User Manual



EVO 10 Series All-In-One Unit

2.5kW ~ 10kW

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

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Version V1.0.0

Date 2026-07

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1 Notes on This Manual

EVO 10 series all-in-one units 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.

1.1 Scope of Validity

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

EVO 10E-2.5-H	EVO 10E-3-H	EVO 10E-3.7-H	EVO 10E-4-H
EVO 10E-4.6-H	EVO 10E-5-H	EVO 10E-6-H	EVO 10E-8-H
EVO 10E-10-H	EVO 10E-4.6-H-L	EVO 10E-5-H-L	EVO 10E-6-H-L
EVO 10E-7.5-H-L			

EVO 10E-2.5-AC	EVO 10E-3-AC	EVO 10E-3.7-AC	EVO 10E-4-AC
EVO 10E-4.6-AC	EVO 10E-5-AC	EVO 10E-6-AC	EVO 10E-8-AC
EVO 10E-10-AC	EVO 10E-4.6-AC-L	EVO 10E-5-AC-L	EVO 10E-6-AC-L
EVO 10E-7.5-AC-L			

1.2 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.

1.3 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:

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⚠ 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.

Symbols	Explanation
	CE mark. The product complies with the relevant EU directives.
	RCM mark.
	Danger of high voltages. Danger to life due to high voltages in the inverter!
	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 unit 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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	Do not place nor install near flammable or explosive materials.
	Install the product out of reach of children.
	Disconnect the equipment before carrying out maintenance or repair.
	Observe precautions for handling electrostatic discharge sensitive devices.
	Prohibit the use of water to extinguish fires.
	Prohibition of private maintenance.
	Prohibit connector reversal.

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2 Safety Precautions

2.1 Personnel Safety

⚠ Danger!

Operating Requirements

- 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.
- Do not energize the equipment without completing the installation or without professional confirmation, and strictly prohibit operation with electricity.

⚠ 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 inverter, make sure that the equipment and its surfaces are at a contact-safe temperature and voltage before proceeding.

Note!

Personnel requirements

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

- Before operating the equipment, be sure to check that it 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 inverter and avoid temporary maintenance of the inverter.
- Special scenario operators, such as electrical operation, high place operation, equipment maintenance operation, etc., must have special operation qualification that meets the requirements of the local country/region, and should comply with local standards and relevant safety codes.
- 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.
- Operators are required to wear appropriate personal protective equipment, including protective clothing, gloves, goggles, and helmets.
- It is strictly prohibited to operate under fatigue, drunkenness, or ill health.
- Take extra care when the inverter 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 insulation or safety distances. Choose the installation location carefully and observe

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the specified cooling requirements.

- Before connecting the inverter 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.
- The manufacturer needs to be notified of any non-standard installation conditions.
- 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.

2.2 Electrical Connection Safety

⚠ Danger!

Operating Requirements

- Remove all electrical connections from the unit before making electrical connections.
- Before making electrical connections, it is important to verify that the equipment itself and its front and rear switches are disconnected and that reliable locking and marking measures are in place to prevent accidental energization.

Wiring Requirements

- No loads may be connected between the inverter and its directly connected AC circuit breaker.
- Use test equipment to ensure that the PV strings have the correct positive and negative terminals.
- The entire grounding system should remain intact, including the grounding electrode, grounding trunk, branch wires, and connections to the equipment.

Grounding Requirements

- The protective earth conductor needs to remain grounded during installation and when removing the equipment.

Maintenance Requirements

- High voltage exists inside the unit, do not open the unit's mainframe panel.
- Disconnect the corresponding output switch of the power supply unit before performing maintenance on the power supply unit's back-end electricity or power distribution equipment.
- Confirm that the built-in battery pack in the newly installed All-in-one unit complies with the product warranty terms and has not been recharged within the past 5 months. Additionally, ensure the State of Charge (SOC) of the current battery system is maintained within 50%±5%.

⚠ Warning!

Wiring Requirements

- In electrical installations, it is important to follow the relevant codes and standards and to use circuit breakers of appropriate specifications to protect the safety of the circuit.

Grounding Requirements

- The grounding resistance should be in accordance with relevant standards and

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regulations to ensure effective current discharge. Normally, the value of grounding resistance should be small enough to ensure that the current can be quickly directed to earth in the event of a fault.

Maintenance 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 operation and maintenance of the inverter.

Note!

Wiring Requirements

- Wires should be secured and supported at appropriate locations to prevent dislodgement or damage due to self-weight or external forces.

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

- Cable slots and crossing holes should have no sharp edges and the location of the pipe or crossing holes should be protected to prevent damage to the cables.

- Strictly follow national and industry standards and codes for electrical wiring for construction and installation.
- Verify that tools and test equipment used are functioning properly, calibrated effectively, and meet safety standards, and check and register the number of tools to prevent them 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.
- Incorrect wiring operations can cause accidents such as fire or electric shock, and the resulting damage will not be covered by the warranty.
- Wiring should be clearly labeled to facilitate maintenance and troubleshooting.
- Wiring personnel need to wear appropriate personal protective equipment and use professional insulated tools for operation .
- The grounding system should be tested regularly to check the grounding resistance, connection status, etc. Before operating the equipment, ensure that the equipment is reliably grounded, and find and repair any damage or abnormality in time.
- Cabling should be kept at a safe distance of at least 30mm from high temperature heat sources to prevent aging of the insulation.
- Cables should not block the air inlet and outlet of the equipment.
- After the connection is completed, it should be ensured that the insulation of the wires is restored intact and the exposed conductor parts are effectively insulated.
- The grounded portion should be clearly labeled to alert personnel.
- The grounding connection must be firm and reliable to avoid loose, corrosion, or poor contact. The connection shall be properly treated against corrosion.
- Wiring should be laid neatly and in an orderly manner, avoiding crossings, tangles

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and excessive bending to minimize the risk of damage to the wires. Select power cords of sufficient length and strictly prohibit making joints or soldering points in power cords.

- The insulation of wires and cables should be intact and have good insulation properties to effectively prevent leakage and short circuit.
- The same kind of cables are tied neatly without outer skin damage, and different kinds of cables are laid out separately, forbidding twisting and crossing.
- Regularly check the system parameters and make records, if anomalies are found, the causes should be identified and dealt with accordingly. If you can not determine the cause of the anomaly, you need to turn to professionals to avoid accidents affecting the use of the system.
- Non-professionals are not allowed to disassemble and overhaul the inverter without authorization, and the operators need to be specially trained.
- Strictly follow the use and maintenance instructions of the product to operate, make sure the warning signs are intact, and replace the signs that become unclear due to long-term use in time.
- Regularly check whether the wiring and connecting terminals of each part of the equipment are firm and whether there is any looseness; especially pay attention to the fan, power module, input terminals, output terminals, grounding, and other parts.
- Place eye-catching warning signs or set up safety warning belts around the products; non-staff are not allowed to enter to avoid mishandling or accidents after unrelated personnel approach the products.
- Hang a "Danger - Do Not Close" tag on the upstream and downstream switches or circuit breakers, and post warning signs to prevent accidental connection.

2.3 Installation Requirements

⚠ Danger!

Equipment Protection

- Strictly follow the operation manual and specifications of the equipment to carry out maintenance operations, do not carry out other maintenance operations beyond this manual without authorization to avoid equipment failure due to incorrect operation.
- Prohibit arc welding, drilling, cutting and other operations on the equipment, and prohibit the installation of other equipment on the top of the product.

Drilling Safety

- Avoid pre-buried pipes or lines when drilling to avoid short circuits or other hazards.
- The entire grounding system should be kept intact, including the grounding electrode, grounding trunk, branch lines, and connections to the equipment.
- In electrical installations, it is important to follow the relevant codes and standards and to use circuit breakers of the right size to protect the safety of the circuits.

