User Manual



Power Cube Series

To prevent damage to the product caused by improper use, please carefully read this manual before operation.

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1 Notes on This Manual

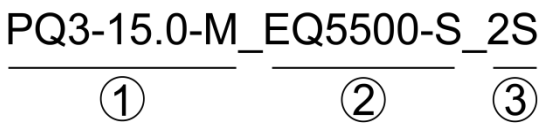
Power Cube series are designed and tested in accordance with international safety requirements. Certain safety precautions must be taken when installing and operating this product. The installer must read and follow all instructions, cautions and warnings in this installation manual.

Scope of Validity

This manual describes the assembly, installation, commissioning, maintenance and troubleshooting of the following model (s) of products:

Example

Here is some additional information: The Power Cube series products consist of an inverter and stacked battery modules. The system model name is composed of the inverter model name, the battery model name, and the number of battery module strings in the stack. Below is an example of this configuration:



①:Inverter Model②:Battery Module Model③:Number of Batteries in Series

①: Inverter model		②: Battery model
HQ3-5.0-M HQ3-6.0-M HQ3-8.0-M HQ3-10.0-M HQ3-12.0-M HQ3-15.0-M	HQ3-5.0-M-AC HQ3-6.0-M-AC HQ3-8.0-M-AC HQ3-10.0-M-AC HQ3-12.0-M-AC HQ3-15.0-M-AC	EQ3300-S (w) EQ3300-S EQ5000-S (w) EQ5000-S EQ5500-S (w) EQ5500-S EQ5000-S-P (w)
①: Inverter model		**②: Battery model**
PQ3-5.0-M PQ3-6.0-M PQ3-8.0-M PQ3-10.0-M PQ3-10.0-L-M PQ3-12.0-M PQ3-15.0-M	PQ3-5.0-M-AC PQ3-6.0-M-AC PQ3-8.0-M-AC PQ3-10.0-M-AC PQ3-10.0-L-M-AC PQ3-12.0-M-AC PQ3-15.0-M-AC	EQ4800-S EQ5000-S (w) TQ5000-S (w) EQ5500-S (w) EQ5500-S TQ5500-S (w) TQ5000-S-P (w)

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Target Group

This manual is intended for use by qualified electricians only. All procedures described herein shall be performed by trained and experienced electrical personnel in compliance with basic electrical safety requirements.

Symbols Used

The following symbols are used in the manual to highlight information in order to ensure the safety of the user's person and property when using the product, and to use the product more efficiently and optimally. The following symbols may appear in this manual, and the meanings they represent are listed below:

⚠ Danger!

"Danger" indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ Warning!

"Warning" indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

Note!

"Note" provides important tips and guidance.

⚠ Danger!

The PV string will generate lethal high voltage when exposed to sunlight.

Operators must wear proper personal protective equipment during electrical connections.

Must ensure that cables are voltage-free with a measuring instrument before touching DC cables.

Respect all safety instructions listed in relevant documents about PV strings.

⚠ Danger!

Before electrical connections, please make sure that the inverter switch and all switches connected to the inverter are set to "OFF", otherwise electric shock may occur!

Ensure that the inverter is undamaged and all cables are voltage free before performing electrical work. Do not close the AC circuit breaker until the electrical connection is complete.

⚠ Warning!

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Damage to the product caused by incorrect wiring is not covered by the warranty.

Electrical connection must be performed by professionals.

Operators must wear proper personal protective equipment during electrical connections.

All cables used in the PV generation system must be firmly attached, properly insulated, and adequately dimensioned.

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Symbols	Explanation
	CE mark. The product complies with the relevant EU directives.
	RCM mark.
	RoHS mark.
	Beware of hot surface. The Power Cube can become hot during operation. Avoid contact during operation.
	Danger of high voltages. Danger to life due to high voltages in the Power Cube!
	Hazards, warnings and cautions. Important safety information regarding personal safety. Failure to follow the safety information in this manual could result in injury or
	Capacitor discharge. Before opening the cover, the inverter must be disconnected from the grid and the PV string. Wait at least 15 minutes for the storage capacitors to discharge completely.
	Read the manual before performing any operations on the inverter.
	Product should not be disposed as household waste.
	PE conductor terminal.

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2 Introduction

2.1 Power Cube features

Power Cube series is high-quality energy storage system which can convert solar energy to AC energy and store energy into battery. The energy storage system 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.

Advantages	
	✓ Advanced DSP control technology. ✓ Utilizes the latest high-efficiency power component. ✓ Advanced anti-islanding solutions. (Active frequency drift positive feedback.) ✓ IP66 protection level. ✓ Max. Efficiency up to 98%; EU efficiency up to 97.3%; THD<3%. ✓ Safety & Reliability: Transformerless design with software and hardware protection. ✓ Power factor regulation. ✓ Friendly HMI. ✓ LCD touch screen for inverter operation, displaying operational status and input/output power information. ✓ PC remote control. ✓ Inverter interface protection: over voltage, over current, external short circuit, reverse polarity, earth Fault, over temp, in rush current. ✓ Battery protection: internal short circuit, over voltage, over current, over temp, under voltage. ✓ Built-in BMS control module.

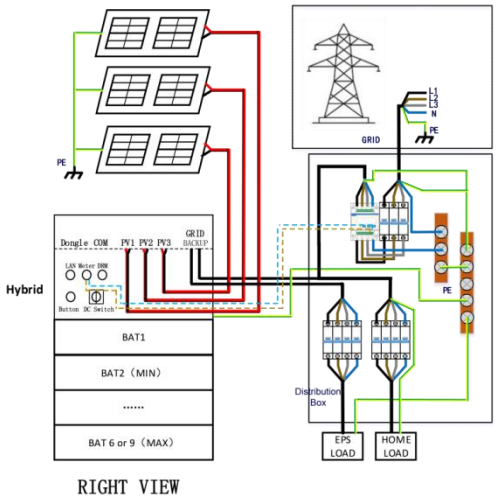
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2.2 System Diagrams

Note!

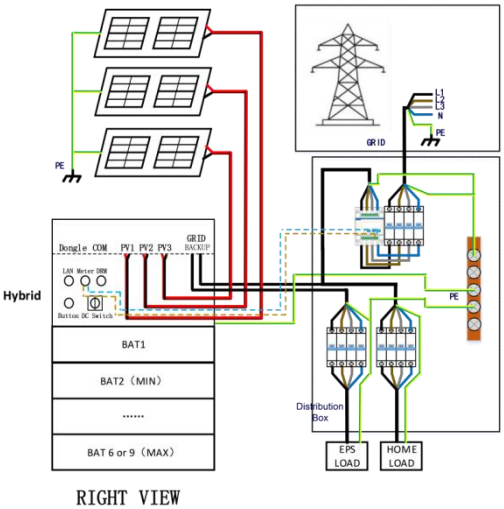
According to Australian safety requirements, the neutral cables of the on-grid side and backup side must be connected together. Otherwise, the backup function will not work.

This diagram is an example for an application that neutral connects with the PE in a distribution box.
For countries such as Australia, New Zealand, South Africa, 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.

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

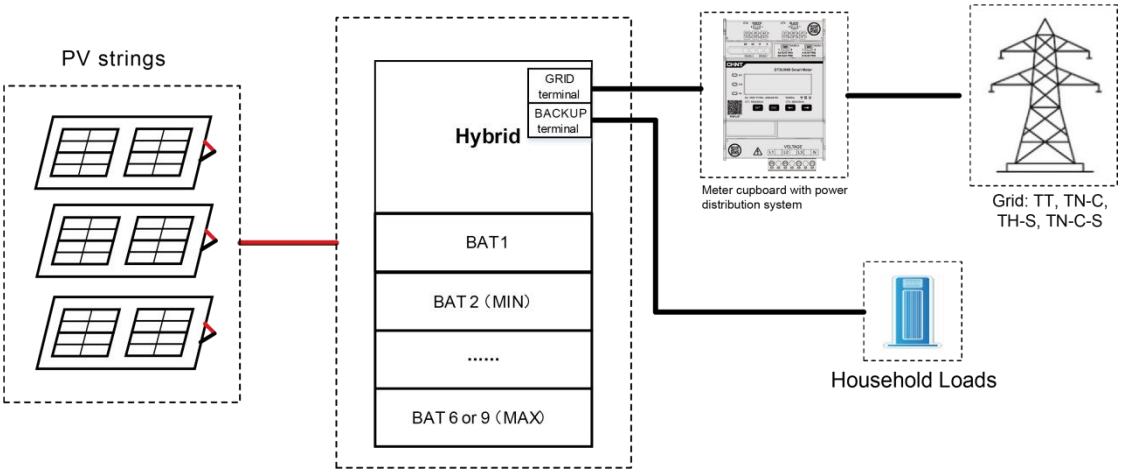


Note!

The number of batteries is determined by the battery model. The minimum number of batteries is 2.

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Whole Home Backup



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2.3 Work Mode

This product features four basic work modes (Self-use, Feed-in priority, Backup, Peak Shaving), which users can select according to actual application requirements. Selection and configuration of these work modes can be performed via the FoxCloud 2.0 app.

In addition to the basic modes, advanced work mode, Mode Scheduler, is also available. Once enabled, users can customize charging and discharging configurations by time period.

Work modes		Description
Basic	Self-use	With PV Power: Priority: load>battery>grid The energy produced by the PV system is used to optimize self-consumption. The excess energy is used to charge the batteries, then exported to grid.
		Without PV Power: When no PV is supplied, the battery will discharge for local loads first. Battery will charge when excess generation from other generation sources is detected.
	Feed-in priority	Priority: load>grid>battery For the energy storage system, power is first used to supply local loads, then exported to the public grid, and finally used to charge the battery.
	Backup	When the grid is off, system will supply emergency power from PV or battery to supply the home loads (Battery is necessary in BACKUP mode). Prioritize charging the battery, and ensure the battery does not discharge during grid-connected operation to maintain battery capacity for off-grid scenarios.
	Peak Shaving	The system can be set to provide a peak shaving function. A Peak Shaving limit must be set by adjusting "Import Limit" to the desired value. We can increase the peak shaving support uptime by setting the "Threshold SOC". When the battery is above the "Threshold SOC" the system will work in "Self-Use" mode. When the battery is below the "Threshold SOC" the peak shaving function will be the priority and the system will only provide power from the battery when the "Import Limit" is exceeded. When below the "Threshold SOC" the system will charge from the grid when there is available power without exceeding the "Import Limit". This is to ensure prolonged Peak Shaving support for extended periods. If the "Import Limit" is exceeded constantly for an extended period of time,

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		the peak shaving function can only guarantee successful operation while energy remains within the battery. If the battery designated "low level" is reached, the peak shaving function will cease.
Advanced	Mode Scheduler	Mode Scheduler requires the user to manually configure the time periods and select a work mode for each period. Once the schedule is saved and enabled, the system automatically switches modes according to the configured schedule. Up to 96 time periods can be configured, enabling flexible management of PV power, battery energy, and grid power.

★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. The PV can also charge the battery when there is sufficient PV outside of charging time.

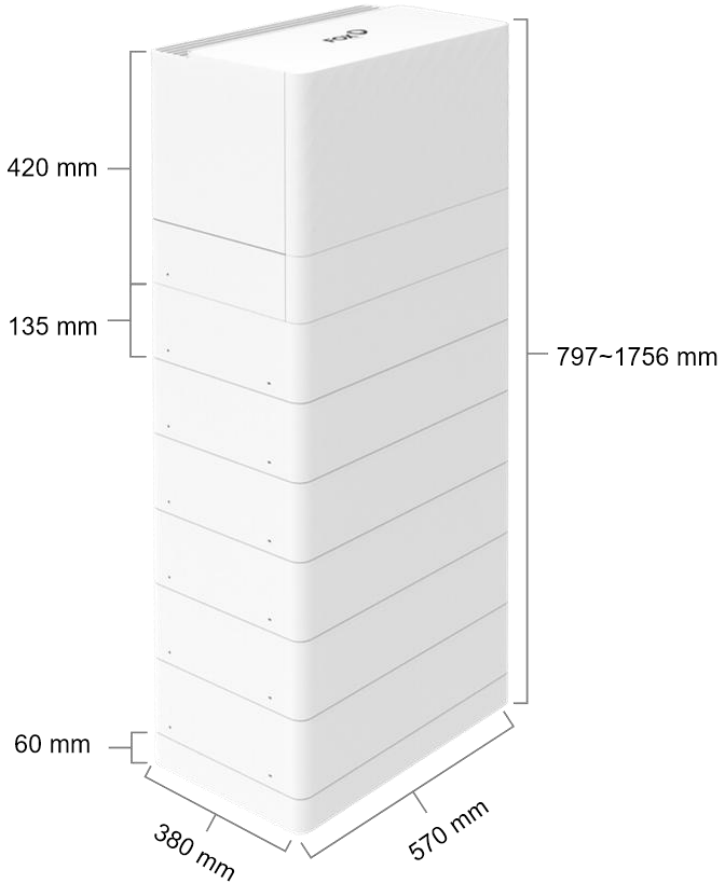
Low-efficiency & Unbalanced-output: When the machine detects that the wiring of the electric meter and inverter is correct, it can output power based on the load size sampled by the electric meter. For example, the three circuits can output 1kW, 2kW, and 3kW respectively.

High-efficiency & Balanced-output only: Suitable for scenarios where balanced output is not a concern. The power output is evenly distributed across all three phases. For example, even if the loads are 1kW, 2kW, and 3kW, each phase will output 2kW uniformly.

Low-efficiency & Balanced-output only: The machine will default to this mode when it fails to detect correct wiring connections, preventing abnormal power output.

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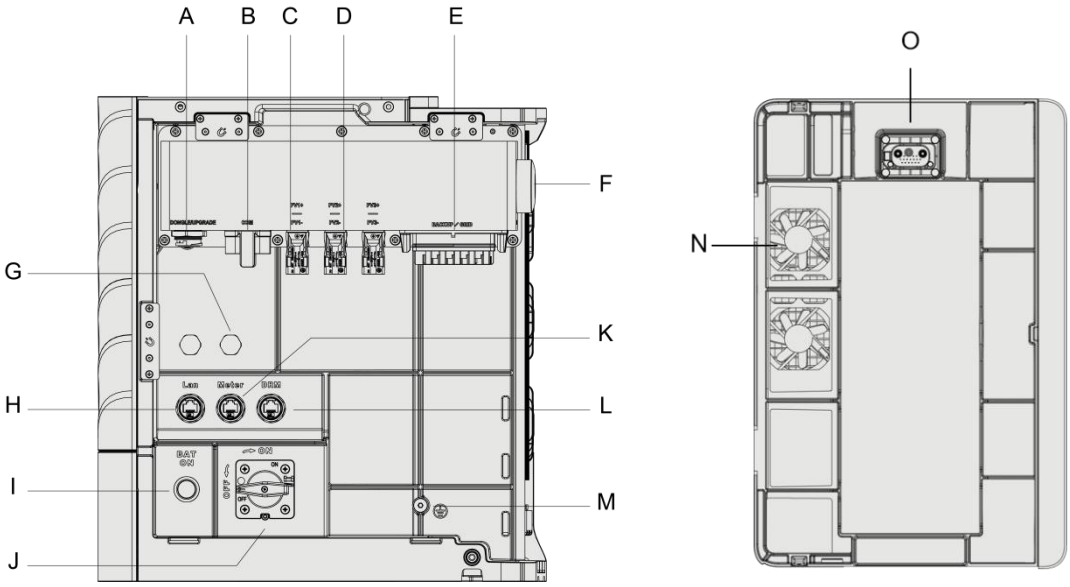
2.4 System Appearance & Dimensions



- This image is for reference only. The actual product received shall be final. The system height varies depending on the number of battery modules.

2.5 Terminals

2.5.1 Inverter Dimensions



Side view

Bottom view

No.	Items	No.	Items
A	Dongle/Upgrade	I	BAT ON/OFF Button
B	COM	J	2 in1 DC Switch (PV+BAT)
C	PV Connectors	K	Meter
D		L	DRM
E	GRID&BACKUP	M	Earthing screw
F	Antenna	N	Fan
G	Waterproof lock valve (Pre-installed)	O	Stacking connector (female)
H	LAN Port		

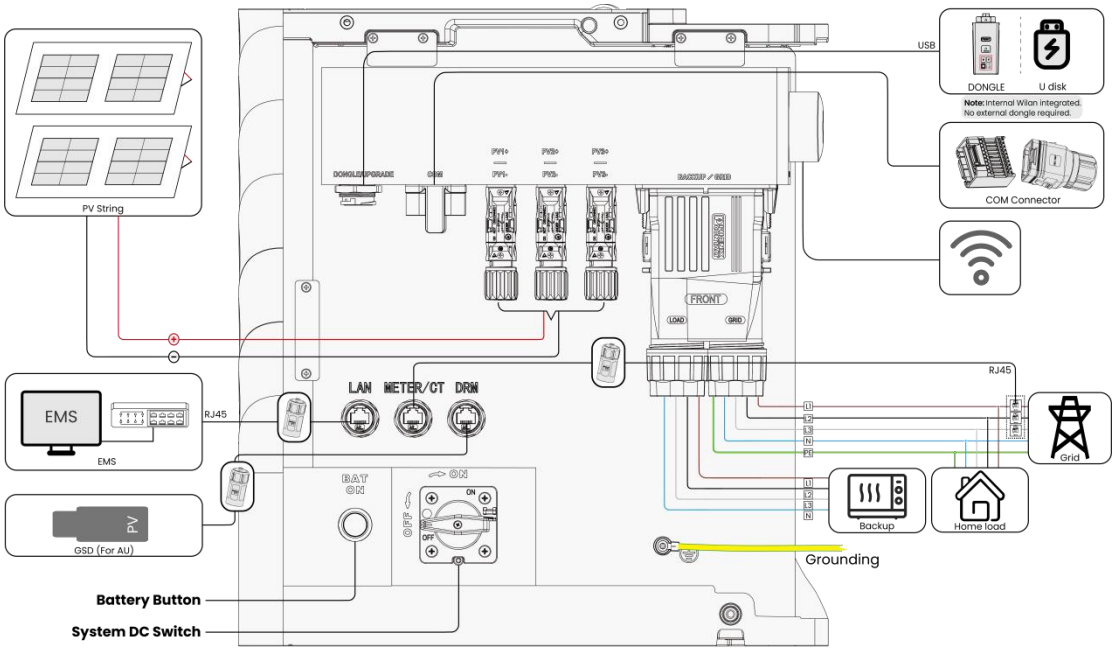
Refer to section 5.6 for detailed instruction.

Note!

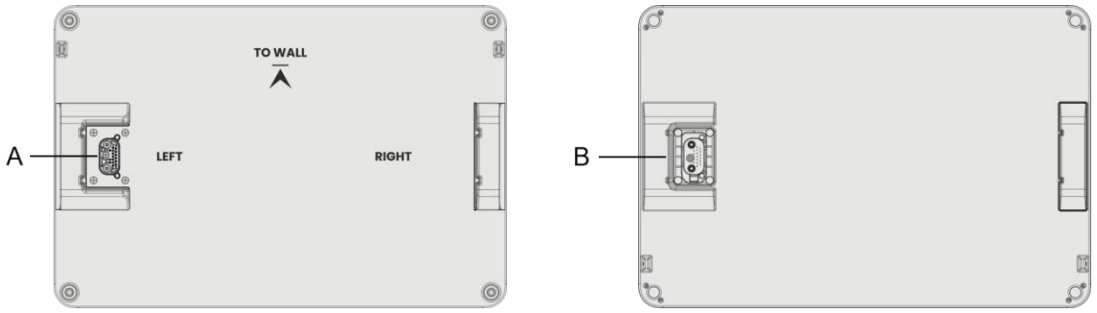
Meter maker: Zhejiang Zhengtai IoT Technology CO., Ltd

Mode: DTSU666

Note: Only authorized personnel are permitted to set the connection.



2.5.2 Battery Dimensions



Top view Bottom view

No.	Items
A	Stacking connector (male)
B	Stacking connector (female)

3 Safety

3.1 Personnel Safety

⚠ Danger!

- High voltage exists inside the equipment. Unauthorized removal of necessary protective measures, improper use, and improper installation and operation may cause serious safety hazards, shock hazards, or equipment damage, and the resulting damage to the equipment is not covered by the warranty.
- The PV string will generate lethal high voltage when exposed to sunlight.
- Operators must wear proper personal protective equipment during electrical connections.
- Respect all safety instructions listed in relevant documents about the energy storage system.
- Do not touch any liquid leaked from the battery. There is a risk of electric shock or skin damage.

Personnel requirements

All operations, including transportation, installation, start-up and maintenance, must be performed by qualified and trained personnel.

⚠ Warning!

Operating Requirements

- Always use special insulated tools for wiring operations. Direct contact or contact with other conductors or indirect contact with the power supply equipment through wet objects is prohibited.
- During operation of the equipment, the enclosure temperature is high and there is a risk of burns. Before touching any part of the system, make sure that the equipment and its surfaces are at a contact-safe temperature and voltage before proceeding.

- Before operating the equipment, be sure to check that the equipment is in proper condition, including, but not limited to, the equipment's parts, safety devices, and meter display.
- If any abnormality is found during operation, do not use the system and avoid temporary maintenance of the system.
- Strictly follow the safety operation procedures, understand the potential dangers in equipment operation, and take precautions to maximize the safety of themselves and related personnel to prevent accidents caused by improper operation.
- It is strictly prohibited to operate under fatigue, drunkenness, or ill health.
- Take extra care when the system is disconnected from the public grid, as certain components may hold a certain voltage, creating a risk of electric shock.
- Before installation, check the machine to make sure that it does not have any damage caused by transportation or handling processes that could affect the

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insulation or safety distances. Choose the installation location carefully and observe the specified cooling requirements.

- Before connecting the system to the distribution grid, contact the local distribution grid company for approval. This connection must be carried out by a qualified technician.
- Do not use the equipment when the safety devices do not work or are disabled.
- All repairs should be carried out only with approved spare parts, which must be installed in accordance with their purpose and by an authorized contractor or an authorized service representative.

3.2 Installation Safety

⚠ Danger!

Equipment Protection

- Perform all installation strictly in accordance with the equipment user manual and specifications. Unauthorized installation procedures not covered by this manual are prohibited to prevent equipment failure caused by improper installation.
- Arc welding, drilling, cutting, and similar operations on the equipment are prohibited. Installing additional equipment on top of the product is also prohibited.

Drilling Safety

- Before drilling, identify and avoid all pre-buried pipes and cables in the wall to prevent short circuits or other hazards.
- Ensure the integrity of the entire earthing system, including earthing electrodes, earthing trunks, branch lines, and all connections to the equipment.
- All installation shall comply with local relevant codes and standards. Circuit breakers of appropriate ratings shall be used to protect circuit safety.

Note!

Use of Tools

- All tools must be complete, properly certified, and within their inspection validity period. Before use, verify that tools are structurally sound and free from damage, loose parts, or missing components.

Equipment Protection

- Paint scratches, dents, or rust stains incurred during equipment transportation and installation shall be repaired promptly. Long-term exposure of scratched areas may degrade system performance or integrity.

Drilling Safety

- Wear appropriate personal protective equipment when drilling, including goggles, earplugs, a helmet, and coveralls, to protect the eyes and face from flying debris, reduce noise-induced hearing damage, and prevent bodily injury.
- Cables must not obstruct equipment air inlets or outlets.

⚠ Danger!

The PV string will generate lethal high voltage when exposed to sunlight.

Respect all safety instructions listed in relevant documents about PV strings.

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⚠ Warning!

Make sure the PV array is well insulated to ground before connecting it to the inverter.

Make sure the maximum DC voltage and the maximum short circuit current of any string never exceed inverter permitted values specified in "Technical Data" Check the positive and negative polarity of the PV strings, and connect the PV connectors to corresponding terminals only after ensuring polarity correctness.

During the installation and operation of the inverter, please ensure that the positive or negative electrodes of PV strings do not short-circuit to the ground. Otherwise, an AC or DC short-circuit may occur, resulting in equipment damage. The damage caused by this is not covered by the warranty.

Electric arc or contactor over-temperature may occur if the PV connectors are not firmly in place, and Fox ESS shall not be held liable for any damage caused.

If the DC input cables are reversely connected and the DC Switch has been rotated to "ON", do not operate immediately. Otherwise, the inverter may be damaged. Please turn the DC Switch to "OFF" and remove the DC connector to adjust the polarity of the strings when the string current is lower than 0.5 A.

⚠ Warning!

Before connecting the PV array to the inverter, ensure that the impedances between the positive terminals of the PV string and earth, and between the negative terminals of the PV string and earth are larger than 1 M Ohm.

- The manufacturer needs to be notified of any non-standard installation conditions.
- Ensure that there is enough space and good lighting, and avoid using tools in dangerous or unstable environments.
- Use the tool correctly and operate the tool correctly according to the instruction manual or professional guidance on the correct way to use the tool.
- Perform regular maintenance, such as cleaning, lubrication, and calibration, to extend the service life of the tools and maintain their performance.
- Before operation, dust, dirt, and debris need to be removed from the surface of the equipment to prevent them from entering the interior of the equipment and causing damage.
- Protect the equipment from external collision and strong vibration.
- Obtain consent from customers and contractors before drilling.
- Check the drilling equipment before use, including whether the drill is securely installed, whether the wires are broken, and whether the switch is normal.
- Ensure that the work piece being drilled is securely fastened to prevent it from moving or rotating during drilling.
- When replacing drills, cleaning debris or performing equipment maintenance, strictly

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prevent debris from falling into the interior of the equipment, and be sure to stop the machine first and then clean up the debris in a timely manner.

- Do not connect the battery directly to system conductors or PV conductors. This will damage the battery and may result in explosion.
- Do not tilt the energy storage forward, horizontally, upside down, backward and sideways.
- After unpacking, inspect the product for damage and missing parts.
- Do not charge or discharge damaged battery.
- Notify the manufacturer of any non-standard installation conditions.
- Ensure adequate working space and good lighting. Do not use tools in dangerous or unstable environments.
- Use tools correctly and operate them in accordance with the instruction manual or professional guidance.
- Before installation, remove dust, dirt, and debris from equipment surfaces to prevent them from entering the equipment interior and causing damage.
- Protect the equipment from external impact and strong vibration.
- Obtain consent from the customer and contractor before drilling.
- Inspect drilling equipment before use, including drill bit security, wire integrity, and switch functionality.
- Ensure the workpiece being drilled is securely fastened to prevent movement or rotation during drilling.
- When replacing drills, clearing debris, or performing equipment maintenance, strictly prevent debris from falling into the equipment interior. Always stop the machine first, then clear debris promptly.
- Do not connect different battery types together.
- In case of fire, use only a dry powder fire extinguisher. Liquid extinguishers must not be used.
- Do not install the equipment in locations where water submersion may occur.
- Make sure all cables are securely fastened and kept out of reach of children and pets.

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3.3 Wiring Safety

⚠ Danger!

Wiring Requirements

- High voltage exists inside the system, do not open the equipment's front panel.
- Turn off the “inverter/battery AC breaker” inside the switchboard before performing maintenance.
- Make sure the equipment is voltage-free before connecting to any cables.
- Before wiring, please make sure that the system DC switch and all external DC switches, if any, connected to the system are set to "OFF", otherwise electric shock may occur!
- Before wiring, do not turn on the AC circuit breaker until the electrical connection is complete.
- No loads are allowed to be connected between the equipment and the AC circuit breaker.
- Verify that the maximum DC voltage and maximum short-circuit current of any string never exceed the system limits specified in "Technical Data."
- Use test equipment to ensure that the PV strings’ positive and negative terminals are in correct positions.

Earthing Requirements

- The entire earthing system should remain intact, including the earthing electrode, earthing trunk, branch wires, and connections to the equipment.
- The protective earth conductor needs to remain earthed during installation and when removing the equipment.

⚠ Warning!

Wiring Requirements

- In electrical installations, it is important to follow the local relevant codes and standards and to use circuit breakers of appropriate specifications to protect the safety of the circuit.
- All cables must be secured and supported at appropriate locations to prevent displacement or damage due to self-weight or external forces.

Earthing Requirements

- The earth resistance should be in accordance with local relevant standards and regulations to ensure effective current discharge. Normally, the value of earth resistance should be small enough to ensure that the current can be quickly directed to earth in the event of a fault.

General Requirements

- Always use measuring equipment to ensure that the equipment is at contact-safe temperatures and voltages before touching any parts, and wear protective equipment for any operation.

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Note!

Inspection before connection

- Check the appearance and structure of the equipment for damage, whether the equipment received and the actual equipment ordered are the same, and contact Fox ESS in case of doubt, connecting damaged equipment can cause the risk of fire and electric shock.

Wiring Requirements

- Conduits and ducts used for cables management should have no sharp edges and the location should be protected to prevent damage to the cables.

- Strictly follow industry and local standards and codes for electrical wiring for construction and installation.
- Confirm that all tools and test equipment used are functional, validly calibrated and compliant with safety standards. Count and record the quantity of tools to prevent tools from being left inside the equipment.
- Check that markings and labels on wires, terminals and equipment are clear and accurate.
- Check that connecting terminals are well insulated and protected, free from corrosion, deformation or looseness.
- Improper wiring operations may cause accidents such as fire and electric shock. Damages resulting therefrom shall not be covered under the warranty.
- Wiring must be clearly labeled to facilitate maintenance and troubleshooting.
- Wiring personnel shall wear appropriate personal protective equipment (PPE) and operate with professional insulated tools.
- Only trained and qualified personnel are authorized to disassemble or service the system. Untrained personnel must not attempt repairs.
- Operate the equipment strictly in accordance with the product operation and maintenance instructions. Ensure all warning signs are legible and intact; replace any signs that have become unclear due to prolonged use.
- Cabling shall maintain a minimum safe distance of 30 mm from high-temperature heat sources to prevent insulation degradation.
- Cables must not obstruct equipment air inlets or outlets.
- After connections are completed, ensure wire insulation is fully restored and all exposed conductors are effectively insulated.
- Route wiring neatly and orderly, avoiding crossings, tangles, and excessive bending to minimize the risk of wire damage. Use power cords of sufficient length; joints or soldered splices in power cords are strictly prohibited.
- Wire and cable insulation shall be intact and in good condition to effectively prevent leakage and short circuits.
- The earthing system shall be tested regularly to verify earthing resistance and connection integrity. Before operating equipment, confirm reliable earthing; promptly identify and repair any damage or abnormalities.
- Earthing points shall be clearly labeled to alert personnel.
- Earthing connections must be firm and reliable, free from looseness, corrosion, or poor contact. All connections shall be properly treated against corrosion.
- Inspect system parameters regularly and keep records. If anomalies are found,

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identify the root cause and take corrective action. If the cause cannot be determined, consult qualified professionals to prevent accidents that could affect system operation.

- Regularly check that wiring and connection terminals throughout the equipment are secure and free from looseness. Pay particular attention to fans, power modules, input terminals, output terminals, and earthing points.
- Place prominent warning signs or install safety warning barriers around the product. Unauthorized personnel must not enter the area to prevent mishandling or accidents caused by unrelated personnel approaching the equipment.

3.4 PE Connection and Leakage Current

PV System Residual Current Factors

Make sure the PV array is well insulated (floating) to earth before connecting it to the system.

In every PV installation, several elements contribute to the current leakage to protective earth (PE). These elements can be divided into two main types:

- Capacitive discharge current: Discharge current is generated primarily by the parasitic capacitance of PV modules to PE. Module type, environmental conditions (rain, humidity), and even the distance of modules from the roof can affect the discharge current. Additional factors contributing to parasitic capacitance include the system's internal capacitance to PE and external protection elements such as lightning protection.

