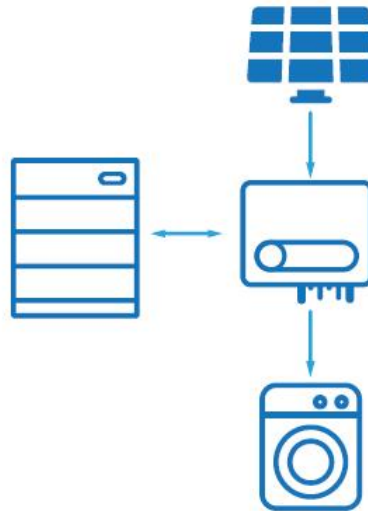
Load Priority: Battery>Household Loads>Grid



During daylight hours with sufficient sunlight (clear weather) , solar photovoltaic (PV) generation first charges the battery up to its maximum charging capacity. Any surplus electricity after achieving maximum charge is then used to supply household loads. If the PV system cannot meet the full electricity demand of the loads, electricity is supplemented by purchasing from the grid.

In case of insufficient sunlight during the day (cloudy/rainy/snowy weather) , all PV generation is directed towards charging the battery. Any shortfall in the required charging power for the battery is supplemented by purchasing electricity from the grid. Household loads are powered directly from the grid.

Mode 4: Off-Grid Mode



In the event of grid abnormalities or power outage, causing the inverter to enter Off-Grid mode. EPS loads are powered by both solar PV and the battery simultaneously. Solar PV generation first satisfies the load requirements. Any surplus solar energy is used to charge the battery.

If solar PV output fluctuates and is insufficient to support the load, the battery quickly discharges to support the load.

Tips: A pure solar PV input system cannot enter Off-Grid mode. It requires a reliable battery connection with a minimum State of Charge (SOC) requirement for energy storage systems to operate in Off-Grid mode. Different battery combinations provide varying EPS load capacities, with detailed information provided in the manual.

Notice: In the power station state, if the battery power is too high or too low, the error of bat invalid will appear.

Note: Charging time is when the battery is charged within the set time range. The setting of charging time can be used in the above work modes. The charging period is mainly used to set the charging time from the power grid to the battery.

3 Installation



Keep Away from Flammable and Explosive Materials: Do not install the inverter on flammable surfaces or in locations where flammable or explosive materials are stored.



Risk of High Temperature Burns: The inverter's enclosure and heat sink can become extremely hot during operation. Avoid installing the inverter in areas where it may be accidentally touched.



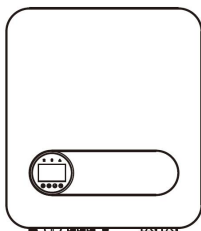
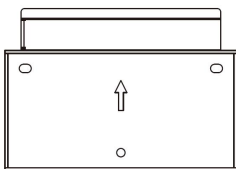
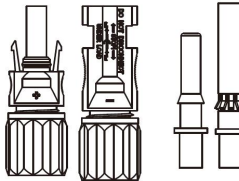
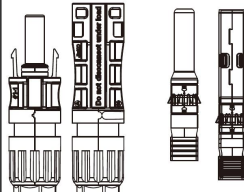
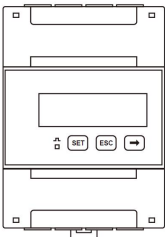
Handling and Installation Precautions: When transporting and handling the inverter, its weight must be taken into account. Select a suitable installation location and surface. At least two people are required during the installation process.

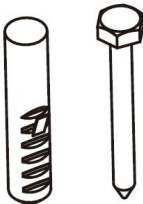
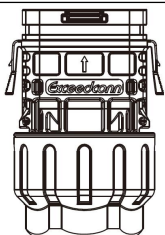
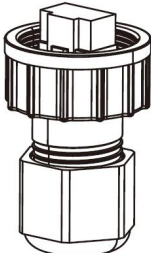
3.1 Check for Transport Damage

After transportation, check the inverter to ensure it is in good condition. If you notice any visible damage, such as cracks or deformation, please contact your distributor or dealer immediately.

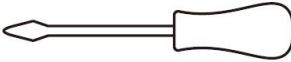
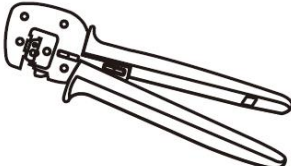
3.2 Packing List

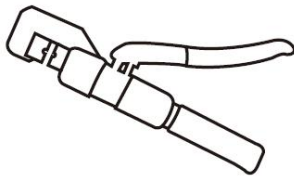
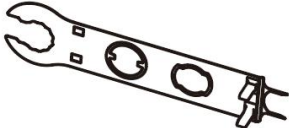
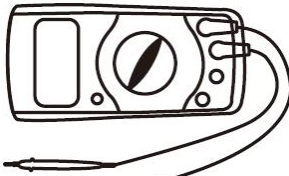
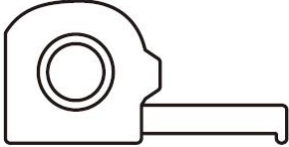
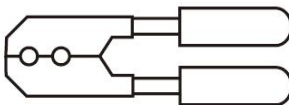
Open the package and take out the product, please check the accessories first. The packing list is shown below.

				
Inverter	Bracket	PV connector×3	Battery connector	AC connector
				
AC connector (yellow)	Smart meter	User Manual	Certificate of conformity	Factory Inspection Report

				
Expansion tube×3 Expansion screw×3	Phillips screw	Communication connector	Data logger	OT terminal
				
RJ45×2				

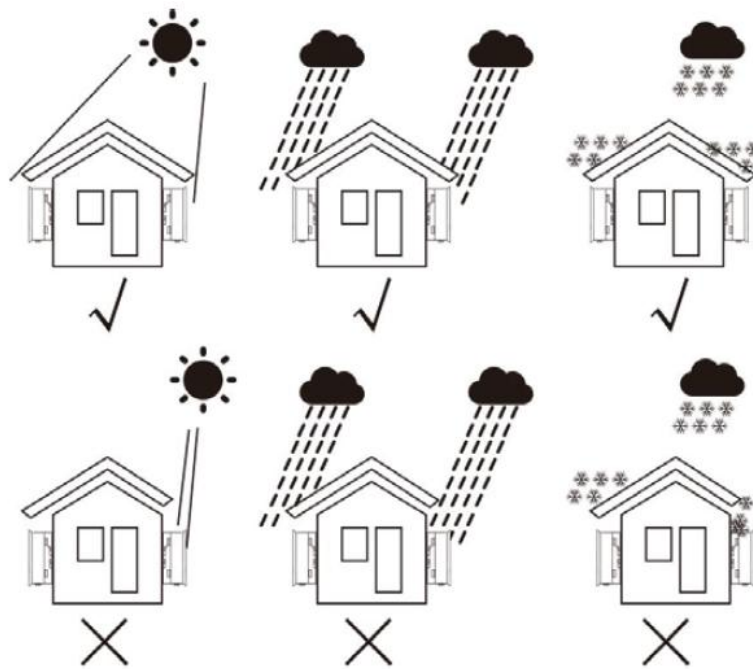
3.3 Tool Preparation

Number	Tool	Description	Function
1		Hammer drill (Recommended 6 mm drill bits)	Punching holes in the wall and installing the bracket
2		Spirit level	Ensure that the bracket is mounted horizontally
3		Marker pen	Marking of perforation positions
4		screwdrivers	Remove mounting screws and wiring
5		PV terminal crimping tool	Crimp PV

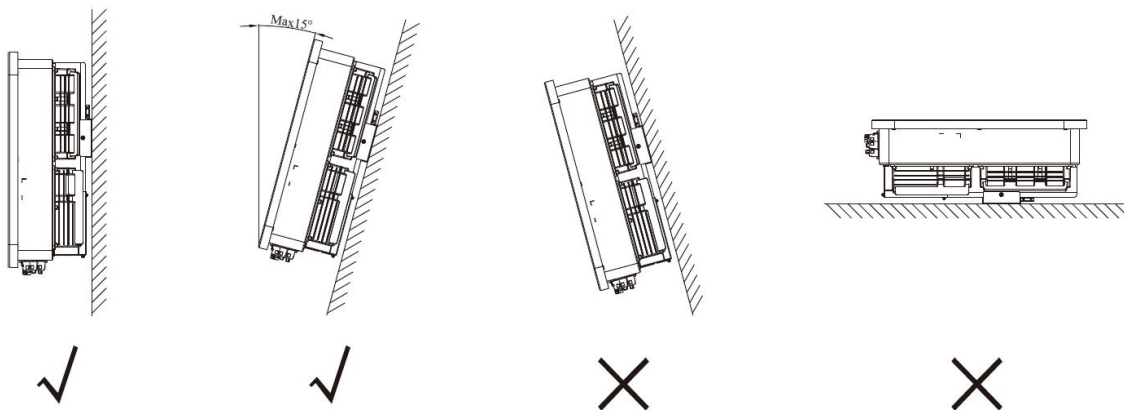
6		Wire stripper	wire stripping
7		PV Wrench	Remove PV terminal
8		Multimeter	Check that the PV± pole, AC wiring is correct and grounding is reliable.
9		tape rule	measuring distance
10		Network cable crimper	Tools for crimping network cables

3.4 Installation Environment

1. The hybrid inverter operates optimally when the ambient temperature is not higher than 45°C .
2. The mounting height should preferably be parallel to the line of sight for ease of operation and maintenance.
3. The installation environment of the hybrid inverter should be far away from flammable and explosive materials and ensure that there is no strong electromagnetic interference equipment around.
4. The parameter labels and warning signs must be clearly visible after the hybrid inverter is installed.
5. When installing the hybrid inverter, ensure it is protected from sunlight, rain, and snow during operation.
6. The inverter should be installed in a location out of reach of children.
7. The inverter weighs 28-29 kg. Please ensure the installation wall can support this weight.
8. In residential areas, do not install the inverter on drywall or similar materials to prevent notice-able noise during product operation.



Install the hybrid inverter at a maximum back tilt of 15 degrees, the hybrid inverter can not be tilted forward, inverted, excessive back tilted or side tilted.

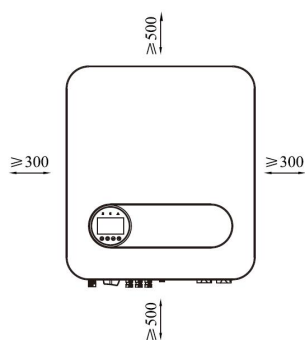


3.5 Installation Space Requirements

⚠ CAUTION

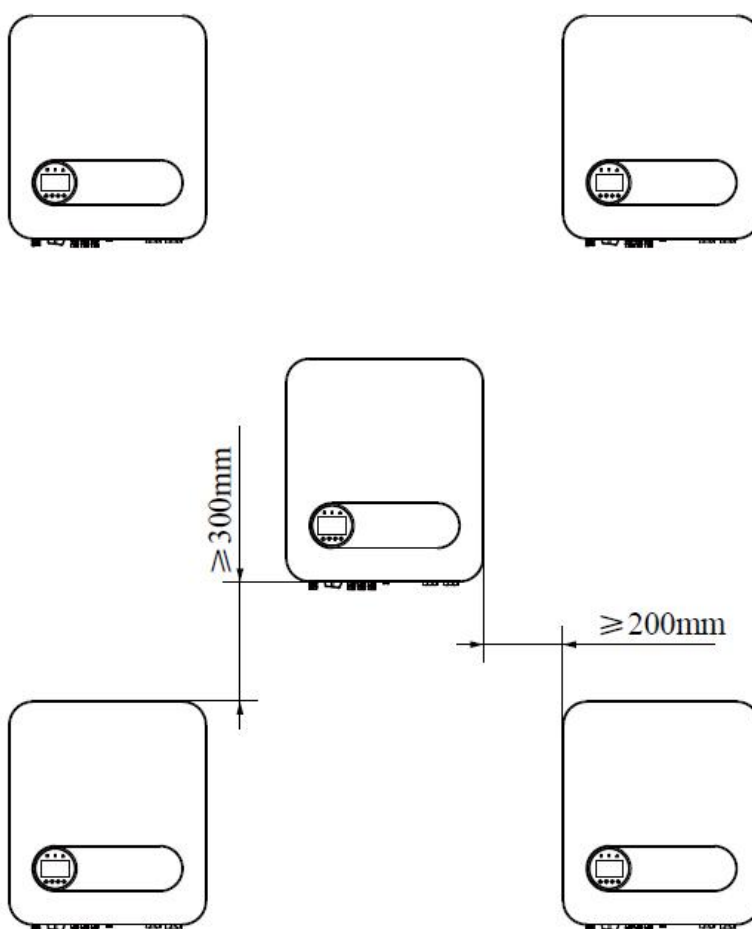
Always ensure that the inverter's cooling system and ventilation openings remain unobstructed to prevent overheating or abnormal operation.