Note!

Use of Tools

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

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Equipment Protection

- Paint scratches, drops or rust stains that occur during transportation and installation of equipment must be repaired in a timely manner, and long-term exposure of the scratched part may affect the use of the inverter.

Drilling Safety

- Appropriate protective equipment such as goggles, earplugs, helmets, and coveralls should be worn when drilling to prevent splashing debris from hurting eyes and face, reduce noise damage to hearing, and protect the body from injury.
- Cabling should be kept at a safe distance of at least 30 mm from high temperature heat sources to prevent deterioration of the insulation.
- Cables should not block the air inlet or outlet of the equipment.

- 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.
- Update the operating system and related software of the equipment in time to fix the loopholes and improve the performance.
- 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 workpiece being drilled is securely fastened to prevent it from moving or rotating during drilling.
- When replacing drills, cleaning debris or performing equipment maintenance, strictly 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.

2.4 PE Connection and Leakage Current

PV System Residual Current Factors

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 mainly by the parasitic capacitance of the PV modules to PE. The module type, the environmental conditions (rain, humidity) and even the distance of the modules from the roof can effect the discharge current. Other factors that may contribute to the parasitic capacitance are the inverter’s internal capacitance to PE and external protection elements such as lighting protection.

During operation, the DC bus is connected to the alternating current grid via the inverter. Thus, a portion of the alternating voltage amplitude arrives at the DC bus. The fluctuating

voltage constantly changes the charge state of the parasitic PV capacitor (i.e capacitance to PE). This is associated with a displacement current, which is proportional to the capacitance and the applied voltage amplitude.

Residual current - if there is a fault, such as defective insulation, where an energized cable comes into contact with a grounded person, an additional current flows, known as a residual current.

Residual Current Device (RCD)

All inverters incorporate a certified internal RCMU (Residual current monitoring unit) to protect against possible electrocution in case of a malfunction of the PV array, cables or inverter (DC). The RCMU in the inverter can detect leakage on the DC side. There are 2 trip thresholds for the RCMU as required by the DIN VDE 0126-1-1 standard. A low threshold is used to protect against rapid changes in leakage typical of direct contact by people. A higher threshold is used for slowly rising leakage currents, to limit the current in grounding conductors for the safety. The default value for higher speed personal protection is 30mA, and 300mA per unit for lower speed fire safety.

The internal RCD only performs leakage current detection in accordance with safety regulations. Its fault threshold cannot be modified, and it cannot fully replace an external RCD. If the current exceeds the permissible limit, the internal RCD will trip and trigger a fault alarm. However, since the internal inverter RCD automatically resets when the residual current is low, no manual reset operation is required.

Installation and Selection of an External RCD device

Fox ESS recommends installing an external RCD. The installer must check which type of RCD is required by the specific local electric codes. Installation of an RCD must always be conducted in accordance with local codes and standards. Unless a lower value is required by the specific local electric codes, Fox ESS suggests an RCD value between 100mA and 300mA.

In installations where the local electric code requires an RCD with a lower leakage setting, the discharge current might result in nuisance tripping of the external RCD. Selecting the appropriate RCD is important for correct operation of the installation. An RCD with a rating of 30mA may actually tip at a leakage as 15mA (according to IEC 61008). High quality RCDs will typically trip at a value closer to their rating.

2.5 Response to Emergency Situations

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

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

1. If there has been inhalation, please leave the contaminated area immediately and seek

medical attention.

2. If there has been contact with eyes, rinse the eyes with running water for 15 minutes and seek medical attention immediately.
3. If there has been contact with the skin, wash the contacted area with soap thoroughly and seek medical attention immediately.
4. 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 FM-200 or Co2 fire extinguisher for the battery and an ABC fire extinguisher for the other parts of the system. Under any fire situation, please evacuate the people from the building immediately before trying to extinguish it.

Water Situation

The battery modules are not water resistant. 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 authorized personnel for further instructions.

2.6 Fire Protection Function

Despite the extremely stable chemical properties of lithium iron phosphate batteries and the multiple protections, each battery unit is equipped with a fire protection 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.

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.

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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•OH→Sr(OH)2 Sr+O•→SrO Sr(OH)2+2H•→Sr+2H2O

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 suc h as •OH, H•and O• from chain reactions, catalyzing their recombination into stable molecules. This interrupts the essential branching chain reactions in the combustible process. For example:

K2O (s)+2H (g)→2KOH (s) KOH (s)+OH (g)→KO (s)+H2O (g)

K2O (s)+O (g)→2KO(s) KO(s)+H(g)→KOH

Note!

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

(2) Non-professionals should not disassemble the battery without authorization.

(3) Do not touch the device until the casing has cooled after the internal fire extinguish er has been activated, to prevent it from burning.

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

2.7 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 problem, Fox ESS has introduced a "Battery Heating" feature, enabling the battery system to operate effectively at extremely low temperature. This feature is exclusively available in the heated versions.

During Full Heating Period

When the battery temperature is between -25℃~ 0℃, the system will heat the battery to 5℃. Heating will stop once this temperature is reached, but if the battery temperature falls below 0℃ again, the heating system will reactivate.

The heating system prioritizes energy from the photovoltaic (PV) system. If PV power is insufficient, it will draw energy from either the battery or the grid, depending on the state of

charge (SOC) of the battery.

- If the battery SOC > 40%, energy will be drawn from the battery, following the priority order:

PV > Battery> Grid.

- If the battery SOC < 40%, energy will be sourced from the grid, with the following priority order:

PV > Grid > Battery.

During PV Heating Period

The battery will only be heated when surplus energy is available from the PV system.

The complete heating function is turned off by default and must be manually enabled via the web interface or app when required. After activation, the heating periods must be configured as follows:

- heating period 1: start time 0:00, end time 0:00
- heating period 2: start time 0:00, end time 0:00
- heating period 3: start time 0:00, end time 0:00

The three time segments may overlap but cannot be mutually exclusive. Any time outside these segments will utilize PV energy only for heating.

Note:

(1) When the unit is not equipped with warm up function or the warm up function is not activated, the battery can only discharge when the battery temperature is above -20℃. The charging temperature support range is above -10℃. When the heating function is enabled, the units can operate at -25°C.

(2) Please ensure that the wiring is properly connected and that all batteries are the heated versions. Otherwise, the heating function will not work.

(3) Heating 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 the authorized personnel or Fox ESS for further instructions.

* The all-in-one units include heating and non-heating versions. Please see the data plate on the unit for the presence of Warm up Function.

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2.8 Surge Protection Devices (SPDs) for PV Installation

WARNING!

Over-voltage protection with surge arresters should be provided when the PV power system is installed. The storage inverters are equipped with SPDs on the PV input side as standard, in order to meet the secondary lightning protection requirements.

The installation of an external SPD is determined based on local regulatory requirements.