During operation, the DC bus is coupled to the AC grid through the system. As a result, a portion of the AC voltage amplitude appears on the DC bus. This fluctuating voltage continuously changes the charge state of the parasitic PV capacitance (i.e., capacitance to PE), producing a displacement current proportional to the capacitance and the applied voltage amplitude.

- Residual current: In the event of a fault — such as defective insulation where an energized cable comes into contact with an earthed person — an additional current flows, known as a residual current.

Residual Current Device (RCMU)

All inverters incorporate a certified internal Residual Current Monitoring Unit (RCMU) to protect against potential electrocution caused by malfunctions in the PV array, cables, or the DC side of the inverter. The internal RCMU monitors the entire circuit and can specifically detect leakage currents on the DC side during operation.

In accordance with the DIN VDE 0126-1-1 standard, the RCMU features two distinct trip thresholds:

- Rapid Change Threshold (30 mA): Designed for personal protection, this threshold detects sudden leakage current spikes typical of direct human contact.
- Slowly Rising Threshold (300 mA): Designed for fire safety, this higher threshold limits gradual leakage currents in earthing conductors to prevent fire hazards.

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Installation and Selection of an External RCD device

An external RCD is required in some countries. The installer shall verify the local codes and standards. If RCD is needed, please follow local electrical codes and standards to choose suitable RCD. RCD installation must always comply with local codes and standards.

The manufacturer recommends the use of a Type B RCD. Unless local electrical codes specify a lower value, a 300 mA RCD is recommended for both grid-connected and standalone ports.

Steady-state Short-circuit Current Iss

- Short-circuit between positive and negative terminals of PV module:Iss≈992A/660us.
- Short circuit of the half DC bus:Iss≈3.27kA/7ms.
- Short circuit between phase voltage line and ground:Iss≈976A/8.6ms.

Note: This product can cause a DC current in the PE conductor. Where a residual current-operated protective device (RCD) is used for protection against electric shock, only a RCD is allowed on the supply side of this product.

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3.5 Response to Emergency Situations

The batteries comprise of multiple batteries connected in series. It is designed to prevent hazards or failures. However, Fox ESS cannot guarantee their absolute safety.

Under exposure to the internal materials of the battery the following recommendations should be carried out by the user.

- If there has been inhalation, please leave the contaminated area immediately and seek medical attention.
- If there has been contact with eyes, rinse the eyes with running water for 15 minutes and seek medical attention immediately.
- If there has been contact with the skin, wash the contacted area with soap thoroughly and seek medical attention immediately.
- If there has been ingestion, induce vomiting and seek medical attention.

Fire Situation

In situations where the battery is on fire, if it is safe to do so, disconnect the battery pack by turn off the circuit breaker to shut off the power to the system. Use dry powder fire extinguisher for the battery and other parts of the system.

Under any fire situation, please evacuate the people from the building immediately before trying to extinguish it.

Water Situation

This product features dust protection and is resistant to powerful water jets, but it is not designed to be submerged. Hence care should be taken not to get it wet. If you find the battery completely or partially submerged in water do not try to open. Contact an authorized personnel or Fox ESS for further instructions.

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3.6 Fire Protection Function (Battery Part)

Each battery unit is equipped with a fire extinguishing module to further ensure the safety and reliability of Fox ESS batteries. This innovative module utilizes a new type of aerosol fire extinguishing device with features such as pressure-free storage, no maintenance required, high extinguishing efficiency, non-toxic and harmless characteristics.

3.6.1 Fire Extinguishing Mechanism

The fire extinguishing mechanisms of common agents mainly include isolation, smothering, cooling, and chemical suppression, with different agents exhibiting varying mechanisms. The fire extinguishing mechanism of thermal aerosols involves two main mechanisms: the cooling effect from endothermic decomposition and the chemical suppression effects in both gas and solid phases, which work synergistically. Additionally, the gaseous components in the products of the aerosol extinguishing agent also play a supportive role.

Cooling Fire Extinguishing Effect from Endothermic Decomposition

The cooling effect of thermal aerosol extinguishing agents is primarily due to the endothermic decomposition of metal oxides and carbonates. When a fire occurs, the solid particles in the aerosol rapidly absorb heat from the fire source, resulting in a decrease in flame temperature. This reduction minimizes the heat radiating to the burning surface and lowers the energy required to dissociate vaporized combustible materials into free radicals. As a result, the combustion reaction is effectively suppressed.

Gas Phase Chemical Suppression Effect

Under thermal conditions, vaporized metal ions, such as strontium (Sr), potassium (K), and magnesium(Mg), exist as vapors and participate in multiple chain reactions with active combustion radicals including hydrogen (H·), hydroxyl (·OH), and oxygen (O·). For example:

$Sr+2{\bullet}OH \rightarrow Sr(OH)_2$

$Sr+O{\bullet} \rightarrow SrO$

$Sr(OH)_2+2H{\bullet} \rightarrow Sr+2H_2O$

Through continuous action, this process consumes active combustion groups, significantly reducing their concentration and effectively suppressing combustion.

Solid Phase Chemical Suppression Effect

The solid particles in thermal aerosol extinguishing agents can adsorb intermediates such as $\bullet OH$, $H\bullet$, and $O\bullet$ from chain reactions, catalyzing their recombination into stable molecules. This interrupts the essential branching chain reactions in the combustion

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process. For example:

K_2O (s)+2H (g)→2KOH (s) KOH (s)+OH (g)→KO (s)+H_2O (g)

K_2O (s)+O (g)→2KO(s) KO(s)+H(g)→KOH

3.6.2 Technical Specifications

Activation method: Thermal activation

Thermal activation temperature: ≥ 170℃

Discharge time: ≤ 5 seconds

Notes:

Please contact Fox ESS for immediate replacement if the fire protection module is activated.

Non-professionals should not disassemble the battery without authorization.

Do not touch the device until the casing has cooled after the internal fire extinguisher has been activated to prevent burns.

For further assistance, please contact an authorized personnel or Fox ESS for further instructions.

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4 Storage Requirement

4.1 Storing the Equipment

If the equipment is not put into operation immediately, it must be stored under specific environmental conditions.

- Regularly inspect the storage condition of the equipment. Check for moisture, mold, or signs of pest/rodent infestation. Replace packaging materials promptly if necessary.
- The equipment must be stored in a dry, well-ventilated area with a relatively stable temperature, consistently maintained between -40°C~+70°C(without battery), and a relative humidity range of 0% to 100%. Avoid direct sunlight and keep a distance of ≥2m from heat sources.
- Avoid locations subject to water splashing, rain, dampness, high temperatures, or outdoor exposure. If the floor is damp, place the packaging box on a shelf or elevated platform to avoid direct contact with the earth and minimize moisture risk.
- The storage area must be free of harmful gases, flammable, explosive materials, and corrosive chemicals.
- For long-term storage, the equipment must be covered or appropriate measures taken to protect it from contamination and environmental impact.
- Avoid mechanical shock, heavy pressure, strong electric fields, and strong magnetic fields.
- When stacking multiple equipment, do not exceed 4 cartons in height.
- Products stored under the above conditions for more than 12 months must undergo capacity verification tests and re-inspection before they can be used.
- Do not expose the battery to open flame.
- Do not store the equipment near water sources.
- Store the equipment on a flat surface.
- Store the equipment out of reach of children and pets.
- Do not damage the equipment by dropping, deforming, impacting, cutting, or penetrating it with a sharp object. This may cause electrolyte leakage or fire.
- Do not step on the equipment or place foreign objects on it, as this may cause damage.

Note: Please adhere to the storage requirements. Product damage caused by failure to meet these conditions is not covered under warranty.

4.2 Transporting the Equipment

- Ensure the equipment is securely packaged before vehicle transport. Use enclosed containers for long-distance transportation.
- It is strictly prohibited to transport this equipment together with equipment or items that could potentially affect or damage it.

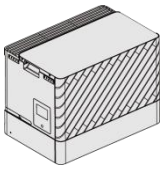
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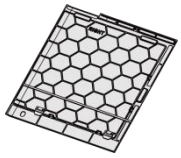
5 Installation

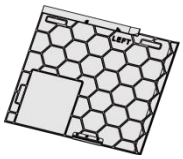
5.1 Packing List

When receiving the goods from the carrier, it is essential to conduct a thorough and careful inspection of the products. Check each received item against the delivery slip. If any item is missing or damaged, the carrier should be notified immediately. The packing list is as shown below.

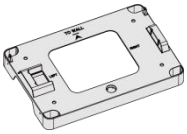
Power Cube Inverter (PQ3) Package Box


Inverter x1


Right side cover x1


Left side cover x1


Anti-tip bracket x1

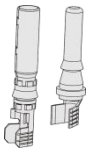

Base x1


Ethernet cable connector x3


Communication connector x1


AC connector x1


PV connectors x3

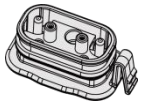

PV pin contacts x3


Install handle x2


Footstand x4


Expansion tube x2 & Expansion screw x2

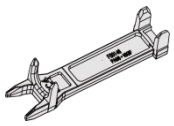

Earth terminal x1


Waterproof cover x1

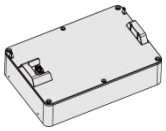


Quick installation guide x1

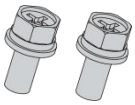

Meter x1


Unlocking tool ×1

Power Cube Battery Package Box (single battery module)



Battery cell x1



Set screw x2

Note:Multiple battery modules are needed to be used with Power Cube installation. The actual quantity of battery modules and spare parts in the system shall be subject to the actual configuration.

Unpacking Precautions

Please gently unpack the boxes. During storage, the packages must not be removed. It should only be removed when the equipment is ready for installation.

The following items must be checked before and after unpacking:

No.	Items
1	Before unpacking, inspect the product's external packaging for any issues such as damage, breakage, moisture, dampness, or deformation.
2	After unpacking, check the product and its accessories for surface defects like damage, rust, or dents.
3	Check if the nameplate information matches the model of the ordered product.
4	Check the warning label for any damage, scratches, fading, etc.

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5.2 Installation Requirements

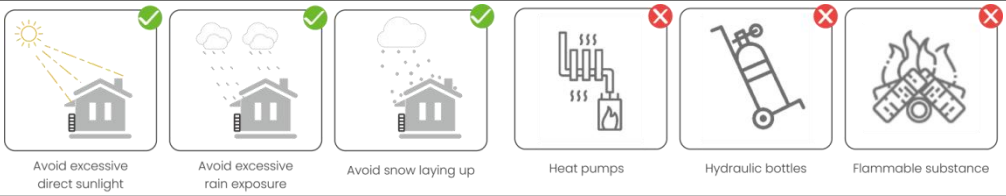
Selecting the optimal installation location is critical to ensuring the system's safe operation, service life, and performance.

Environment Requirements

Note!

Site selection should be in accordance with local laws and regulations and relevant standard requirements.

Items	Requirements
Location	● Ensure the installation area is protected from direct sunlight, rain, and snow accumulation, a shelter(e.g., rain canopy)is recommended. ● Keep the installation area away from high-temperature sources, flammable or explosive materials and other potential explosion hazards such as gas valves, LPG cylinders, heat pumps, firewood stacks, etc. ● The installation area must be completely waterproof, with a hard, level floor, and the wall should not have noticeable inclined angle. ● Maintain low and stable humidity with good ventilation; dust and dirt within the installation area must be minimized. ● Position the installation area away from television antennas or antenna cables to avoid lightning strikes and electromagnetic interference. ● Avoid the presence of flammable debris around the battery, such as cotton, fabric, haystacks, etc. which may be ignited by sparks and then lead the fire source to the battery, thus causing the battery to burn. ● Avoid the presence of hot or flammable objects around the battery, such as hydraulic bottles natural gas, oxygen, etc.), heat pumps and so on.



Installation Surface Requirements

Requirements for the Wall

The wall used for mounting the system must meet the following conditions:

- Wall brackets must be mounted on a flat wall surface. It is recommended to use screws and anchor into the supporting beam or equivalent.
- It is strictly prohibited to install the system on flammable surfaces or surfaces prone to resonance.

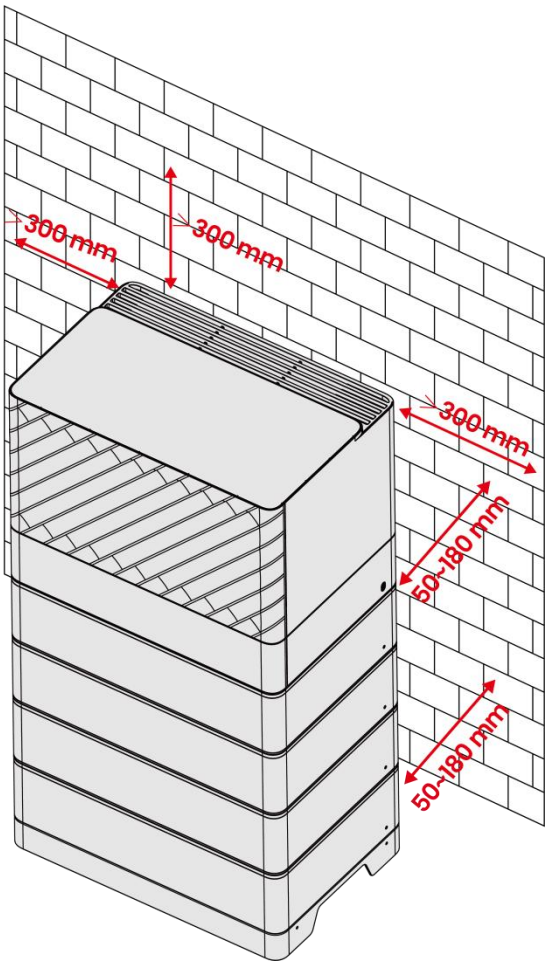
Requirements for the Foundation

The foundation for the system must meet the following conditions:

- The installation surface must be dry, and free of standing water.
- Ensure the ground is level, stable (free from vibration), and capable of supporting the equipment's weight.
- If installed in an area with dense vegetation, mud area, sanding area etc, in addition to routine weeding, the ground beneath the equipment must be hardened (e.g., by laying concrete or gravel) over an area of no less than the equipment footprint.

Requirements for the Space

Adequate space must be reserved around the system, and a suitable installation angle must be selected to ensure sufficient room for installation and heat dissipation. The specific space requirements for the Power Cube is illustrated in the following diagram.



5.3 Installation Precautions

⚠ Danger!

- Do not wear loose metal clothing or jewelry when performing installation work, otherwise there may be a risk of electric shock!

⚠ Warning!

- All jumper components and component-mounted racks must be properly earthed, with unpainted contact surfaces.

5.3.1 Inverter Handling

- When manually handling the unit, wear protective gloves, safety shoes, and other personal protective equipment to prevent injury during the process.
- Use correct lifting posture: Bend your knees to lower your center of gravity, grasp the inverter handles with both hands, and slowly straighten your knees, using the strength of your legs to lift the load. Keep the load close to your body and move using short, quick steps.
- Always maintain body balance during handling. Avoid making sudden turns or changes in direction.
- If a turn is necessary, execute it slowly and adjust your body posture in advance.
- If you feel fatigued or lack sufficient strength, you must stop handling immediately.
- Handling shall be performed by at least two persons.

Warning!

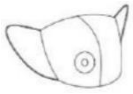
Do not jerk or twist your body using the strength of your lower back, as this can lead to injury.

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5.4 Tools Preparation


Safety Glasses


Helmet


Dust Mask


Insulating Gloves


Steel Toe Boots


Electric Drill


Hex Key


Tape


Sleeve


Level


Phillips Screwdriver


Flat-head Screwdriver


Adjustable Wrench


Wire Stripper

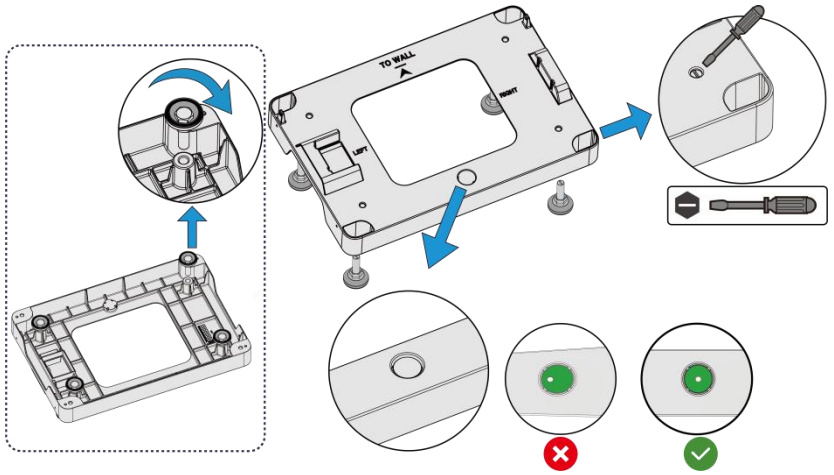
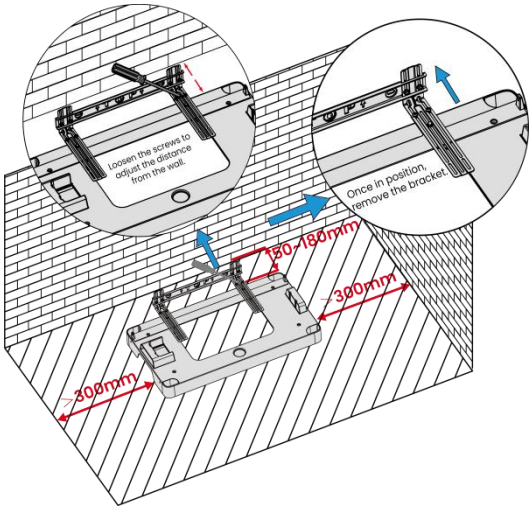

Multimeter

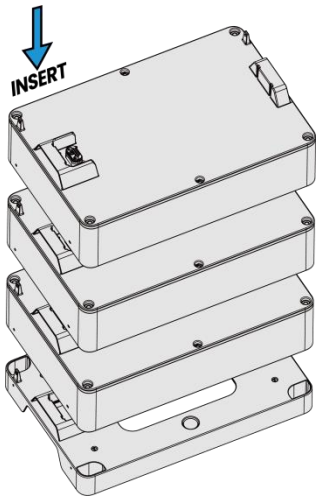
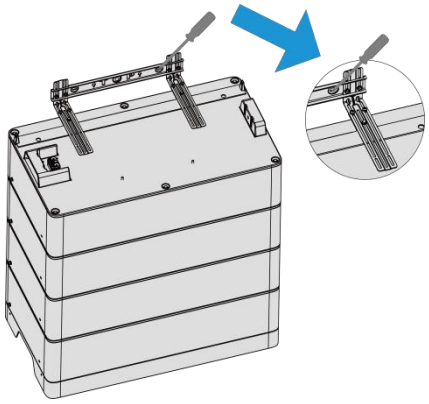
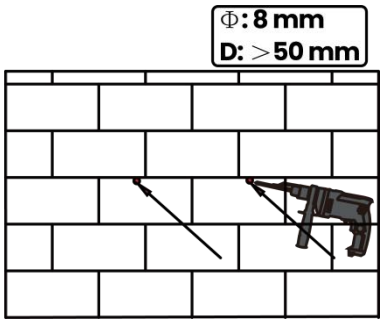

Hammer Drill

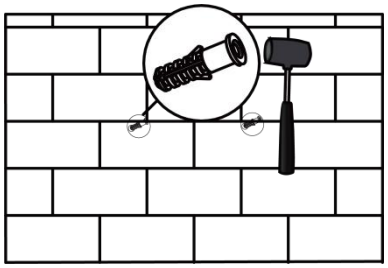
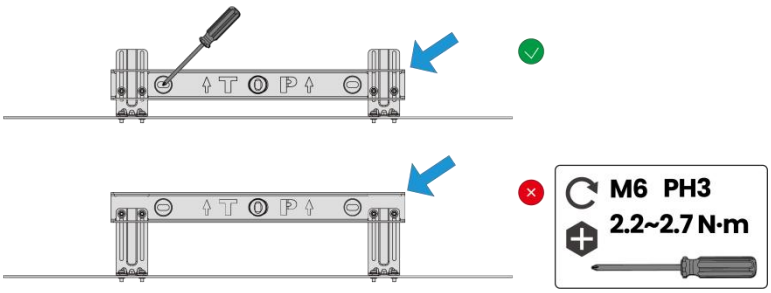
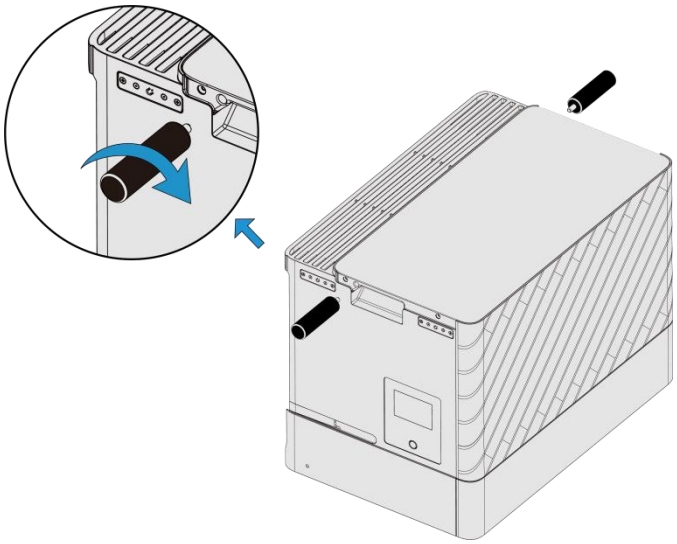

Phone

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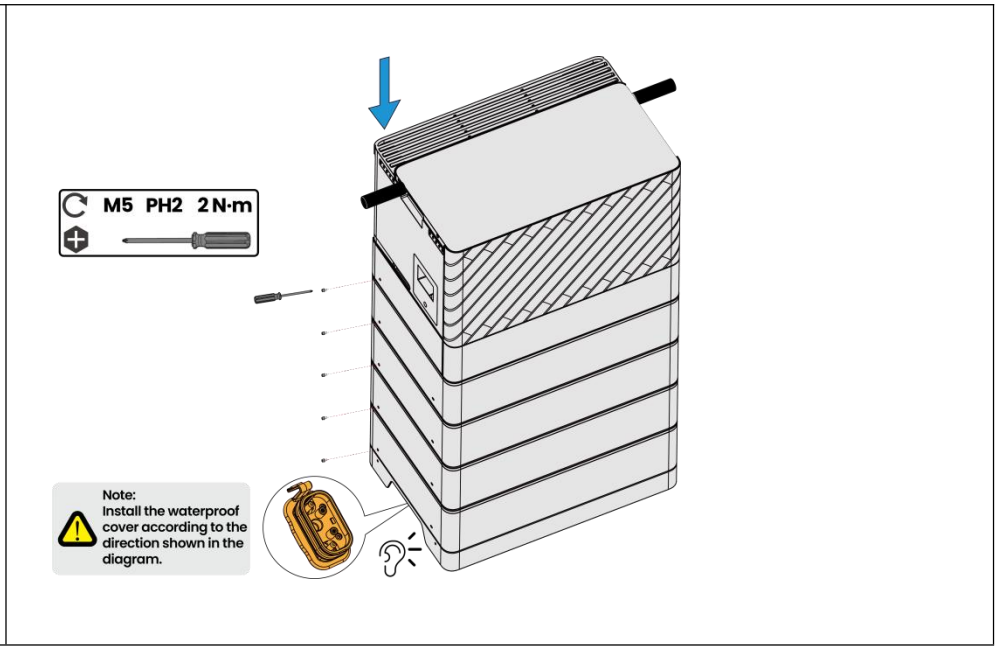
5.5 Installation Steps

Procedures	
Step 1	Screw the accessory foot pegs clockwise into the base; use a screwdriver to level the base with reference to the level bubble.
	
Step 2	Place the hanger on the base. Adjust the bracket screws to set the distance from the wall, with an adjustable range of 50~180 mm.
	
Step 3	After confirming the distance from the wall, first remove the hanger, then stack the slave control batteries.

	
	Battery NO.: Depends on battery series.
Step 4	After completing the stacking of the slave units, place the hanger on the top slave unit and mark the drilling positions on the wall.
	
Step 5	Drill holes in the wall (φ8mm, depth D > 50mm), then install the expansion bolts.
	

<table>
<tr><td rowspan="2"></td><td></td></tr>
<tr><td>
</td></tr>
<tr><td rowspan="2">Step 6</td><td>Install the hand lift on the machine, and stack the all-in-one unit on the top layer.</td></tr>
<tr><td></td></tr>
<tr><td>Step 7</td><td>Fasten the anti-drop screws on both sides, and install the waterproof cover.</td></tr>
</table>

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M5 PH2 2 N·m
Note:
Install the waterproof cover according to the direction shown in the diagram.

5.6 Wiring

5.6.1 Connection Overview

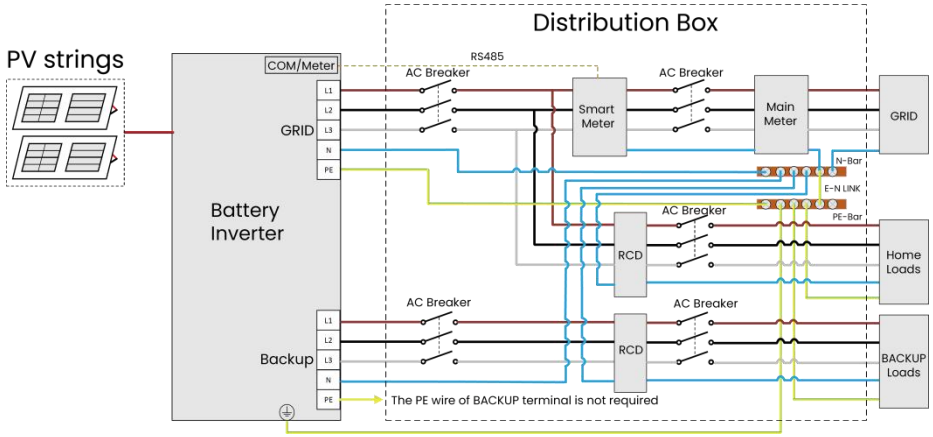
Note!

The upper face of the expansion tubes must be made sure that it is level with the concrete wall surface and does not protrude from the concrete wall surface, otherwise it will make the wall plate unevenly placed on the wall surface.

Cable material selection: Nickel-plated copper is recommended, but aluminum can also be used.

For countries such as Australia, New Zealand, South Africa, etc, please follow local wiring regulations.

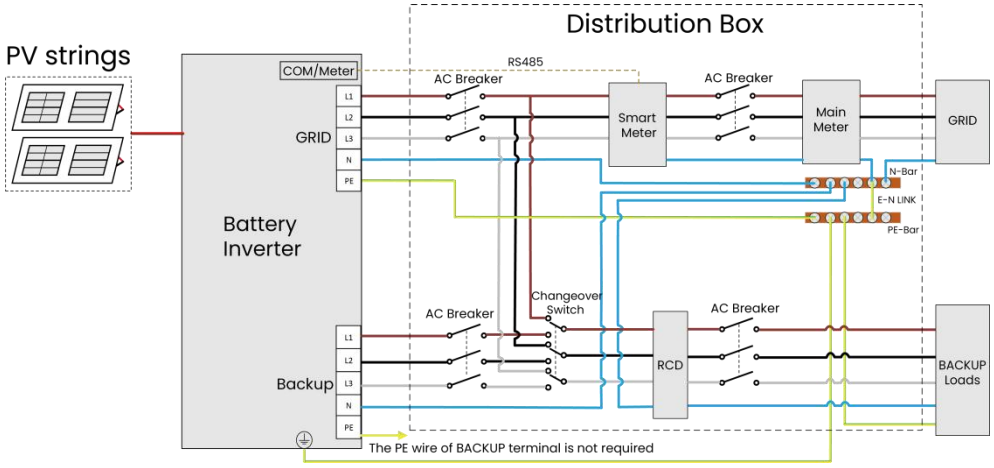
According to Australian safety requirements, the N cables of the GRID side and BACKUP side must be connected together. Otherwise, the BACKUP function will not work.



Note!

Select an MCB with an appropriate rated current based on the actual requirements, including the overall wiring scheme, the number of loads, and the inverter's load-carrying capacity. Selection of an External RCD device, suggest choosing a 300mA RCD (Comply with local regulation).

Whole Home Backup Wiring Diagram (Australia and New Zealand)



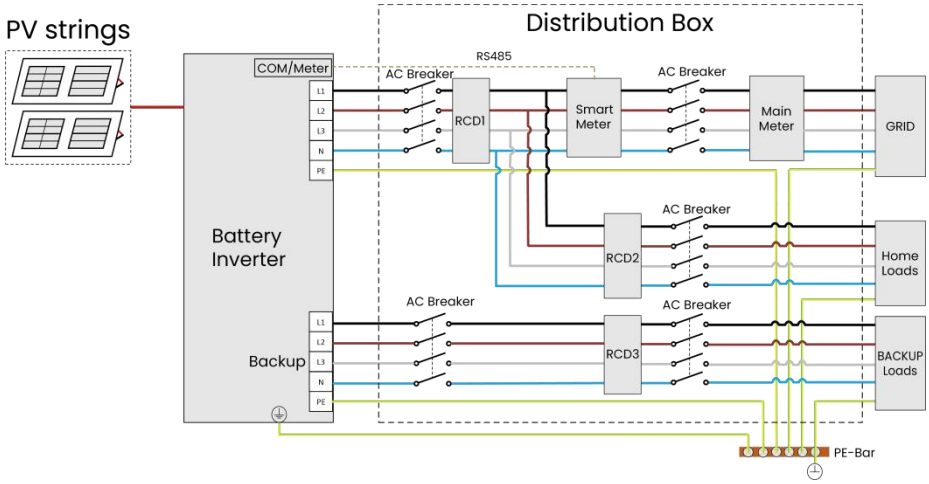
Note!

- AC breaker:Depends on loads;
- RCD: 30mA RCD (Comply with local regulation);
- Changeover switch: A 63A manual changeover switch is required for the whole home backup scenario. When switching to "BACKUP" using the changeover switch, household loads will be supplied by the PV installation and battery. When the inverter is faulty or undergoing maintenance, switch to"GRID" to ensure the loads can work normally.

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

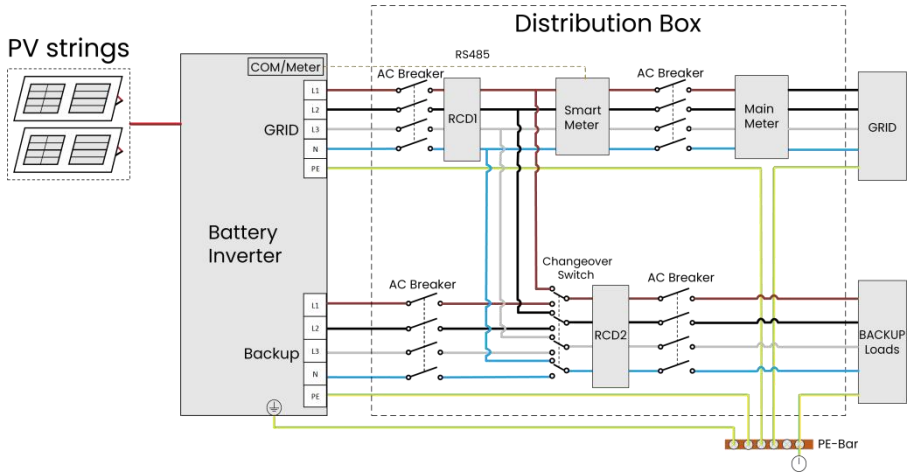
This diagram is an example for an application in which neutral is separated from the PE in the distribution box.