Considering heat dissipation and ease of disassembly, as well as ensuring sufficient space around the hybrid inverter for ventilation, the minimum distance around the hybrid inverter should not be less than the following values.

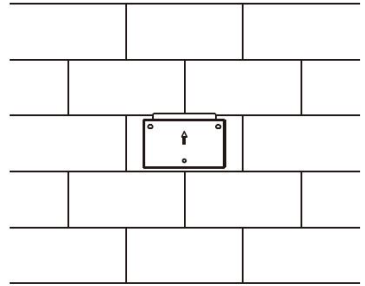
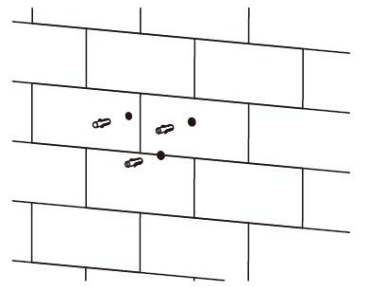
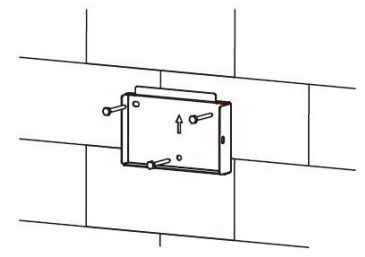
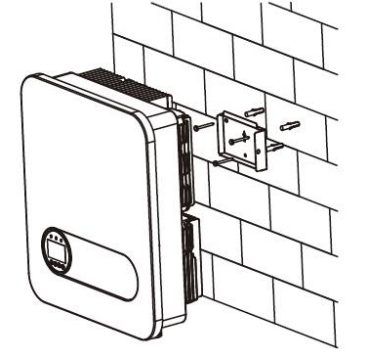


Position	Min Distance
Left	300mm
Right	300mm
Top	500mm
Bottom	500mm

When installing multiple inverters, a certain spacing should be reserved between the inverters. The recommended installation method is the herringbone shape as follows.



3.6 Installation

Procedure		
Step 1	Place the bracket at the installation point and use a level to adjust it to a horizontal angle. Mark the drilling positions with a marker.	
Step 2	Drill holes in the wall using a hammer drill. Ensure the drill is held perpendicular to the wall, and make the holes slightly deeper than the length of the plastic expansion anchors.	
Step 3	Carefully hammer the expansion anchors into the drilled holes, and then secure the bracket with expansion screws.	
Step 4	Lift the hybrid inverter onto the bracket, ensuring the grooves align properly. Secure the hybrid inverter to the bracket with screws.	

4 Electrical Connections

DANGER

PV Array Energization Warning: When exposed to sunlight, the PV array supplies DC voltage to the inverter. Before connecting the cables, make sure the DC switch on the inverter is in the OFF position. Failure to do so may result in electric shock or fatal injury due to high voltage.

WARNING

Precautions During Cable Preparation: Wire stripping, cutting, and other cable preparation work should be carried out away from the device to prevent cable debris from entering the equipment. Debris may cause electrical sparks, leading to personal injury or equipment damage.

Personnel Qualification Requirements: Only qualified electricians are permitted to perform electrical connections and related operations. Unauthorized personnel are strictly prohibited from performing such work.

Personal Protective Equipment Requirements: During cable connection, operators must wear appropriate personal protective equipment, including insulated gloves, safety glasses, and safety shoes, to ensure personal safety.

CAUTION

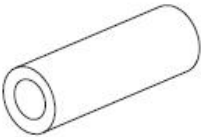
Cable Tension and Connection Quality: Before connecting the cables, allow adequate slack for each cable to reduce tension and prevent poor contact or equipment failure caused by excessive pulling force.

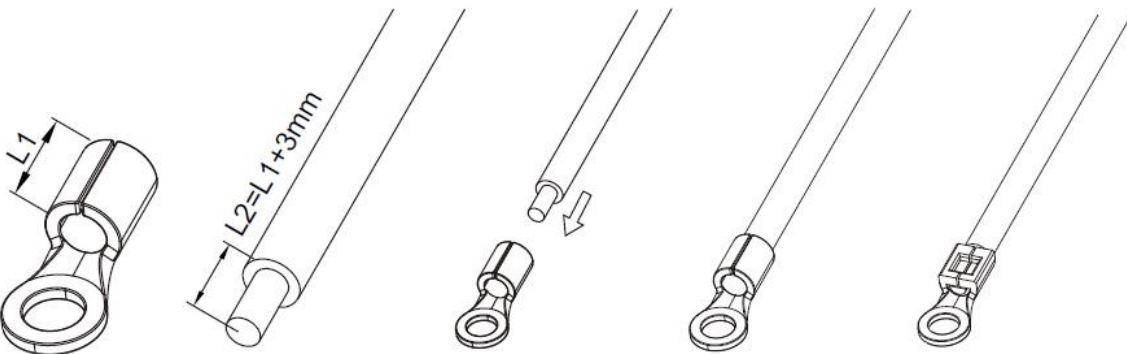
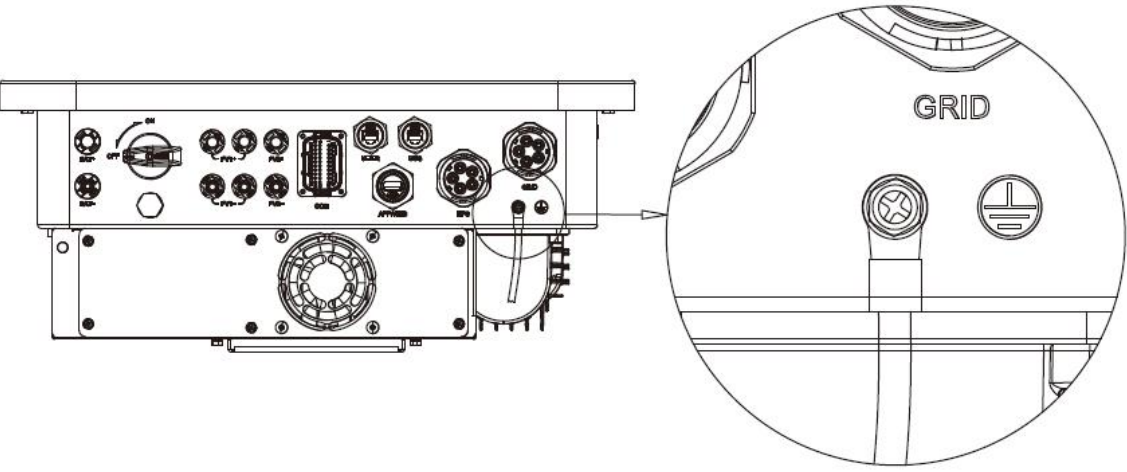
Firefighting Equipment Requirements: The installation site must be equipped with appropriate firefighting equipment, such as dry sand, dry powder extinguishers, or carbon dioxide extinguishers, to handle fire emergencies.

NOTICE

Warranty Scope Statement: Damage caused by incorrect cable connections is not covered under the product warranty. Please strictly follow the user manual for electrical connections.

4.1 Grounding Connection

Procedure			
Step 1	Prepare a one-core cable (4-6 mm ²) and then find the ground terminal in the accessories.		
			
	one-core cable (4~6 mm ²)	Phillips screw	OT terminal

Step 2	Strip the grounding cable insulation (length" L2), insert the stripped cable into the ring terminal, and then clamp it. 
Step 3	Find the ground connection port on the hybrid inverter, and screw the ground wire on the hybrid inverter. 

4.2 PV Connection



DANGER

Before connecting the photovoltaic (PV) strings, ensure that the DC switch is in the off position.



CAUTION

Ensure that the polarity of the PV strings matches that of the DC connectors; otherwise, the hybrid inverter may be damaged.

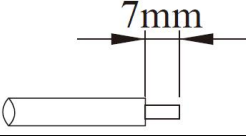
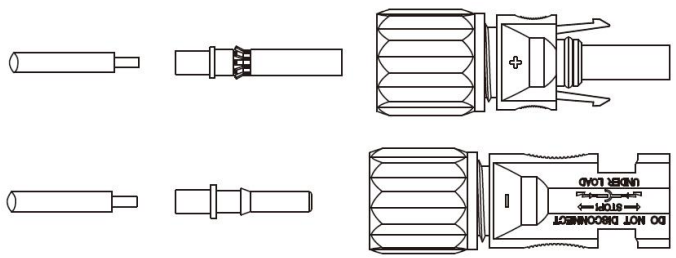
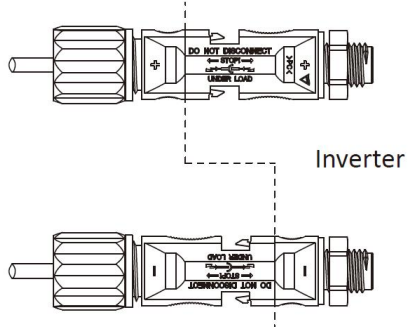
Ensure that under no circumstances does the open-circuit voltage of the PV strings exceed the hybrid inverter's maximum input voltage of 1100V.

The positive and negative terminals of the PV strings must not be connected to the PE (ground) line, as this will cause damage to the hybrid inverter.

Recommended Cable Specifications

Inverter Model	BRH010KH-B1	BRH012KH-B1	BRH015KH-B1
Recommended Cable	4mm ²	4mm ²	4mm ²

Wiring

Procedure	
Step 1	Turn off the DC switch, connect the PV module, prepare a 4mm ² PV cable, and trim 7mm of insulation from the wire end. 
Step 2	Separate the DC connector (PV) as below. 
Step 3	Insert the stripped cable into the pin contact, ensuring all conductor strands are fully enclosed within the pin contact.
Step 4	Use a crimping tool to crimp the pin contact. Place the pin contact with the stripped cable into the appropriate slot of the crimping tool and crimp it securely.
Step 5	Insert the pin contact through the cable nut to secure it into the back of the male or female plug. A "click" sound or tactile Inverter feedback indicates that the pin contact is properly seated. 
Unlock	Unlock the DC connector. Use the specified wrench tool. When separating the DC+ connector, push the tool down from the top. When separating the DC-connector, push the tool down from the bottom. Separate the connectors by hand.

4.3 Battery Connection

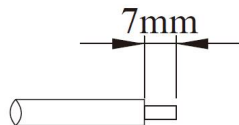
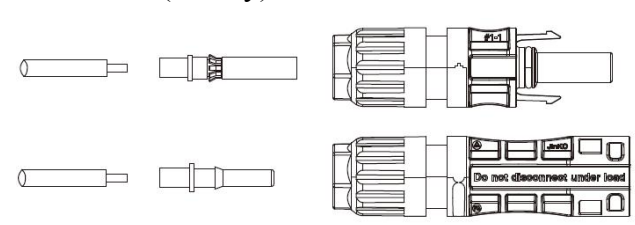
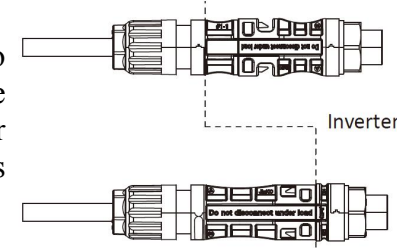

DANGER

Batteries deliver electric power, resulting in burns or a fire hazard when they are short circuited, or wrongly installed.

Lethal voltages are present at the battery terminals and cables connecting to the inverter. Severe injuries or death may occur if the cables and terminals in the inverter are touched.

Recommended Cable Specifications

Inverter Model	BRH010KH-B1	BRH012KH-B1	BRH015KH-B1
Recommended Cable	6 mm ²	6 mm ²	6 mm ²

Procedure	
Step 1	Turn off the DC switch, connect the PV module, prepare a 6 mm² BAT cable, and trim 7mm of insulation from the wire end. 
Step 2	Separate the DC connector (battery) as below. 
Step 3	Insert the stripped cable into the pin contact, ensuring all conductor strands are fully enclosed within the pin contact.
Step 4	Use a crimping tool to crimp the pin contact. Place the pin contact with the stripped cable into the appropriate slot of the crimping tool and crimp it securely.
Step 5	Insert the pin contact through the cable nut to secure it into the back of the male or female plug. A "click" sound or tactile Inverter feedback indicates that the pin contact is properly seated. 
Unlock	Unlock the DC connector Use the specified wrench tool. When separating the DC +connector, push the tool down from the top When separating the DC-connector, push the tool down from the bottom. Separate the connectors by hand.