3 Product Introduction

3.1 Basic Features

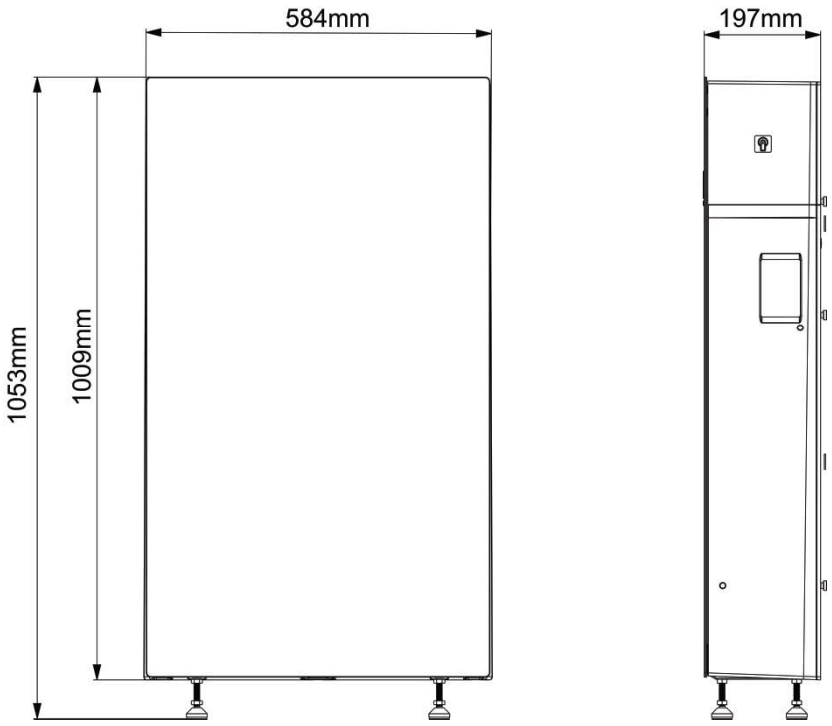
EVO 10 series all-in-one units are high-quality inverters which can convert solar energy to AC energy and store energy into battery. The inverter can be used to optimize self-consumption, store in the battery for future use or feed-in to public grid. Work mode depends on PV energy and user's preference.

Advantages	
	✓ Advanced DSP control technology. ✓ Utilizes the latest high-efficiency power component. ✓ Advanced anti-islanding solutions. ✓ IP66 Ingress protection (for outdoor use). ✓ Max. Efficiency up to 97.8%; EU efficiency up to 97.4%; THD<3%. ✓ Safety & Reliability: Transformerless design with software and hardware protection. ✓ Export limitation. ✓ Power factor regulation. ✓ Friendly HMI. ✓ LED status indications. ✓ LCD display technical data, human-machine interaction through four touch keys. ✓ PC remote control.

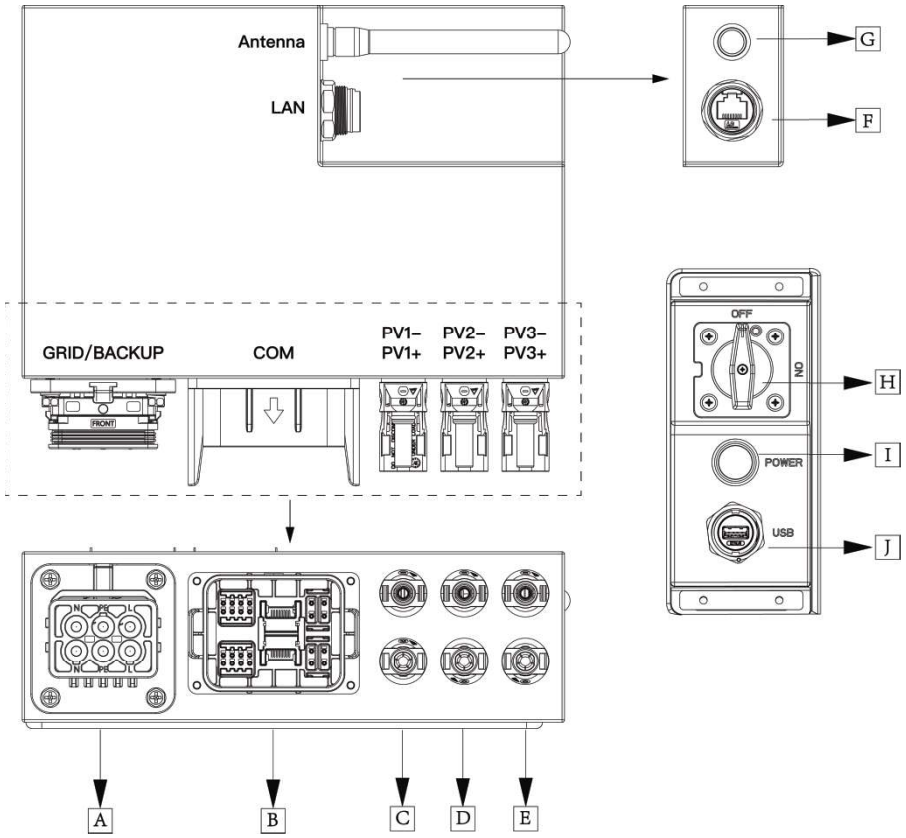
Work modes	Description
Self-use (with PV Power)	Priority: load>battery>grid The energy produced by the PV system is used to optimize self-consumption. The excess energy is used to charge the batteries, then exported to grid.
Self-use (without PV Power)	When no PV is supplied, the battery will discharge for local loads first. Battery will charge when excess generation from other generation sources is detected.
Feed in priority	Priority: load>grid>battery In the case of the external generator, the power generated will be used to supply the local loads firstly, then export to the public grid. The redundant power will charge the battery.
Back up mode	When the grid is off, system will supply emergency power from PV or battery to supply the home loads (Battery is necessary in Back up mode).

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3.2 Dimensions



3.3 Terminals



No.	Description	No.	Description
A	Grid & BACKUP port	F	LAN
B	Communication port	G	Antenna
C	PV1	H	DC switch
D	PV2	I	Power button@Black start
E	PV3	J	USB disk & Dongle

- Only authorized personnel are permitted to set the connection.

4 Technical Data

4.1 PV Input

Models	EVO 10E -2.5-H	EVO 10E -3-H	EVO 10E -3.7-H	EVO 10E -4-H	EVO 10E -4.6-H	EVO 10E -5-H	EVO 10E -6-H	EVO 10E -8-H	EVO 10E -10-H	EVO 10E -4.6-H-L	EVO 10E -5-H-L	EVO 10E -6-H-L	EVO 10E -7.5-H-L
PV INPUT													
Max. PV array power [W]	16000	16000	16000	16000	16000	16000	16000	20000	20000	16000	16000	16000	20000
Max. input power [W]	12500	13000	13700	14000	14600	15000	16000	18000	20000	14600	15000	16000	18000
Max. MPPT input power [W]	8000/ 8000	8000/ 8000	8000/ 8000	8000/ 8000	8000/ 8000	8000/ 8000	8000/ 8000	8000/ 8000/ 8000	8000/ 8000/ 8000	8000/ 8000	8000/ 8000	8000/ 8000	8000/ 8000/ 8000
Max. Input voltage [V]	600												
Min. input voltage [V]	75												
Start-up PV voltage [V]	80												
Nominal voltage [V]	360												
MPP voltage range [V]	80-550												
Max. PV input current [A]	20/20							20/20/20		20/20			20/20/20
Max. Isc PV current [A]	25/25							25/25/25		25/25			25/25/25
Strings per MPP tracker	1+1							1+1+1		1+1			1+1+1
No. of MPP trackers	2							3		2			3