Note!

1. Select an MCB with an appropriate rated current based on the actual requirements, including the overall wiring scheme, the number of loads, and the inverter's load-carrying capacity.
2. Select RCD1:300mA RCD (Comply with local regulation).
3. Select RCD2 and RCD3:30mA RCD (Comply with local regulation).

Whole Home Backup Wiring Diagram (China, Germany, the Czech Republic, Italy,etc,)



Note!

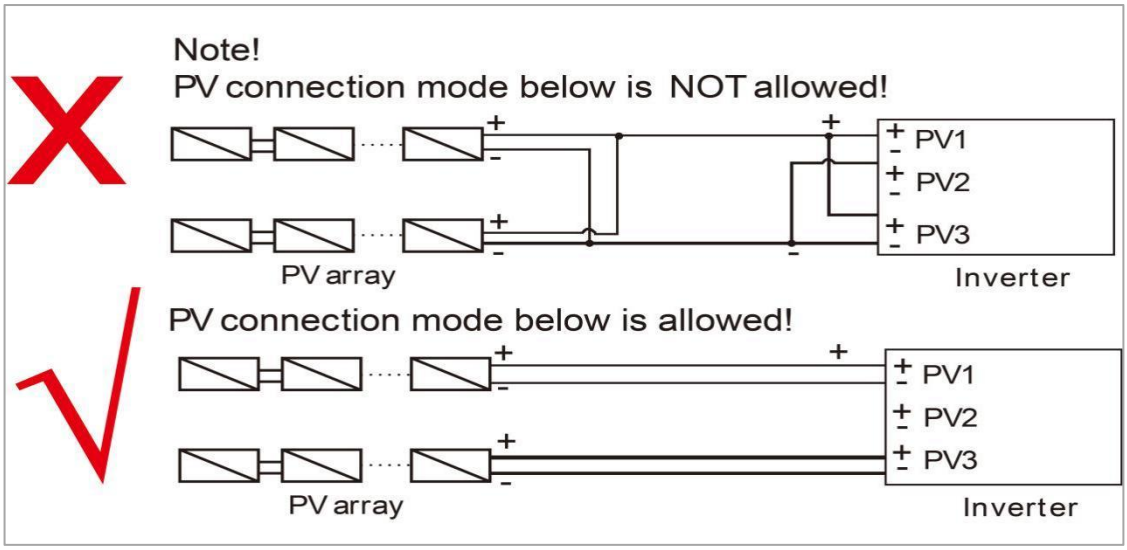
1. Select an MCB with an appropriate rated current based on the actual requirements, including the overall wiring scheme, the number of loads, and the inverter's load-carrying capacity.
2. Select RCD1:300mA RCD (Comply with local regulation).
3. Select RCD2 and RCD3:30mA RCD (Comply with local regulation).

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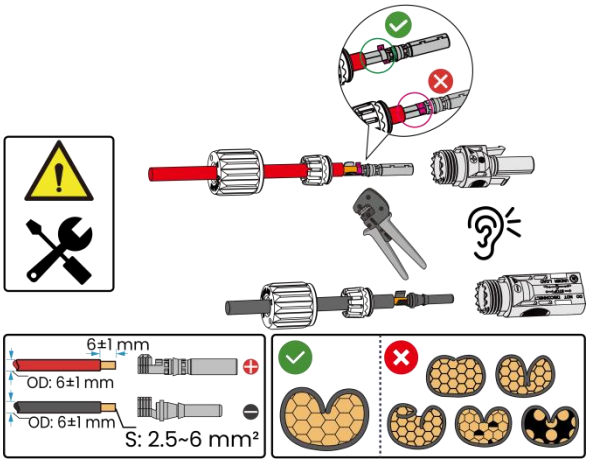
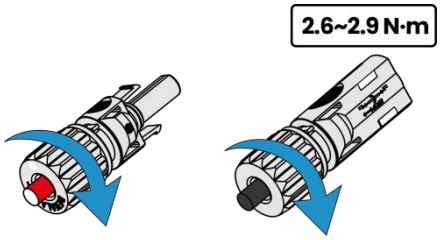
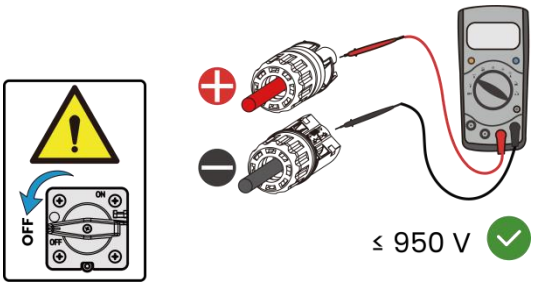
5.6.2 PV Connection

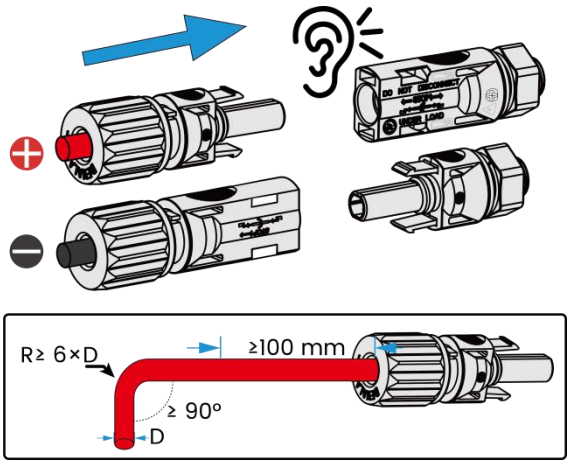
Step 1: PV String Connection

Note!
PV modules: Please ensure they are the same type, have the same output and specifications, are aligned identically, and are tilted to the same angle. In order to save cable and reduce DC loss, we recommend installing the inverter as near to the PV modules as possible.



Step 2: PV Wiring

Procedures	
Step 1	
Step 2	
Step 3	

Step 4	

Unlock the DC connector

Danger!

Before separating the DC connector, make sure that there is no current on the DC connector. You can measure it with current clamp or disconnect the DC switch, otherwise serious safety accidents may occur. Make sure that the power cable connected to the inverter is connected vertically and that the vertical length is greater than 30 cm. If the cable is bent close to the terminals, it may cause poor line contact and result in burnt terminals.

- 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.

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5.6.3 Grid Connection

Step 1: Grid String Connection

Hybrid series inverters are designed for single-phase grid. Per voltage range is 220/230/240V; frequency is 50/60Hz. Other technical requests should comply with the requirement of the local public grid.

Model (kW)	PQ3-5.0-M PQ3-5.0-M-AC HQ3-5.0-M HQ3-5.0-M-AC	PQ3-6.0-M PQ3-6.0-M-AC HQ3-6.0-M HQ3-6.0-M-AC	PQ3-8.0-M PQ3-8.0-M-AC HQ3-8.0-M HQ3-8.0-M-AC	PQ3-10.0-M PQ3-10.0M-AC PQ3-10.0-L-M PQ3-10.0-L-M-AC HQ3-10.0-M HQ3-10.0-M-AC	PQ3-12.0-M PQ3-12.0-M-AC HQ3-12.0-M HQ3-12.0-M-AC	PQ3-15.0-M PQ3-15.0-M-AC HQ3-15.0-M HQ3-15.0-M-AC
Cable (ON-GRID)	16.0mm²					
Cable (BACKUP)	16.0mm²					
Micro-Breaker	63A					

⚠ Warning!

A micro-breaker for max output overcurrent protection device shall be installed between inverter and grid, and the current of the protection device is referred to the table above, any load SHOULD NOT be connected with the inverter directly.

Step 2: Grid Wiring

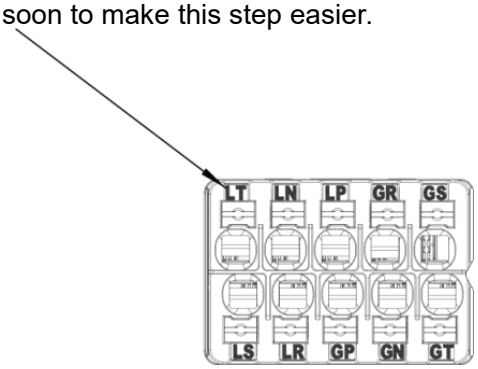
Check the grid voltage and compare with the permitted voltage range (refer to technical data).

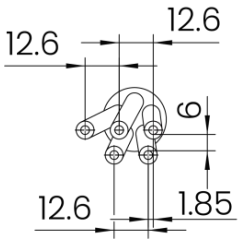
Disconnect the circuit-breaker from all the phases and secure against re-connection.

Trim the wires:

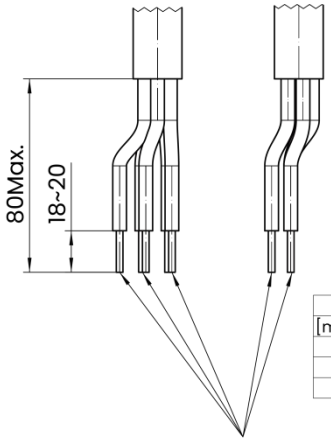
Prepare the cable and stripping with the recommended dimension, crimp ferrule for Fine-stranded wire place the wire according to the mark on insert.

* a stripping tool will be ready soon to make this step easier.



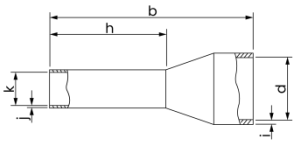


Cable wire type	Single-stranded	Multi-stranded (number of wires≤7)	Fine-stranded
With ferrule	No	No	Yes



Bottom of wire should be on one horizontal plane

Recommended ferrule wire stripping length 20-24mm.



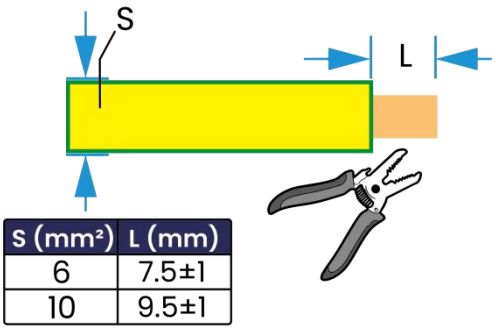
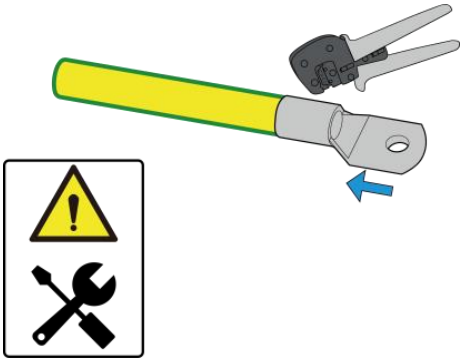
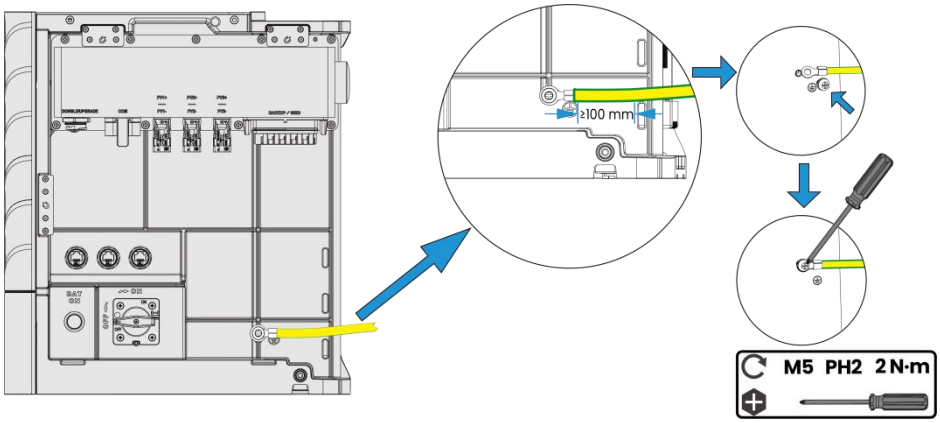
		Dimension [mm]				
[mm²]	AWG	a	b	d	h	k
6	10	-	26.00	6.20	18.00	3.50
10	8	-	28.00	7.50	18.00	4.60
16	8	-	28.00	8.80	18.00	5.80

Note!

The wiring of the power grid must be connected to the N line, otherwise the machine will report an error and cannot work normally. The SW BUS Volt fault will appear. The method to detect whether the N line is connected is to measure whether the voltage of each phase is within the normal working voltage range separately. Then disconnect one of the live wires and check whether the voltage of the other two phases is within the range. If it is within the range, it means that the N wire is connected. If, after disconnecting the live wire, the voltage of the other two phases changes, it means that the N wire is not connected.

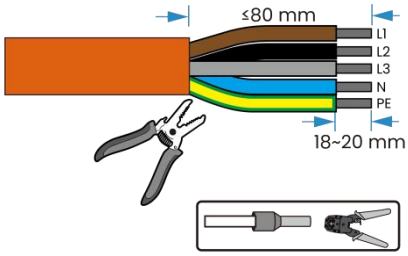
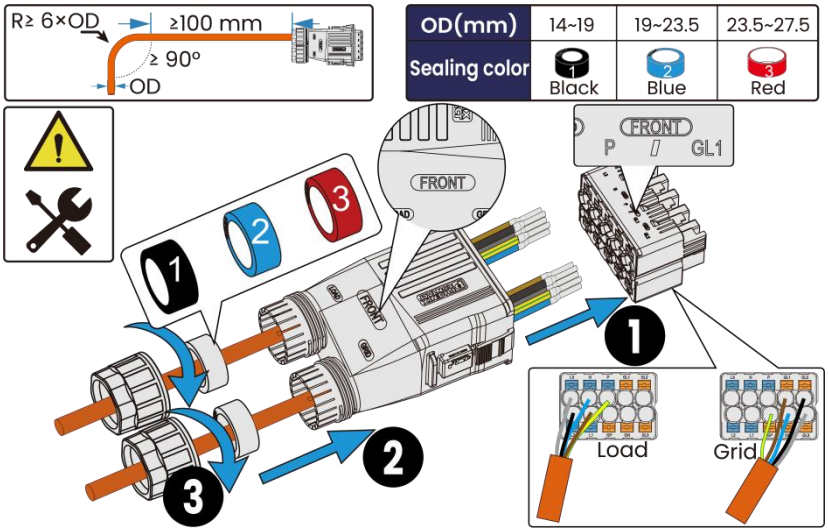
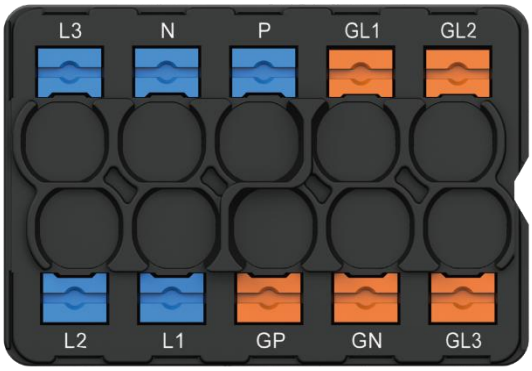
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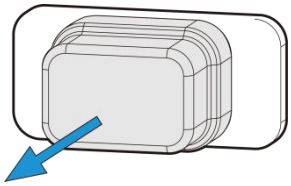
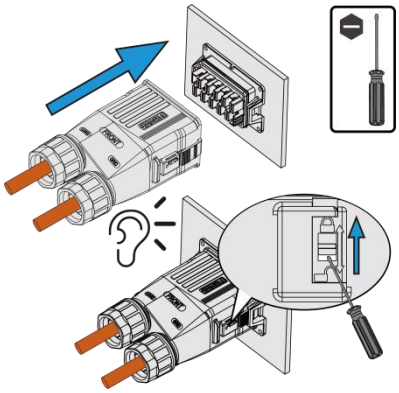
5.6.4 Earth Connection

Procedures	
Step 1	 Note: Select the appropriate grounding wire based on the power rating.
Step 2	
Step 3	

S (mm²)	L (mm)
6	7.5±1
10	9.5±1

5.6.5 AC Cable Installation

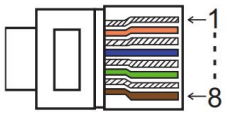
Procedures	
Step 1	 Power (kW) / Conductor cross-section(mm²) / Micro-Breaker (A) 5.0~15.0 / 10.0~16.0 / 63
Step 2	 Note: The interfaces of the Grid and Backup connectors are shown in the figures. 

Step 3	
Step 4	

5.6.6 RJ45 Connection

The machine has three RJ45 terminals, which are meter, Ethernet, and DRM0 functions

The definition of meter port pin is as follows:



PIN / Port	1	2	3	4	5	6	7	8
Meter	meter 485B	meter 485A	meter 485A	/	/	meter 485B	/	/

The definition of Ethernet port pin is as follows:

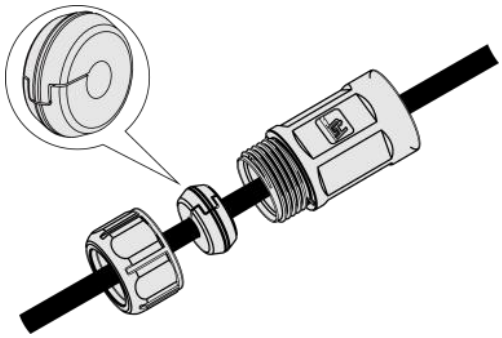
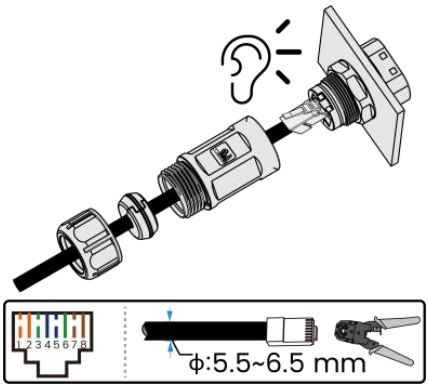
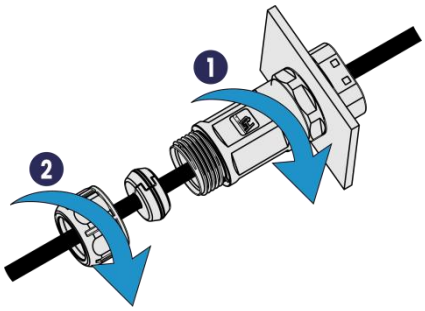
PIN / Port	1	2	3	4	5	6	7	8
Ethernet	TX+	/	TX-	RX+	/	RX-	/	/

The definition of DRM port pin is as follows:

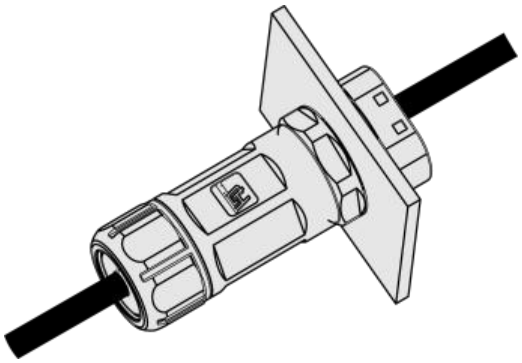
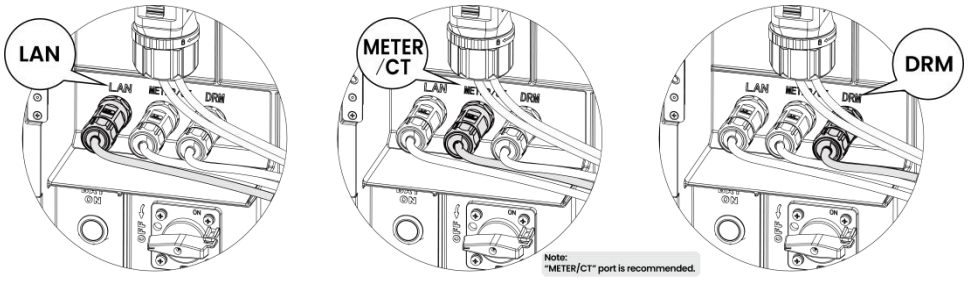
PIN / Port	1	2	3	4	5	6	7	8
DRM	I/O1	I/O2	I/O3	I/O4	+3.3V	I/O0	GND	GND

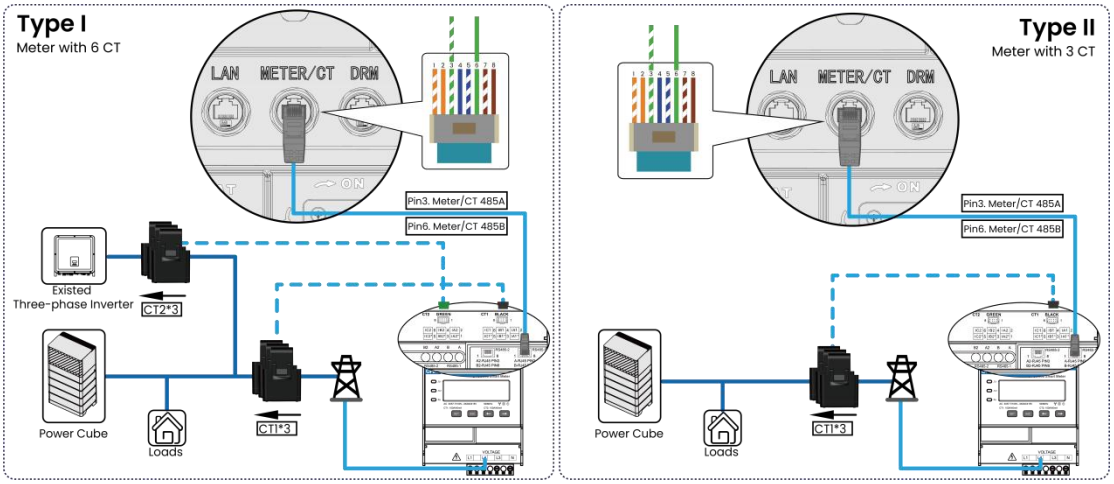
RJ45 Wiring

Installation Procedure

Procedures	
Step 1	
Step 2	
Step 3	

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Step 4	
Step 5	



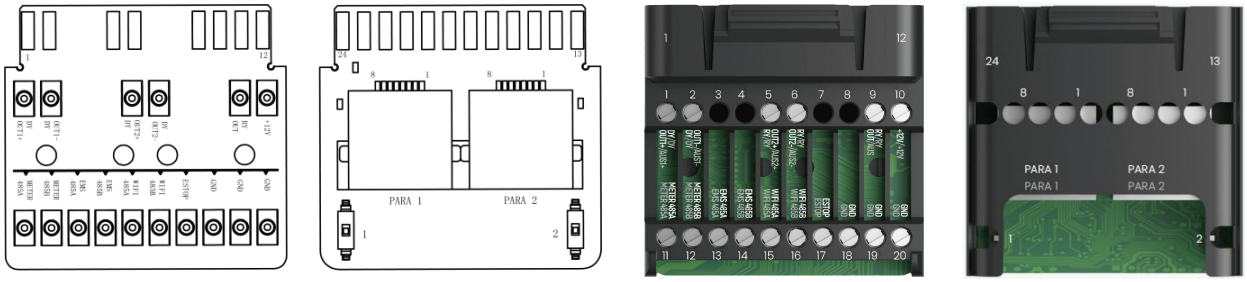
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5.6.7 COM Connection

Introduction to COM port:

The COM port mainly includes EMS485, Meter485, WiFi485, Estop port, two relay output ports, two parallel ports and a toggle switch, +12V and corresponding relay output signals.

One communication connector is supplied in the packing list (see below).



EMS 485:

Supports Modbus485 communication, which can be used to read and control machines.

The specific protocol is provided by the manufacturer.

Meter 485:

Similar to the Meter485 interface, this interface is designed to be redundant.

WiFi 485:

For internal testing.

Estop port:

When short circuiting Esotp and GND, the machine will stop working.

DY OUT:

The machine has two DY OUT interfaces, with two internal contacts of relays hat can drive loads of 230VAC1A/50VDC0. 5A, and can be used for powering on and starting heat pumps.

5.6.8 Communication Connection

Communication Device Installation

The Power Cube is available with multiple communication options such as WiFi-, GPRS-, LAN- or 4G-Dongle, and Smart meter with an external device.

Operating information like output voltage, current, frequency, fault information, etc., can be monitored locally or remotely via these interfaces.

- **WiFi/LAN(internally installed) and GPRS (Optional)**

The Power Cube has an interface for WiFi/GPRS/LAN/4G-Dongle that allow this device to collect information from inverter; including inverter working status, performance etc., and update that information to monitoring platform (the WiFi/GPRS/LAN4G-Dongle is available to purchase from your local supplier).

Connection steps:

1. For GPRS device: Please insert the SIM Card (please refer to the GPRS product manual for more details).
2. Plug the WiFi/ GPRS/ LAN 4G-Dongle into “WiFi/GPRS/LAN 4G-Dongle” port at the bottom of the inverter.
3. For WiFi device: Connect the WiFi with the local router, and complete the WiFi configuration (please refer to the WiFi product manual for more details).
4. Set-up the site account on the monitoring platform (please refer to the monitoring user manual for more details).

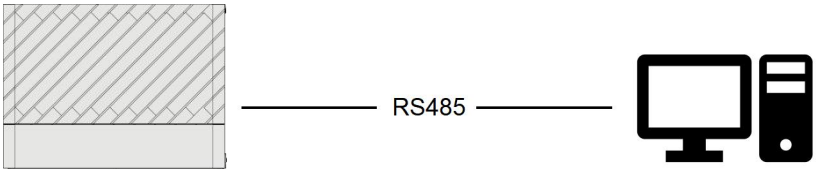
APP Installation:

Scan the QR Code below to download and install the FoxCloud 2.0 app on your smartphone.

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- **RS485**

RS485 is a standard communication interface which can transmit the real time data from inverter to PC or other monitoring devices.



- **Meter**

The Power Cube has integrated export limitation functionality. To use this function, a power meter must be installed. For Meter installation, please install it on the grid side.

Note:

- Compatible Meter type: DTSU666 (CHINT).

Please check and configure the meter before use:

Addr: 1;

Baud: 9600

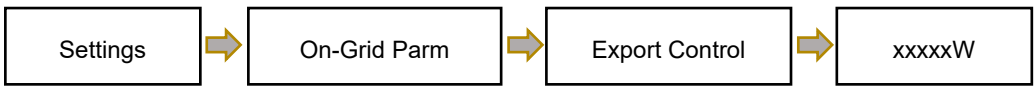
Protocol:n.1

Use the meter that comes standard in the box. Non-standard meters of the same model may not be suitable.

Please refer to the user manual of electricity meter for detailed setting steps.

Note!
When connecting the electricity meter, please make sure that the way of the electricity meter is correct, otherwise it will affect the size of the load obtained by the inverter and affect the normal operation of the inverter. When the battery is available and can work normally, the machine provides the self-test function in the direction of the meter, which can be set in the meter interface.

Export control setting:

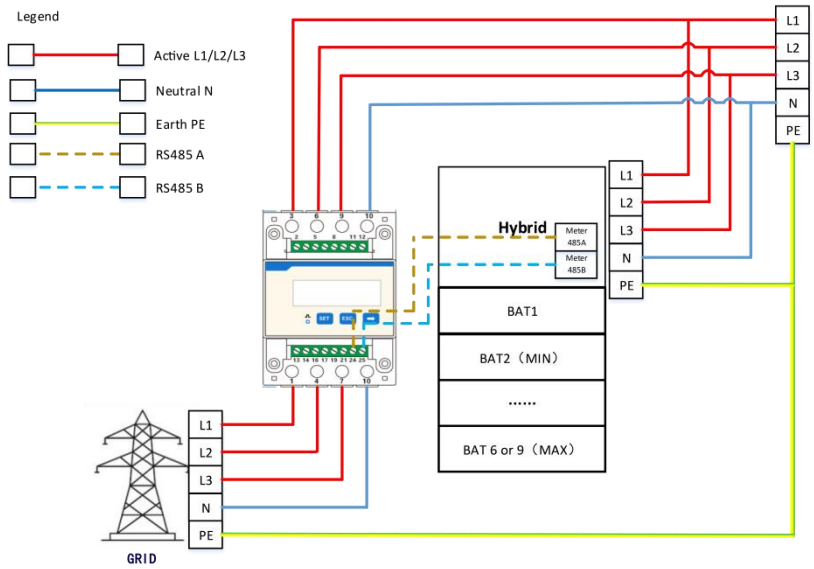


The inverter supports the wiring of various types of electricity meters, including direct-connected meters, 3CT meters, and 6CT meters.

The definition of meter port pin is as follows:

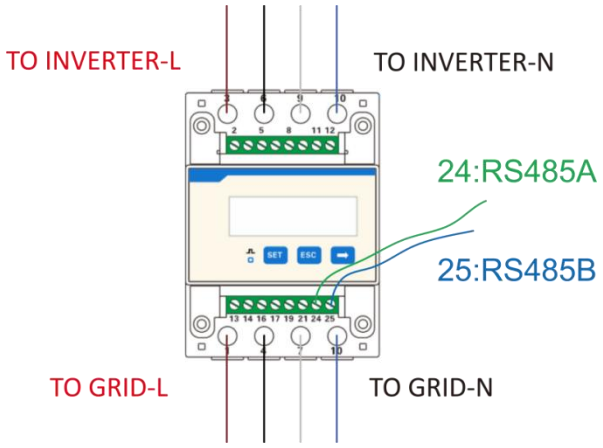
PIN / Port	1	2	3	4	5	6	7	8
Meter	meter 485B	meter 485A	meter 485A	/	/	meter 485B	/	/

Direct-connected meter is connected as follows:



Step 1:

Insert L1/L2/L3/N wires and RS485A/B cable into the meter. Please refer to the meter wiring diagram on side of meter itself.



Step 2:

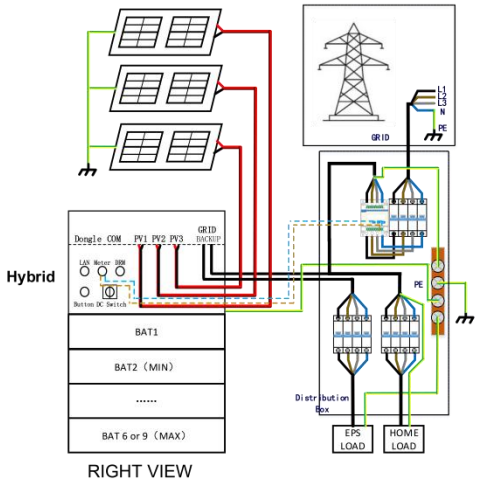
Connect RS485A to pin 2/3 of the inverter METER/RS485 port.

Connect RS485B to pin 1/6 of the inverter METER/RS485 port.