4.4 Grid and EPS (Off-grid) Connection



DANGER

High voltage may be present in inverter! Ensure all cables are voltage-free before electrical connection. Do not connect the AC circuit breaker until all inverter electrical connections are completed.

WARNING

Do not connect any local load between the inverter and the AC circuit breaker.

Multiple inverters cannot share one AC circuit breaker.

CAUTION

AC circuit breakers should be installed on the output side of the inverter and the grid side to ensure safe disconnection from the grid.

Determine whether an AC circuit breaker with greater overcurrent capacity is required based on actual conditions.

Recommended Specifications

Inverter Type	BRH010KH-B1	BRH012KH-B1	BRH015KH-B1
Recommended Grid-side Cable	4.0-6.0mm ²	6.0-10.0mm ²	6.0-10.0mm ²
Recommended EPS-side Cable	4.0-6.0mm ²	6.0-10.0mm ²	6.0-10.0mm ²
Miniature Circuit Breaker Rated Current	25A	40A	40A

Description of Common Loads for Emergency Power Supply

1. In emergency power supply (EPS) mode, if inductive loads are to be connected to the EPS port, please ensure that the instantaneous power at startup is lower than the maximum output power of the EPS mode.
2. Single-pole loads are not supported.
3. Half-wave loads are not supported.
4. For certain motor loads, the starting current may greatly exceed the rated current (by more than 5 times); therefore, motor loads are also not supported.

Neutral and Protective Earth Wiring Requirements

Australia, New Zealand, South Africa, and other countries



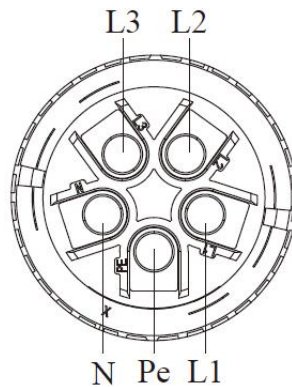
Diagram A: N line and PE line together wiring

China, Germany, Czech Republic, Italy, and most other countries



Diagram B: N line and PE line separate wiring

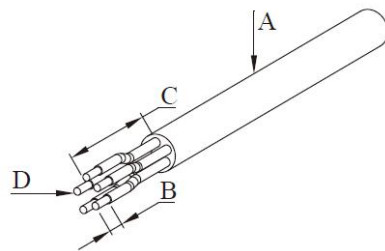
Wiring



Procedure

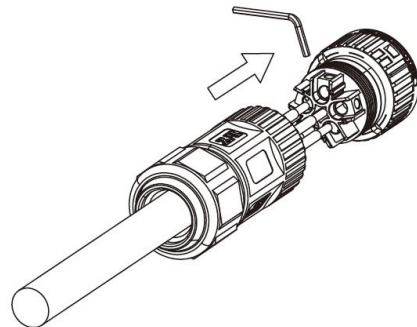
Step 1 Prepare a Grid cable and an EPS (Off-grid) cable.

Step 2 Strip the wires with wire strippers according to the diagram below.

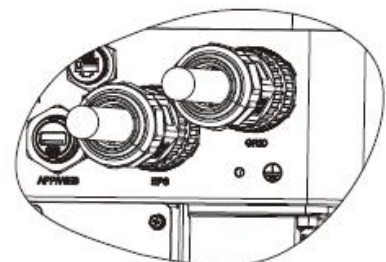
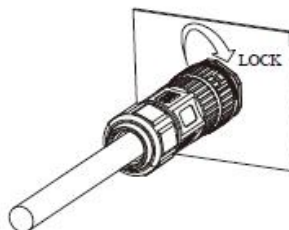
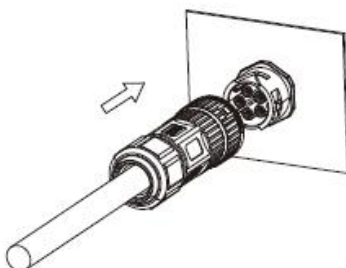


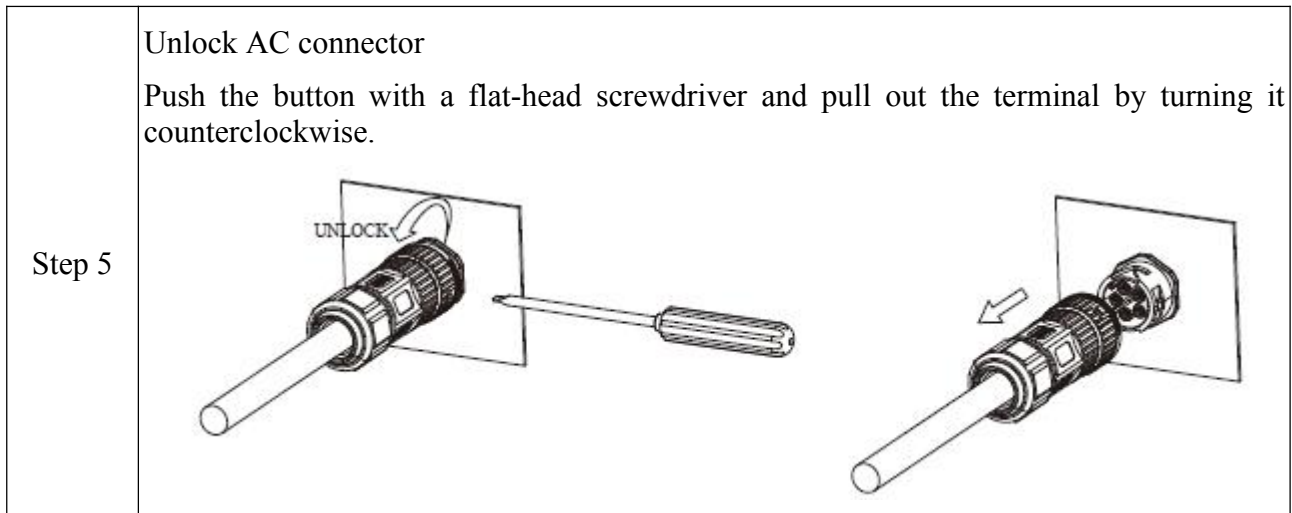
Number	Requirement
A	15-20mm
B	16mm
C	50mm
D	4-10mm ²

Step 3 Put the AC cable through the terminal nut and sheath, then insert it into the corresponding numbered terminal and secure it tightly.



Step 4 Align both ends of the terminal with the bayonet catch, then push them together and rotate clockwise. A clicking sound will indicate a successful connection.

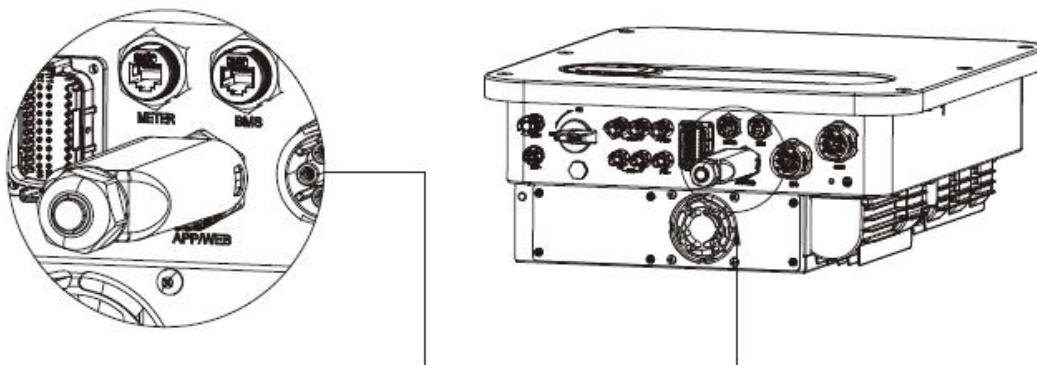




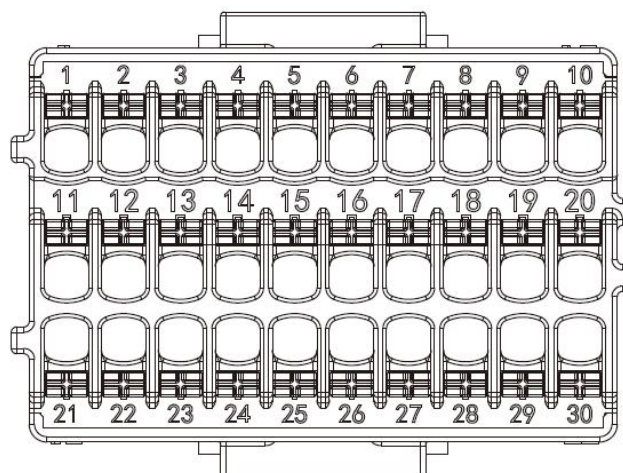
4.5 Communication Connection

APP/WEB Connection

The USB data interface is primarily used to connect a Data logger.



COM Definition

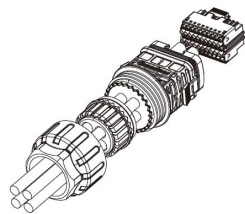
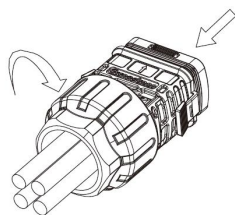
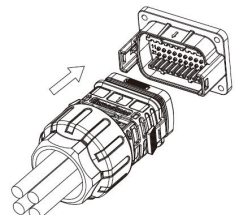


PIN	1	2	3	4	5	6
External interface	IL2+	IL2-	ILI-	IL3+	IL1+	IL3-
Definition	External CT sampling					

PIN	16	17	18	19	20
External interface	COM/LOADO	DRM4/8	DRM3/7	DRM2/6	DRM1/5
Definition	DRM				

PIN	21	22	23	24
External interface	RS485+_Parallel	RS485+_Parallel	RS485-_Parallel	RS485-_Parallel
Definition	Inverter Parallel Interface			

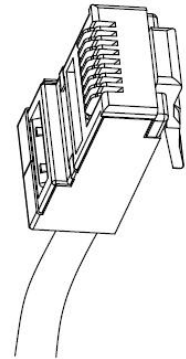
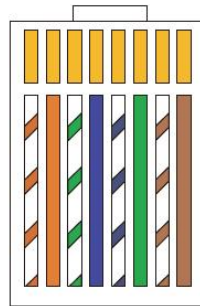
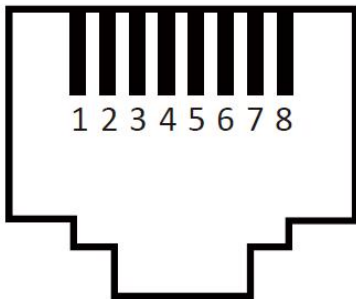
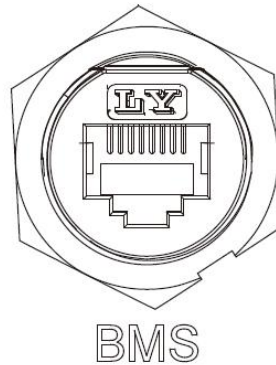
Wiring

Procedure	
Step 1	COM port component is shown below. 
Step 2	Push the main component into the rubber core and assemble it into place when you hear a clicking sound. 
Step 3	Align the COM port slot at the bottom of the hybrid inverter and insert this terminal. 

BMS Connection

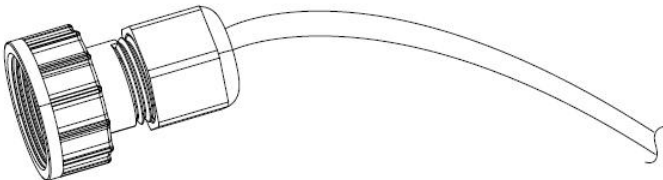
The BMS (Battery Management System) communication interface is used for CAN communication

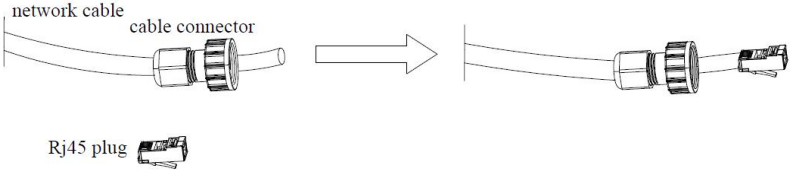
between the hybrid inverter and the lithium battery BMS. If this wire is poor, the communication between the hybrid inverter and BMS will not work properly. The stable SOC value displayed on the hybrid inverter home page is a good performance of communication.