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4.2 Battery

Models	EVO 10E -2.5-H, EVO 10E -2.5-AC	EVO 10E -3-H, EVO 10E -3-AC	EVO 10E -3.7-H, EVO 10E -3.7-AC	EVO 10E -4-H, EVO 10E -4-AC	EVO 10E -4.6-H, EVO 10E -4.6-AC	EVO 10E -5-H, EVO 10E -5-AC	EVO 10E -6-H, EVO 10E -6-AC	EVO 10E -8-H, EVO 10E -8-AC	EVO 10E -10-H, EVO 10E -10-AC	EVO 10E -4.6-H-L, EVO 10E -4.6-AC-L	EVO 10E -5-H-L, EVO 10E -5-AC-L	EVO 10E -6-H-L, EVO 10E -6-AC-L	EVO 10E -7.5-H-L, EVO 10E -7.5-AC-L
BATTERY													
Battery type	LFP ($LiFePO_4$)												
Battery designation	IFpR66/124[64S]M/-20+50/95												
Battery energy	10.24kWh												
Battery rated voltage [V]	204.8												
Battery voltage range [V]	185.6~233.6												
Max. battery charge power [W]	10000, 2500	10000, 3000	10000, 3680	10000, 4000	10000, 4600	10000, 5000	10000, 6000	10000, 8000	10000, 10000	10000, 4600	10000, 5000	10000, 6000	10000, 7500
Max. battery discharge power [W]	2500, 2500	3000, 3000	3680, 3680	4000, 4000	4600, 4600	5000, 5000	6000, 6000	8000, 8000	10000, 10000	4600, 4600	5000, 5000	6000, 6000	7500, 7500
Max. charge / discharge current [A]	50/12.5, 12.5/12.5	50/15, 15/15	50/18.4, 18.4/18.4	50/20, 20/20	50/23, 23/23	50/25, 25/25	50/30, 30/30	50/40, 40/40	50/50, 50/50	50/23, 23/23	50/25, 25/25	50/30, 30/30	50/37.5, 37.5/37.5
Max. continuous current [A]	50												
Depth of Discharge [%]	95%												
Scalability	1~3 units (just for ET 10 battery)												

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4.3 AC Output/Input

Models	EVO 10E -2.5-H, EVO 10E -2.5-AC	EVO 10E -3-H, EVO 10E -3-AC	EVO 10E -3.7-H, EVO 10E -3.7-AC	EVO 10E -4-H, EVO 10E -4-AC	EVO 10E -4.6-H, EVO 10E -4.6-AC	EVO 10E -5-H, EVO 10E -5-AC	EVO 10E -6-H, EVO 10E -6-AC	EVO 10E -8-H, EVO 10E -8-AC	EVO 10E -10-H, EVO 10E -10-AC	EVO 10E -4.6-H-L, EVO 10E -4.6-AC-L	EVO 10E -5-H-L, EVO 10E -5-AC-L	EVO 10E -6-H-L, EVO 10E -6-AC-L	EVO 10E -7.5-H-L, EVO 10E -7.5-AC-L
AC OUTPUT													
Rated power [W]	2500	3000	3680	4000	4600	5000	6000	8000	10000	4600	5000	6000	7500
Rated apparent power [VA]	2500	3000	3680	4000	4600	5000	6000	8000	10000	4600	5000	6000	7500
Max. apparent power [VA]	2750	3300	3680	4400	5060	5500	6600	8800	11000	4600	5000	6000	7500
Nominal voltage [V]	220/230/240, L/N/PE												
Nominal frequency [Hz]	50/60Hz , ±5Hz												
Rated output current (Per phase) [A]	11.4/ 10.9/ 10.4	13.6/ 13.0/ 12.5	16.7/16	18.2/ 17.4/ 16.7	20.9/ 20.0/ 19.2	22.7/ 21.7/ 20.8	27.3/ 26.1/ 25.0	36.4/ 34.8/ 33.3	45.5/ 43.5/ 41.7	20.0	21.7	26.1	34.1
Max. AC current (Per phase) [A]	12.5/ 12.0/ 11.5	15.0/ 14.3/ 13.8	16.7/16	20.0/ 19.1/ 18.3	23.0/ 22.0/ 21.1	25.0/ 23.9/ 22.9	30.0/ 28.7/ 27.5	40.0/ 38.3/ 36.7	50.0/ 47.8/ 45.8	20.0	21.7	26.1	34.1
Power factor	1(Adjustable from 0.8 leading to 0.8 lagging)												
Inrush current [A]	3.2A@1ms												
Max. output fault current [A]	150A@0.5ms												
Max. output overcurrent protection [A]	128A												
THDI	<3%@rated power												
AC INPUT													
Max. apparent power [VA]	3500	4400	7000	7000	7000	8800	11000	14500	14500	4600	8800	11000	14500
Nominal voltage [V]	220/230/240, L/N/PE												
Nominal frequency [Hz]	50/60Hz, ±5Hz												
Max. input current [A] (Per Phase)	16.0	20.0	32.0	32.0	32.0	40.0	50.0	63	63	20.0	40.0	50.0	63.0
Power factor	1(Adjustable from 0.8 leading to 0.8 lagging)												
Inrush current [A]	3.2A@1ms												

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4.4 Backup Output

Models	EVO 10E -2.5-H, EVO 10E -2.5-AC	EVO 10E -3-H, EVO 10E -3-AC	EVO 10E -3.7-H, EVO 10E -3.7-AC	EVO 10E -4-H, EVO 10E -4-AC	EVO 10E -4.6-H, EVO 10E -4.6-AC	EVO 10E -5-H, EVO 10E -5-AC	EVO 10E -6-H, EVO 10E -6-AC	EVO 10E -8-H, EVO 10E -8-AC	EVO 10E -10-H, EVO 10E -10-AC	EVO 10E -4.6-H-L, EVO 10E -4.6-AC-L	EVO 10E -5-H-L, EVO 10E -5-AC-L	EVO 10E -6-H-L, EVO 10E -6-AC-L	EVO 10E -7.5-H-L, EVO 10E -7.5-AC-L
BACKUP OUTPUT													
Max. apparent power [VA]	2500	3000	3680	4000	4600	5000	6000	8000	10000	4600	5000	6000	7500
Load Start Capability [A]	100A@2s												
Nominal voltage [V]	220/230/240, L/N/PE												
Nominal frequency [Hz]	50/60												
Max. output current (Per phase) [A]	11.4/ 10.9/ 10.4	13.6/ 13.0/ 12.5	16.7/16	18.2/ 17.4/ 16.7	20.9/ 20.0/ 19.2	22.7/ 21.7/ 20.8	27.3/ 26.1/ 25.0	36.4/ 34.8/ 33.3	45.5/ 43.5/ 41.7	20.0	21.7	26.1	34.1
Power factor	1(Adjustable)												
Switch time	<4ms												
THDV	<3%@Linear Load												
Parallel operation	Yes @max 3PCS												

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4.5 Efficiency and Protection

Models	EVO 10E -2.5-H, EVO 10E -2.5-AC	EVO 10E -3-H, EVO 10E -3-AC	EVO 10E -3.7-H, EVO 10E -3.7-AC	EVO 10E -4-H, EVO 10E -4-AC	EVO 10E -4.6-H, EVO 10E -4.6-AC	EVO 10E -5-H, EVO 10E -5-AC	EVO 10E -6-H, EVO 10E -6-AC	EVO 10E -8-H, EVO 10E -8-AC	EVO 10E -10-H, EVO 10E -10-AC	EVO 10E -4.6-H-L, EVO 10E -4.6-AC-L	EVO 10E -5-H-L, EVO 10E -5-AC-L	EVO 10E -6-H-L, EVO 10E -6-AC-L	EVO 10E -7.5-H-L, EVO 10E -7.5-AC-L
EFFICIENCY													
*Max. static MPPT efficiency	99.90%	99.90%	99.90%	99.90%	99.90%	99.90%	99.90%	99.90%	99.90%	99.90%	99.90%	99.90%	99.90%
*Max. conversion efficiency	97.60%	97.60%	97.60%	97.60%	97.62%	97.62%	97.62%	97.62%	97.62%	97.62%	97.62%	97.62%	97.62%
*European efficiency	96.50%	96.80%	97.16%	97.16%	97.20%	97.20%	97.20%	97.20%	97.20%	97.20%	97.20%	97.20%	97.20%
*Max. Battery charge efficiency (PV to BAT) (@full load)	97.33%	97.33%	97.33%	97.33%	97.33%	97.33%	97.33%	97.33%	97.33%	97.33%	97.33%	97.33%	97.33%
Max. Battery charge/discharge efficiency (BAT to AC)(@full load)	96.40%	96.40%	96.40%	96.40%	96.40%	96.40%	96.40%	96.40%	96.40%	96.40%	96.40%	96.40%	96.40%
PROTECTION													
*PV Reverse Polarity Protection	YES												
Anti-islanding Protection	YES												
Output Short Protection	YES												
Leakage Current Protection	YES												
Insulation resistance detection	YES												
Over-current protection	YES												
Over-temperature Protection	YES												
Earth fault	YES												
DC/AC Surge Protection	YES [Type II (PV)/Type II (AC)]												
AFCI Protection	YES												

The lines above marked by "*" are only for hybrid products.