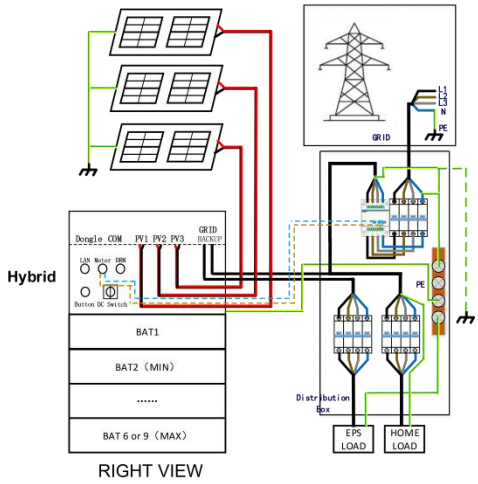
PIN / Port	1	2	3	4	5	6	7	8
Meter	meter 485B	meter 485A	meter 485A	/	/	meter 485B	/	/

Insert L1/L2/L3/N wires, CT and RS485A/B cable into the meter. Please refer to the meter wiring diagram on side of meter itself. During CT use, the direction of the CT arrow faces the inverter.

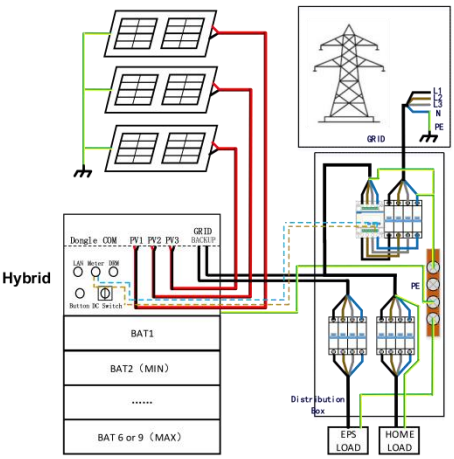
There are different ways of wiring for different grid systems. Four grid types, TT / TN-C-S / TN-C/TN-S are shown as below:



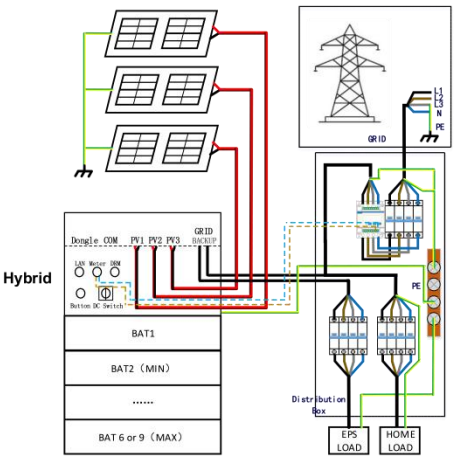
RIGHT VIEW



RIGHT VIEW



RIGHT VIEW



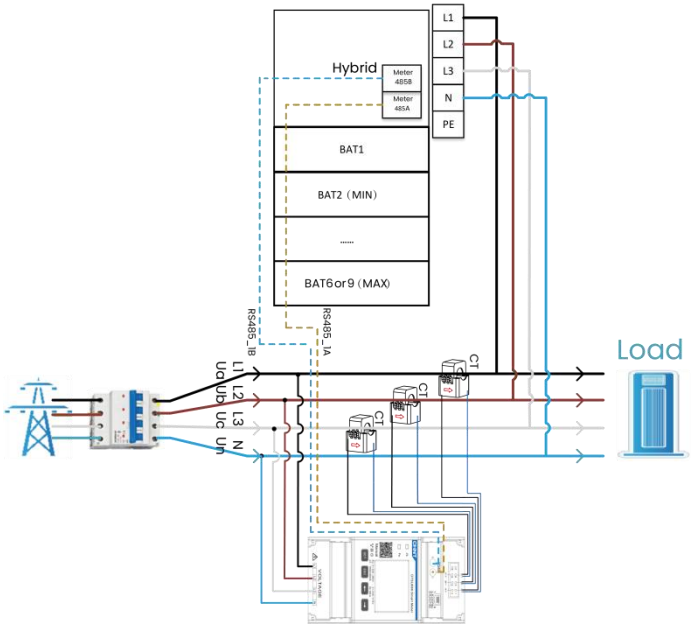
RIGHT VIEW

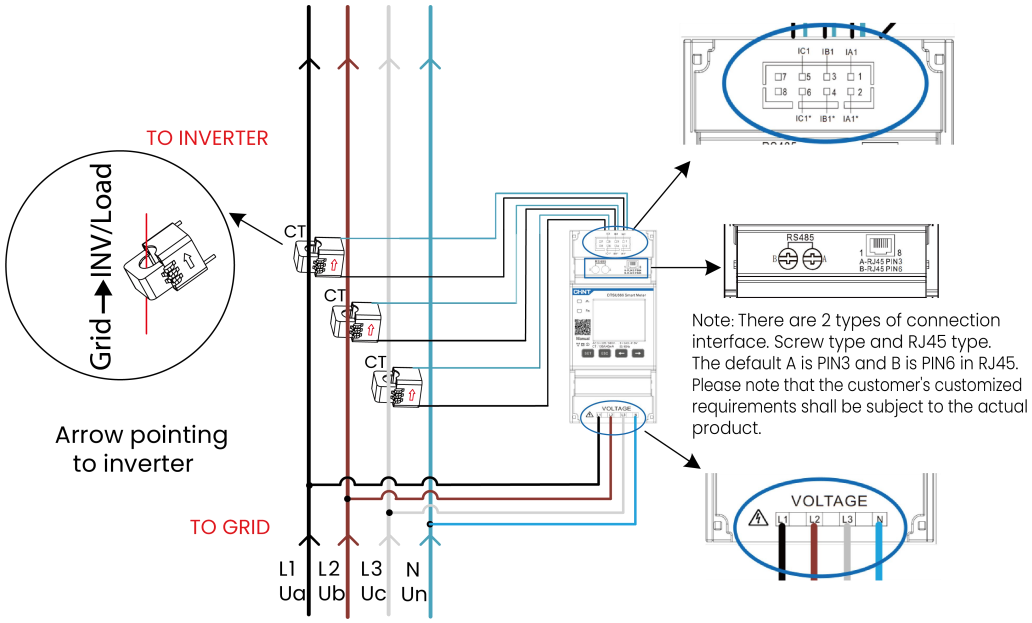
3CT energy meters

Note!

The electric meter is not included in the attachment and needs to be purchased separately.

Insert L1/L2/L3/N wires, CT and RS485A/B cable into the meter. Please refer to the meter wiring diagram on side of meter itself. During CT use, the direction of the CT arrow faces the inverter.





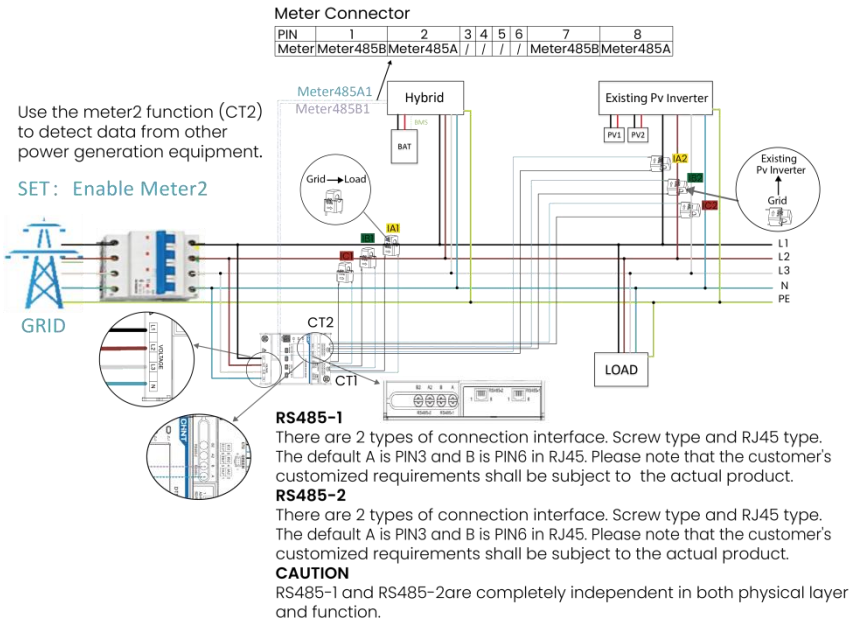
6CT energy meters

6CT meter enables dual-meter functionality

Step 1:

A 6CT meter can be used to monitor the power output of an additional inverter or generation device.

Step 2:



Note!

- For the three-phase wiring of the Current Transformer (CT), it must be in phase with the corresponding voltage detection. Specifically, the CT corresponding to the L1 phase is IA, the CT corresponding to the L2 phase is IB, and the CT corresponding to the L3 phase is IC.
- The black power line is connected: the meter terminals L1, IA1 and IA2 should be clamped to the black wire.
- The brown power line is connected: the meter terminals L2, IB1 and IB2 should be clamped to the brown wire.
- The gray-white power line is connected: the meter terminals L3, IC1 and IC2 should be clamped to the gray-white wire.
- Need to enable meter2

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Method for Checking the Correctness of CT Wiring

In the web-based settings, there is a "meter/CtDetection" interface. On this interface, there is a "DetectionEnable" option. After clicking it, the inverter will automatically check the phase and direction of meter1. The inspection result will be displayed, and you can also set and change the direction of the CT.

Local Testing Wiring Method:

Use the AC voltage range of a multimeter to test.

Whether the voltages on the wire of L1 on the electricity meter and the CT (Current Transformer) wire with the yellow sleeve are at the same potential;

Whether the voltages on the wire of L2 on the electricity meter and the CT wire with the green sleeve are at the same potential;

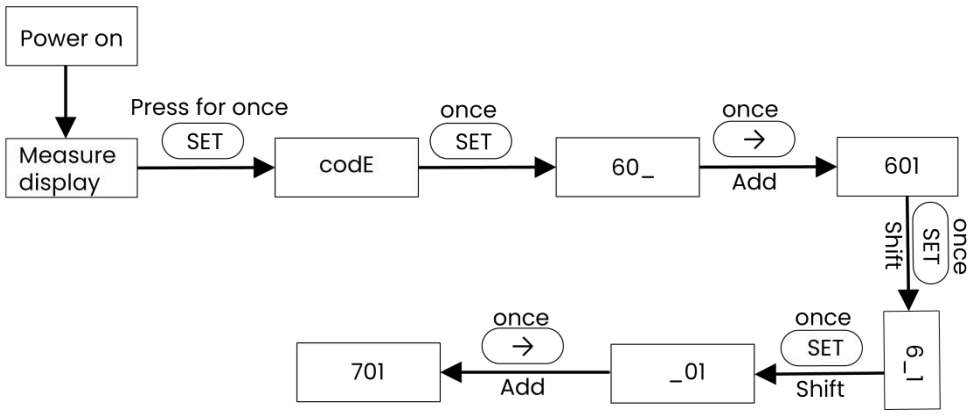
Whether the voltages on the wire of L3 on the electricity meter and the CT wire with the red sleeve are at the same potential.

The settings of the electric meter

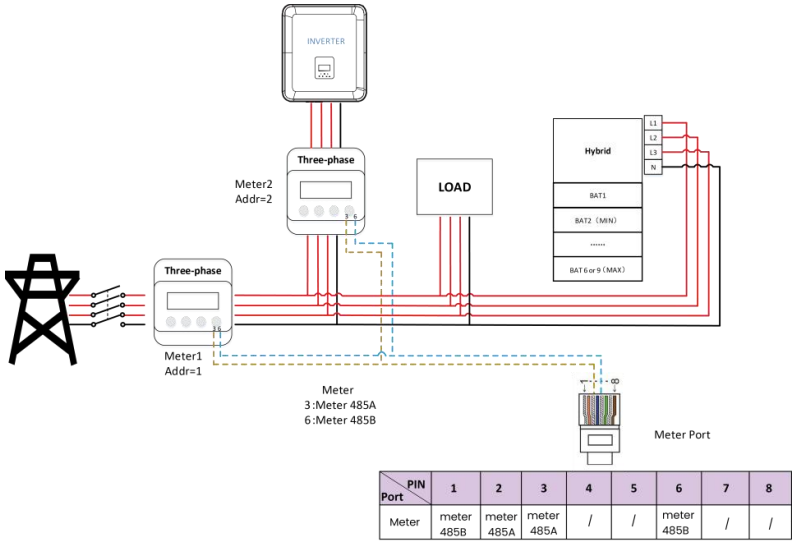
A password is required to set up the electricity meter. The password is "701",

and the password input process is as follows:

You can change the addr and CT ratio in the settings. Please refer to the electricity meter manual for details.



The address of the second meter is 2. Please ensure that the address is 2, otherwise the communication of the first meter will be affected, and the output and monitoring data of the inverter will be affected.



Port \ PIN	1	2	3	4	5	6	7	8
Meter	meter 485B	meter 485A	meter 485A	/	/	meter 485B	/	/

- **DRM**

The definition of DRM port pin is as follows:

Red rubber ring - new version DRM interface

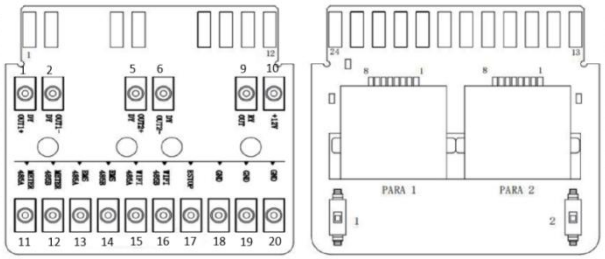
Port \ PIN	1	2	3	4	5	6	7	8
DRM	I/O1	I/O2	I/O3	I/O4	+3.3V	I/O0	GND	GND

Note: To achieve the DRM0 function, pins 5 and 6 need to be short-circuited.

Note: The new version supports the 568B cable standard and is directly compatible with GSD devices, eliminating the need for an external converter.

- **BMS**

BMS is used to communicate with the battery for data exchange, please use the network cable configured for the battery to communicate the communication distance should not exceed 10m.



- Insert one side of CAT 7 cable into the first inverter's CAN port and the other side into the next inverter’s CAN port.

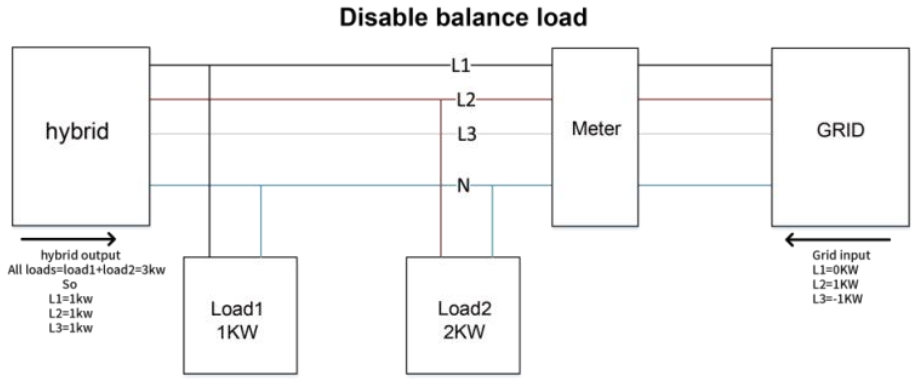
- Insert one side of CAT 5 cable into the Meter port of meter, and the other side into the CAN 1 port the first inverter or the CAN 2 port of the last inverter.

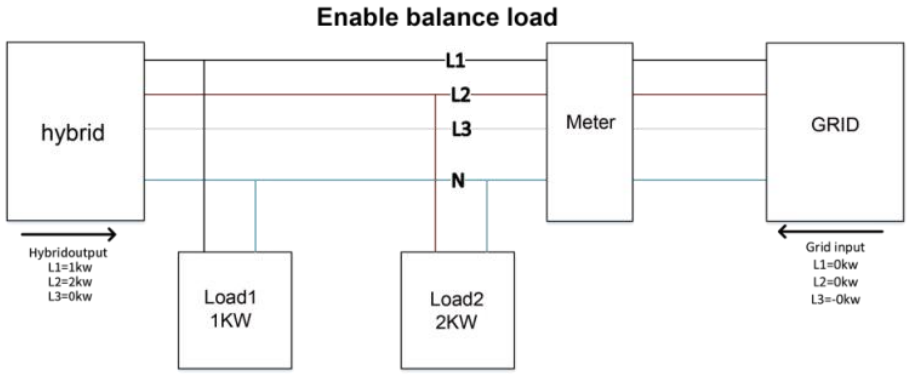
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5.6.9 Introduction to the function of unbalanced load

If the load of each phase in the household load is different, and the power of each phase output by the inverter is the same, there will be one phase output and one phase input. In order to avoid this situation, the unbalanced load can be turned on. The use method is to enable in the balance load interface.

The following is a simple schematic diagram of this function:





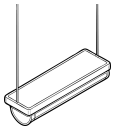
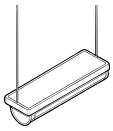
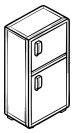
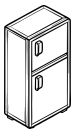
Note!

The maximum capacity of balanced load is 1/3 of the rated power, that is, the maximum output capacity of 12kW machine per phase is 4kW. The same is true for unbalanced load of off-grid function. If the single-phase load exceeds 1/3 of the output capacity under off-grid condition, the machine will report an error.

5.6.10 BACKUP Connection (Non-parallel State)

Common loads description

Under BACKUP mode, if need to connect the inductive load on BACKUP port, please ensure that the instantaneous power of the load at startup is lower than the maximum power of the BACKUP mode. Below table shows some conventional and reasonable loads for you reference. Please refer to your loads' manual for the actual specs.

Type	Power		Common equipment	Example		
	Start	Rated		Equipment	Start	Rated
Resistive load	× 1	× 1	 Incandescent Lamp  TV	 100W Incandescent lamp	100VA (W)	100VA (W)
Capacitive load	× 2	× 1,5	 Fluorescent lamp	 40W Fluorescent lamp	80VA (W)	60VA (W)
Inductive load	× 3~5	× 2	 Fan  Fridge	 150W Fridge	450-750VA (W)	300VA (W)
Half-wave load	× 2.4	× 2	 Electric blanket  Hair dryer	 50W Electric blanket	120VA (W)	100VA (W)

*Unipolar 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.

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5.6.11 DRM wiring

The use of the DRM function shall be subject to local codes and standards.

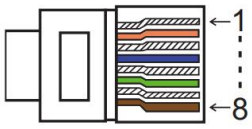
DRM0 setting

Settings → Feature Parm → DRM0 → Enable/Disable

DRM supports several demand response modes by configuring control signals as below.

Mode	Asserted by shorting pins		Requirement
DRM0	VCC	I/O0	Operate the disconnecting device, under Australian safety regulations.
DRM1	I/O1	I/O0	Do not consume power.
DRM2	I/O2	I/O0	Do not consume at more than 50% of rated power.
DRM3	I/O3	I/O0	Do not consume at more than 75% of rated power and source reactive power if capable.
DRM4	I/O4	I/O0	Increase power consumption (subject to constraints from other active DRMs).
DRM5	I/O1	VCC	Do not generate power.
DRM6	I/O2	VCC	Do not generate at more than 50% of rated power.
DRM7	I/O3	VCC	Do not generate at more than 75% of rated power and sink reactive power if capable.
DRM8	I/O4	VCC	Increase power generation (subject to constraints from other active DRMs).

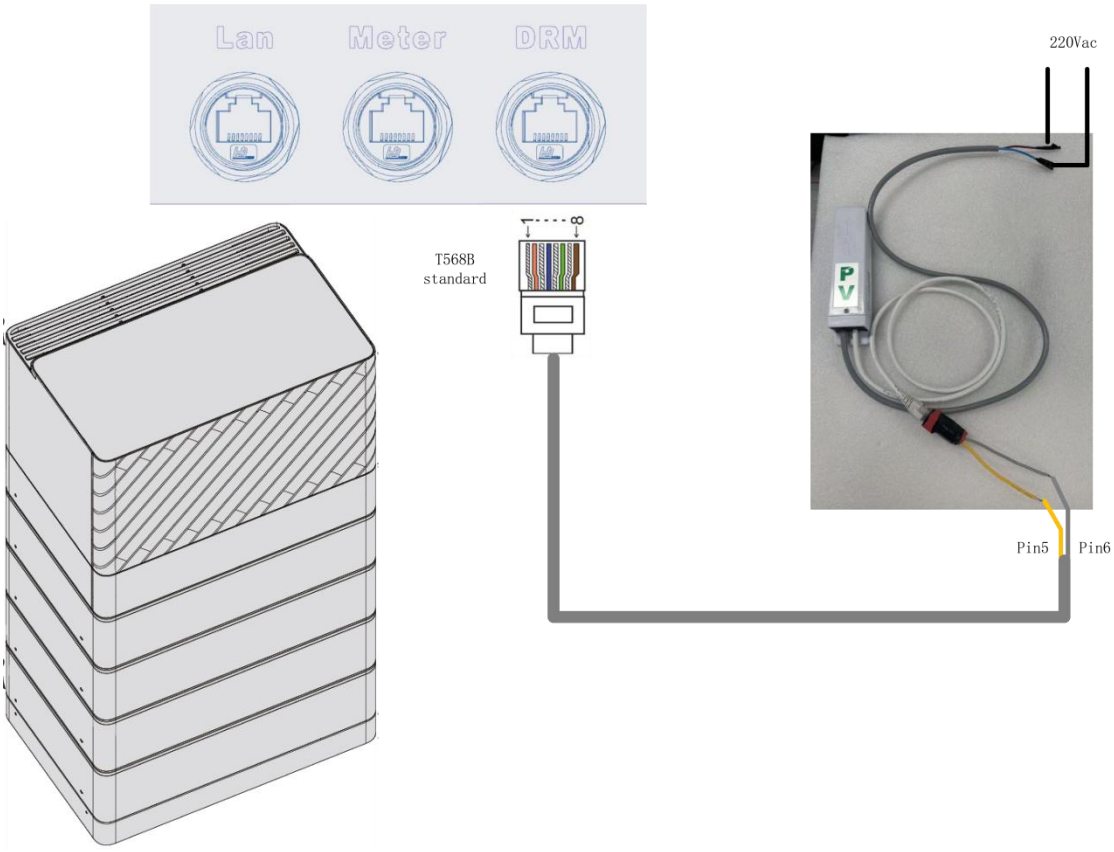
For the Australian market, only the DRM0 function is supported.



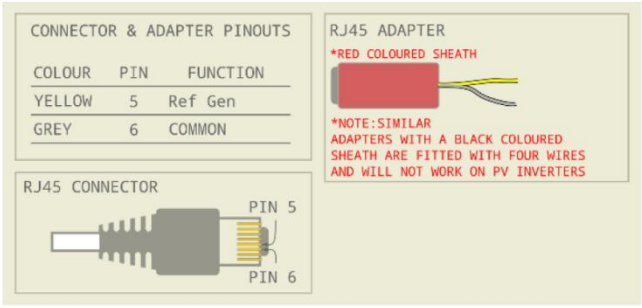
PIN / Port	1	2	3	4	5	6	7	8
DRM	I/O1	I/O2	I/O3	I/O4	+3.3V	I/O0	GND	GND

For the Australian market, only the DRM0 function is supported.

System Diagram of DRM0 (only for Australia)



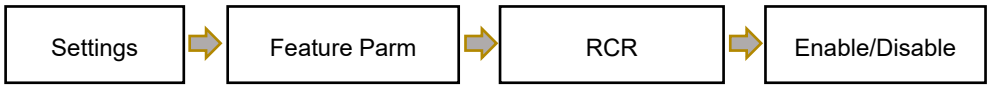
Pin Defi	1	2	3	4	5	6	7	8
	DRM1/5	DRM2/6	DRM3/7	DRM4/8	RefGen	DRM0	GND	GND



Note: Similar adapters with a black coloured sheath are fitted with four wires and will not work on PV inverters. A third-party device shall be purchased.

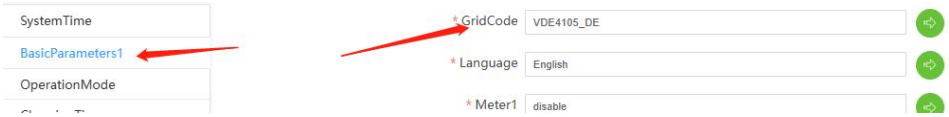
5.6.12 RCR wiring

RCR setting

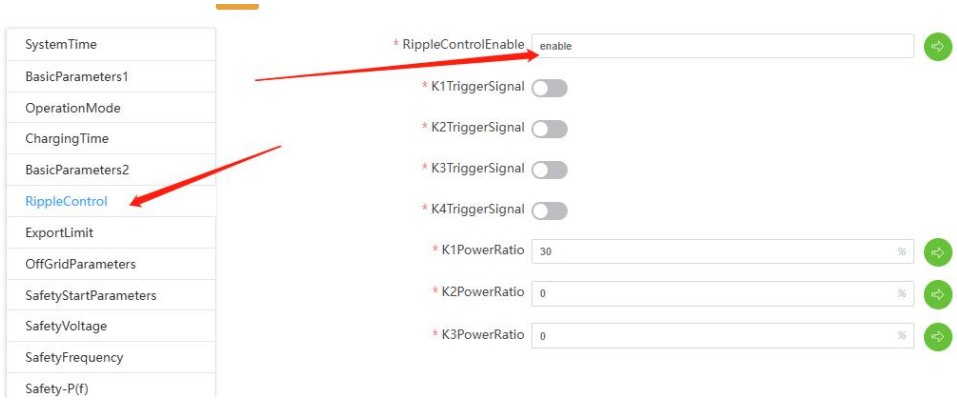


The prerequisite for the use of this function is the selection of the German grid connection regulation VDE 4105 and the use of the RCR function.

On the web page, first determine if the safety regulations are correct.



The settings for ripple control are as follows on the web page.



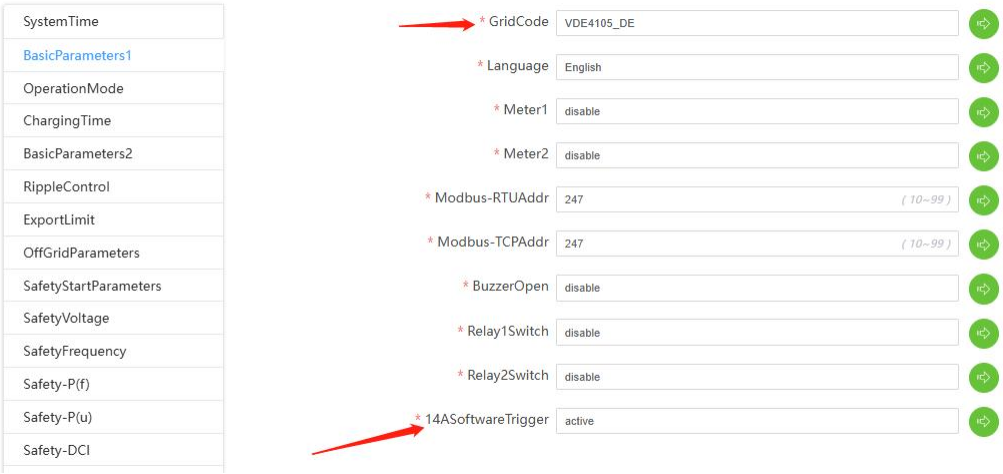
Firstly make sure that the ripple control Enable switch is in the Enable state, which indicates that the ripple control function has been turned on. The following K1-K4 Trigger signals function to display the status of ripple control, and K1-K3 power ratio indicates the corresponding power ratio.

For example, when I/O1 and +3.3 V are externally short-circuited, K1TriggerSignal will trigger and Limit the power to 30%.

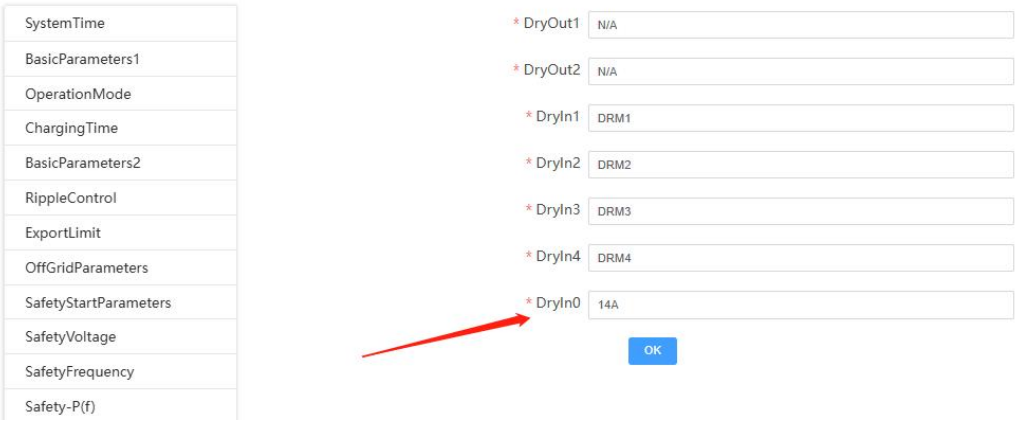
When K4 is enabled, that is, when I/O4 and +3.3 V are short-circuited, the machine will be off-grid.

For the function of 14a under German safety regulations, there are two ways to operate: hardware and Software. This is the 14a function via the web page, limiting the input power to 4.2kW.

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When realizing this through hardware, you need to change the setting in the setup to And external hardware short-circuits I/O0 and +3.3V.



The ripple control function is described below:

PIN / Port	1	2	3	4	5	6	7	8
Ethernet	+3.3V	I/O1	I/O2	I/O3	I/O4	I/O0	GND	GND

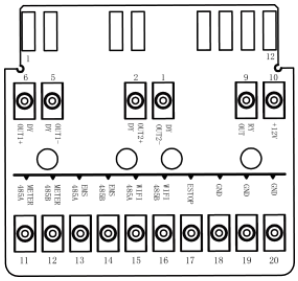
Switching state	Output active power (%Pn)
No contact closed	100%
Several contacts closed	100%
Contact I/O1 to +3.3V	60%
Contact I/O2 to +3.3V	30%
Contact I/O3 to +3.3V	0%
Contact I/O4 to +3.3V	Immediate OFF
Contact I/O0 to 3.3V	AC Max.Chr power limit to 4.2KW under Vde4105 Safety

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5.6.13 SG ready Wiring

- **SG Ready**

The Smart Grid Ready is controlled by the dry contact output 1 of the inverter.





	Relay-1	
Label	DRY_RLY1-	DRY_RLY1+
Mode 1	0	
Mode 2	1	

Note:0-Relay open,1-Relay closed

Mode 1-Normal operation (0):

The heat pump runs in energy-efficient normal mode.

Mode 2-Encouraged operation (1):

The operation of the heat pump is encouraged to increase electricity consumption for heating and warm water.

The controller has 1 control models:

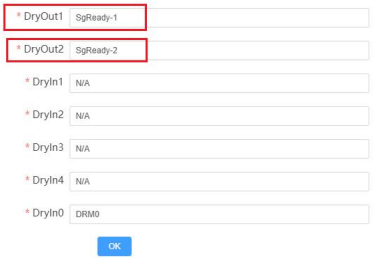
i) The heat pump is switched on.

ii) The heat pump is switched on AND the warm water temperature is raised.

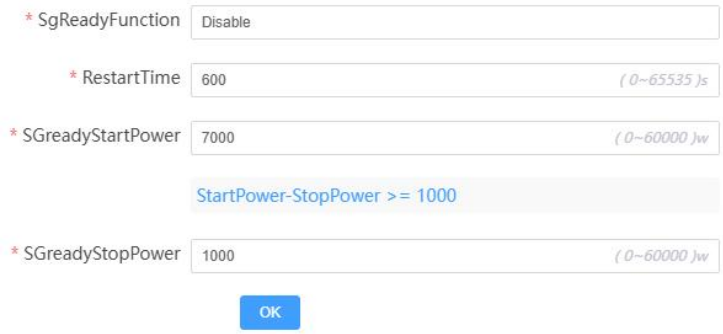
Configure DRY1 as SGready1

DryConfigure setting: DryConfigure Set the DryOut1 to SgReady-1.