Pin Port	1	2	3	4	5	6	7	8
BMS	5V	/	GND	/	CANL	/	CANH	/

Wiring

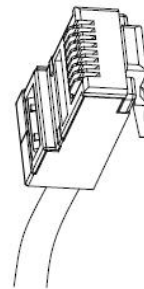
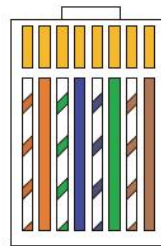
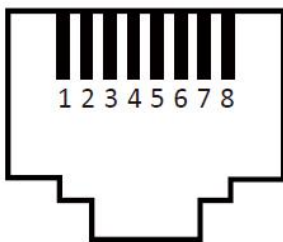
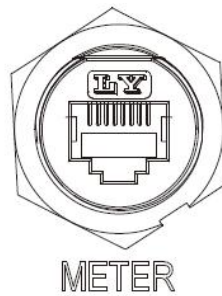
Procedure	
Step 1	Prepare a standard network cable and cable connector, then insert the network cable through the cable connector. 

Step 2	Crimp the cable with a RJ45 plug which is inside of the cable connector. network cable connector. 
Step 3	Insert the communication cable into the RJ45 connector. Lock the connector by turning clockwise.

Smart Meter Communication Interface

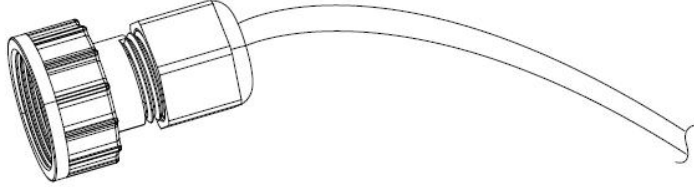
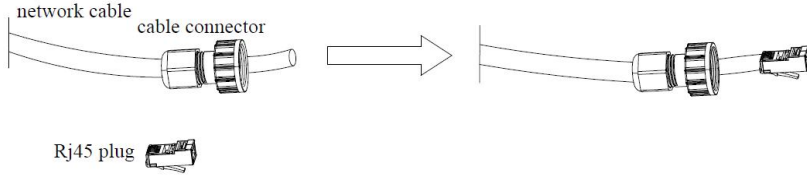
Meter Connection

The meter and RS485 should be connected to the hybrid inverter using the connector shown in the figure below. Each port on the connector must be connected to the corresponding port on the hybrid inverter.



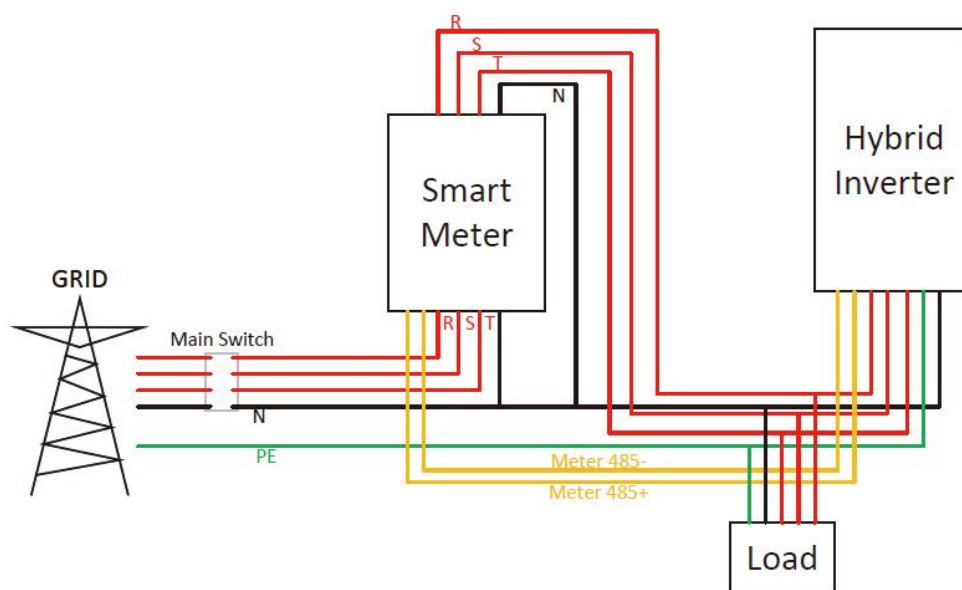
Pin Port	1	2	3	4	5	6	7	8
Meter	/	/	GND	/	485A	/	485B	/

Wiring

Procedure	
Step 1	Prepare a standard network cable and cable connector, then insert the network cable through the cable connector. 
Step 2	Crimp the cable with a RJ45 plug which is inside of the cable connector. 
Step 3	Insert the communication cable into the RJ45 connector. Lock the connector by turning clockwise.

NOTICE

- Compatible Meter type: DTSU666 (CHINT) .
- For other pin definitions, please refer to the user manual.
- Communication A and B are marked on the side of the meter.
- Please check and configure the meter before use:
Add: 1;Baud: 9600
- The Meter connections and grid connections are shown in the figure below.



4.5.5 Parallel Connection

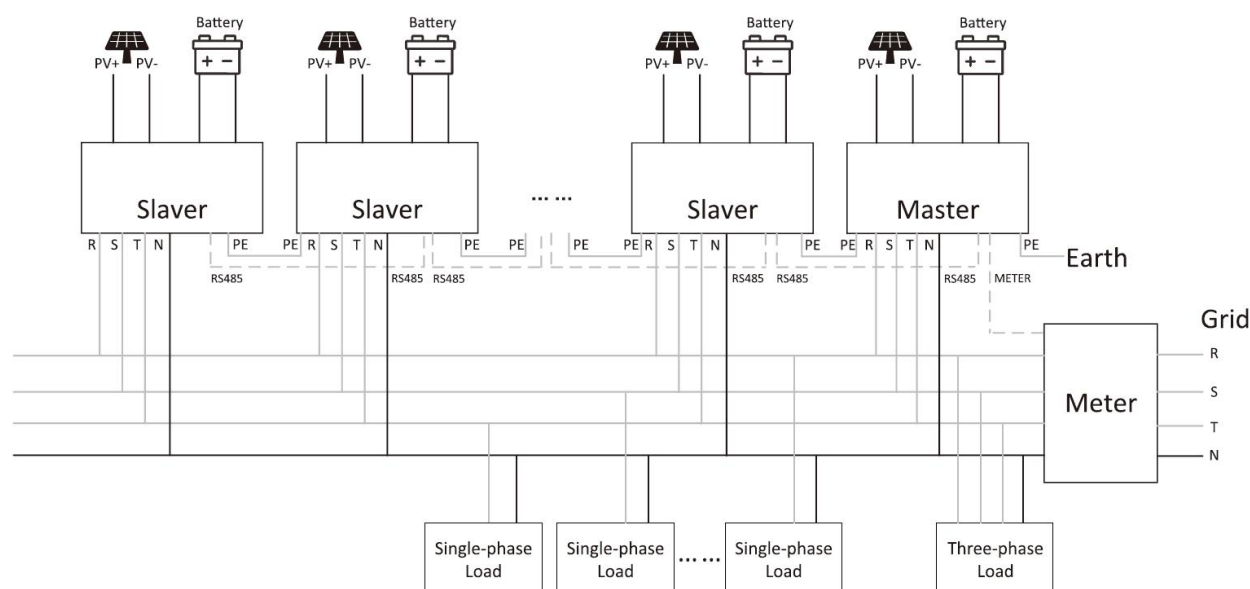
A. On-Grid Parallel Connection

BRH series hybrid inverter provides the parallel connection function which should make four hybrid inverters maximumly connected in one system when the grid is on. In this system, one inverter will be set as the “Master inverter” which will control every other inverter's energy management and dispatch control. Only one meter needs to be connected in this system and communicate with the “Master inverter”, and all other slaver inverter communicate with “Master inverter” by RS485 communication parallel connection.

Please note the parallel connection function can only be used when the grid is on.

PIN	21	22	23	24
External interface	RS485+_Parallel	RS485+_Parallel	RS485-_Parallel	RS485-_Parallel
Definition	Inverter Parallel Interface			

The system diagram is as follows:



4.5.6 EPS Connection (Non-parallel State)

Common loads description

Under EPS mode, if need to connect the inductive load on EPS port, please ensure that the instantaneous power of the load at startup is lower than the maximum power of the EPS mode. Please refer to your loads' manual for the actual specs.

Unipolar load is not supported. Half-wave load is not supported.

For some motor loads, the starting current may be far more than 5 times the current, which is also not supported.

4.5.7 System Connection Diagrams

For countries such as Australia, New Zealand, South Africa, etc, please follow local wiring regulations. According to Australian safety requirements, the N cables of the GRID side and EPS side must be connected together. Otherwise, the EPS function will not work.

For countries such as China, Germany, the Czech Republic, Italy, etc, please follow local wiring regulations.

This diagram is an example for an application in which neutral is separated from the PE in the distribution box.

4.5.8 Inverter Start-Up

 DANGER	Wear personal protective equipment and use dedicated insulated tools to avoid electric shocks or short circuits.
---	--

Please refer to the following steps to start up the inverter.

Procedure	
Step 1	Ensure the inverter fixed well.
Step 2	Make sure all the DC wiring and AC wiring are completed.
Step 3	Make sure the meter is connected well.
Step 4	Make sure the battery is connected well.
Step 5	Make sure the external EPS contactor is connected well (if needed) .
Step 6	Make sure the BMS buttons and battery switches are off.
Step 7	Turn on the PV/DC switch, AC breaker, EPS breaker and battery breaker.
Step 8	Enter the settings page, use default password “8888”to select the Admin.
Step9	Enter the settings page, select “Power ON/OFF” and set it to “Power ON” .

NOTICE	• When starting the inverter for the first time, the country code will be set by default to the local settings. Please check if the country code is correct. • Set the time on the inverter by using the APP.
---------------	--

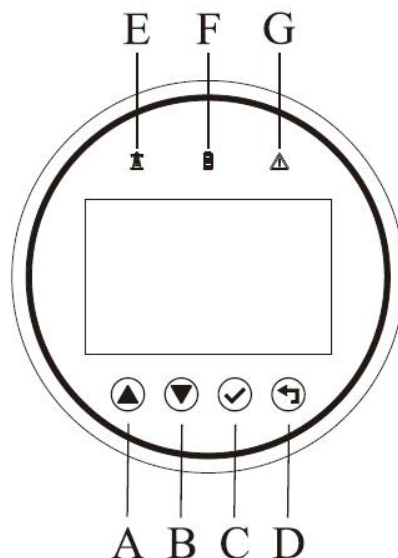
4.5.9 Inverter Switch Off

Please refer to the following steps to switch off the inverter.

Procedure	
Step 1	Enter the settings page, select Power ON/OFF and set it to stop.
Step 2	Turn off the PV/DC switch, AC breaker, EPS breaker and battery breaker.
Step 3	Wait 5 min before you open the upper lid (if in need of repair) .