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4.6 General Data

General Data	
Dimension (W/H/D) [mm]	584*1009*197
Net weight [Kg]	108Kg (hybrid); 105Kg (AC)
Installation	Floor-mounted / Wall-mounted
*Operating temperature range [℃]	-20 to +55 ℃ (Derating at 45℃)
Storage temperature [℃]	0 ~35 ℃
Storage/Operation Relative humidity	0%-100%
Altitude [m]	<4000m @Derating exceeding 2000m
Protective class	I
Overvoltage category	III(AC), II(DC)
Pollution degree	PD3 (PD2 inside)
Ingress protection	IP66 (For Outdoor Use)
Standby consumption [W]	＜20W
AFCI function	YES
Battery heating function	Optional
Cooling principle	Intelligent air cooling
Noise emission [dB]	<45dB Average
Inverter topology	Non-Isolated
Communication Interface	Ethernet, EMS, Meter, WiLAN (WiFi+LAN+Bluetooth), 4G(Optional), DRM, Ripple Control, USB, SG Ready, Dry Contactor
Display	LED/LCD/APP/website
Export limit control	YES
DC switch	YES
Button	Capacitive touch sensor * 1
Standard Compliance	
Safety (hybrid)	EN/IEC 62109-1, EN/IEC 62109-2, EN/IEC62477-1, EN/IEC 62040 (Australia)
Safety (AC)	EN/IEC62477-1, EN/IEC 62040 (Australia)
EMC	EN IEC 61000-6-1:2019, EN IEC 61000-6-3:2021, EN IEC 61000-6-2:2019, EN IEC 61000-6-4:2019, IEC 62920:2017
RED	EN 50665:2017, ENIEC 62311:2020,EN 301 489-1 V2.2.3 (2019-11), EN 301 489-17 V3.2.4 (2020-09), EN 300 328 V2.2.2(2019-07), EN 55032:2015+A11:2020+A1:2020, EN 55035:2017+A11:2020
Grid Regulation	G98, CEI 0-21, AS/NZS 4777.2:2020, NRS 097-2-1, IEC 61727, EN 50549-1, P140/P515
Battery Regulation	IEC62619:2022
Transportation	UN 38.3

*When the Warm Up Function is enabled, the operating temperature range extends to -25~55℃.

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5 Installation

5.1 Installation Precautions

⚠ Danger!

- Do not wear loose clothing or jewelry when performing installation work, otherwise there may be a risk of electric shock!
- Before carrying out installation work, make sure that the mechanical strength of the installation location is sufficient to support the weight of the equipment, otherwise a mechanical hazard may result.

⚠ Warning!

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

Please strictly observe the following safety tips during installation operations. Otherwise, personal injury or death may occur.

- Installation must be performed properly by a professional under conditions that follow all warning tips.
- Nickel-plated copper is recommended, but aluminum can also be used.
- Remove the oxide layer and apply a suitable antioxidant caulking mix before connecting the aluminum busbar.
- For ease of installation and maintenance, it is recommended that sufficient space be allowed around the equipment: adequate cooling airflow, required clearances, and space needed for cables and cable support structures.

5.2 Unpackaging

Note!

Please open the package in order and do not knock it violently!

The following items must be checked before and after opening the box:

No.	Items
1	Check the appearance for any damage, scratches, dents, etc.
2	Check if all the accessories are included.
3	Check if the nameplate information matches the model of the ordered product.
4	Check the warning label for any damage, scratches, fading, etc.

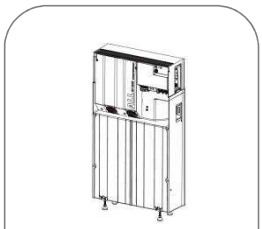
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Unpackaging Precautions

- During storage, the packaging must not be removed. It should only be removed when the equipment is ready for installation.
- Before unboxing, inspect the product's external packaging for any issues such as damage, breakage, moisture, dampness, or deformation.
- During unboxing, check the product and its accessories for surface defects like damage, rust, or dents.

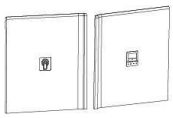
Packing List

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 items are missing or damaged, the carrier should be notified immediately upon discovery. The packing list is as shown below:


All-in-one unit*1

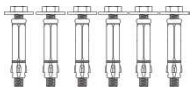

Cover*1


Handles*4


Side panels*2

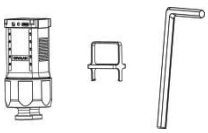

Bracket*1


PV connectors*4/6
(for hybrid only)


Expansion screws*6


CT*1

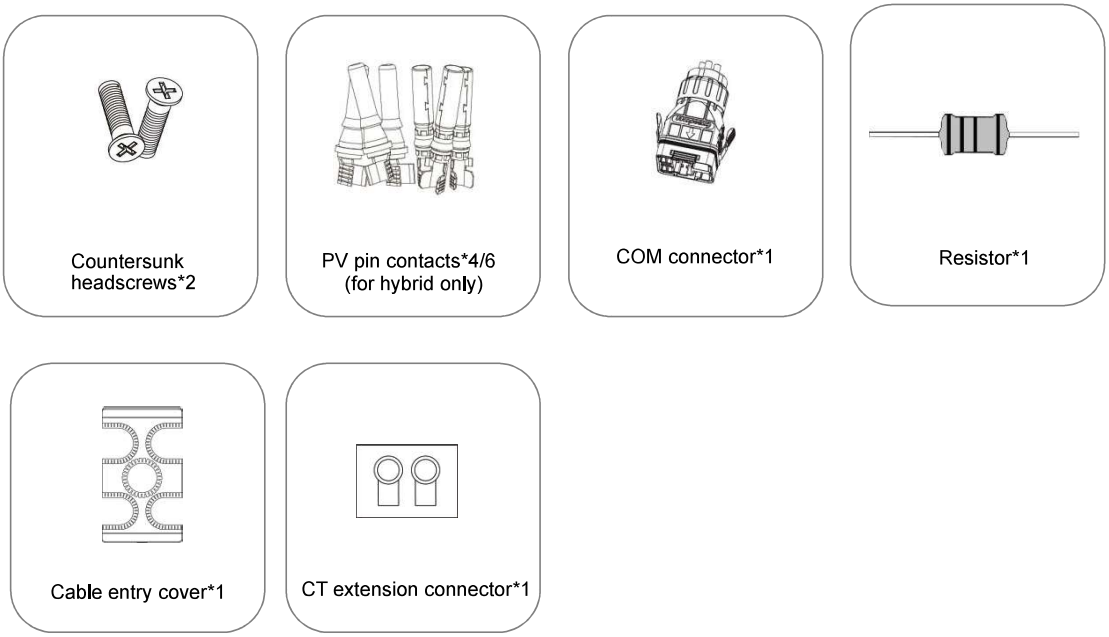

OT terminal*1


AC connector*1&
Removal tool*1 &
Hex key*1



Quick installation guide*1


Ethernet cable connector*1



Note:

For 2.5~6kW, the package includes 4 PV connectors and 4 PV pin contacts (2*positive, 2*negative);

For 7~10kW, the package includes 6 PV connectors and 6 PV pin contacts (3*positive, 3*negative).