Configure SG ready power management settings



* SgReadyFunction: Disable/Enable sgready function.

* RestartTime: Interval between two launches of sgready.

* SgReadyStartPower: when the feed-in power exceeded the set value, the heat pump starts operation.

* SgReadyStopPower: When the feed-in power is less than the set value, the heat pump stops operation.

Note!

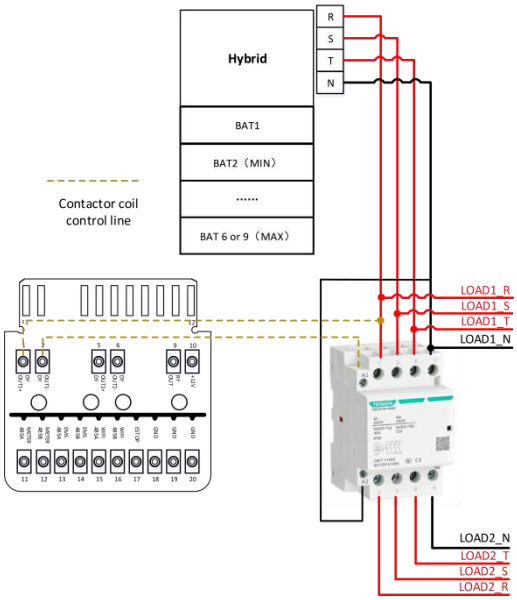
Zero-feed-in system, if the PV-generation achieves a predefined value (Mode3), The heat pump will start automatically.

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5.6.14 Implementation of dual-channel Backup Function

Note: For the dual-channel BACKUP function required in some areas, in the off-grid situation, it can allow the customers to turn on and turn off the off-grid additional loads, and provide the settings. of turning on and turning off by adjusting the battery capacity.

Wiring diagram for dual BACKUP



Load1 is directly connected to the BACKUP port and only loses power when the BACKUP stops outputting. Load2 is connected after the contactor and will shut off once the SOC drops below a certain level, causing the contactor to disconnect.

Contactor disconnected SOC parameter: SOC _ split

Contactor connected SOC parameter: SOC _ return

Relationship: min soc < soc _ split < soc _ return < max soc

Difference: SOC _ return between SOC _ split is at least greater than 10%

Contactor disconnected Logic:

In BACKUP mode: SOC < SOC _ split

Contactor connected logic:

1. In BACKUP mode: SOC > SOC _ return

2. In the case the grid is on or restored and the bypass relay is connected,

eg:

Set SOC _ split = 60%, SOC _ return = 80%

It means that in BACKUP mode, if the current SOC drops below 60%, disconnect the relay and the Load2; if the current SOC returns to more than 80%, connect the relay and the Load 2 or connect the relay when the power grid is restored.

The setting interface: Feature----Dry Contact Ctrl-----Dry1---------1.Smart Load Ctrl-----Function ON (Yes/No) / SOC OFF / SOC Restore

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6 Commissioning and Operation

6.1 System Start-Up

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

- Make sure the equipment installed correctly.
- Make sure all the DC and AC wirings are connected well.
- Make sure the meter or CT is connected well.
- Make sure the external BACKUP breaker is connected well (if any).

Step 1 Turn on the DC Switch (PV+Battery), AC breaker, BACKUP breaker (if any).

Step 2 Press and hold the battery button on the inverter for 3 seconds to start the battery.

Step 3 Enter the settings page, We need to select the language, safety standards, and time.

Note!
When starting the system 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 system using the button or by using the APP.

6.2 System Switch Off

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

Step 1 Enter the settings page, select START / STOP and set it to stop.

Step 2 Turn off the external AC breaker, and the BACKUP breaker if equipped.

Step 3 Remove the two side panels from the inverter.

Step 4 Press and hold the battery button on the inverter for 5 seconds to shut down the battery. Turn off the DC Switch (PV+Battery) on the inverter.

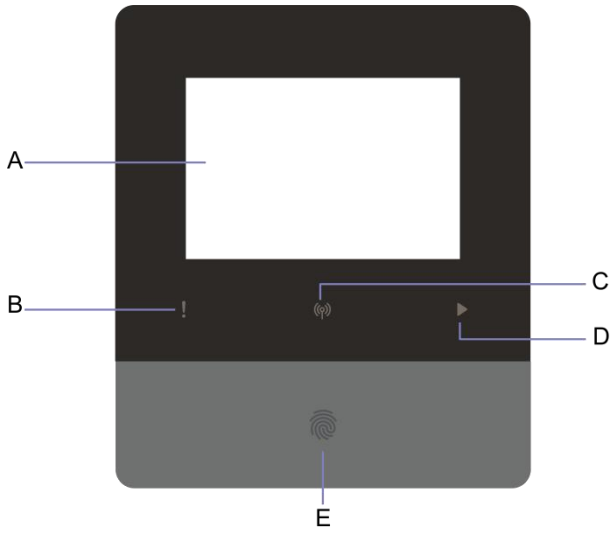
Step 5 Verify that the entire system is de-energized: Confirm all LED indicators are off, then wait an additional 15 minutes.

Note!

When the switch is in the OFF state, users can select a suitable lock to manually lock the switch, as shown in the figure.



6.3 Control Panel Introduction



Object	Name	Function
A	LCD screen	Display the information of the system.
B	Indicator LED	Red: The system is in fault mode.
C		Blue: Light off- No network connection. Blink- connect to the internet. Light on- connection successful.
D		Green: The system is in normal state.
E	Function button	**Touchscreen Wake-up** Light press: When the touchscreen is off, the user lightly presses the button. After the finger is released, the system responds and performs the screen wake-up operation.
		Return to Home Double-tap (Screen on): In any menu interface other than the home screen, quickly double-tap the button will trigger the action. (Judgment condition: The time interval between two consecutive valid short presses is not greater than 1 second.)
		Touchscreen System Reset Long press for 10s (Screen on): When the touchscreen experiences abnormal states such as interface freeze or unresponsiveness, the user long-presses the system button for 10 seconds while the screen is on. Upon releasing the finger, a forced reset operation is triggered, and the screen displays "Loading".
		Wlan Reset Screen on:

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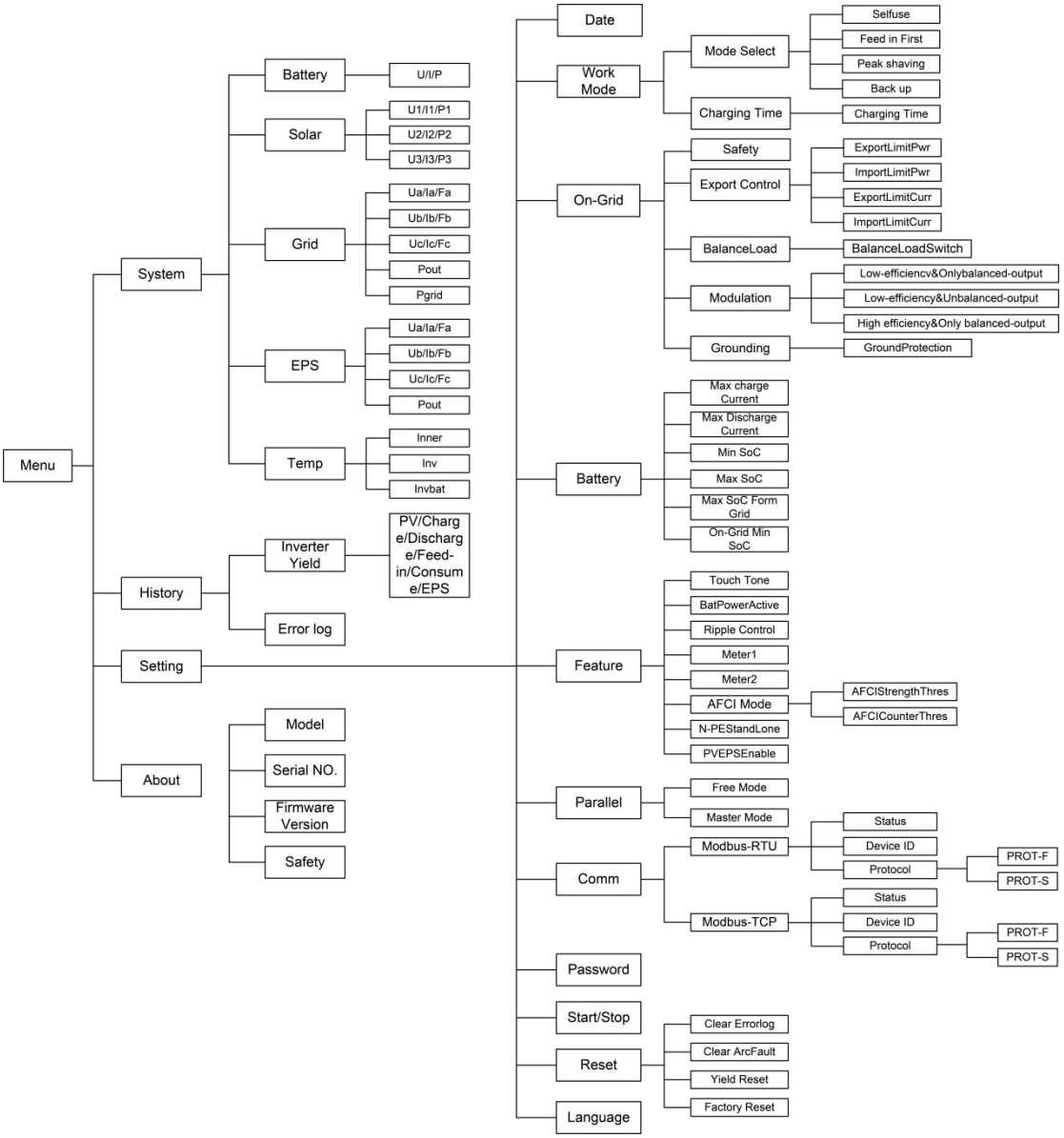
		While the screen is on, the user long-presses for 25 seconds. Upon releasing the finger, a wlan reset is triggered. The software DC Switch Hadds a reset register to implement the factory ATE test reset function. (This function is a safety regulation requirement and is defined as a hidden operation.)

1. Disconnect the AC and BACKUP vacs.
2. Rotate to the off state.
3. Turn off the buttons and control switches on the battery.
4. Wait for the screen on top of the machine to go off.
5. Wait for 15 minutes, this is to ensure that the capacitors inside the machine discharge.
6. Use a current clamp to make sure there is no current on the DC line.
7. Using the tool on the DC terminal, press the two snaps on the DC terminal and pull it outward with force at the same time.
8. Make sure there is no PV positive terminal and no voltage above the PV negative terminal, use a altimeter to measure.
9. Also use a altimeter to measure the PV positive and PV negative terminals to the PE line above the voltage no voltage.
10. Use a tool to disconnect the AC terminal and the terminal for communication.

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6.4 Function Tree

- Single machine operation mode



- The function tree is updated continuously and is consistent with the screen display.
- Functions displayed on the inverter LCD screen are view-only for users and cannot be modified. (The “Reset” function shall only be viewed or modified by the manufacturer or its authorized installers.)
- Viewing “System”, “History”, “About” functions: no password required. Viewing “Setting” or Changing settings requires a password. Please contact the installer to change the settings.
- **Enable/Setup Power Quality Response Modes/Soft Export Limit**

Please refer to the Advanced Configuration Guide Power Cube Series for details.

Inverter export control capabilities.Generation and Export limit control are tested to AS/NZS 4777.2:2020+A1:2021+A2:2024.

- **Setup Region Code (After initial commission)**

Select “Setting” on the display, enter the password, then select “On Grid”, followed by “Safety”.

- **Check Firmware Version, Region Code and Power Quality Response Modes.**

Please refer to the Function Tree diagram.

Firm ware version: “About”-”Version”

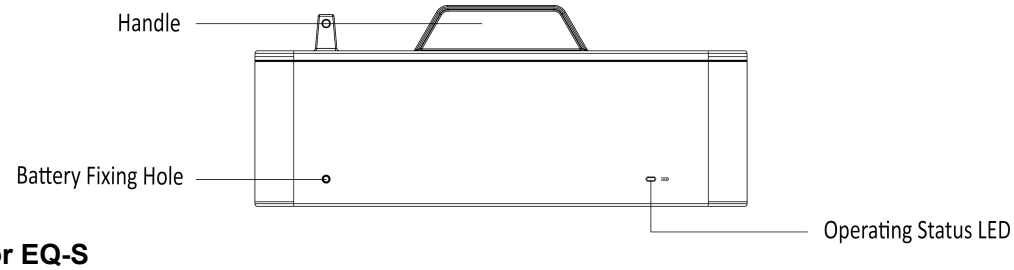
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6.5 Battery Operating status LED

This LED is used to indicate if the battery is operating effectively. A green light on this LED means the battery is ON and operating normally. If the battery is operating failure, a red light on this LED means the battery is operating abnormally.

EQ-S Features:

Interface:

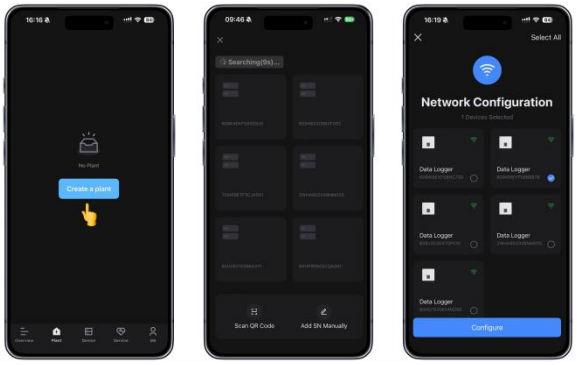
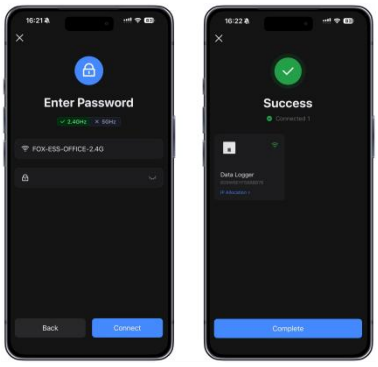


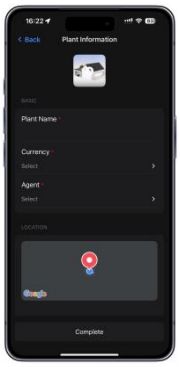
For EQ-S

Green LED	Red LED	Batteries Status
On for 0.5s, Off for 0.5s	On for 0.5s, Off for 0.5s	Running in boot
On for 0.1s, Off for 0.1s	On for 0.1s, Off for 0.1s	Upgrading
On for 1s, Off for 1s	Off	Normal working
Off	On for 1s, Off for 1s	Alarm

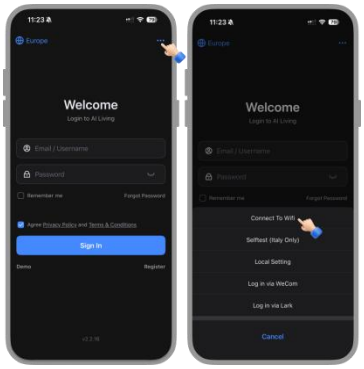
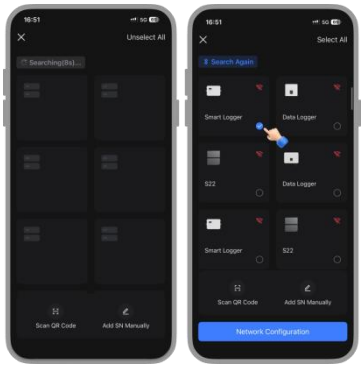
6.6 APP Operation

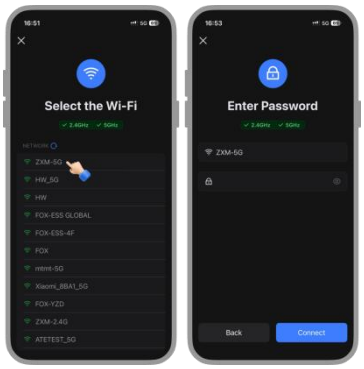
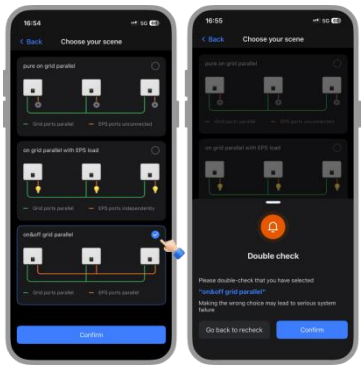
- How to connect to the internet?

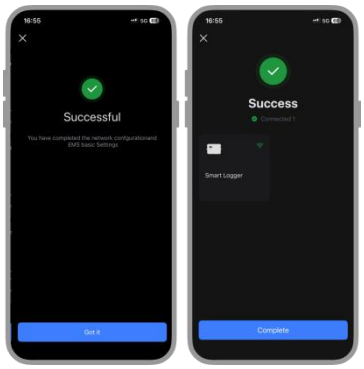
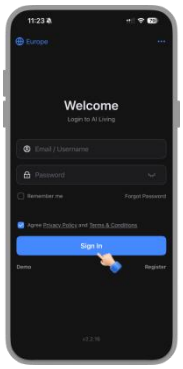
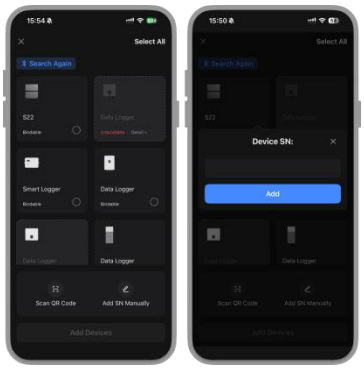
<table>
<tr><th colspan="3">Procedures</th></tr>
<tr><td colspan="3">After logging into your account, create a plant and complete network configuration for your devices by following the steps below:</td></tr>
<tr><td>Step 1</td><td>Tap the "Plant" tab on the bottom navigation bar, then tap "Create a Plant".
Wait for the system to search for devices, then tap "Add Devices" once complete.</td><td rowspan="3">
</td></tr>
<tr><td>Step 2</td><td>Select the target device(s) and tap "Configure" to start WLAN configuration.</td></tr>
<tr><td>Step 3</td><td>Select the Wi-Fi, enter pass word and tap "Connect".</td></tr>
<tr><td>Step 4</td><td>Wait for the system to con nect the devices to the net work, then tap "Complete" once successful.</td><td>
</td></tr>
</table>

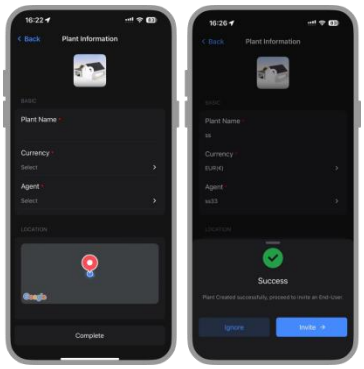
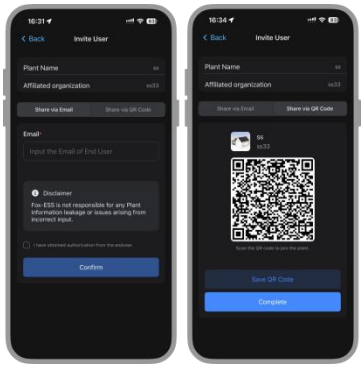
Step 5	**Wait and refresh** It may need to wait for 3-5 minutes to upload inverters data, please be patient. You can swipe to refresh this page.	

- AI LINK

Procedures		
Step 1	1-1 **Connect to network** Open APP, then click three point in the top right corner of login page, and choose "Connect to WiFi".	
	1-2 Keep Bluetooth on and wait for device searching.Then choose the device (XXXXXXXXXXXXXXX) and click"Network Configuration".	

	1-3 Choose SSID of home router and enter password, then click "Connect".	
	1-4 **Connect to device** Wait for a moment, it will complete the configuration. Then it twill start communicate with devices a utomatically. A confirmation pop-up window will appear. Please check whether the number of devices is consistent with the actual number. Click "Finish" if they match.If not, please click "Reconnect" or confirm the cable connection is correct.	
Step 2	2-1 **Choose your scene** Select a scene based on the onsite cable connection. Then click "Confirm".	

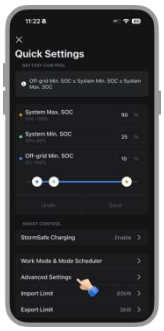
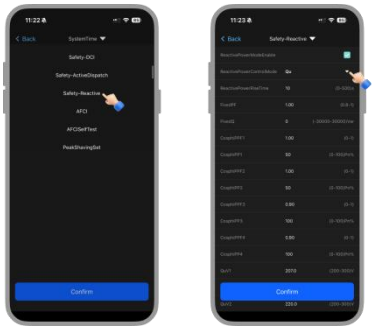
	2-2 It indicates successful AI Link network and EMS basic settings setup. Tap "Got it" to enter the device connection page with Smart Logger displayed, then tap "Complete".	
Step 3	Navigate to the login interface, enter your username and password, then click the "Sign In" button.	
Step 4	4-1 **Create a plant** Click "Create a plant".	
	4-2 Wait for Bluetooth device scanning to complete. Select the newly configured device if detected; alternatively, click the "Add SN Manually" button at the bottom of the page, input the device serial number in the pop-up dialog, and click "Add".	

	4-3 Navigate to the Network Configuration page, deselect all device check boxes, then tap "Skip" to proceed.	
	4-4 Fill in the plant information and click "Complete". A pop-up window for terminal invitation will be displayed. Click "Ignore" to go back to the plant page.	
	4-5 Alternatively, you may send invitations to end users via email or QR code.Click "Confirm" or "Complete" to return to the plant page.	
Step 5	**Wait and refresh** It may need to wait for a moment to upload inverters data, please be patient. You can swipe to refresh this page.	

Step 6	**Check device** Tap the topology icon on the plant overview view to enter the System Diagram page, where you can check all EMS devices and verify that all equipment is properly connected.	

7 Main Function Implementation

7.1 Reactive Function Setting

Procedures		
Step 1	Open the Plant screen and tap Quick Settings.	
Step 2	Select Advanced Settings to access the settings screen.	
Step 3	Navigate to Safety Reactive, then enable Reactive Power Mode Enable.	

1. Fixed PF Over

If you want set the fix PF over, Find the Reactive Power Control Mode drop down menu and select the Fixed PF Over option;

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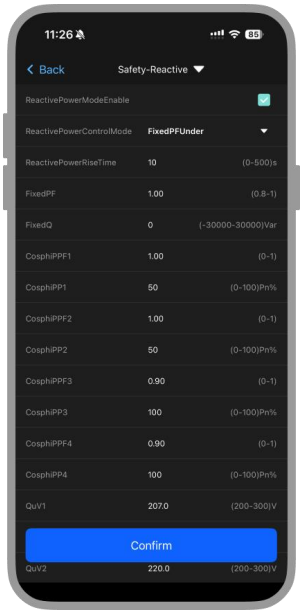
Set fixed PF parameters according to your needs, with a default value of 1;



2. Fixed PF Under

If you want set the fix PF Under, Find the Reactive Power Control Mode drop down menu and select the Fixed PF Under option;

Set fixed PF parameters according to your needs, with a default value of 1;

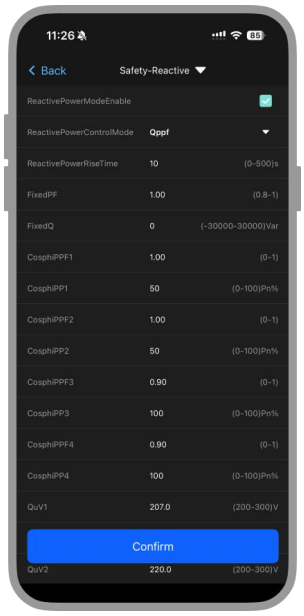


3. Reactive Power Fixed Power Factor

If you want set the Qppf, Find the Reactive Power Control Mode drop down menu

and select the Qppf;

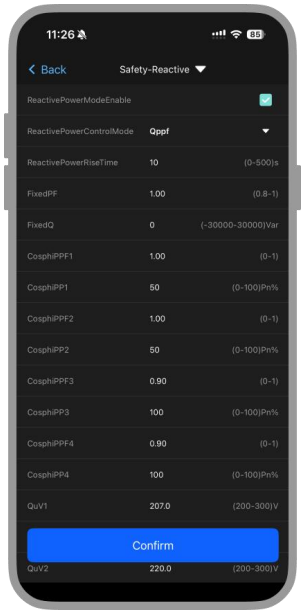
Set fixed PF parameters according to your needs, with a default value of 1;



4. Fixed Q

If you want set the fix Q, Find the Reactive Power Control Mode drop down menu and select the Fixed Q option;

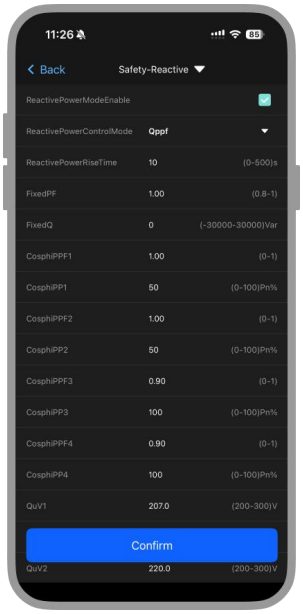
Set fixed Q parameters according to your needs;



5. Q and U function setting

If you want set the Q and U, Find the Reactive Power Control Mode drop down menu and select the Qu;

You only need to set the following parameters (QuV1-4,QuQ1-4) according to your needs;

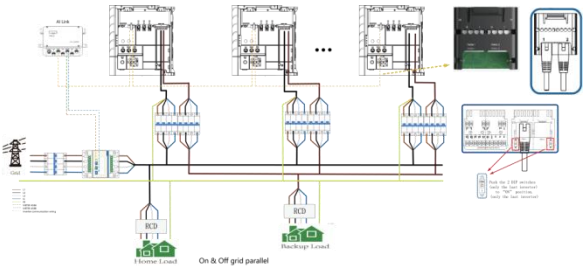


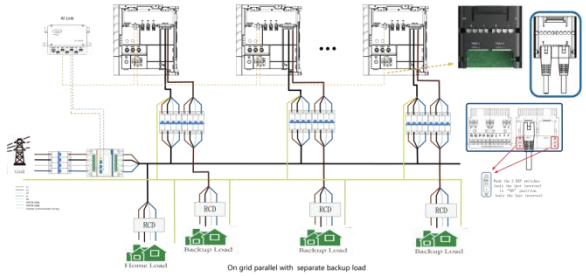
7.2 Parallel Connection and Operating Instructions

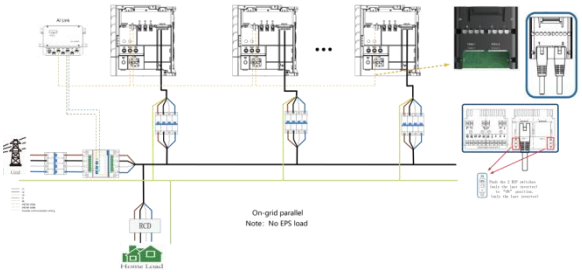
Each Power Cube series system support Max. 10 units parallel connection for on-grid system or Max.

4 units parallel connection for off-grid system.

1) System Diagram







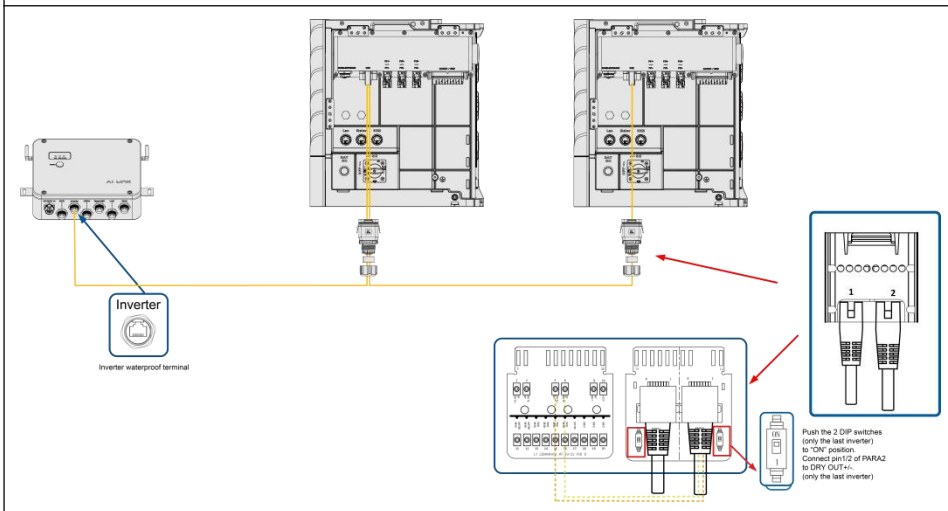
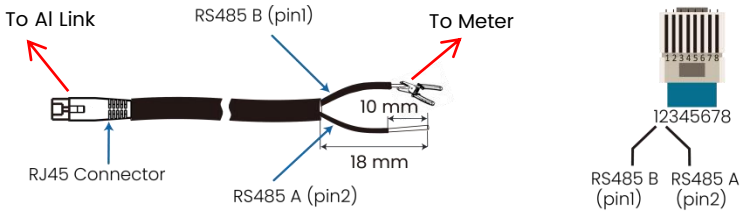
Note!

1) Parallel inverters need to be of the same type and same version of software.

2) For "On grid parallel with Backup load" , "On&off grid parallel " scene, each inverter must be connected to the battery.

3) The cable length from each inverter's grid port to the grid connection point and from the backup port to the common load connection point should be consistent, to avoid excessive line impedance deviation that could cause abnormal inverter operation.

2) Wire Connection

Procedures	
Step 1	Parallel Power wiring Please select the corresponding power wiring method according to different scenarios.
Step 2	Inverter communication wiring 
Step 3	Meter wiring 

Note!

Grid-side inflow/outflow current < 80A, meter can be connected directly.

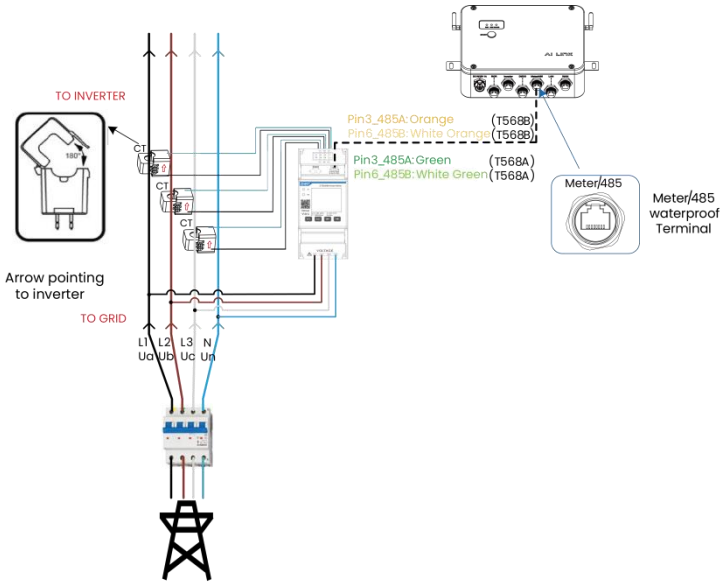
Wiring Table between the AI Link and the Meter.