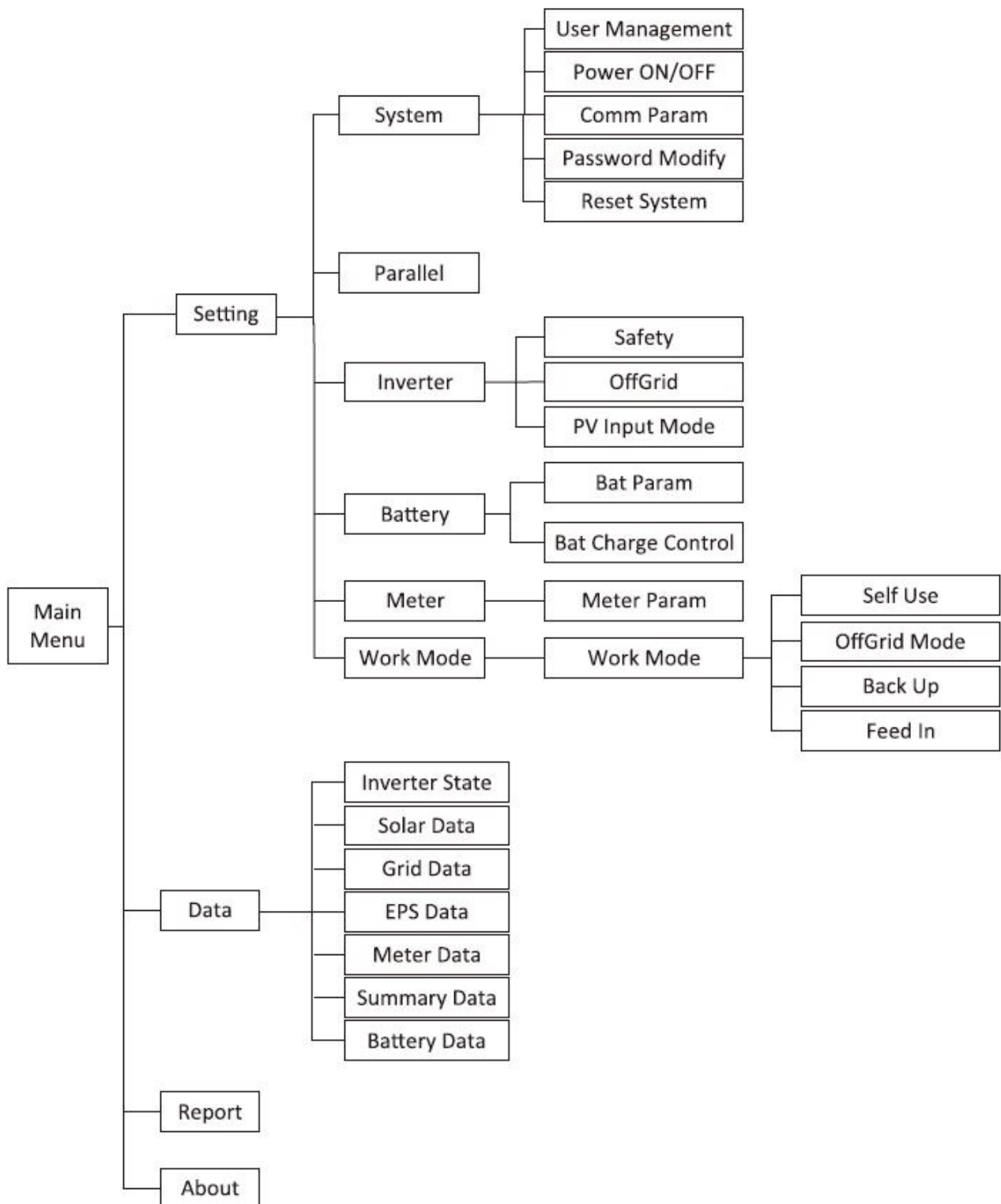
5. LCD Operation

5.1 Control Panel



Name	Number	Description
Button	A	Up
	B	Down
	C	Confirm
	D	Return
Indicator	E	Green light steady on: Normal operation Green light flashing: The smart meter is connecting to the inverter. Green light is not flashing: Smart meter not configured
	F	Green light steady on: The inverter is normally connected to the battery. Green light flashing: The inverter is connecting to the battery.
	G	Red light on: Device fault Yellow light on: Device warning

5.2 Menu Structure



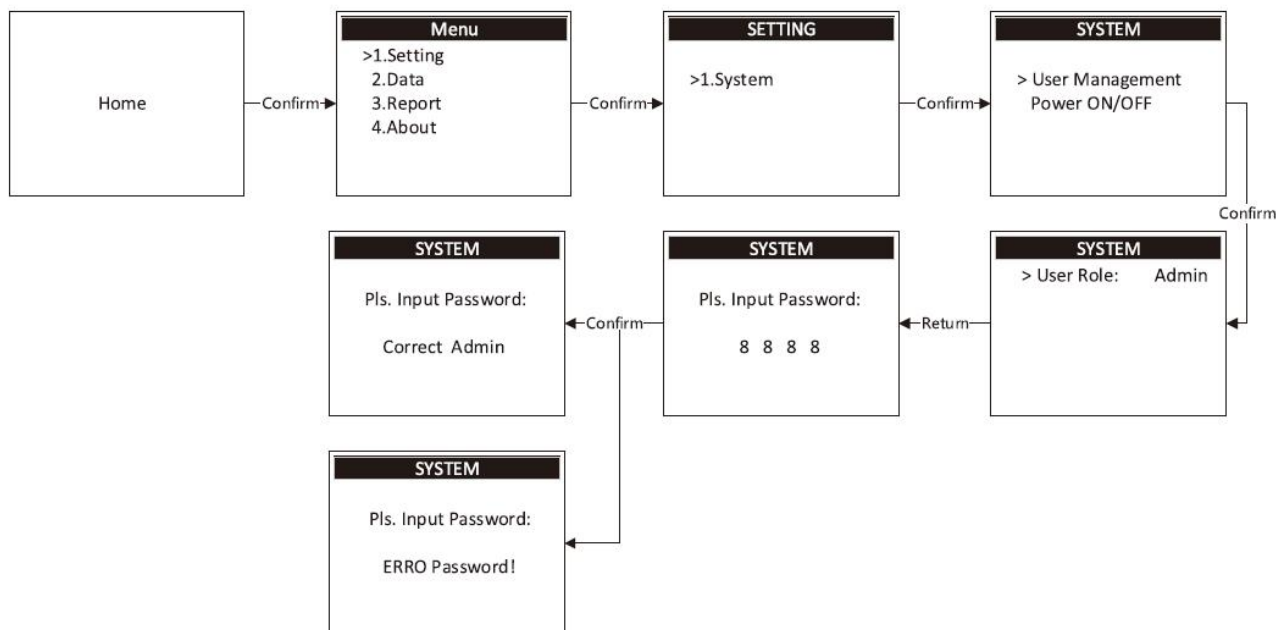
5.2.1 General setting

The following settings require the engineer user to set except for the first and second items.

1. Set user role

The setup user can select either an Admin or a Guest account.

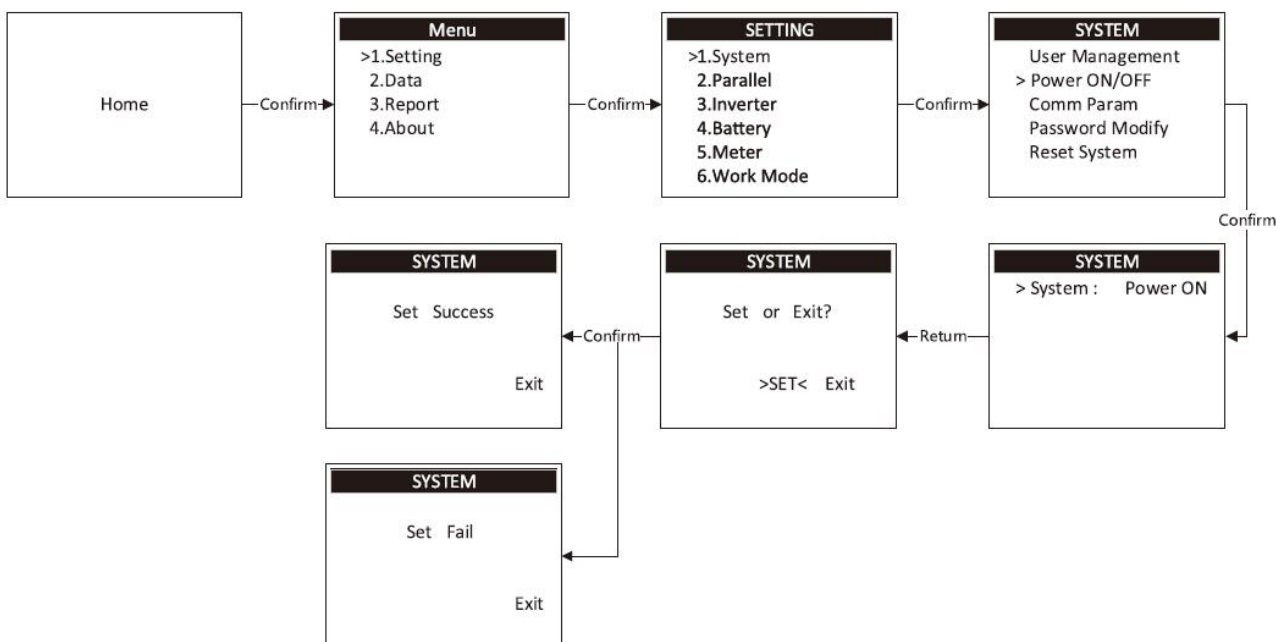
Set user role as described below:



2. Power On/OFF

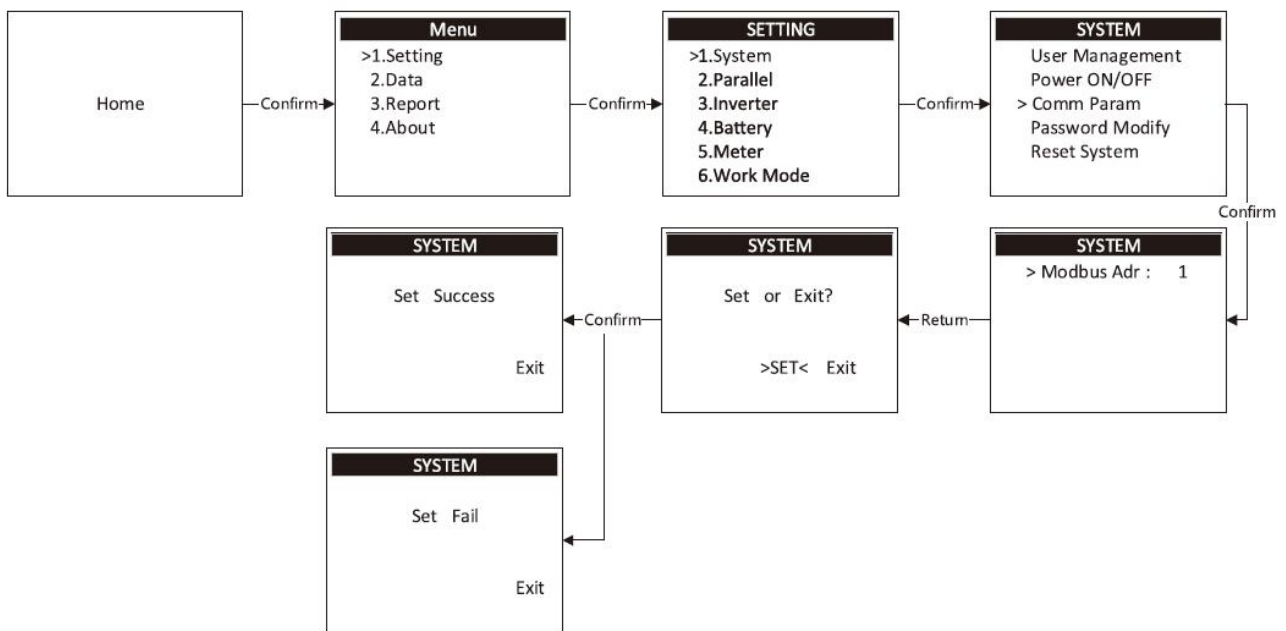
Run or stop the inverter by setting “Power On/OFF” .

Set Power On/OFF as described below:



3. Set Modbus address (Admin role)

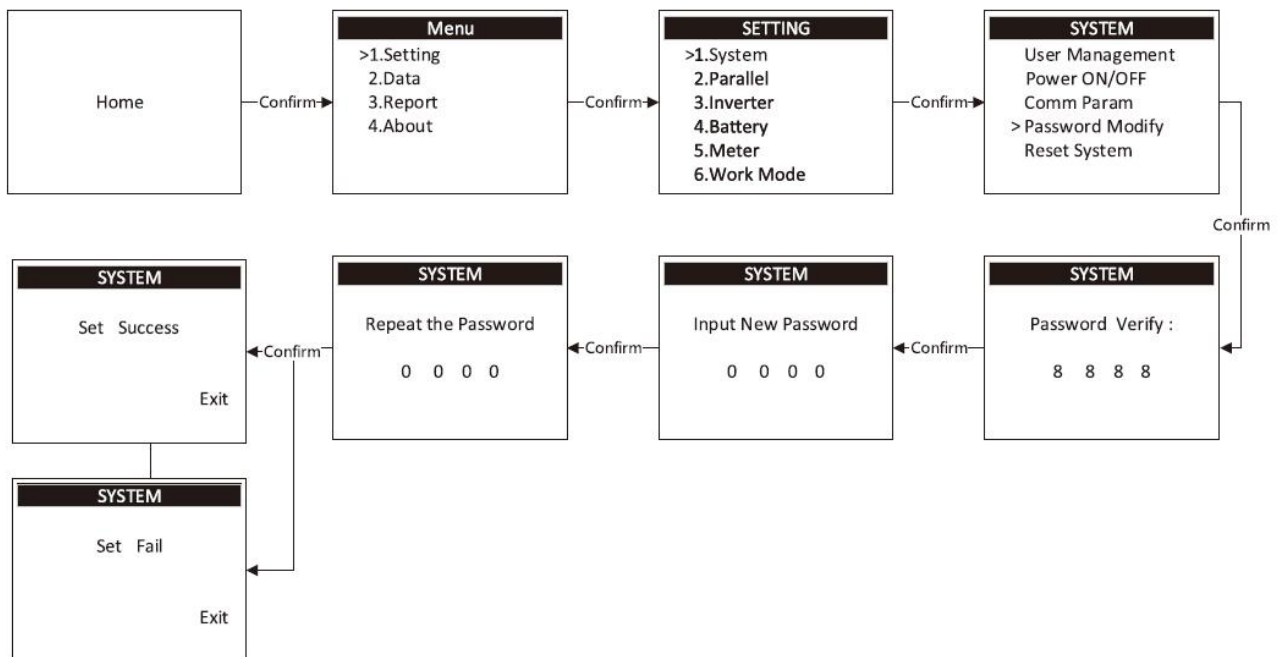
The inverter default Modbus address is 1. The Setting as described below:



4. Set password (Admin role)

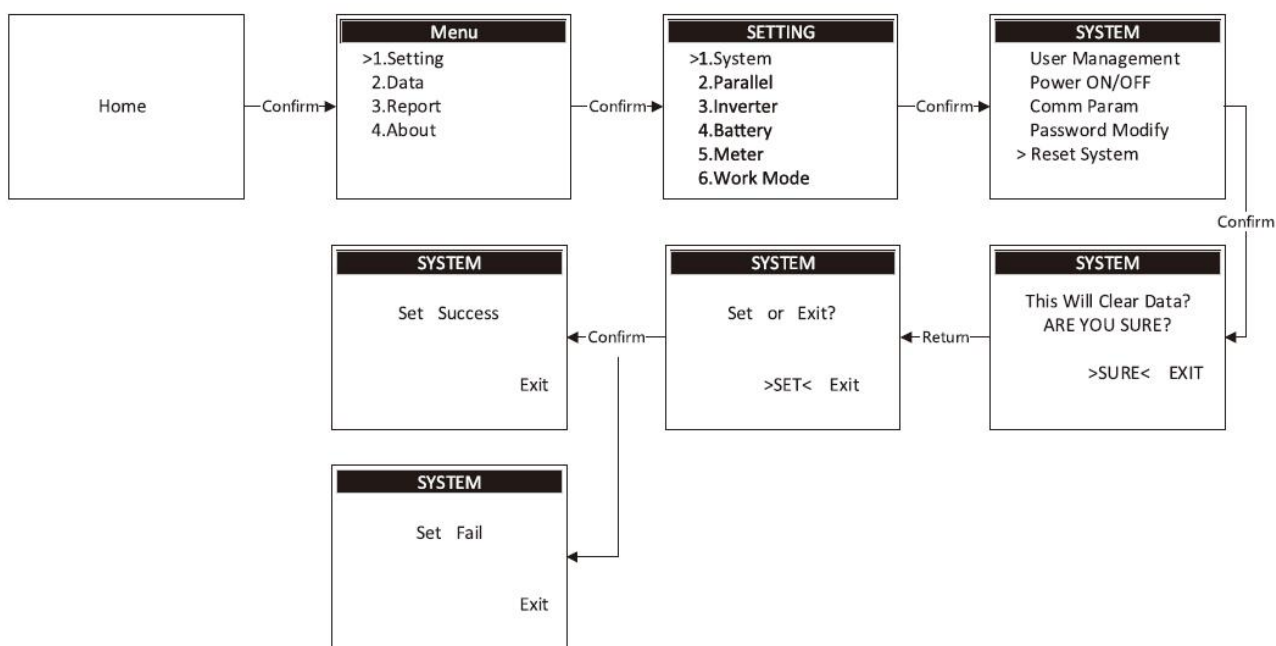
Engineer users can change the password.

The Setting as described below:



5. System reset (Admin role)

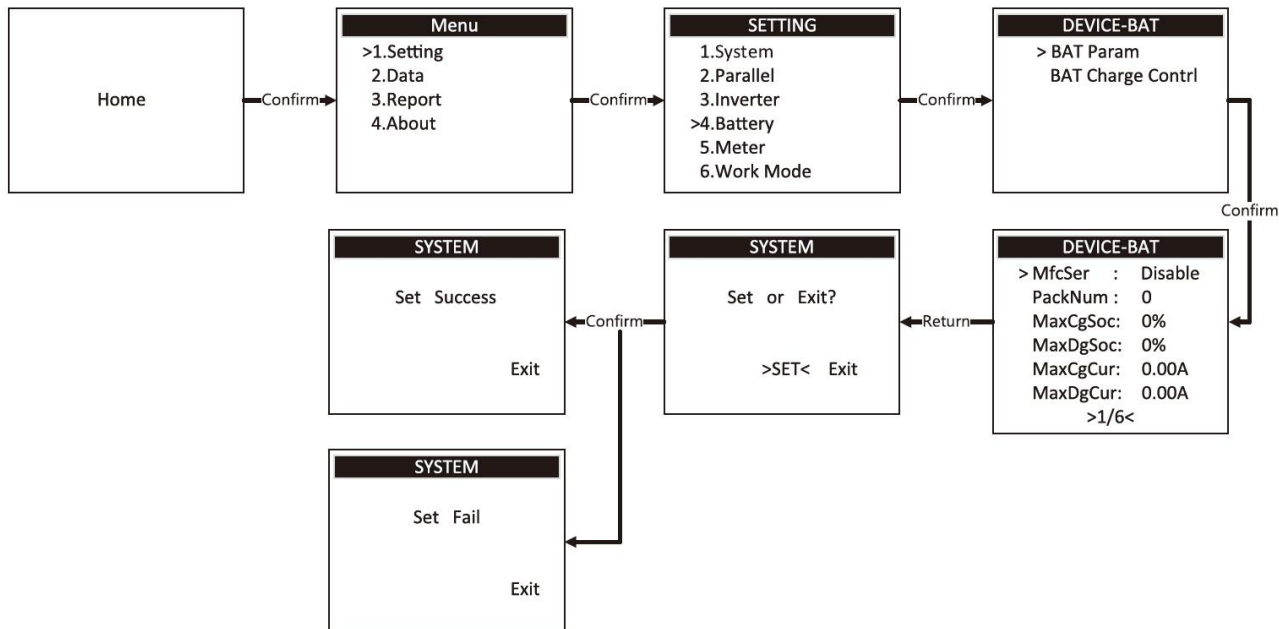
System reset will reset the inverter configuration and data, and set it up according to the steps below:



6. Battery configure (Admin role)

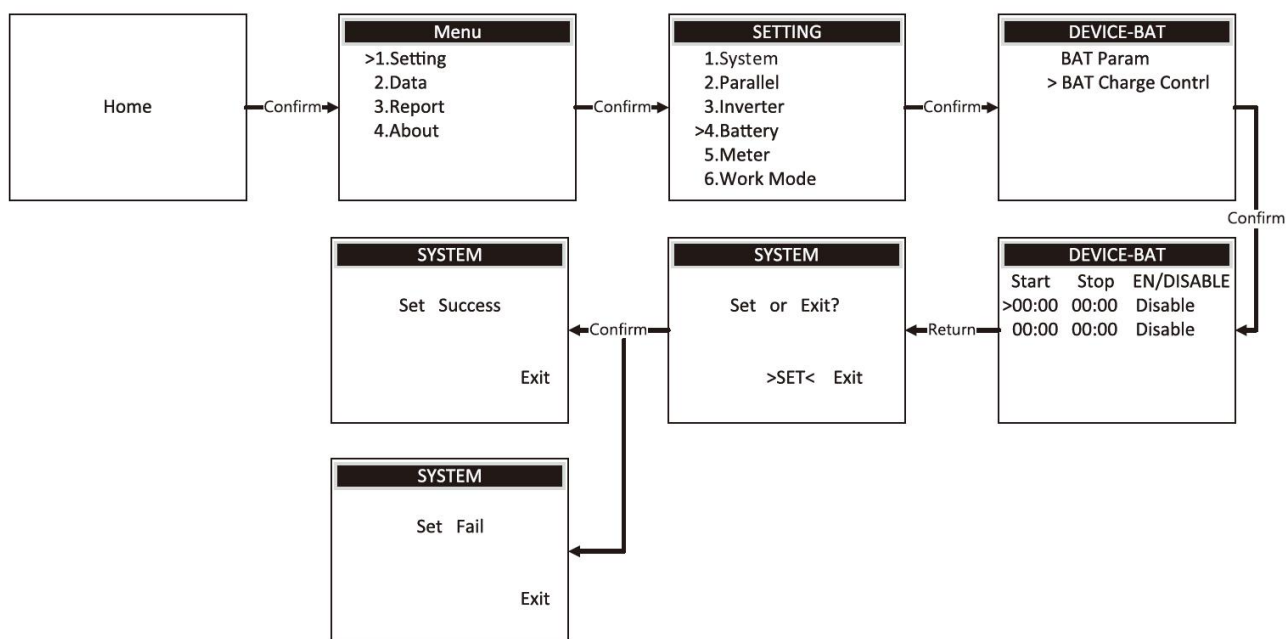
① Battery parameter settings

When the inverter configures the battery, you need to set the battery model and other parameters. The Setting as described below:



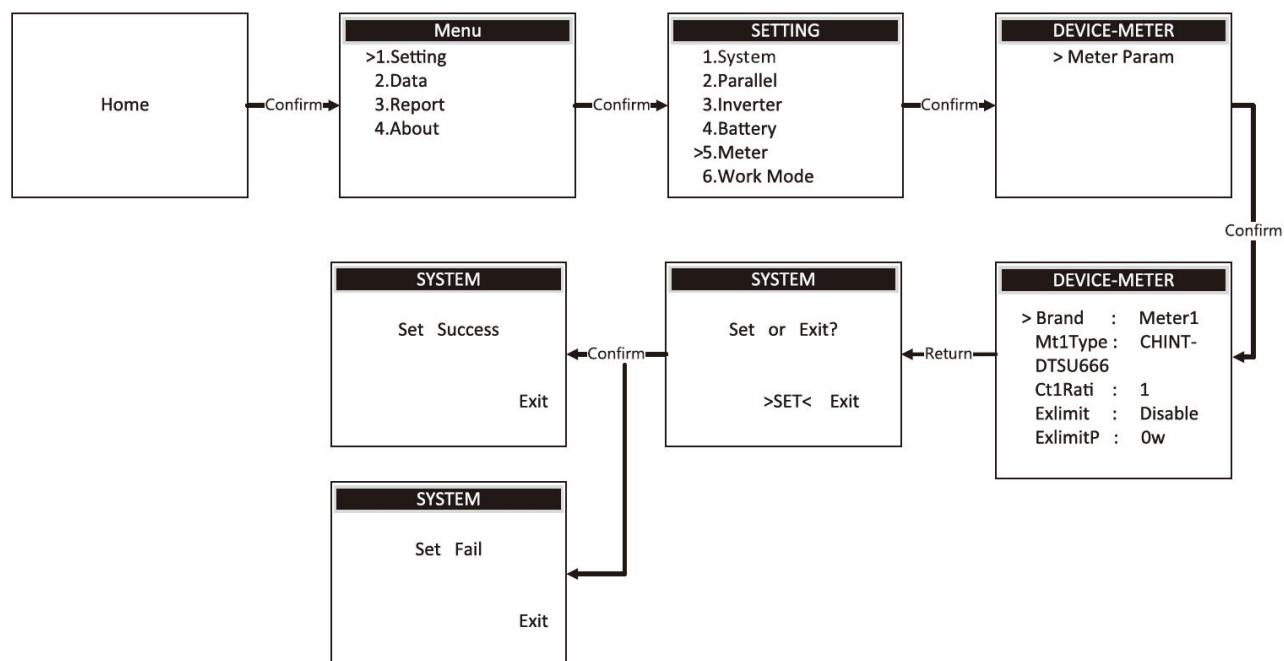
② Battery charging time period setting

To set the battery charging period, set it as follows:



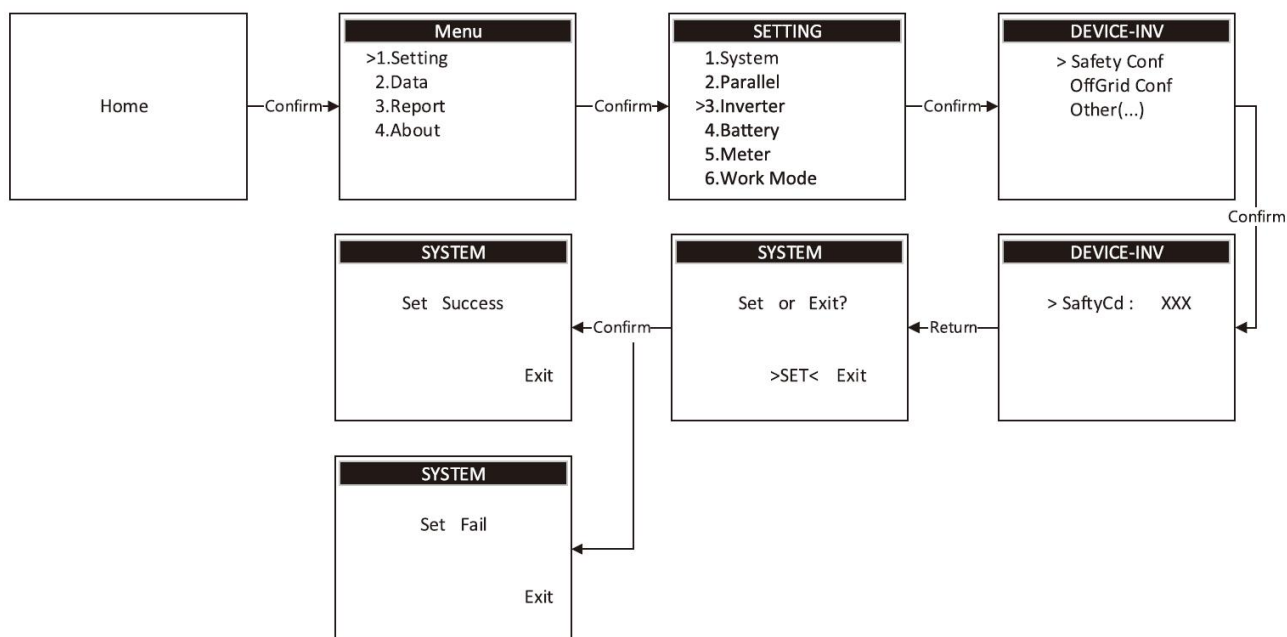
7. Meter configure (Admin role)

When configuring the inverter with a meter or CT, you need to set configuration information such as type and installation location, and set it according to the following steps.