5.3 Installation Requirements

Selecting the optimal installation location for the inverter plays a very important role in its safe operation, life assurance and performance guarantee.

Environment Requirements

⚠ Warning!

The all-in-one units generate high temperature during operation, so please install it in a location where it cannot be touched by human beings or isolate it by installing a protective net and erecting a safety warning sign on the outside.

Note!

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

Items	Requirements
Location	● Not in direct sunlight. ● Not in potential explosive areas. ● Not in areas where highly flammable materials are stored, e.g. pressurized gas cylinders, natural gas lines, gunpower products and so on. ● Ensure adequate ventilation to allow free air flow for effective dissipation of heat generated during inverter operation.

- The air intake and outlet must be professionally protected against rain, windborne sand, and dust.
- Ensure there are no trees around the installation site to prevent branches or leaves from being blown by strong winds and obstructing the product door or air intake.
- Necessary measures for fire prevention, water protection, and rodent prevention must be in place.
- It should be located away from areas with concentrated toxic or hazardous gases.
- Keep away from flammable, explosive, and corrosive materials.
- It is strictly prohibited to install the equipment in areas prone to microbial growth, such as fungi or mold.
- Install away from areas with strong vibration, high noise sources, and strong electromagnetic interference, such as large transformers and high-voltage power lines.
- Locate away from noise-sensitive areas (e.g., residential, office, and school zones). If installation in such areas is unavoidable, the installation site must be at least 40 meters away from the noise-sensitive area, and noise reduction measures must be implemented.
- Avoid salt damage areas. Installation in such areas will cause corrosion to the inverter. A salt damage area is defined as within 500 meters of the coastline or any area affected by sea breezes.
- Install the inverter in a sheltered location, avoiding direct sunlight, to minimize adverse effects from high temperatures and weather conditions (rain, snow).
- It should ideally be installed in an environment with low dust levels, low humidity, and no condensation to prevent dust and moisture from entering the inverter, which could affect its performance and lifespan.
- Do not install the equipment outdoors in salt-affected areas because it may be corroded. A salt-affected area refers to the region within 1000 m of the coast or prone to sea breeze. Regions prone to sea breeze vary with weather conditions (such as typhoons and monsoons) or terrains (such as dams and hills).



Space	Sufficient space must be reserved on all sides (front, rear, left, right) and above the equipment for heat dissipation, maintenance, and emergency evacuation.
Altitude	≤4000m
Temperature	-20℃~+55℃
Relative Humidity	0%~95%

⚠ Warning!

The intrusion of moisture can easily cause damage to the equipment! For normal use of the equipment:

- Do not open the cabinet door when the air humidity exceeds 95%.
- Avoid opening the cabinet door, performing maintenance or overhauling, etc., in rainy, lightning or humid weather conditions.

Installation Surface Requirements

⚠ Warning!

Mounting the all-in-one units on a wall that does not meet the specified conditions may cause equipment damage. Any resulting damage will not be covered under the warranty.

Requirements for the Wall

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

- It must be a solid brick/concrete surface or a surface of equivalent strength, and must be capable of bearing the weight.
- If the wall lacks sufficient strength (e.g., column walls or walls with thick decorative coverings), the inverter must be properly supported or reinforced.
- It is strictly prohibited to install the inverter on flammable surfaces or surfaces prone to resonance.
- It should be installed on a wall with good sound insulation to reduce the impact of operational noise.

Requirements for Foundation

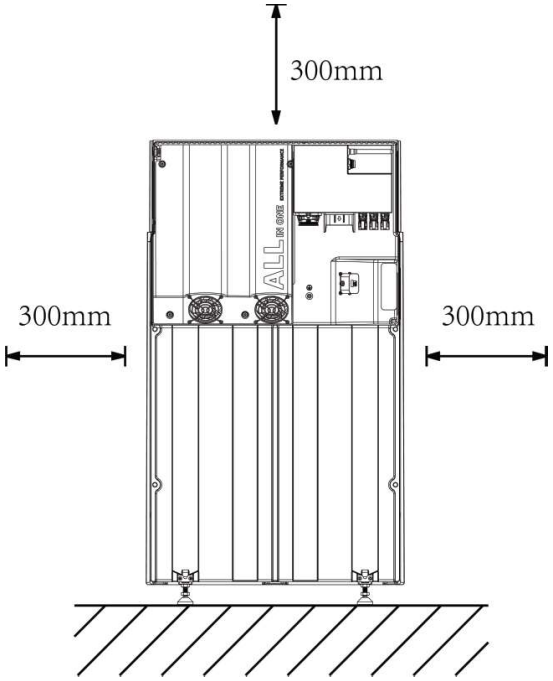
The foundation for the inverter must meet the following conditions:

- The installation surface must be flat, dry, and must be free of standing water.
- Ensure the ground is level, stable (without shaking), and can support the equipment's weight.
- If installed in an area with abundant vegetation, in addition to routine weeding, the ground beneath the equipment must be hardened (e.g., by laying concrete, gravel, etc.) over an area of no less than 3m × 2.5m.

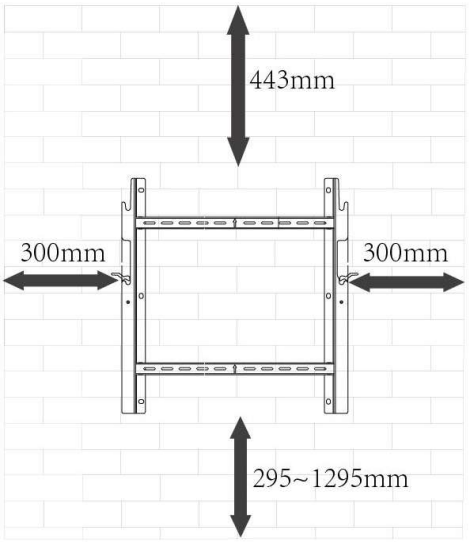
Requirements for Space

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

For the unit:



For the bracket:



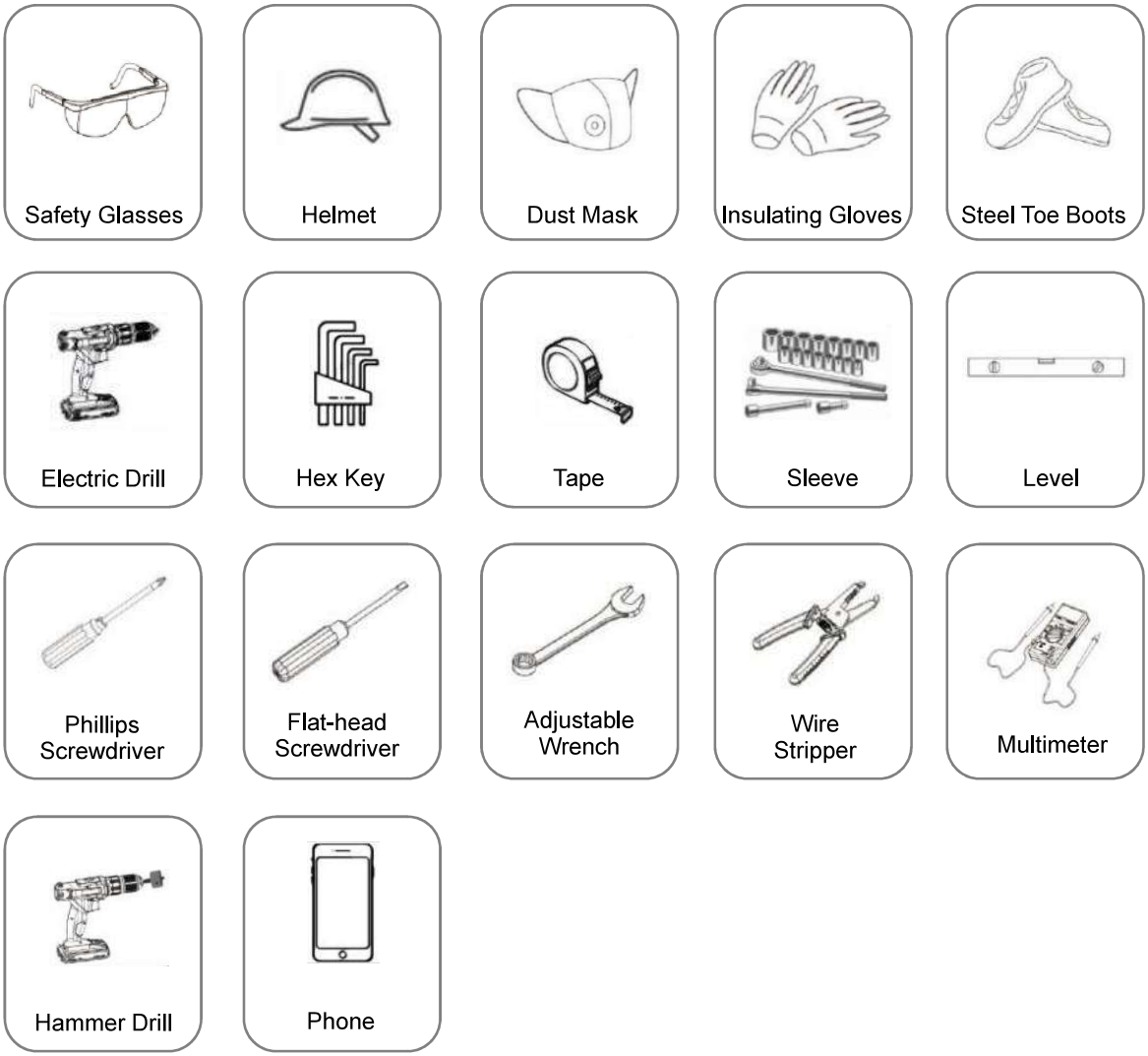
If the bearing capacity of the installation surface is poor, it is recommended that the feet contact the ground, that is, the bottom of the bracket is 295~300mm away from the ground; if the installation surface is a cement wall, please ensure the height of the bottom of the unit from the ground does not exceed 1000 mm to prevent the product from falling and causing damage to the battery or any other danger.

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⚠ Warning!

The wall inclination must be within ±5°.

5.4 Tools Preparation



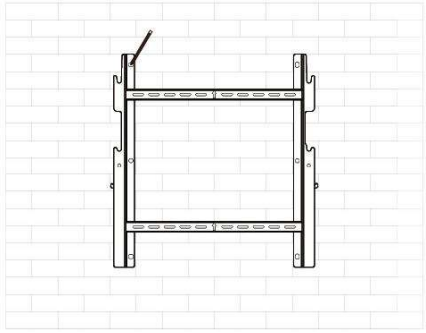
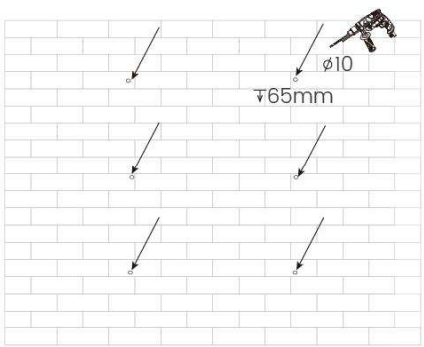
5.5 Inverter Handling

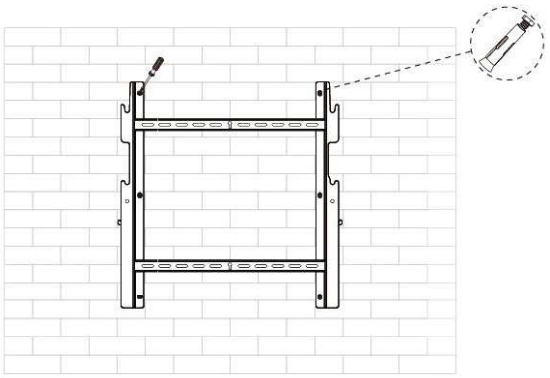
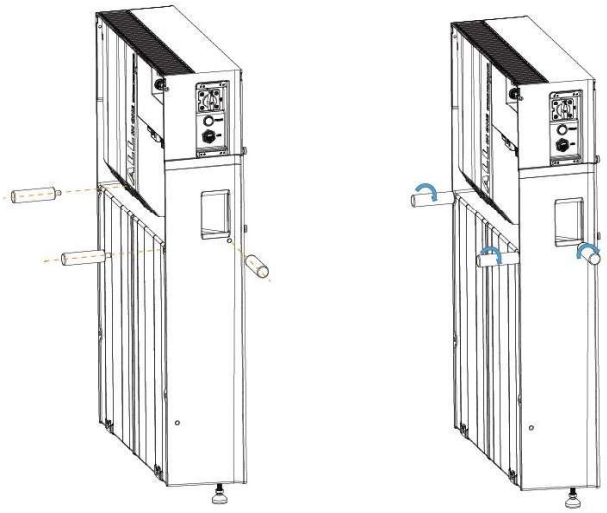
- When manually handling the unit, wear protective gloves, safety shoes, and other personal protective equipment to prevent injury during the process.
- Use correct lifting posture: Bend your knees to lower your center of gravity, grasp the inverter handles with both hands, and slowly straighten your 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.

⚠ Warning!

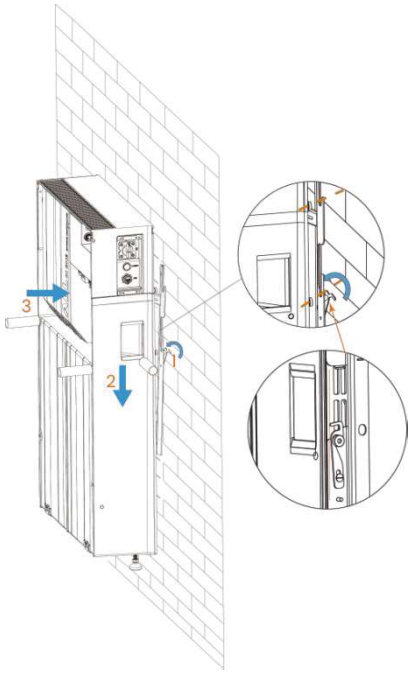
Do not jerk or twist your body using the strength of your lower back, as this can lead to injury.

5.6 Installation Steps

Procedures	
Step 1	Confirm the installation position, place the bracket close to the wall, and mark the position of the installation hole.
	
Step 2	Drill six 65mm deep holes at the marked locations with a drill bit of 10mm diameter.
	

Step 3	Align the bracket with the hole, then knock the expansion screws into the holes and tighten it with a screwdriver.
	
Step 4	Align the four handle screws to the corresponding holes on the box and rotate to tighten them.
	