	AI Link	Meter (CHINT DTSU666)
RS485 A	Pin2 (Meter/485, RS485- A1)	Pin3
RS485 B	Pin1 (Meter/485, RS485- B1)	Pin6

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CT meter needs to be purchased separately, if required. The meter's part number is 30-803-00051-01. The CT for this meter is not standard and can be selected according to the customer's actual requirements.

CT Meter wiring Diagram：

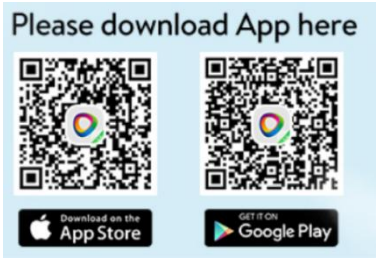


Note!

Grid-side inflow/outflow current ＞ 80A, use Current Transformer.

3) APP Configuration Reference

Please download the FoxCloud2.0 APP from Apple store or Google store.



Note!

Configure only AI Link networks, no inverter setup needed.

Note!

Make sure all communication cables between AI Link and inverters are connected.

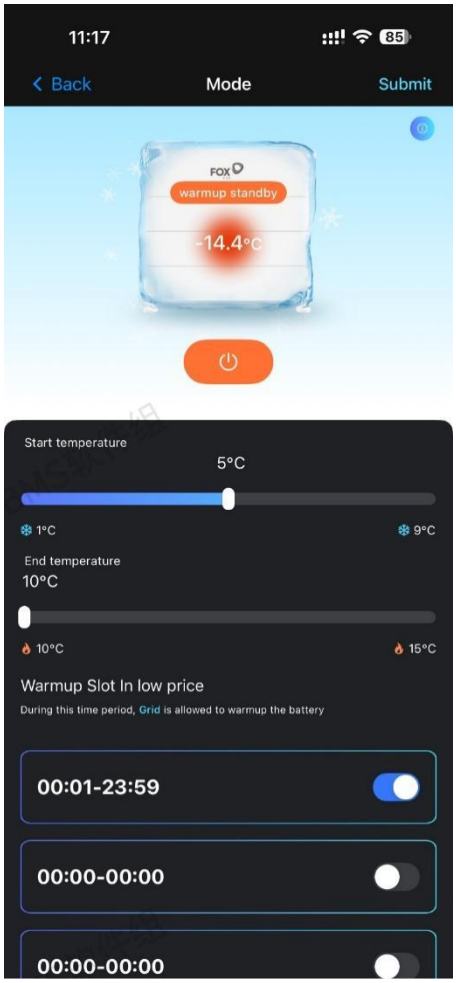
Make sure all inverters and smart logger are powered on.

7.3 Warm up Function

In low-temperature climates at high altitudes or latitudes, particularly during winter, the charging and discharging performance of batteries can significantly decline due to cold temperatures. To address this Fox ESS has introduced a "Battery Warm up" feature, enabling the battery system to operate effectively extremely low temperatures. This feature is exclusively available in the warm-up versions.

7.3.1 During Full Warm up Period

The battery heating interface in the APP



1. Heating main switch button;
2. Heating start temperature, eg.: temperature range 1~9℃ optional;
3. Heating stop temperature, eg.: temperature range 10~15℃ optional;
4. Three heating time periods can be set;
5. Battery heating status and minimum temperature display.

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Battery self heating state

If Battery SOC ≥ 10%, MinCell Temperature < Start Temperature, and not in low-temperature protection state, and within the set heating time.

Then the battery is in a self heating state, and the heating resistor is powered by the battery itself. At this time, the inverter power control is not affected

7.3.2 During PV Warm up Period

If Battery SOC < 10% or in low-temperature protection state, and MinCell Temperature < Start Temperature and within the set heating time.

Then the battery is in an inverter controlled heating state, and the heating resistor is powered by the inverter. In this state, the inverter can only provide power for heating the battery and cannot respond to other charging and discharging requests.

Important Notes:

Control method:

The app or cloud platform transmits settings for the heating switch, heating activation temperature, shutdown temperature and heating activation time window to the PCS via the network; the PCS sends these settings to the BMS via the CAN protocol; the BMS controls the temperature based on these settings and uploads temperature-related status data to the PCS via CAN; the PCS then uploads this data to the app or cloud platform via the network.

1. The battery can only discharge when the internal temperature of battery is above -10℃. It can only charge when the internal temperature of battery is above 0℃.

2. Please check that the wiring is properly connected and that all batteries are the warm up versions; otherwise, the Warming up function will not operate.

3. Warming up control is based on the internal cell temperature of the battery, rather than the ambient temperature. Typically, the cell temperature will be higher than the ambient temperature under normal operating conditions.

For further assistance, please contact an authorized personnel or Fox ESS for further instructions.

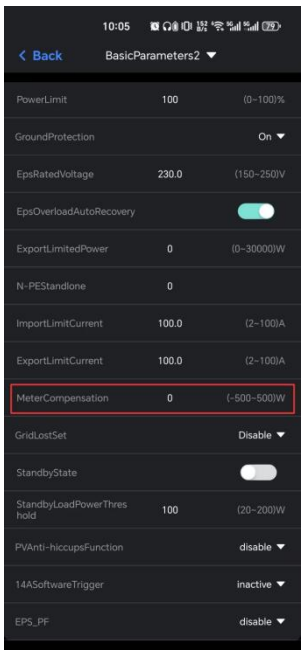
Note: Products with "(w)" suffix, such as EQ3300-S (w), EQ5000-S(w), TQ5000-S (w), EQ5500-S (w), EQ5000-S-P (w) and TQ5000-S-P (w) are equipped with Battery Warm up function. Without the "(w)" suffix, like EQ3300-S, EQ5000-S, EQ4800-S and EQ5500-S are not equipped with the Battery Warm up function.

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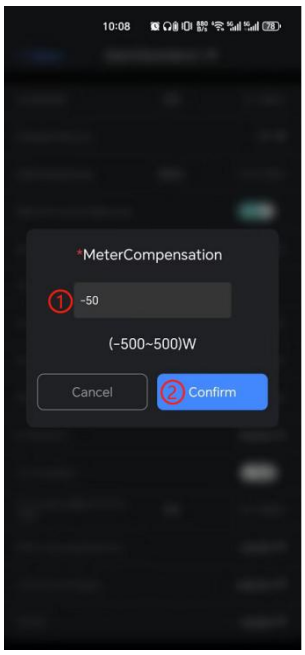
7.4 Electricity Meter Compensation Function

Meter Compensation: When the grid power is 0 while the meter power is not zero, the power displayed on the meter is an error offset. You can set the Meter Compensation function according to the power value shown on the meter to eliminate such error. Example: If the meter displays a power value of 50, set the Meter Compensation parameter to -50.

Operation Procedure: Launch the FoxCloud 2.0 app, navigate to Device – Inverter – Settings – System Time – Basic Parameter 2. Locate Meter Compensation, tap the number inside the input box, set the required value, and then tap Confirm.



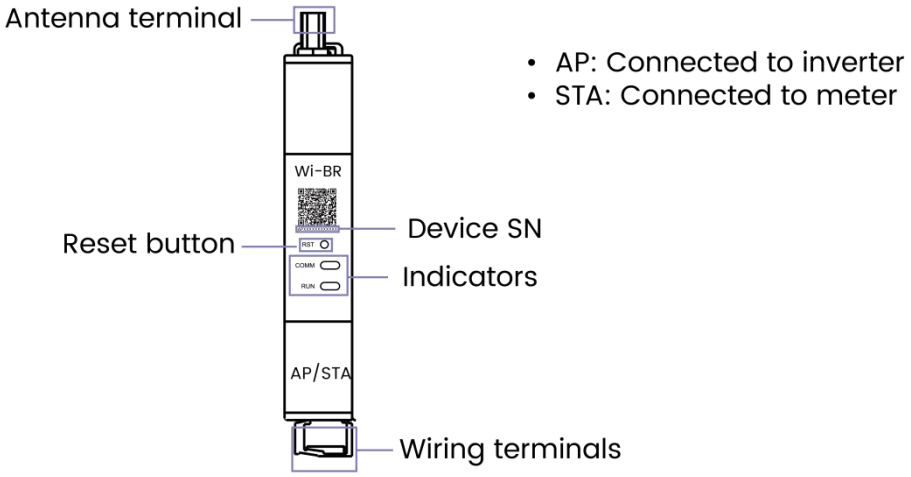




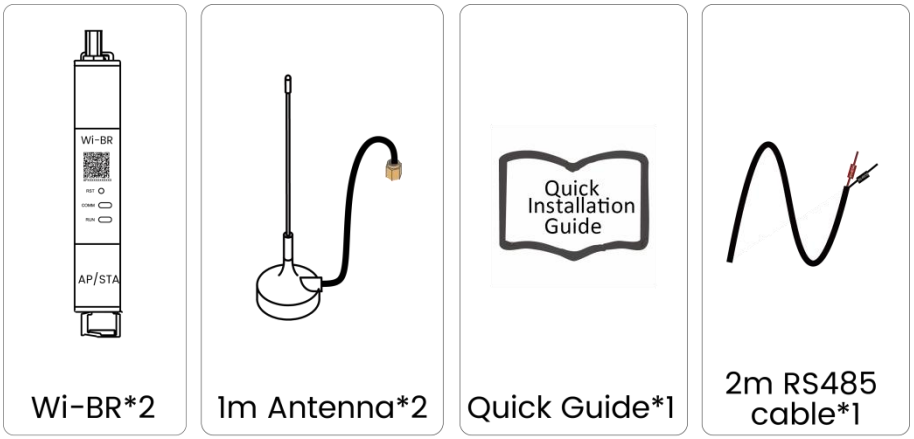
Note: Power discharging to the grid is indicated by a positive meter value; power drawing from the grid is indicated by a negative meter value.

7.5 (Optional) Wi-BR

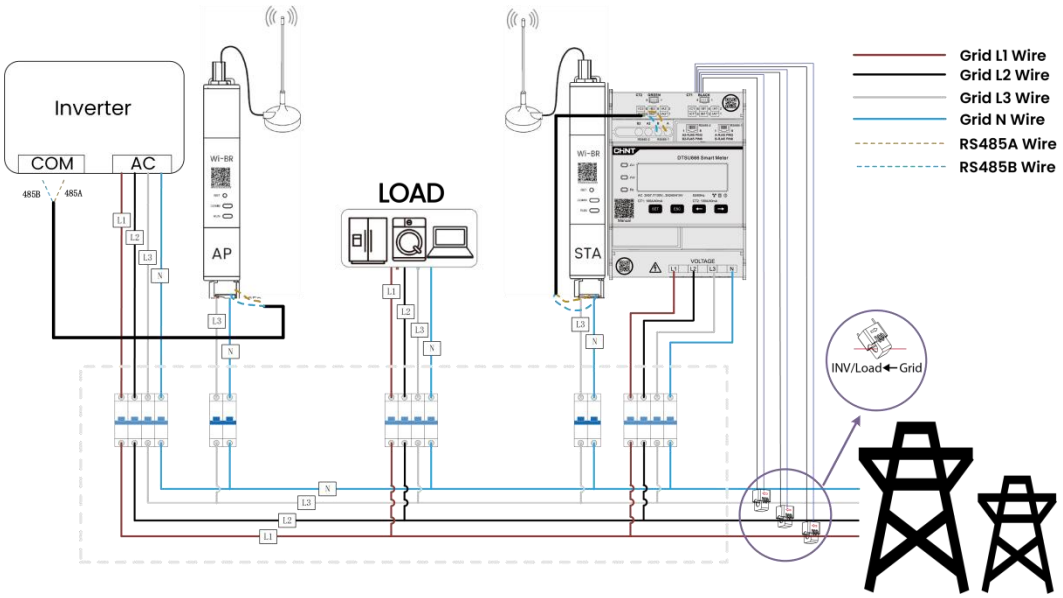
1. Product Introduction



2. Scope of Delivery



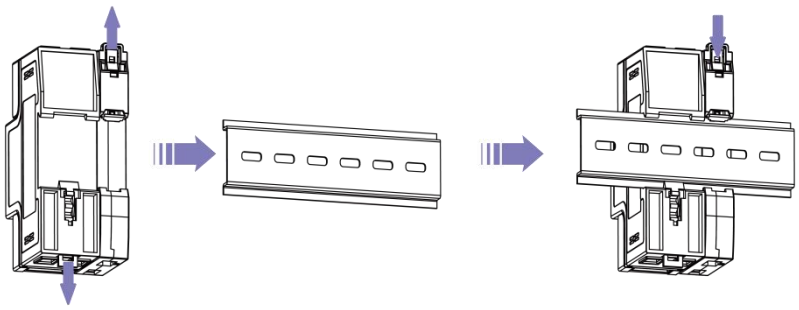
3. System Wiring

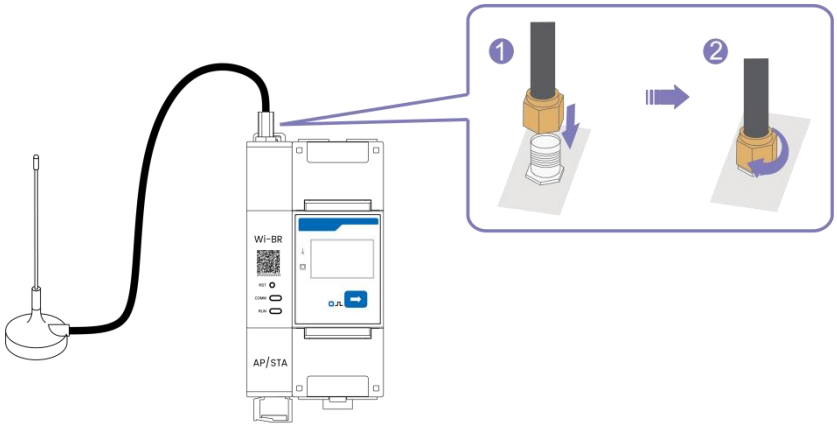
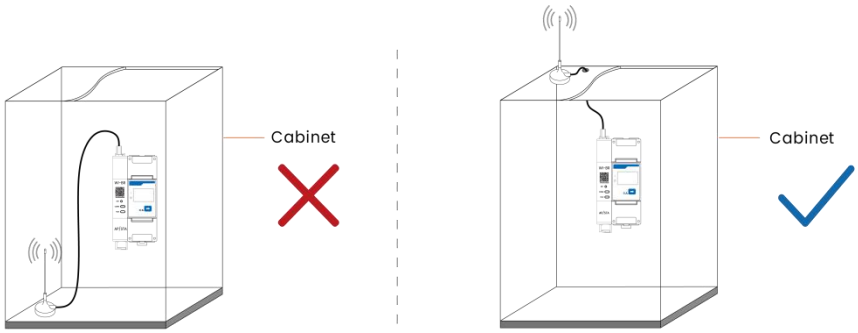


*The Wi-BR can work with both single-phase and three-phase meters. This manual uses the connection to three-phase meter for example.

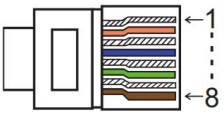
*The rectangled part uses the wiring in power distribution box for example and is for reference only. The actual wiring is subject to on-site conditions.

4. Mounting

Procedures	
Step 1	Connect the cables based on the system wiring diagram, and then mount the Wi-BRs and meter to the 35 mm DIN rails.
	
Step 2	Connect the antenna to the Wi-BR through the antenna terminal.

<table>
<tr><td></td><td>
</td></tr>
<tr><td rowspan="3">Step 3</td><td>Fix the antenna outside the power distribution cabinet.</td></tr>
<tr><td>
</td></tr>
<tr><td>Note: Please fix the antenna on the top of the cabinet. Otherwise, it may interfere in the signal transmission inside the cabinet.</td></tr>
</table>

5. Compatible Inverters and Pin Definition



PIN / Port	1	2	3	4	5	6	7	8
Meter	meter 485B	meter 485A	meter 485A	/	/	meter 485B	/	/

6. Indicator Description

Note: The Wi-BRs are already paired before delivery. The AP model enters the pairing mode after you press the Reset button for 3 seconds, and then exit pairing after 1 minute if no STA is detected.

Indicator	Color	Status	Description
RUN		Solid green	Normal power supply, RS485 cable connection and antenna connection
		Flashing green	Abnormal RS485 cable connection between AP and inverter, or between STA and meter
		Off	No power supply
COMM		Solid green	AP and STA paired successfully.
		Flashing green	Transmitting data between AP and STA
		Flashing red	Pairing AP and STA
		Solid red	AP and STA failed to pair

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7.6 Adaptive Electricity Meter

Go to the Plant homepage, find the blue "Meter" button on the flow diagram, and tap it to enter the "Meter Check" screen.

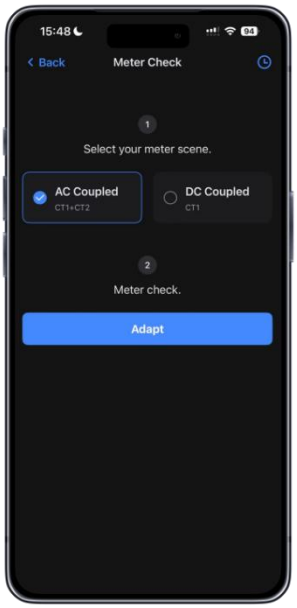


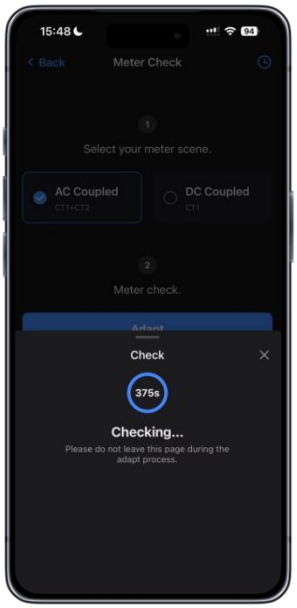
Meter Check (6CT):

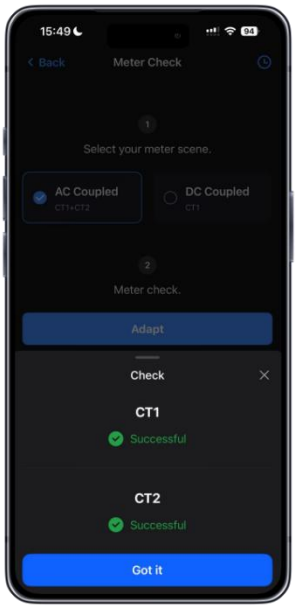
1.Select your meter scene.

2.Once confirmed, tap “Adapt” to initiate meter check.

3.Wait for the system to complete the meter check. This process typically takes around 40 seconds.



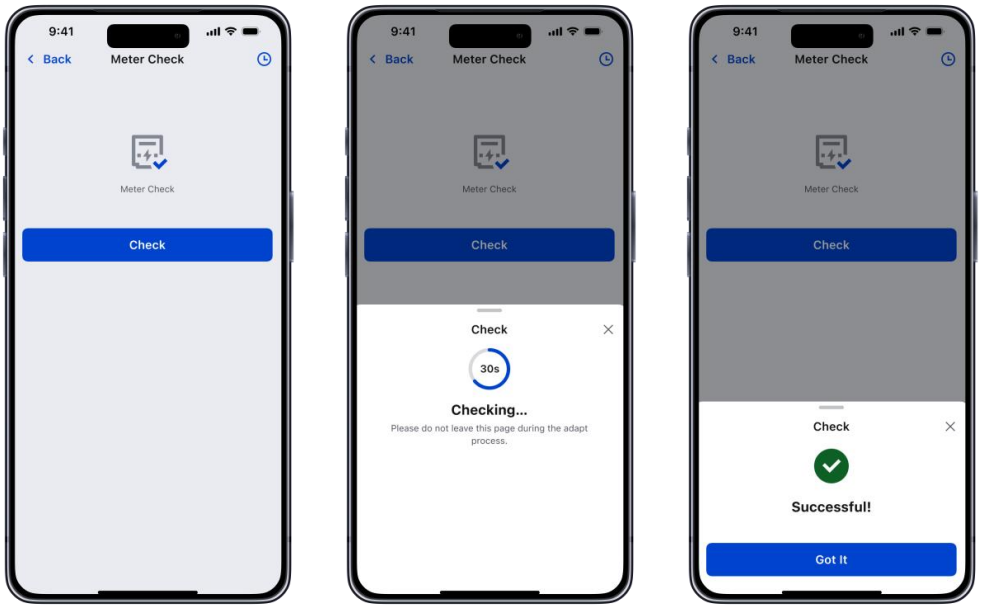




Meter Check (3CT):

1.Tap “Check ” to initiate meter check.

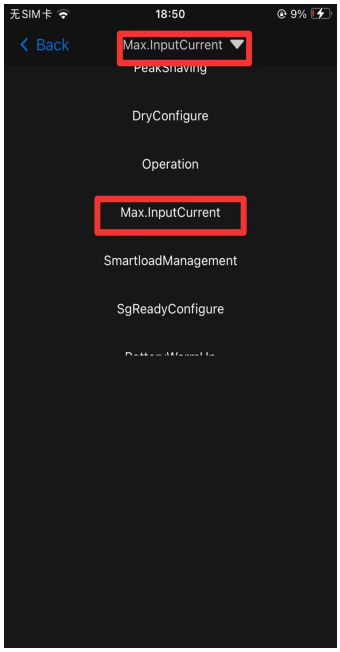
2.Wait for the system to complete the meter check. This process typically takes around 40 seconds.

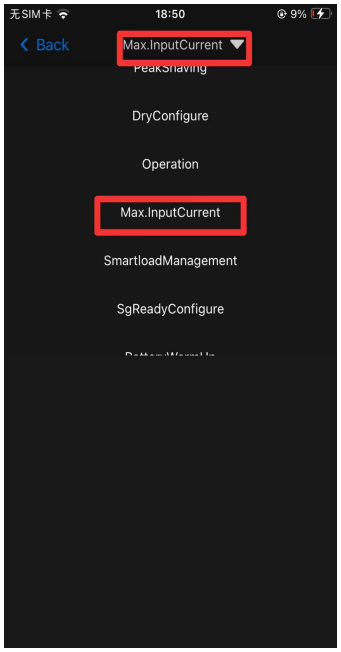


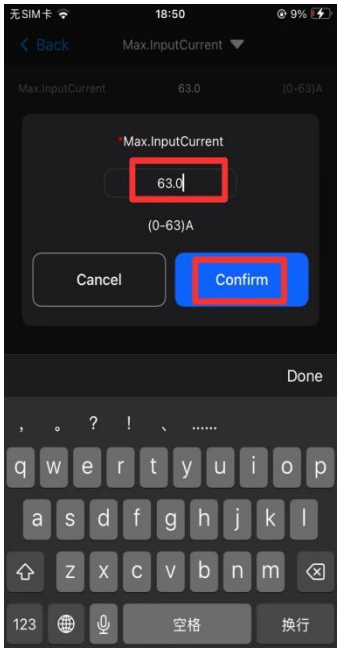
7.7 Maximum Current Input

Import/Export Limit Current: This function allows limiting the maximum input and output current of the Power Cube according to user requirements. The setting shall be based on the inverter model.

Operation Procedure: Launch the FoxCloud 2.0 app, go to Device – Inverter – Settings – MAX.Input current, tap the number in the input box, set the required value, and then tap Confirm.



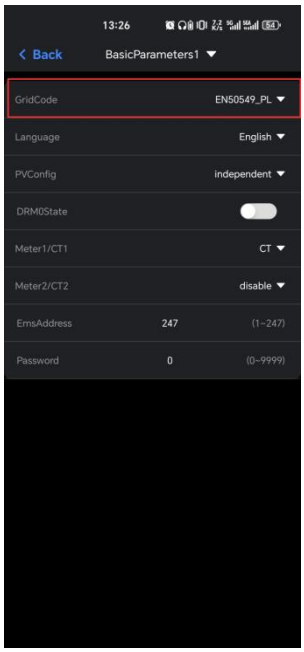


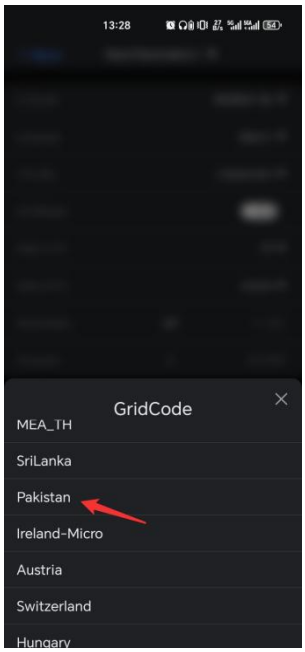


7.8 PV-EPS

PV-EPS Function: In countries such as Brazil and Pakistan, users often purchase an energy storage inverter without configuring a battery. Meanwhile, the power supply grid in these regions is unstable. Therefore, after a grid outage, the energy storage inverter needs to enter EPS mode only when PV power is available and the battery is empty.

Operation Steps: Launch the FoxCloud 2.0 app, navigate to Device – Inverter – Settings – System Time – Basic Parameter 1. Locate Grid Code, and select a safety standard that supports the PV-EPS function, such as Pakistan. Then go to the Basic Parameter 2 page and enable the PV-EPS function option.





7.9 EPS-PF

EPS-PF: In EPS mode, the inverter can control power by adjusting its output frequency.

When this product is operated in parallel with a grid-tied inverter, this mode can be enabled. Under EPS mode, the voltage at the EPS port supports the normal operation of the grid-tied inverter. When the battery SOC reaches its maximum value and the output power of the grid-tied inverter exceeds the load power, the energy storage inverter will adjust the output frequency of the EPS port to limit the output power of the grid-tied inverter and prevent inverter fault alarms.

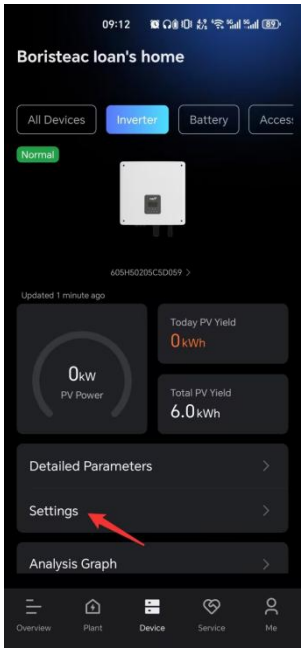
In off-grid mode, when the battery SOC exceeds 90%, the energy storage inverter stops the PV inverter by adjusting the EPS output frequency. When the battery SOC falls below 80% or the grid is restored, the energy storage inverter ceases to control the EPS output frequency, and the PV inverter resumes operation.

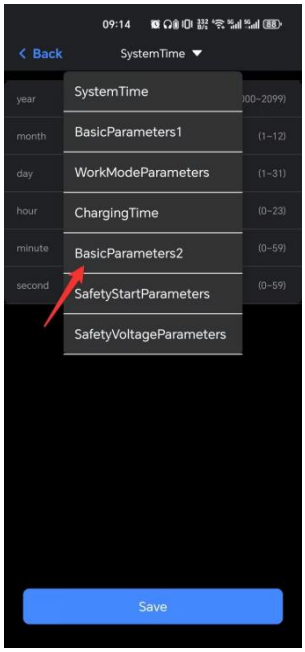
Note: To use this function, ensure that the grid-tied inverter is connected to the EPS port of the energy storage inverter, and the rated power of the grid-tied inverter shall not exceed that of the energy storage inverter.

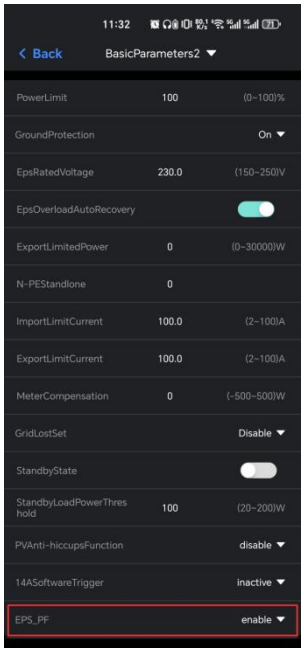
1. Instructions

Launch the FoxCloud 2.0 app. Navigate to Device – Inverter – Settings – System Time – Basic Parameter

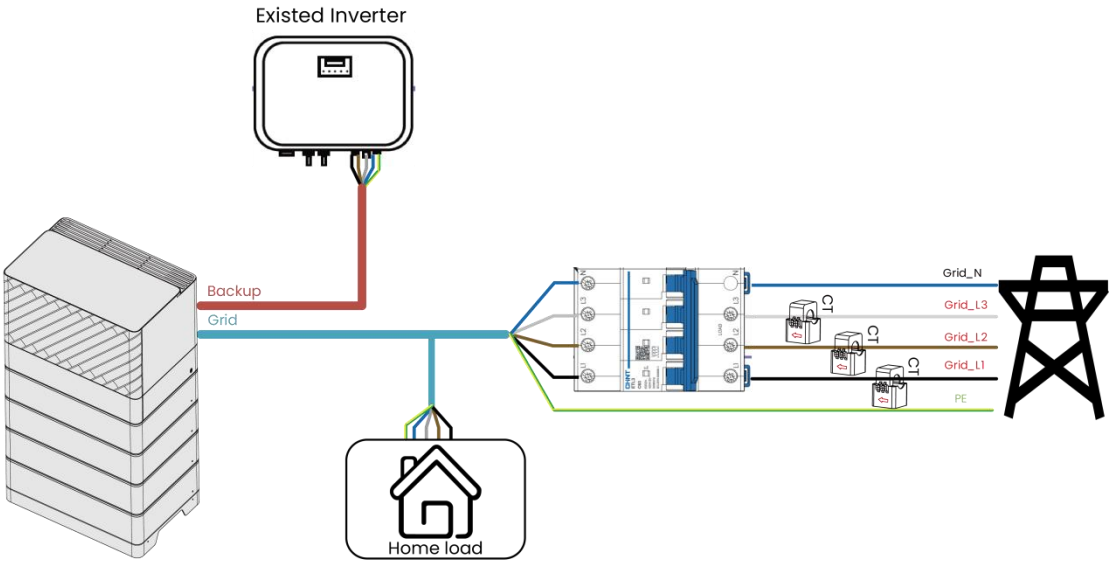
2. Locate the EPS-PF parameter and set its status to Enable.