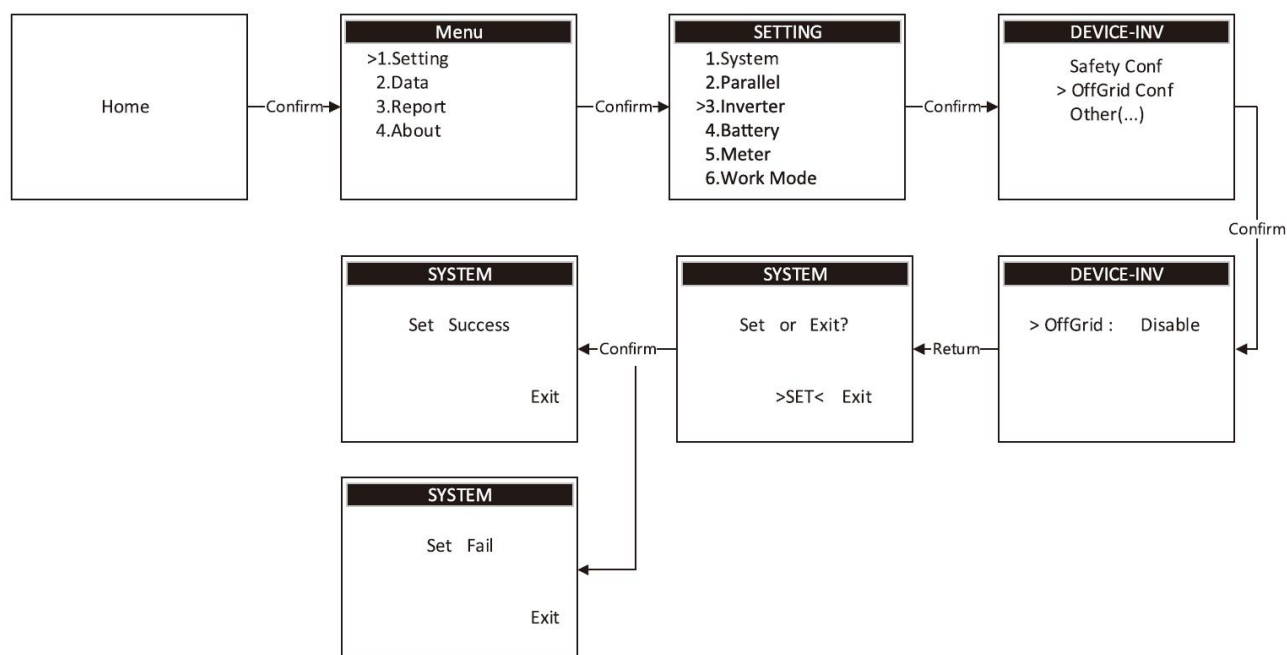
8. Inverter configure (Admin role)

Set safety as described below:



9. Off-grid configuration (Admin role)

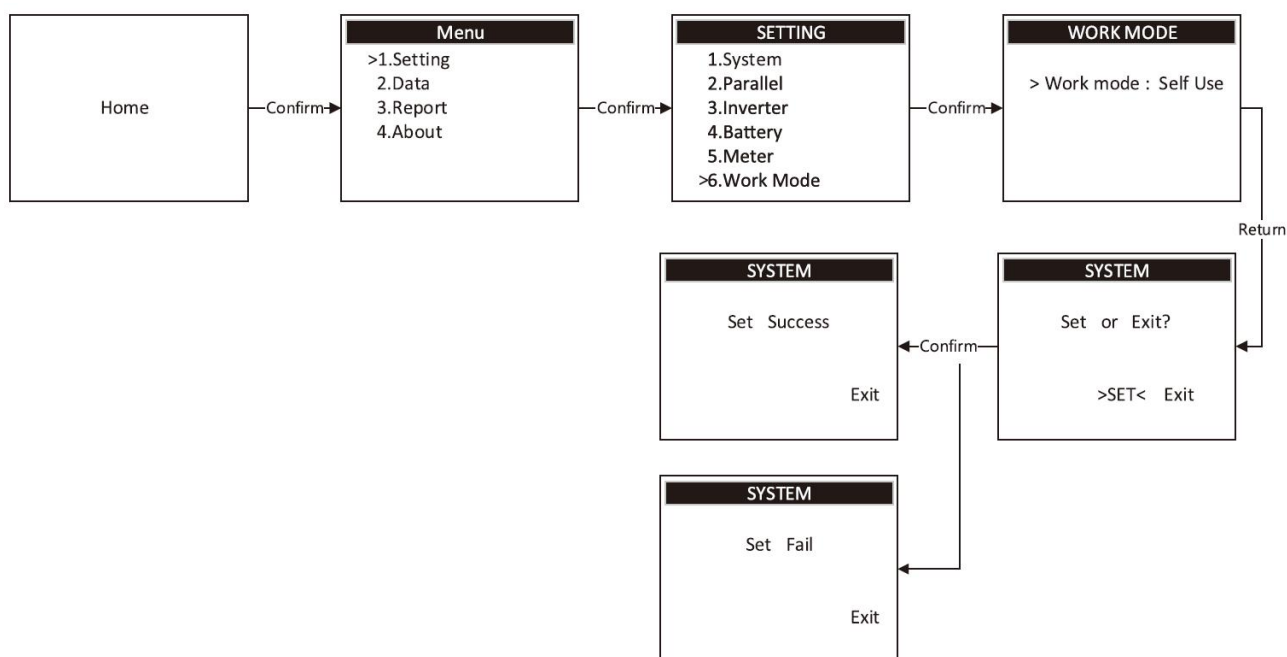
The off-grid configuration is set up as follows:



10. Set work mode (Admin role)

There are five working modes that can be set by the user, Self use, Feed in, Back up, Offgrid, Custome Def. Users can set the inverter to work in different modes.

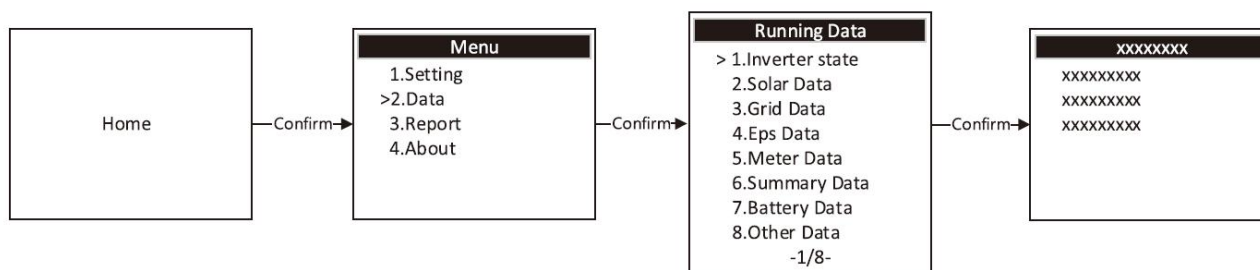
Set work mode as described below:



5.2.2 Inverter information

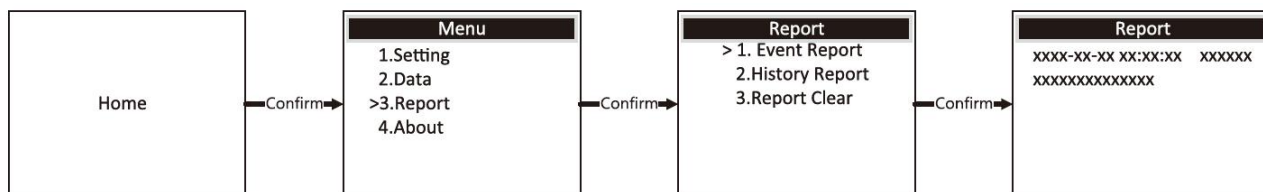
1. Inverter run data

We can view the inverter operation data, follow the steps below:

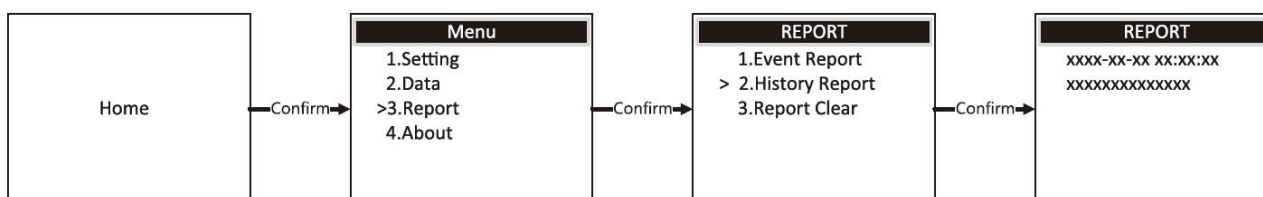


2. Error log

We can view the inverter operation error log, follow the steps below:

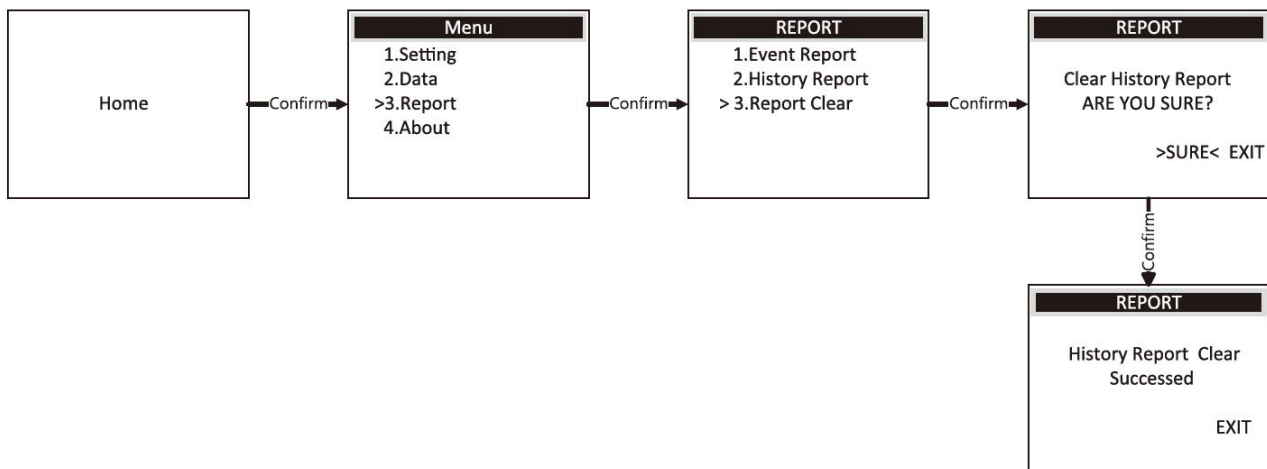


We can check the inverter historical fault information. Please follow the steps below:



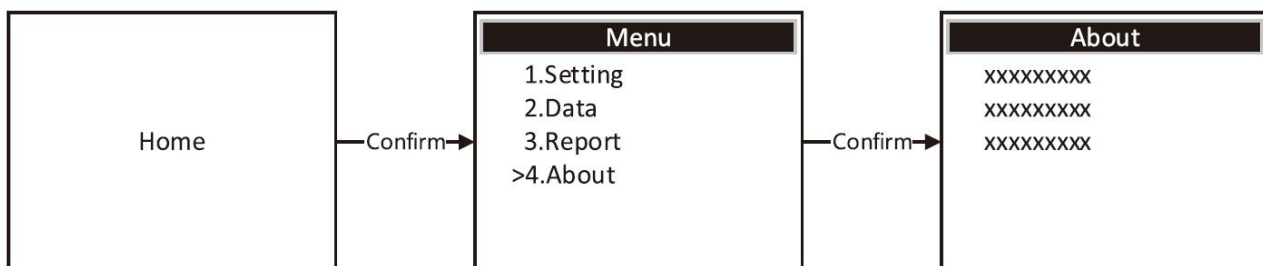
We can clear the inverter's historical fault information (Admin role) by following the steps

below:



3. About

We can view the inverter device information by following these steps:



6. Borochoi Cloud

The Borochoi Cloud App is a mobile software application that communicates with the energy storage inverter via WiFi, GPRS, or WLAN modules. The app offers the following key functions:

1. View the operational data, software version, and alarm information of the energy storage inverter.
2. Configure grid parameters and communication settings of the energy storage inverter.
3. Perform device maintenance.
4. Upgrade the device's software version.

For more details, refer to the “Borochoi Cloud App User Manual” .

7. Troubleshooting

When the system is in alarm, please log into the BoroChi Cloud App to review. The possible causes and their troubleshooting are detailed in the following table:

Display	Handling Suggestions
INV_OC_HW	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
BAT_OC_HW	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
PV_OC_HW	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
INV_OC_SW	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
BAT_OC_SW	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
PV_OC_SW	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
LOAD_OC_SW	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
BAT_OV_HW	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
BUS_OV_SW	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
HALF_BUS_OV_SW	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
UNBALANCE_BUS_SW	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
BAT_OV_SW	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
GRID_OF_SW	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
GRID_UF_SW	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes

	and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
LINE_CONNECT YO_PE	1. Check the cable connection. 2. If the alarm continues, please contact us for assistance.
PV_REVERSE CONNECT_SW	1. Check if the corresponding string has reverse polarity. If it does, disconnect the DC switch and adjust the polarity when the string current drops below 0.5 A. 2. If the alarm continues, please contact us for assistance.
BUS_UV_SW	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
ARM_SW	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
BUS_VOLT_OVE RSHOOT_SW	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
GRID_ZERO CROSS_LOSS_SW	1. Check if there is a power outage in the grid. If power is available, proceed to the next step. 2. Check whether the AC side circuit breaker or other protective switches are tripped. If the circuit breaker is functioning normally, proceed to the next step. 3. Check if the external AC wire, neutral wire, and ground wire are correctly connected to the corresponding terminals. 4. If the alarm continues, please contact us for assistance.
PV_OV	1. Check the specifications and number of corresponding string PV modules. 2. If the alarm persists, please contact us for assistance.
GRID_PH_OV	1. Ensure the inverter's safety country setting is correct. 2. Verify that the grid voltage in your area is stable and within the normal range. 3. Check if the AC cable is securely in place. 4. If the alarm continues, please contact us for assistance.
GRID_PH_UV	1. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
ISLANDING	1. Wait for the grid to restore power. 2. If the alarm continues, please contact us for assistance.
GRID_10MIN_OV	The inverter will reconnect to the grid once it stabilizes. If the alarm frequently occurs, please contact us for assistance.
ARM-S Hw ERR	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
MTR Comm Lost	1. Check if the Meter communication cable and terminal are functioning properly. 2. Reconnect the Meter communication cable.

	3. If the alarm persists, please contact us for assistance.
ARM comm Lost	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
RTC Fault	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
BMS Lost	1. Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2. If the alarm continues, please contact us for assistance.
BMS Hw ERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS In Way Err	1. Check if the corresponding string has reverse polarity. If it does, disconnect the DC switch and adjust the polarity when the string current drops below 0.5 A. 2. If the alarm continues, please contact us for assistance.
BMS Check Err	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS. COV	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS. CLV	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS LV	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS OV	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS Relay ERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
Bms EMRG Stop	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
Bms In Cmm ERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
T. BMS High	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
T. BMS Low	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again

	2. If the alarm continues, please contact us for assistance.
BMS OC	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS Safty ERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
Cell. V IMB	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS ERRO	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS. V SNR ERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS. T SNR ERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS. IV OV	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS. C ERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS DCG LV	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS CG OV	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS. STP CRERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS BMIC ERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS In Bus ERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS CRT ERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS T. V. D ERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again

	2. If the alarm continues, please contact us for assistance.
BMS PreCgERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS ISO ERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS Hi Out Ctrl	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS Low IN OV	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS Low IN LV	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS. C LV2	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS SR. NMERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS CP. SZERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMIS INIT ERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS L2&3. CME	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS InL2 Bus E	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS L2 LOST	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS LG. C ERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.
BMS C. IC ERR	1. Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2. If the alarm continues, please contact us for assistance.

8. Maintenance

 CAUTION	- Incorrect maintenance may result in damage to the inverter or personal injury! - Always keep in mind that the inverter PV string and the grid supply power in both directions, and follow these steps before performing any maintenance work: - Disconnect the AC circuit breaker, then place the inverter's DC disconnect switch to OFF. - Wait at least 5 minutes for the internal capacitors to fully discharge. - Verify that there is no voltage or current before unplugging any connectors.
	Caution! Restart the inverter only after troubleshooting faults that affect the safety performance. Do not replace any internal parts as there are no maintenance spare parts in the inverter package. Please contact us for any maintenance requirements. Otherwise, the Company is not liable for any damage caused.

8.1 Daily maintenance

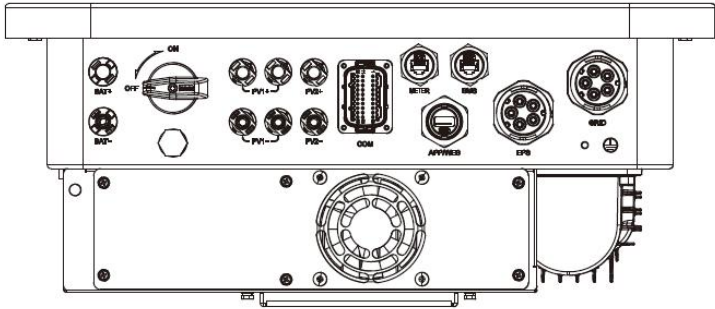
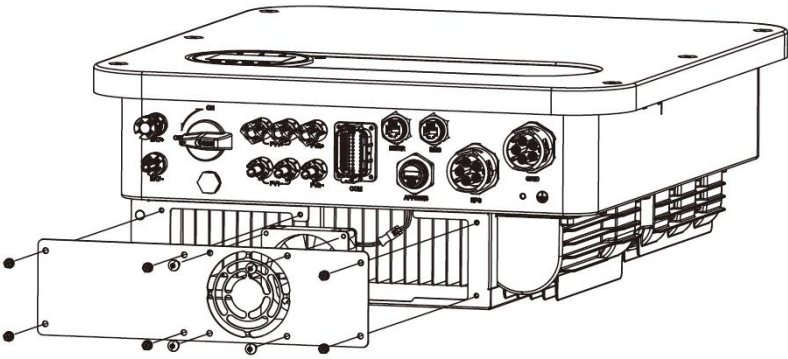
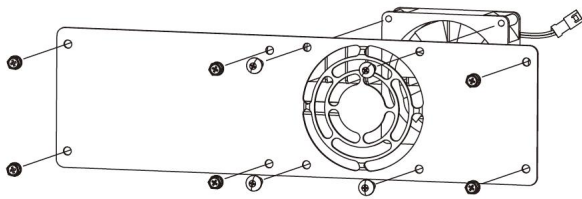
Maintenance parts	Operation	Cyclicity
System Cleaning	Check the temperature and dust condition of the inverter. Clean the inverter housing if necessary. Check the air inlet and outlet for proper functioning and clean the inlet and outlet if necessary.	Six months to one year (depending on the amount of dust in the air.)
Cable Connector	Check cable connections for inadequate sealing or excessive gaps, reseal connections if necessary	Once a year
Electrical Connection	Check that all cables are securely in place. Check that the cables are not damaged, especially where they come into contact with the metal casing	Six months to one year
Fan	Check for abnormal noises when the fan is rotating. Clean or replace the fan if necessary(see the following section)	Once a year
Air Inlet and Outlet	Check to make sure that the air inlet and outlet vents are not blocked. Clean the air inlet and outlet with a soft brush or Hoover if necessary.	Once every six months

8.2 Fan maintenance

 NOTICE	- Stop the inverter and disconnect all power connected to it before maintenance. - Wait at least 5 minutes after disconnecting to make sure there is no power to the inverter before performing maintenance.
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- Only a qualified electrician should service the fan.

The fan inside the inverter is used to cool the inverter during operation. If the fan is not functioning properly, the inverter may not be able to cool and the inverter efficiency may be reduced. Therefore, clean the dirty fan and replace the bad fan in time. The specific replacement procedure is as follows:

Procedure	
Step 1	Stop the inverter (turn off the inverter's DC and AC switches and wait at least 5minutes) . 
Step 2	Unscrew the 6 screws of one fan baffle. Loosen the 4 screws on each fan module. Disconnect the fan cable, pull out the fan module, clean the fan with a soft brush or Hoover, and replace the fan if necessary. 
Step 3	Reinstall the fan back into the inverter in the reverse order and restart the inverter. Note that the fans must not be fitted in reverse. 

9. Technical Data

Model	BHW-10	BHW-12	BHW-15
PV Input			
Recommended Max. PV Input Power [Wp]	13000	15600	18750
Max. Input Voltage [V]	1000		
MPPT Voltage Range [V]	180~950		
Rated Voltage [V]	600		
Start-up Voltage [V]	200		
No. of MPP-Trackers	2		
No. of PV Strings per MPPT	2/1		
Max. Input Current per MPPT [A]	30/15		
Max. Short-Circuit Current per MPPT [A]	36/18		
AC Output			
Rated Output Power [W]	10000	12000	15000
Rated Output Current [A]	14.5	17.4	21.7
Max. Output Current [A]	15.9	19.1	23.8
Max. Apparent Output Power [VA]	11000	13200	16500
Rated Output Voltage [V]	220/380;230/400		
Rated Grid Frequency [Hz]	50/60		
Power Factor [cos φ]	1/0.8(leading)~0.8(lagging)		
THDi (@Rated Output Power)	< 3%		
AC Input (Grid)			
Max. Apparent Input Power [VA]	11000	13200	16500
Max. Input Current [A]	15.9	19.1	23.8
Rated Input Voltage [V]	220/380;230/400		
Rated Grid Frequency [Hz]	50/60		

Battery			
Battery Module Type	Lithium Iron Phosphate (LiFePO4)		
Battery Voltage Range [V]	150-600		
Maximum Charge/Discharge Current [A]	25		
Battery Communication	CAN		
AC Output (Off-Grid)			
Rated Output Power [W]	10000	12000	15000
Rated Output Voltage[V]	220/380;230/400		
Rated Output Frequency [Hz]	50/60		
Rated Output Current[A]	14.5	17.4	21.7
THDi (@Rated Output Power)	< 3%		
Switch Time [ms]	< 10		
Peak Apparent Power , Duration [VA, s]	15000, 30	18000, 30	22500, 30
Efficiency			
Max. Efficiency	98%		
Euro Efficiency	97.3%		
Charging/Discharging Efficiency of the Battery	98.5%@Charge / 97.0%@Discharge		
Protection			
DC-Schalter	Integrated		
Insulation Resistance Detection	Integrated		
Input Reverse Polarity Protection	Integrated		
Anti-island Protection	Integrated		
Residual Current Monitoring	Integrated		
Overtemperature Protection	Integrated		
DC Surge Protection	Integrated (Type II)		
AC Surge Protection	Integrate (Type II)		

General Data			
Dimensions (W×H×D) [mm]	498 × 563 × 200		
Weight [kg]	28	28	29
Display	LCD / WEB / APP		
Communication	WIFI / RS485 / LAN		
Operating Temperature Range [°C]	-25~60		
Relative Humidity	0%~100%, Non-condensing		
Operation Altitude[m]	≤4000 (Derating above 2000)		
Self Consumption (night) [W]	< 15		
Topology	Transformerless		
Cooling Concept	Natural Convection	Natural Convection	Smart Fan-cooling
Ingress Protection (IP) Rating	IP66		
Warranty	10 Years		
Certification	VDE 4105; IE+A1:D65+A1:D65C 62109-1/2; IEC 62477-1; IEC 61000-6-1/2/3/4; CE		



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