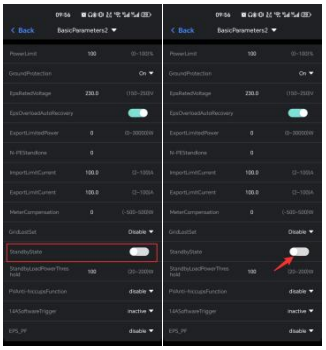
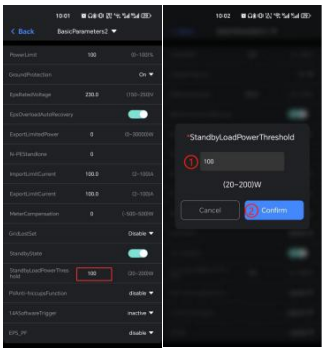




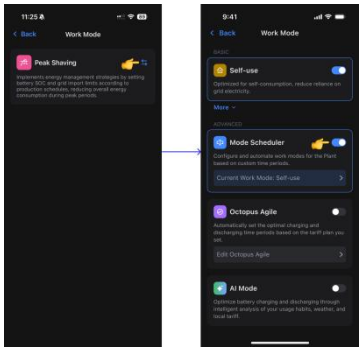
3. System Wiring

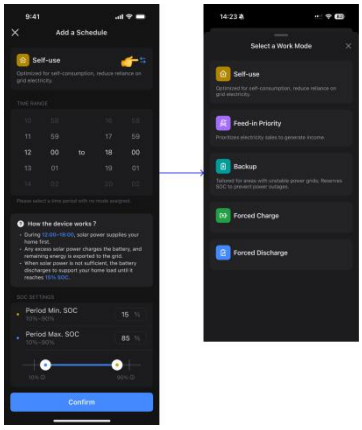
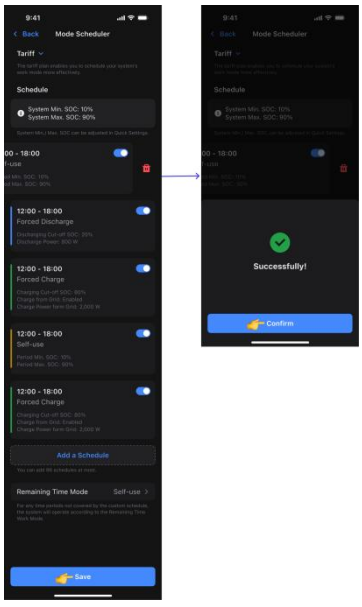


7.10 Standby Mode

Procedures		
Standby State: When this function is enabled and there is no grid input or output, and the load power remains below the set value (20~200W) for 5 consecutive minutes, the inverter will enter Standby mode. In this mode, the standby power consumption of the inverter will be reduced.		
Step 1	Launch the FoxCloud 2.0 app, go to Device – Inverter – Settings – System Time – Basic Parameter 2. Locate “StandbyState”, then tap the toggle switch”  ” on the right. The function is enabled when the switch is in the”  ” activated state.	
Step 2	Click the number in the box below, enter the required parameter value, and tap Confirm.The adjustable range is 20~200W.	

7.11 Mode Scheduler on the app

<table>
<tr><th colspan="3">Procedures</th></tr>
<tr><td>Step 1</td><td>Navigate to Home Screen and tap “Work Mode”</td><td></td></tr>
<tr><td>Step 2</td><td>Tap the switch button and select “Mode Scheduler”.</td><td></td></tr>
<tr><td rowspan="2">Step 3</td><td>Tap “Add a Schedule”.</td><td></td></tr>
<tr><td colspan="2">Note: For any time periods not covered by the custom schedule, the system will operate according to the Remaining Time Mode.</td></tr>
</table>

Step 4	Tap the switch button and select a work mode.	
Step 5	Set the time range and configure the parameters as needed, then tap “Confirm”.	
Step 6	Review all schedules and tap “Save” to complete the process.	

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Step 7	Mode Scheduler set successfully.	

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8 Maintenance

This section contains information and procedures for solving possible problems with the system and provides you with troubleshooting tips to identify and solve most problems that can occur.

8.1 System Maintenance

To ensure that the system can operate properly for a long term, you are advised to perform routine maintenance on it.

- Perform regular maintenance, including cleaning, lubrication, and calibration, to extend tool service life and maintain performance.
- The equipment cannot be opened without tools, and no internal components or wires are accessible. For repair works during daily operation and maintenance, only authorized personnel from Fox ESS are permitted to perform such repairs.

8.1.1 Routine Maintenance

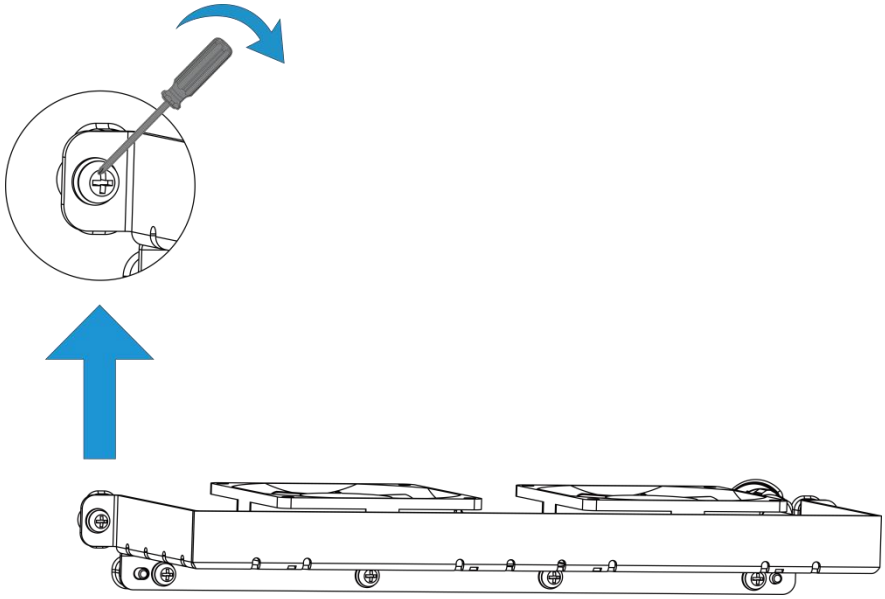
Item	Check Method	Interval
System cleanliness	● Periodically check that the heat sinks are free from obstacles or dust. ● Clean and inspect the top and side panels.	Every six months
System running status	● Check that the system is not damaged or deformed. ● Check that the running sound of the system is normal. ● When the system is running, check that all parameters are correctly set.	Every six months
Electrical connections	● Check that cables are securely connected. ● Check if the input and output wires are damaged or aged. ● If clamps are used for AC cable connections, check that they are secured. ● Check that cables are intact, in particular, the parts touching the metallic surface are not scratched. ● Check that the unused ports are covered by watertight caps.	The first inspection is six months after the initial commissioning. From then on, the interval can be six months.
Earthing reliability	● Check that earth cables are securely connected.	The first inspection is six months after the initial commissioning. From then on, the interval can be six months.

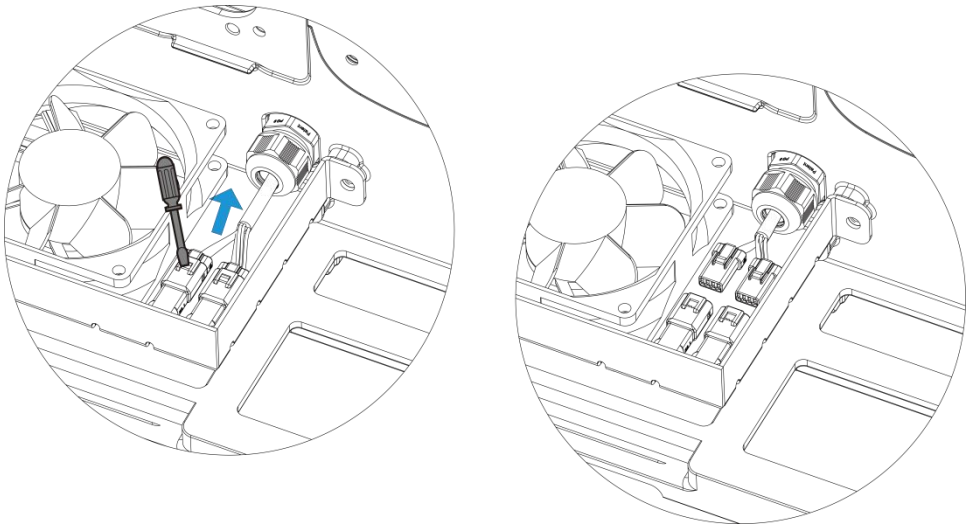
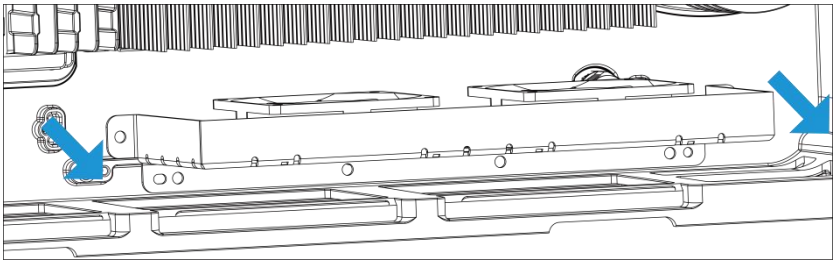
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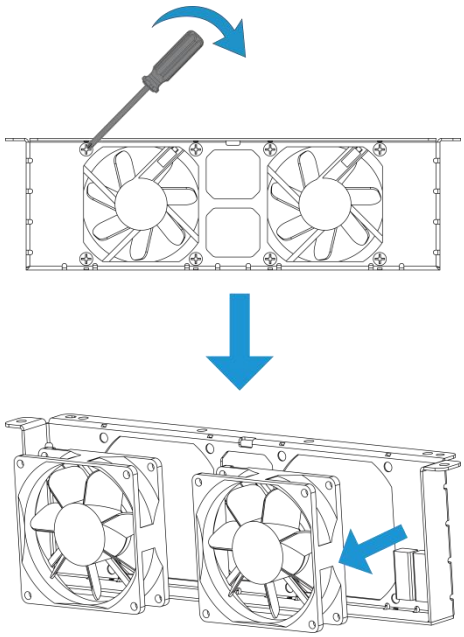
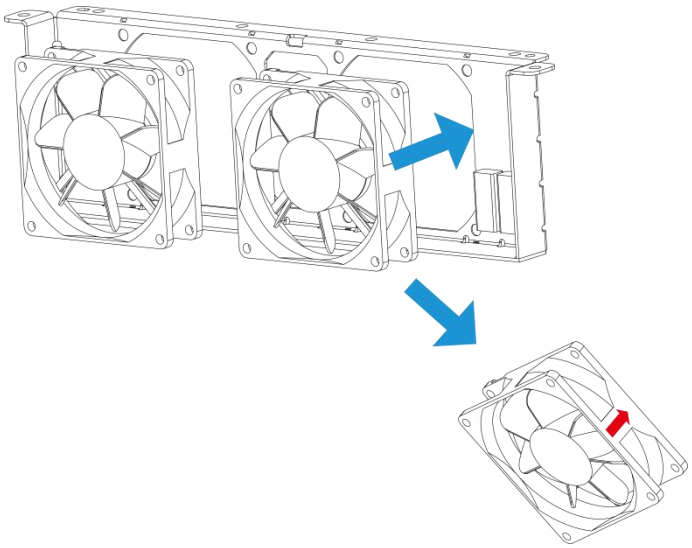
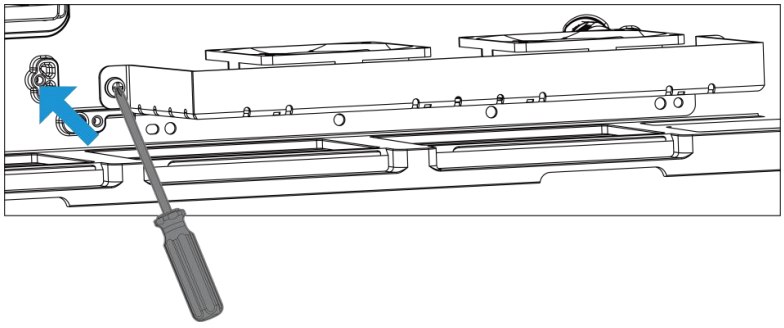
Fans condition	● Check that if the cooling fans at the rear of the inverters are collecting dust/dirt, and the machine should be cleaned when necessary.	Every three months
Indicators	● Check that if the indicators of the inverter are in normal state, check if the display of the inverter is normal.	Every year

Note: Only personnel with the appropriate qualifications may perform the above tasks.

8.1.2 Fans Maintenance

Procedures	
Step 1	Remove the six screws that secure the fan bracket.
	
Step 2	Disconnect the fan harness connected to the housing.

<table>
<tr><td></td><td></td></tr>
<tr><td rowspan="2">Step 3</td><td>Remove the fan bracket assembly.</td></tr>
<tr><td></td></tr>
<tr><td>Step 4</td><td>Unscrew the eight screws securing the fan, then remove the fan.</td></tr>
</table>

<table>
<tr><td></td><td></td></tr>
<tr><td rowspan="2">Step 5</td><td>Insert the new fan to be installed into the bracket in the direction indicated by the arrow. Make sure the exhaust port faces upward during installation!</td></tr>
<tr><td></td></tr>
<tr><td rowspan="2">Step 6</td><td>Refer to the fan removal procedures in Steps 1, 2 and 3, reinstall the fan bracket assembly with the new fan in place.</td></tr>
<tr><td></td></tr>
</table>

8.2 Battery Maintenance

8.2.1 Maintenance

- Regularly check whether the service environment of the battery meets the requirements, and the installation position should be far away from the heat source.
- Regularly check whether the battery and its supporting terminals, connecting cables and indicator lights are normal.

8.2.2 Expanded capacity requirement

If a battery is replaced or added for capacity expansion, each battery's SOC should be consistent. The max. SOC difference should be between±5%.

If users want to increase their battery system capacity, please ensure that the SOC of the existing system capacity is about 50%. The manufacturer date of the new battery shall not exceed 12 months; in case of exceeding 12 months. please charge the new battery to around 50%.

8.2.3 Storage with Low SOC

After the product is powered off, static power consumption and self-discharge loss may occur in internal modules. Therefore, charge batteries in a timely manner and do not store the product in low SOC. Otherwise, the product may be damaged due to over discharge, and battery modules need to be replaced.

Storage in low SOC may occur in the following scenarios:

- The DC Switch on the power control module is OFF.
- The power cables or signal cables are not connected.
- The batteries cannot be charged due to a system fault after discharge.
- The batteries cannot be charged due to incorrect configurations in the system.
- The batteries cannot be charged due to no PV input and long-term mains failure.

Regardless of scenarios, the batteries must be charged within the longest interval corresponding to the SOC when the batteries are powered off. If the batteries are not charged within the specified interval, they may be damaged due to over discharge.

Storage environment temperature	Power-Off SOC Before Storage	Maximum Charge Interval
0~35℃	0% ≤ SOC < 5%	7 days

Note: When the battery SOC decreases to 0%, charge the batteries within seven days. Permanent battery faults caused by delayed charge due to customer reasons are beyond the warranty scope.

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8.3 Troubleshooting

8.3.1 Inverter Troubleshooting

a. Please check the fault message on the System Control Panel or the fault code on the inverter information panel. If a message is displayed, record it before doing anything further.

b. Attempt the solution indicated in table below (Section 8.3.3).

c. If your inverter information panel is not displaying a fault light, check the following to make sure that the current state of the installation allows for proper operation of the unit:

(1) Is the inverter located in a clean, dry, adequately ventilated place?

(2) Have the DC input breakers opened?

(3) Are the cables adequately sized?

(4) Are the input and output connections and wiring in good condition?

(5) Are the configurations settings correct for your particular installation?

(6) Are the display panel and the communications cable properly connected and undamaged?

Contact Customer Service for further assistance. Please be prepared to describe details of your system installation and provide the model and serial number of the unit.

8.3.2 Battery Troubleshooting

When the red / green LED on the panel is flashing or normally on, it does not mean that the battery is abnormal, it may be just an alarm or protection. In general, the alarm indication is normal without manual intervention. When the alarm triggering state is removed, battery will automatically return to normal use.

Problem determination based on the following points:

- Whether the battery system can be communicated with inverter;
- Whether the battery can be output voltage or not.

Preliminary determination steps

In the case that the DC switch is turned on and powered, and that the waterproof cover is properly installed, if the battery system still fails to work and the LED flashes or does not light up, please contact the local distributor.

- In the case that the subordinate battery displays normally while the battery system cannot charge or discharge and the inverter display does not show SOC or battery voltage, please contact the local distributor.
- After the battery system is powered on, if you can see the alarm information on the LED and inverter display screen at the same time, please contact the local distributor.

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8.3.3 System Alarm List

Fault Code	Solution
Grid Lost Fault	Grid is lost. ● System will reconnect if the utility is back to normal. ● Or seek help from us, if not go back to normal state.
Grid Volt Fault	Grid voltage out of range. ● System will reconnect if the utility is back to normal. ● Or seek help from us, if not go back to normal state.
Grid Freq Fault	Grid frequency out of range. ● System will reconnect if the utility is back to normal. ● Or seek help from us, if not go back to normal state.
10min Volt Fault	The grid voltage is out of range for the last 10 Minutes. ● System will reconnect if the utility is back to normal. ● Or seek help from us, if not go back to normal state.
SW Inv Cur Fault	Output current high detected by software. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
DCI Fault	DC component is out of limit in output current. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
HW Inv Cur Fault	Output current high detected by hardware. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
SW Bus Vol Fault	Bus voltage out of range detected by software. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.

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Bat Volt Fault	Battery voltage fault. ● Check if the battery input voltage is within the normal range. ● Or seek help from us.
SW Bat Cur Fault	Battery current high detected by software. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
Iso Fault	The isolation is failed. ● Please check if the insulation of electric wires is damaged. ● Wait for a while to check if back to normal. ● Or seek for help from us.
Res Cur Fault	The residual current is high. ● Please check if the insulation of electric wires is damaged. ● Wait for a while to check if back to normal. ● Or seek for help from us.
Pv Volt Fault	PV voltage out of range. ● Please check the output voltage of PV panels. ● Or seek for help from us.
SW Pv Cur Fault	PV input current high detected by software. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
Temp Fault	The inverter temperature is high. ● Please check if the environment temperature. ● Wait for a while to check if back to normal. ● Or seek for help from us.
Ground Fault	The ground connection is failed. ● Check the voltage of neutral and PE.

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	● Check AC wiring. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
Over Load Fault	Over load in on grid mode. ● Please check if the load power exceeds the limit. ● Or seek for help from us.
BACKUP Over Load	Over load in off grid mode. ● Please check if the BACKUP load power exceeds the limit. ● Or seek for help from us.
Bat Power Low	The battery power is low. ● Wait the battery to be recharged. ● Or seek for help from us.
HW Bus Vol Fault	Bus voltage out of range detected by hardware. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
HW Pv Cur Fault	PV input current high detected by hardware. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
HW Bat Cur Fault	Battery current high detected by hardware. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
SCI Fault	The communication between master and manager is fail. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
MDSP SPI Fault	The communication between master and slave is fail. ● Disconnect PV, grid and battery, then reconnect.

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	● Or seek help from us, if not go back to normal state.
MDSP Smpl Fault	The master sample detection circuit is failed. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
Res Cur HW Fault	Residual current detection device is failed. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
Inv EEPROM Fault	The inverter eeprom is fault. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
PvCon Dir Fault	The PV connection is reversed. ● Check if the positive pole and negative pole of PV are correctly connected. ● Or seek help from us.
Bat Relay Open	The battery relay keeps open. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
Bat Relay Short Circuit	The battery relay keeps close. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
Bat Buck Fault	The battery buck circuit mosfet is fail. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
BACKUP Relay Fault	The BACKUP relay is failed. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
BatCon Dir Fault	The battery connection is reversed.

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	● Check if the positive pole and negative pole of battery are correctly connected. ● Or seek help from us.
Main Relay Open	The grid relay keeps open. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
S1 Close Fault	The grid relay S1 keep close. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
S2 Close Fault	The grid relay S2 keep close. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
M1 Close Fault	The grid relay M1 keep close. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
M2 Close Fault	The grid relay M2 keep close. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
GridV Cons Fault	The grid voltage sample value between master and slave is not consistent. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
GridF Cons Fault	The grid frequency sample value between master and slave is not consistent. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
Dci Cons Fault	The dci sample value between master and slave is not consistent. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.

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Rc Cons Fault	The residual current sample value between master and slave is not consistent. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
ARM EEPROM Fault	The manager eeprom is fault. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
Meter Lost Fault	The communication between meter and Inverter is interrupted. ● Check if the communication cable between meter and Inverter is correctly and well connected.
GFCI Fault	The GFCI mode is fault. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
BACKUP Vol Fault	BACKUP voltage out of range. ● Please check the output voltage of BACKUP panels. ● Or seek for help from us.
Byp Relay Short	The bypass relay keeps close. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.
INV Vol Fault	INV voltage out of range. ● Disconnect PV, grid and battery, then reconnect. ● Or seek help from us, if not go back to normal state.

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8.3.4 Ground Fault

The Power Cube complies with the ground fault alarm monitoring requirements of IEC 62109-2, Section 13.9. In the event of a ground fault alarm, the Power Cube screen will display the fault code “Ground Fault”, and the red LED indicator will light up. Additionally, a notification will be received in the application. Meanwhile, the entire system will be powered off.

The specific phenomenon is:

- LCD screen displays “Ground Fault”.
- Reports “Ground fault” on the web page.
- App sends a warning information of ground fault.

Note: If a ground fault alarm occurs, contact the installer immediately. Do not attempt to operate or touch the product until the fault is fully cleared.

8.4 How Vulnerabilities are Disclosed

Vulnerability Report: Please upload a detailed description of the product vulnerability to security@fox-ess.com.After receiving the vulnerability report, we will analyze it and reply within 7 working days. After confirming the vulnerability, we will provide the vulnerability repair plan within 30 working days. After confirming the solution, we will implement the repair and verification within 30 working days.

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8.5 Firmware Upgrading

User can upgrade inverter's firmware via a U-disk.

- Update the equipment operating system and related software in a timely manner to fix vulnerabilities and improve performance.

Note: This section is intended to inform users on how to perform software upgrades via a U-disk. Please note that firmware upgrades are only permitted to be conducted by manufacturer-authorized installers. Additionally, during the upgrade process, installers must contact the manufacturer to obtain the upgrade firmware. Sharing of firmware programs is strictly prohibited. Upgrades may only be initiated after receiving explicit authorization from the manufacturer. End-users and other non-authorized personnel are prohibited from performing upgrades.

- Safety check

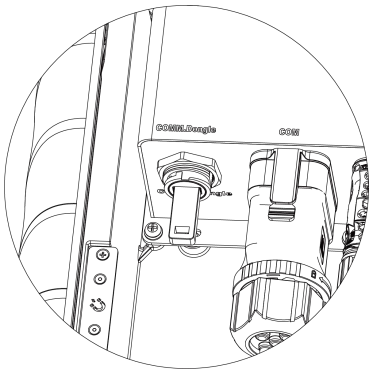
Please ensure the inverter is steadily powered on.

Inverter must keep the battery on through whole procedure of upgrading. Please prepare a PC and make sure the size of U-disk is under 32G, and the format is fat 16 or fat 32.

- **local upgrading**:

Procedures	
Step 1	Please contact our service support to get the update files, and extract it into your U-disk as follow: update/master/ H3_G2_Smart_Master_Vx.xx.bin update/slave/ H3_G2_Smart_Slave_Vx.xx.bin update/manager/ H3_Power_Qube_Manager_Vx.xx.bin Note: Vx.xx is version number.
	⚠ Warning!
	If the inverter has faulted, avoid standing directly in front of it. Avoid touching any parts of the inverter that may be energized.
Step 2	Unscrew the waterproof lid and insert U-disk into the "USB" port at the bottom of the inverter.

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Step 3	The LCD will show the selection menu. Then press up and down to select the one that you want to upgrade and press "OK" to confirm to upgrade.
Step 4	After the upgrade is finished, pull out the U-disk. Screw the waterproof lid.

USB Upgrade Operation Guide (Apply to Hybrid)

Introduction: The inverter is a high-tech integrated system with a CPU controller, which requires maintenance and upgrade. The upgrade files will be provided by manufacturer, please prepare everything ready before performing this upgrade.

Preparations:

- Use a USB 2.0 flash drive (≤32 GB, FAT16/FAT32). USB 3.0 is not compatible.
- Install the USB disk on your laptop, open it and create a folder named‘update’
- Create another three separate sub folders named ‘manager’ ‘master’ ‘slave’ under ‘update’ folder.
- Put the upgrade file into corresponding folder as shown below
- Prepare a slotted screwdriver for removing the upgrade port cover.

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* For mate of the file name: Model_Firmware type_Vx_xx.bin

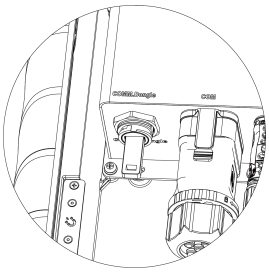
File names example:

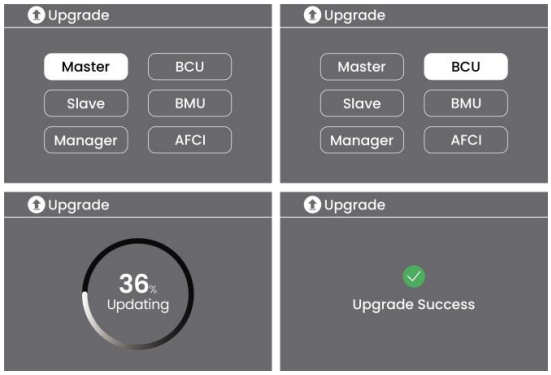
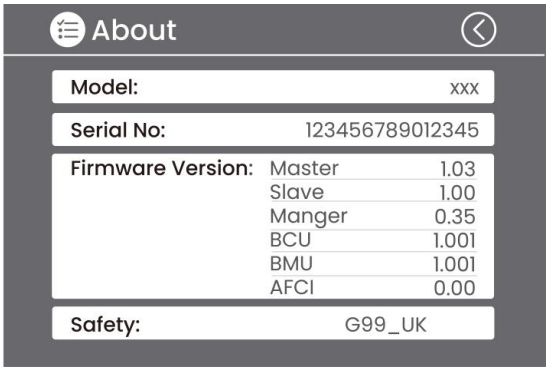
U:\update\master\H3_G2_Smart_Master_Vx_xx.bin

U:\update\slave\ H3_G2_Smart_Slave_Vx_xx.bin

U:\update\manager\H3_Power_Qube_Manager_Vx_xx.bin



Procedures	
Step 1	Turn off AC breaker (main circuit breaker) firstly then turn off DC breaker, make sure the inverter is powered off.
Step 2	Remove the upgrade port cover with a screwdriver.
Step 3	Plug in the USB disk.
	
Step 4	Only turn on DC breaker **(make sure PV voltage is above 120V)** wait for 10 seconds, the inverter screen will show as below:
	

Step 5	Upon inserting a USB flash drive, the firmware update page will automatically pop up. click on different icons to switch views; the option with a white background indicates selection.
	
Step 6	Remove the USB disk after upgrade completed. Follow the procedure blew and click the option to view the version.
	Menu -> About -> Inv Ver 
Step 7	Turn on AC &DC breaker. If you updated the HMI, long press the “enter” and click “set” to turn on the inverter. Make sure the inverter can enter **Normal State**.

9 Decommissioning and Disposal

9.1 Decommissioning the System

Before decommissioning the system, make sure no loads are connected to the system; otherwise, the loads will be powered off. The operation shall be performed by authorized professionals.

Step 1 Enter the settings page, select START / STOP and set it to stop.

Step 2 Turn off the external AC breaker, and the BACKUP breaker if equipped.

Step 3 Remove the two side panels from the inverter.

Step 4 Press and hold the battery button on the inverter for 5 seconds to shut down the battery. Turn off the DC Switch (PV+Battery) on the inverter.

Step 5 Verify that the entire system is de-energized: Confirm all LED indicators are off, then wait an additional 15 minutes.

Step 6 Remove the battery waterproof cover (located on the bottom battery module). System is voltage-free once cover is removed.

Step 7 Disconnect external connections on the inverter, including AC, PV and communication terminals（with tools）.

Step 8 Remove the M5 fixing screws (interlocking screws), between the inverter and battery, and between batteries.

Step 9 Remove the inverter, removal shall be performed by at least two persons.

Step 10 Remove the anti-tip bracket.

Step 11 Remove the batteries one by one. The battery stacking connectors (top and bottom) meet IP2X requirements, and the connector on one side is voltage-free.

- Do not touch the connectors on the top and bottom of the battery module when removing it.
- This equipment complies with the test requirements of SA TS5398. The measured arc flash energy is only 0.004 cal/cm².

If possible, use the original packaging to repack the system. If the original packaging is unavailable, an equivalent box meeting the following requirements may be used:

- Capable of bearing weight ≥ 40 kg.
- Includes handles.
- Can be fully enclosed.

9.2 Disposal

- Certain components of the system may cause environmental pollution. When disposing of the product or its related components, ensure compliance with local waste disposal regulations.

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10 Product Specifications

10.1 PV Input

Models	HQ3-5.0-M PQ3-5.0-M	HQ3-6.0-M PQ3-6.0-M	HQ3-8.0-M PQ3-8.0-M	HQ3-10.0-M PQ3-10.0-M	PQ3-10.0 -L-M	HQ3-12.0-M PQ3-12.0-M	HQ3-15.0-M PQ3-15.0-M
Max. PV array power [W]	11000	14000	18000	20000	20000	24000	30000
Max. DC input power [W]	11000	13200	17600	20000	20000	24000	30000
Max. DC voltage [V d.c.]	1000[1]						
Min. operating PV voltage [V d.c.]	90[2]						
Nominal DC operating voltage [V d.c.]	620						
Max. MPPT input current [A d.c.]	20/20/20	20/20/20	20/20/20	20/20/20	20/20/20	20/20/20	20/20/20
Max. MPPT short circuit current [A d.c.]	25/25/25	25/25/25	25/25/25	25/25/25	25/25/25	25/25/25	25/25/25
MPPT voltage range [V d.c.]	120~950						
MPPT voltage range (full load) [V d.c.]	120~850	120~850	140~850	175~850	175~850	210~850	263~850
Start-up voltage [V d.c.]	140	140	140	140	140	140	140
No. of MPP trackers	3	3	3	3	3	3	3
Strings per MPP tracker	1+1+1	1+1+1	1+1+1	1+1+1	1+1+1	1+1+1	1+1+1

[1] For 1000V system, PV maximum operating voltage is 950V.

[2] The starting working voltage of the power supply is 90V.

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10.2 Battery

Models	HQ3-5.0-M HQ3-5.0 -M-AC PQ3-5.0-M PQ3-5.0 -M-AC	HQ3-6.0-M HQ3-6.0 -M-AC PQ3-6.0-M PQ3-6.0 -M-AC	HQ3 -8.0-M HQ3-8.0 -M-AC PQ3 -8.0-M PQ3-8.0 -M-AC	HQ3-10.0-M HQ3-10.0 -M-AC PQ3-10.0-M PQ3-10.0 -M-AC	PQ3-10.0 -L-M PQ3-10.0-L -M-AC	HQ3-12.0-M HQ3-12.0 -M-AC PQ3-12.0-M PQ3-12.0 -M-AC	HQ3-15.0-M HQ3-15.0 -M-AC PQ3-15.0-M PQ3-15.0 -M-AC
Battery type	Lithium-ion battery (LFP)						
Battery voltage [V d.c.]	80~500						
Min. operating battery voltage [V d.c.]	85						
Full AC load battery voltage [V d.c.]	108	125	160	210	210	250	310
Max. battery charge Power [W]	6000	7200	9600	12000	12000	14400	15000
Max. battery discharge Power [W]	5000	6000	8000	10000	10000	12000	15000
Max. charge/ discharge current [A d.c.]	50/50						
Communication interface	CAN						

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10.3 AC Output/Input

Models	HQ3-5.0-M HQ3-5.0 -M-AC PQ3-5.0-M PQ3-5.0 -M-AC	HQ3-6.0-M HQ3-6.0 -M-AC PQ3-6.0-M PQ3-6.0 -M-AC	HQ3 -8.0-M HQ3-8.0 -M-AC PQ3 -8.0-M PQ3-8.0 -M-AC	HQ3-10.0-M HQ3-10.0 -M-AC PQ3-10.0-M PQ3-10.0 -M-AC	PQ3-10.0 -L-M PQ3-10.0-L -M-AC	HQ3-12.0-M HQ3-12.0 -M-AC PQ3-12.0-M PQ3-12.0 -M-AC	HQ3-15.0-M HQ3-15.0 -M-AC PQ3-15.0-M PQ3-15.0 -M-AC
AC output							
Nominal AC power [VA]	5000	6000	8000	10000	9999	12000	15000
Rated apparent power [VA]	5000	6000	8000	10000	9999	12000	15000
Max. apparent AC power [VA]	5500	6600	8800	11000	9999	13200	16500
Rated grid voltage (AC voltage range) [V a.c.]	400 / 230 ; 380 / 220 , 3L/N/PE						
Rated grid frequency [Hz]	50/60						
Rated AC current (Per phase) [A a.c.]	7.2/7.6	8.7/9.1	11.6/12.1	14.5/15.2	14.5/15.2	17.4/18.2	21.7/22.7
Max. AC current (Per phase) [A a.c.]	8.0/8.3	9.6/10.0	12.8/13.3	15.9/16.7	14.5/15.2	19.1/20.0	23.9/25.0
Power factor	1 (Adjustable from 0.8 leading to 0.8 lagging)						
Export control	YES						
AC inrush current [A a.c.]	15A@0.5ms						
Max. output fault current [A a.c.]	150A@0.5ms						
Max. output over current protection [A a.c.]	50						
THDI	<3%@rated power						
AC input							
Max. AC power [VA]	43470	43470	43470	43470	43470	43470	43470
Rated grid voltage (AC voltage range) [V a.c.]	400 / 230 ; 380 / 220 , 3L/N/PE						
Rated grid frequency [Hz]	50/60						
Max. AC current (Per phase) [A a.c.]	63	63	63	63	63	63	63
AC inrush current [A a.c.]	15A@0.5ms						

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10.4 BACKUP Output

Models	HQ3-5.0-M HQ3-5.0 -M-AC PQ3-5.0-M PQ3-5.0 -M-AC	HQ3-6.0-M HQ3-6.0 -M-AC PQ3-6.0-M PQ3-6.0 -M-AC	HQ3 -8.0-M HQ3-8.0 -M-AC PQ3-8.0-M PQ3-8.0 -M-AC	HQ3-10.0-M HQ3-10.0 -M-AC PQ3-10.0-M PQ3-10.0 -M-AC PQ3-10.0-L-M PQ3-10.0-L -M-AC	HQ3-12.0-M HQ3-12.0 -M-AC PQ3-12.0-M PQ3-12.0 -M-AC	HQ3-15.0-M HQ3-15.0 -M-AC PQ3-15.0-M PQ3-15.0 -M-AC
Backup Output (on grid mode)						
Max. output power for backup load [W]	43470	43470	43470	43470	43470	43470
Max. output current for backup load [A a.c.]	63	63	63	63	63	63
Backup Output (off grid mode)						
Max. apparent AC power [VA]	5000	6000	8000	10000	12000	15000
Rated apparent power [VA]	5000	6000	8000	10000	12000	15000
Peak apparent AC power [VA] (60s)	6000	7200	9600	12000	14400	15000
Rated output voltage [V a.c.]	400 / 230.; 3L/N/PE					
Rated output current (Per phase) [A a.c.]	7.2	8.7	11.6	14.5	17.4	21.7
Rated grid frequency [Hz]	50/60	50/60	50/60	50/60	50/60	50/60
Backup max current (Per phase) [A a.c.]	7.2	8.7	11.6	14.5	17.4	21.7
Power factor	1 (Adjustable from 0.8 leading to 0.8 lagging)					
Parallel operation	Yes @max. 4 PCS					
Switch time	<20ms					
THDV	<3%@Linear Load					

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10.5 Efficiency and Standard

Models	HQ3-5.0-M HQ3-5.0 -M-AC PQ3-5.0-M PQ3-5.0 -M-AC	HQ3-6.0-M HQ3-6.0 -M-AC PQ3-6.0-M PQ3-6.0 -M-AC	HQ3 -8.0-M HQ3-8.0 -M-AC PQ3 -8.0-M PQ3-8.0 -M-AC	HQ3-10.0-M HQ3-10.0 -M-AC PQ3-10.0-M PQ3-10.0 -M-AC	PQ3-10.0 -L-M PQ3-10.0-L -M-AC	HQ3-12.0-M HQ3-12.0 -M-AC PQ3-12.0-M PQ3-12.0 -M-AC	HQ3-15.0-M HQ3-15.0 -M-AC PQ3-15.0-M PQ3-15.0 -M-AC
Efficiency							
MPPT efficiency	99.90%	99.90%	99.90%	99.90%	99.90%	99.90%	99.90%
Max. efficiency (PV to AC)	97.80%	97.80%	97.90%	97.90%	97.90%	97.90%	97.90%
European efficiency (PV to AC)	97.00%	97.00%	97.10%	97.30%	97.30%	97.50%	97.50%
Protection							
PV reverse polarity protection	YES						
Battery reverse protection	YES						
Anti-islanding protection	YES						
Output short protection	YES						
Leakage current protection	YES						
Insulation resistor detection							
Over voltage category	III (AC side), II (DC side)						
Reverse connect protection	YES						
Over-current protection /over-temperature protection	YES						
DC/AC surge protection	Type II (PV)/Type II (AC)						
AFCI protection	optional						
DC switch	TGHX3S-63P						

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10.6 Inverter General Data

Dimension and weight		
Dimensions (W*H*D) [mm]	570*420*380	
Tolerance (W*H*D) [mm]	±3/±3/±3	
Cooling	Natural	FAN cooling
Inverter topology	Non-isolated	
Communication interface	Meter,WIFI/4G(optional),Bluetooth,DRM,Ethernet,USB,BMS(CAN),RS485,Ripple control,DRY CONTACT*2	
LCD display	HMI	
Environment requirements		
Installation	Ground mount	
Ingress protection	IP66 (For outdoor use)	
Operating temperature range [℃]	-25~55 (Derating at 45 ℃)	
Storage/Operation relative humidity	0%-100% (without condensation)	
Altitude [m]	Max. 3000	
Protective class	I	
Storage temperature [℃]	-40~+70	
Standby consumption [W]	100W for work,15W for switch off （only PV or battery）	
Standby mode	YES	
Button	Capacitive touch sensor	
Buzzer	1, Inside (Backup&Earth fault)	

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10.7 Battery Technical Specifications

10.7.1 EQ3300-S/EQ3300-S (w) Specifications

Specifications for Support-module	
Model No.	EQ3300-S (w)
Max. charge/discharge current (A)	50
Operating charge/discharge temperature (℃)	0~55/-10~55[*1] -25~55/-25~55[*2]
Storage temperature (℃)	-10~50
Humidity (%)	5~95
Nominal voltage (V)	64.0
Nominal capacity (Ah)	50
Nominal energy (kWh)	3.2
Battery voltage range (V)	58.0~73.0
Max. continuous discharge/charge current (A)	50/50
(CC-CV) Standard charging current (A)	25
Constant current and voltage charging cut-off current (A)	2
Depth of discharge(%)	90[*3]
Peak discharge current (60s) (A)	65
Altitude (m)	3000
Overall dimensions (W*H*D) (mm)	570*170*380
Stacking dimensions (W*H*D) (mm)	570*135*380
Tolerance (W*H*D)(mm)	±3/±3/±3
Weight (kg)	36.0±5%
Communication interfaces	CAN
[*1]warm up function off [*2]warm up function on [*3]AU only: 100% DOD	

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Specifications for Support-module	
Model No.	EQ3300-S
Max. charge/discharge current (A)	50
Operating charge/discharge temperature (℃)	0~55/-10~55
Storage temperature (℃)	-10~50
Humidity (%)	5~95
Nominal voltage (V)	64.0
Nominal capacity (Ah)	50
Nominal energy (kWh)	3.2
Battery voltage range (V)	58.0~73.0
Max. continuous discharge/charge current (A)	50/50
(CC-CV) Standard charging current (A)	25
Constant current and voltage charging cut-off current (A)	2
Depth of discharge(%)	90[*1]
Peak discharge current (60s) (A)	65
Altitude (m)	3000
Overall dimensions (W*H*D) (mm)	570*170*380
Stacking dimensions (W*H*D) (mm)	570*135*380
Tolerance (W*H*D)(mm)	±3/±3/±3
Weight (kg)	36.0±5%
Communication interfaces	CAN
[*1]AU only: 100% DOD	

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Specifications for EQ3300-S/EQ3300-S (w)					
Model No.	**EQ3300-S_2S EQ3300-S_2S (w)**	**EQ3300-S_3S EQ3300-S_3S (w)**	**EQ3300-S_4S EQ3300-S_4S (w)**	**EQ3300-S_5S EQ3300-S_5S (w)**	**EQ3300-S_6S EQ3300-S_6S (w)**
Battery designation	IFpP41/149/102 [(20S)2S] E/-10+50/90	IFpP41/149/102 [(20S)3S] E/-10+50/90	IFpP41/149/102 [(20S)4S] E/-10+50/90	IFpP41/149/102 [(20S)5S] E/-10+50/90	IFpP41/149/102 [(20S)6S] E/-10+50/90
The number of batteries	2	3	4	5	6
Nominal voltage (V)	128.0	192.0	256.0	320.0	384.0
Nominal capacity (Ah)	50	50	50	50	50
Nominal energy (kWh)	6.4	9.6	12.8	16.0	19.2
Battery voltage range (V)	116.0~146.0	174.0~219.0	232.0~292.0	290.0~365.0	348.0~438.0
Max. charge/discharge current (A)	50/50				
(CC-CV) Standard charging current (A)	25				
Constant current and constant voltage charging cut-off current (A)	2				
Peak discharge current (60s) (A)	65				
Depth of discharge(%)	90[*3]				
Storage temperature (℃)	-10~50				
Operating charge/discharge temperature (℃)	0~55/-10~55[*1] -25~55/-25~55[*2]				
Discharge capacity (Ah)	35@-10±2℃ @1C; 50@25±2℃ @1C; 47@55±2℃ @1C				
Cycle life	≥6000 @25℃ @ 70%SOH				
Ingress protection	IP66				
Protective class	Class I				
Communication interfaces	CAN				
[*1]warm up function off [*2]warm up function on [*3]AU only: 100% DOD					

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10.7.2 EQ4800-S Specifications

Specifications for Support-module	
Model No.	EQ4800-S
Max. charge/discharge current (A)	50
Operating charge/discharge temperature (℃)	0~55/-10~55
Storage temperature (°C)	-10~35
Humidity (%)	5~95
Normal voltage (V)	44.8
Normal capacity (Ah)	104
Normal energy (kWh)	4.66
Battery voltage range (V)	40.6~51.1
Max. continuous discharge/charge current (A)	50/50
Short circuit current (kA)	2.5
(CC-CV) Standard charging current (A)	30
Constant current and voltage charging cut-off current (A)	5.3
Depth of discharge(%)	90[*1]
Peak discharge current (60s) (A)	65
Altitude (m)	3000
Overall dimensions (W*H*D) (mm)	570*172*380
Stacking dimensions (W*H*D) (mm)	570*137*380
Tolerance (W*H*D)(mm)	±3/±3/±3
Weight (kg)	39.0±5%
Communication interfaces	CAN
[*1]AU only: 100% DOD	

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Specifications for EQ4800-S								
Model No.	**EQ4800-S_ 2S**	**EQ4800-S_ 3S**	**EQ4800-S_ 4S**	**EQ4800-S_ 5S**	**EQ4800-S_ 6S**	**EQ4800-S_ 7S**	**EQ4800-S_ 8S**	**EQ4800-S_ 9S**
Battery designation	IFpP53/149/ 113[(14S)2S] E/-10+50/90	IFpP53/149/ 113[(14S)3S] E/-10+50/90	IFpP53/149/ 113[(14S)4S] E/-10+50/90	IFpP53/149/ 113[(14S)5S] E/-10+50/90	IFpP53/149/ 113[(14S)6S] E/-10+50/90	IFpP53/149/ 113[(14S)7S] E/-10+50/90	IFpP53/149/ 113[(14S)8S] E/-10+50/90	IFpP53/149/113[(14S)9S] E/-10+50/90
The number of batteries	2	3	4	5	6	7	8	9
Nominal voltage (V)	89.6	134.4	179.2	224.0	268.8	313.6	358.4	403.2
Nominal capacity (Ah)	104	104	104	104	104	104	104	104
Nominal energy (kWh)	9.32	13.98	18.64	23.30	27.96	32.61	37.27	41.93
Battery voltage range (V)	81.2 ~102.2	121.8 ~153.3	162.4 ~204.4	203.0 ~255.5	243.6 ~306.6	284.2 ~357.7	324.8 ~408.8	365.4 ~459.9
Max. charge/ discharge current (A)	50/50							
(CC-CV) Standard charging current (A)	30							
Constant current and constant voltage charging cut-off current (A)	5.3							
Peak discharge current (60s) (A)	65							
Depth of discharge(%)	90*1							
Storage temperature (℃)	-10~35							
Operating charge/discharge temperature (℃)	Charge: 0~55 Discharge: -10~55							

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Discharge capacity (Ah)	90@-20±2℃ @1/3C ; 104@25±2℃ @1C; 104@55±2℃ @1C
Ingress protection	IP66
Protective class	Class Ⅰ
Communi-cation interfaces	CAN
Standard	IEC 62477-1;IEC 62619
*1AU only: 100% DOD	

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10.7.3 EQ5000-S/EQ5000-S (w)/TQ5000-S (w) Specifications

Specifications for Support-module	
Model No.	EQ5000-S
Max. charge/discharge current (A)	50
Operating charge/discharge temperature (℃)	0~55/-10~55
Storage temperature (℃)	-10~50
Humidity (%)	5~95
Nominal voltage (V)	64.0
Nominal capacity (Ah)	77
Nominal energy (kWh)	4.92
Battery voltage range (V)	58.0~73.0
Max. continuous discharge/charge current (A)	50/50
(CC-CV) Standard charging current (A)	38.5
Constant current and voltage charging cut-off current (A)	2
Depth of discharge(%)	90[*1]
Peak discharge current (60s) (A)	65
Altitude (m)	3000
Overall dimensions (W*H*D) (mm)	570*170*380
Stacking dimensions (W*H*D) (mm)	570*135*380
Tolerance (W*H*D)(mm)	±3/±3/±3
Weight (kg)	41.0±5%
Communication interfaces	CAN
[*1]AU only: 100% DOD	

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Specifications for Support-module	
Model No.	EQ5000-S (w)/TQ5000-S (w)
Max. charge/discharge current (A)	50
Operating charge/discharge temperature (℃)	0~55/-10~55[*1] -25~55/-25~55[*2]
Storage temperature (℃)	-10~50
Humidity (%)	5~95
Nominal voltage (V)	64.0
Nominal capacity (Ah)	77
Nominal energy (kWh)	4.92
Battery voltage range (V)	58.0~73.0
Max. continuous discharge/charge current (A)	50/50
(CC-CV) Standard charging current (A)	38.5
Constant current and voltage charging cut-off current (A)	2
Depth of discharge(%)	90[*3]
Peak discharge current (60s) (A)	65
Altitude (m)	3000
Overall dimensions (W*H*D) (mm)	570*170*380
Stacking dimensions (W*H*D) (mm)	570*135*380
Tolerance (W*H*D)(mm)	±3/±3/±3
Weight (kg)	41.0±5%
Communication interfaces	CAN
[*1]warm up function off [*2]warm up function on [*3]AU only: 100% DOD	

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Specifications for EQ5000-S/EQ5000-S (w)/TQ5000-S/TQ5000-S (w)					
Model No.	**EQ5000-S_2S EQ5000-S_2S (w) TQ5000-S_2S (w)**	**EQ5000-S_3S EQ5000-S_3S (w) TQ5000-S_3S (w)**	**EQ5000-S_4S EQ5000-S_4S (w) TQ5000-S_4S (w)**	**EQ5000-S_5S EQ5000-S_5S (w) TQ5000-S_5S (w)**	**EQ5000-S_6S EQ5000-S_6S (w) TQ5000-S_6S (w)**
Battery designation	IFpP40/150/112 [(20S)2S] E/-10+50/90	IFpP40/150/112 [(20S)3S] E/-10+50/90	IFpP40/150/112 [(20S)4S] E/-10+50/90	IFpP40/150/112 [(20S)5S] E/-10+50/90	IFpP40/150/112 [(20S)6S] E/-10+50/90
The number of batteries	2	3	4	5	6
Nominal voltage (V)	128.0	192.0	256.0	320.0	384.0
Nominal capacity (Ah)	77	77	77	77	77
Nominal energy (kWh)	9.84	14.76	19.68	24.60	29.52
Battery voltage range (V)	116.0~146.0	174.0~219.0	232.0~292.0	290.0~365.0	348.0~438.0
Max. charge/discharge current (A)	50/50				
(CC-CV) Standard charging current (A)	38.5				
Constant current and constant voltage charging cut-off current (A)	2				
Peak discharge current (60s) (A)	65				
Depth of discharge(%)	90[*3]				
Storage temperature (℃)	-10~50				
Operating charge/discharge temperature (℃)	0~55/-10~55[*1] -25~55/-25~55[*2]				
Discharge capacity (Ah)	56@-10±2℃ @0.5C; 77@25±2℃ @0.5C; 73@55±2℃ @0.5C				
Cycle life	≥6000 @25℃ @ 70%SOH				
Ingress protection	IP66				
Protective class	Class Ⅰ				
Communication interfaces	CAN				
[*1]warm up function off [*2]warm up function on [*3]AU only: 100% DOD					

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10.7.4 EQ5500-S/EQ5500-S (w)/TQ5500-S (w) Specifications

Specifications for Support-module	
Model No.	EQ5500-S
Max. charge/discharge current (A)	50
Operating charge/discharge temperature (℃)	0~55/-10~55
Storage temperature (°C)	-10~35
Humidity (%)	5~95
Normal voltage (V)	44.8
Normal capacity (Ah)	122
Normal energy (kWh)	5.46
Battery voltage range (V)	40.6~51.1
Max. continuous discharge/charge current (A)	50/50
Short circuit current (kA)	2.6
(CC-CV) Standard charging current (A)	50
Constant current and voltage charging cut-off current (A)	2.0
Depth of discharge(%)	90[*1]
Peak discharge current (60s) (A)	65
Altitude (m)	3000
Overall dimensions (W*H*D) (mm)	570*172*380
Stacking dimensions (W*H*D) (mm)	570*137*380
Tolerance (W*H*D)(mm)	±3/±3/±3
Weight (kg)	41.0±5%
Communication interfaces	CAN
[*1]AU only: 100% DOD	

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Specifications for Support-module	
Model No.	EQ5500-S (w)/TQ5500-S (w)
Max. charge/discharge current (A)	50
Operating charge/discharge temperature (℃)	0~55/-10~55*1 -25~55/-25~55*2
Storage temperature (°C)	-10~35
Humidity (%)	5~95
Normal voltage (V)	44.8
Normal capacity (Ah)	122
Normal energy (kWh)	5.46
Battery voltage range (V)	40.6~51.1
Max. continuous discharge/charge current (A)	50/50
Short circuit current (kA)	2.6
(CC-CV) Standard charging current (A)	50
Constant current and voltage charging cut-off current (A)	2.0
Depth of discharge(%)	90*1
Peak discharge current (60s) (A)	65
Altitude (m)	3000
Overall dimensions (W*H*D) (mm)	570*172*380
Stacking dimensions (W*H*D) (mm)	570*137*380
Tolerance (W*H*D)(mm)	±3/±3/±3
Weight (kg)	41.0±5%
Communication interfaces	CAN
*1warm up function off *2warm up function on *3AU only: 100% DOD	

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Specifications for EQ5500-S/EQ5500-S (w)/TQ5500-S (w)								
Model No.	**EQ5500-S_ 2S EQ5500-S (w)_2S TQ5500-S (w)_2S**	**EQ5500-S_ 3S EQ5500-S (w)_3S TQ5500-S (w)_3S**	**EQ5500-S_ 4S EQ5500-S (w)_4S TQ5500-S (w)_4S**	**EQ5500-S_ 5S EQ5500-S (w)_5S TQ5500-S (w)_5S**	**EQ5500-S_ 6S EQ5500-S (w)_6S TQ5500-S (w)_6S**	**EQ5500-S_ 7S EQ5500-S (w)_7S TQ5500-S (w)_7S**	**EQ5500-S_ 8S EQ5500-S (w)_8S TQ5500-S (w)_8S**	**EQ5500-S_ 9S EQ5500-S (w)_9S TQ5500-S (w)_9S**
Battery designation	IFpP53/150/ 120[(14S)2S] E/-10+50/90	IFpP53/150/ 120[(14S)3S] E/-10+50/90	IFpP53/150/ 120[(14S)4S] E/-10+50/90	IFpP53/150/ 120[(14S)5S] E/-10+50/90	IFpP53/150/ 120[(14S)6S] E/-10+50/90	IFpP53/150/ 120[(14S)7S] E/-10+50/90	IFpP53/150/ 120[(14S)8S] E/-10+50/90	IFpP53/150/ 120[(14S)9S] E/-10+50/90
The number of batteries	2	3	4	5	6	7	8	9
Nominal voltage (V)	89.6	134.4	179.2	224.0	268.8	313.6	358.4	403.2
Nominal capacity (Ah)	122	122	122	122	122	122	122	122
Nominal energy (kWh)	10.92	16.38	21.84	27.30	32.76	38.22	43.68	49.14
Battery voltage range (V)	81.2 ~102.2	121.8 ~153.3	162.4 ~204.4	203.0 ~255.5	243.6 ~306.6	284.2 ~357.7	324.8 ~408.8	365.4 ~459.9
Max. charge/ discharge current (A)	50/50							
(CC-CV) Standard charging current (A)	50							
Constant current and constant voltage charging cut-off current (A)	2.0							
Peak discharge current (60s) (A)	65							
Depth of discharge(%)	90*3							
Storage temperature (℃)	-10~35							
Operating charge/dischar	0~55/-10~55*1 -25~55/-25~55*2							

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ge temperature (℃)	
Discharge capacity (Ah)	97@-20±2℃ @1/3C ; 122@25±2℃ @1C; 122@55±2℃ @1C
Ingress protection	IP66
Protective class	Class I
Communi-cation interfaces	CAN
Standard	IEC 62477-1;IEC 62619
*1warm up function off *2warm up function on *3AU only: 100% DOD	

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10.7.5 TQ5000-S-P (w)/EQ5000-S-P (w) Specifications

Specifications for Support-module	
Model No.	TQ5000-S-P (w)/EQ5000-S-P (w)
Max. charge/discharge current (A)	50
Operating charge/discharge temperature (℃)	0~55/-10~55[*1] -25~55/-25~55[*2]
Storage temperature (°C)	-10~35
Humidity (%)	5~95
Normal voltage (V)	44.8
Normal capacity (Ah)	122
Normal energy (kWh)	5.46
Battery voltage range (V)	40.6~51.1
Max. continuous discharge/charge current (A)	50/50
Short circuit current (kA)	2.6
(CC-CV) Standard charging current (A)	50
Constant current and voltage charging cut-off current (A)	2.0
Depth of discharge(%)	90[*3]
Peak discharge current (60s) (A)	65
Altitude (m)	3000
Overall dimensions (W*H*D) (mm)	570*172*380
Stacking dimensions (W*H*D) (mm)	570*137*380
Tolerance (W*H*D)(mm)	±3/±3/±3
Weight (kg)	41.0±5%
Communication interfaces	CAN
[*1]warm up function off [*2]warm up function on [*3]AU only: 100% DOD	

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Specifications for TQ5500-S-P (W)/EQ5000-S-P (w)								
Model No.	**TQ5000-S-P (w)_2S EQ5000-S -P_2S (w)**	**TQ5000-S-P (w)_3S EQ5000-S -P_3S (w)**	**TQ5000-S-P (w)_4S EQ5000-S -P_4S (w)**	**TQ5000-S-P (w)_5S EQ5000-S -P_5S (w)**	**TQ5000-S-P (w)_6S EQ5000-S -P_6S (w)**	**TQ5000-S-P (w)_7S EQ5000-S -P_7S (w)**	**TQ5000-S-P (w)_8S EQ5000-S -P_8S (w)**	**TQ5000-S-P (w)_9S EQ5000-S -P_9S (w)**
Battery designation	IFpP53/150/120[(14S)2S] E/-10+50/90	IFpP53/150/120[(14S)3S] E/-10+50/90	IFpP53/150/120[(14S)4S] E/-10+50/90	IFpP53/150/120[(14S)5S] E/-10+50/90	IFpP53/150/120[(14S)6S] E/-10+50/90	IFpP53/150/120[(14S)7S] E/-10+50/90	IFpP53/150/120[(14S)8S] E/-10+50/90	IFpP53/150/120[(14S)9S] E/-10+50/90
The number of batteries	2	3	4	5	6	7	8	9
Nominal voltage (V)	89.6	134.4	179.2	224.0	268.8	313.6	358.4	403.2
Nominal capacity (Ah)	111	111	111	111	111	111	111	111
Nominal energy (kWh)	9.94	14.91	19.88	24.85	29.82	34.79	39.76	44.73
Battery voltage range (V)	81.2~102.2	121.8~153.3	162.4~204.4	203.0~255.5	243.6~306.6	284.2~357.7	324.8~408.8	365.4~459.9
Max. charge/ discharge current (A)	50/50							
(CC-CV) Standard charging current (A)	50							
Constant current and constant voltage charging cut-off current (A)	2.0							
Peak discharge current (60s) (A)	65							
Depth of discharge(%)	90*3							
Storage temperature (℃)	-10~35							

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Operating charge/discharge temperature (℃)	0~55/-10~55*¹ -25~55/-25~55*²
Discharge capacity (Ah)	90@-20±2℃ @1/3C ; 111@25±2℃ @1/3C; 111@55±2℃ @1/3C
Ingress protection	IP65
Protective class	Class Ⅰ
Communi-cation interfaces	CAN
Standard	IEC 62477-1;IEC 62619
*¹warm up function off *²warm up function on *³AU only: 100% DOD	

10.8 Overall Dimensions and Weight for the Power Cube System

Power Cube Overall dimensions and weight									
Battery Model \ The number of batteries		2	3	4	5	6	7	8	9
EQ3300-S/ EQ3300-S (w)	Dimensions (W*H*D)(mm)	570*793 *380	570*928 *380	570*1063 *380	570*1198 *380	570*1333 *380	/	/	/
	Tolerance (W*H*D)(mm)	±3/±6/±3	±3/±9/±3	±3/±12/±3	±3/±15/±3	±3/±18/±3	/	/	/
	Weight (kg)	119.0±5%	155.0±5%	191.0±5%	227.0±5%	263.0±5%	/	/	/
EQ5000-S/ EQ5000-S(w)/ TQ5000-S (w)	Dimensions (W*H*D)(mm)	570*793 *380	570*928 *380	570*1063 *380	570*1198 *380	570*1333 *380	/	/	/
	Tolerance (W*H*D)(mm)	±3/±6/±3	±3/±9/±3	±3/±12/±3	±3/±15/±3	±3/±18/±3	/	/	/
	Weight (kg)	129.0±5%	170.0±5%	211.0±5%	252.0±5%	293.0±5%	/	/	/
EQ4800-S	Dimensions (W*H*D)(mm)	570*797 *380	570*934 *380	570*1071 *380	570*1208 *380	570*1345 *380	570*1482 *380	570*1619 *380	570*1756* 380
	Tolerance (W*H*D)(mm)	±3/±6/±3	±3/±9/±3	±3/±12/±3	±3/±15/±3	±3/±18/±3	±3/±21/±3	±3/±24/±3	±3/±27/±3
	Weight (kg)	125.0±5%	164.0±5%	203.0±5%	242.0±5%	281.0±5%	320.0±5%	359.0±5%	398.0±5%
EQ5500-S/ EQ5500-S (w)/ EQ5000-S-P (w)/ TQ5000-S-P (w)	Dimensions (W*H*D)(mm)	570*797 *380	570*934 *380	570*1071 *380	570*1208 *380	570*1345 *380	570*1482 *380	570*1619 *380	570*1756 *380
	Tolerance (W*H*D)(mm)	±3/±6/±3	±3/±9/±3	±3/±12/±3	±3/±15/±3	±3/±18/±3	±3/±21/±3	±3/±24/±3	±3/±27/±3
	Weight (kg)	129.0±5%	170.0±5%	211.0±5%	252.0±5%	293.0±5%	334.0±5%	375.0±5%	416.0±5%
*Base: Dimensions 570 * 103 * 103 mm, Weight 4.4 kg, Height Adjustment Range 73~103 mm.									
Note: All dimensions and weights in the table are for the Power Cube (Inverter+Batteries) system.									

Note: The battery for the system configuration must be selected based on the battery system numbers available for sale in your area.

Note: Products with "(w)" suffix, such as EQ3300-S (w), EQ5000-S(w), TQ5000-S (w), EQ5500-S (w), EQ5000-S-P (w) and TQ5000-S-P (w) are equipped with Battery Warm up function. Without the "(w)" suffix, like EQ3300-S, EQ5000-S, EQ4800-S and EQ5500-S are not equipped with the Battery Warm up function.

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11 Appendix

11.1 Quality Guarantee

FOXESS CO., Ltd. (hereinafter referred to as "the Company") will, for products found to be faulty during the warranty period, repair the product free of charge or replace it with a new one.

Supporting Documentation Required

When requesting warranty service, the customer must present the original purchase invoice indicating the date of purchase. Furthermore, the product's trademark must be clearly visible. The Company reserves the right to decline warranty coverage if these conditions are not met.

Relevant Conditions

- Non-conforming products replaced under warranty shall be disposed of by the Company.
- The customer must allow the Company a reasonable period of time to complete repairs on faulty equipment.

Warranty Exclusions

The Company reserves the right to decline warranty coverage under the following circumstances:

- The entire machine or specific components have exceeded the free warranty period.
- Damage incurred during transportation.
- Faults resulting from incorrect installation, modification, or use.
- Operation in environments that exceed the limits specified as harsh in this manual.
- Malfunctions or damage caused by installation, repair, alteration, or disassembly performed by service organizations or personnel not authorized by the Company.
- Use or installation outside the scope defined in the relevant international standards.
- Damage caused by abnormal natural disasters.
- Damage resulting from storage conditions that do not meet the requirements stated in the product documentation.
- Any losses arising from failure to adhere to the safety precautions outlined in this manual.

If a product failure is caused by any of the above circumstances and the customer still requests repair services, the Company's authorized service organization may, upon assessment, provide repair services subject to a charge.

Other Provisions

The Company reserves the right to change product dimensions and parameters based on its latest documentation without prior notice.

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11.2 Contact Us

If you have any questions about the product, please contact us:

- Fox ESS Headquarters: No.939, Jinhai Third Road, New Airport Industry Area, Longwan District, Wenzhou, Zhejiang, China.
- Wuxi R&D Center: No. 37 Huaqing Avenue, Wuxi Economic Development Zone (Intersection of Huaqing Avenue and Huayun Road)
- Wuhan R&D Center: 6th Floor, Block A, Tower T4, CHINA PROCUREMENT CENTER No. 789 Gaoxin Avenue, East Lake New Technology Development Zone, Wuhan, Hubei, China.
- Shanghai R&D Center: No.1255, Jinhai Road, Pudong New Area, Shanghai, China.
- After-Sales Service Hotline: 400 1888 900
- Contact Telephone (Wenzhou): 0577-88159999
- Contact Telephone (Wuxi): 0510-68092998
- Contact Us: info@fox-ess.com
- Contact Us (EV Charger): ev@fox-ess.com
- After-Sales Service: service@fox-ess.com

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