Step 5	Two installers stand on the two sides of the unit, lift the unit by handles and align the screws to the corresponding groove positions of the bracket. Ensure the anti-release hook is fully engaged.

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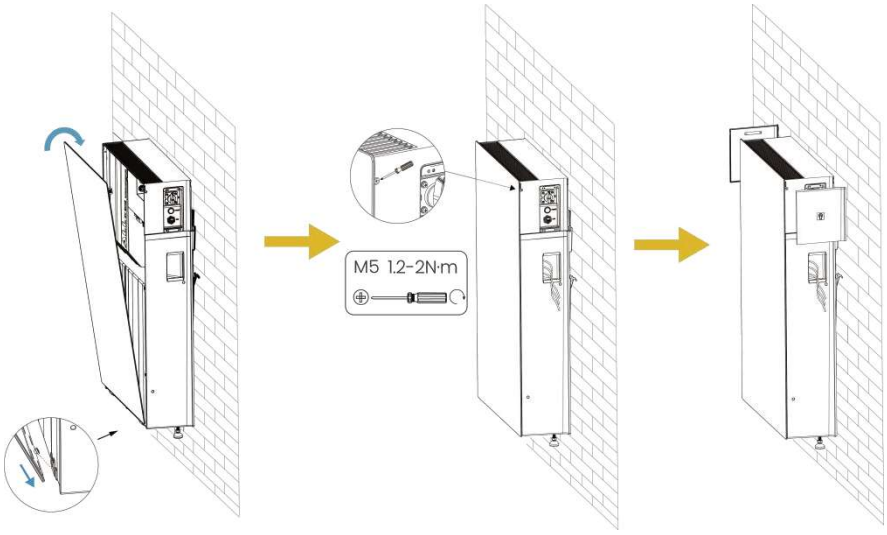
NOTE

The handles and feet can be removed after hanging the unit on the wall.

If the package includes the cover, please implement step 6:

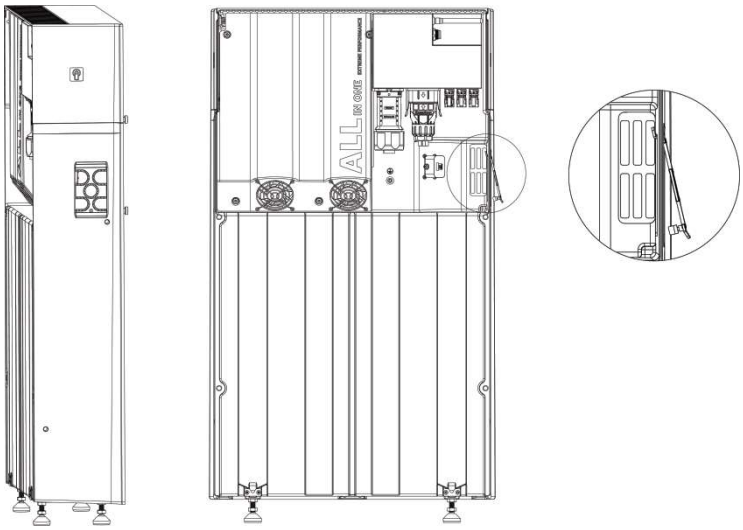
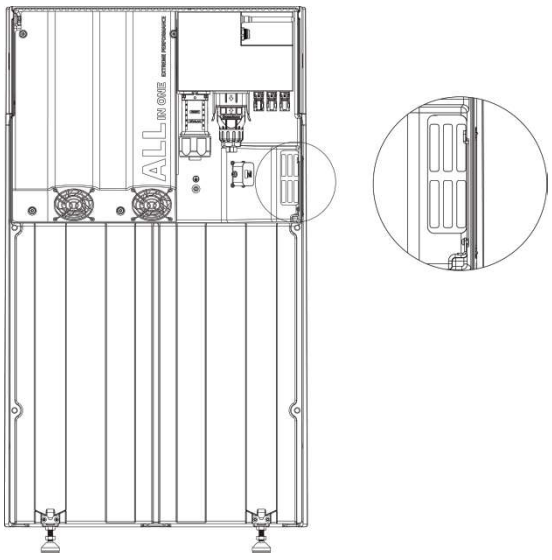
Step 6

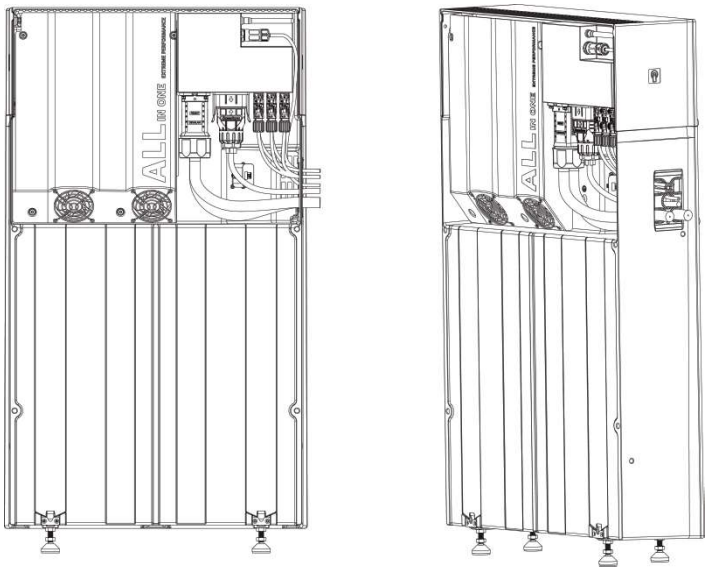
After connecting each port of the unit, turn on the switch and start the power supply, and then close the cover. Tighten the screws on both sides of the top to fix the cover and close the side panels.

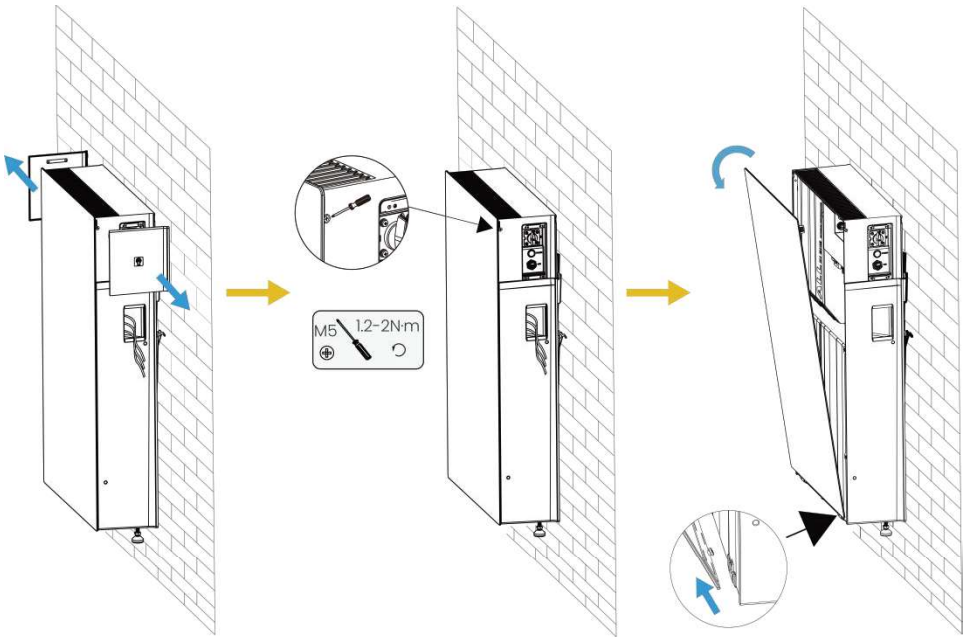


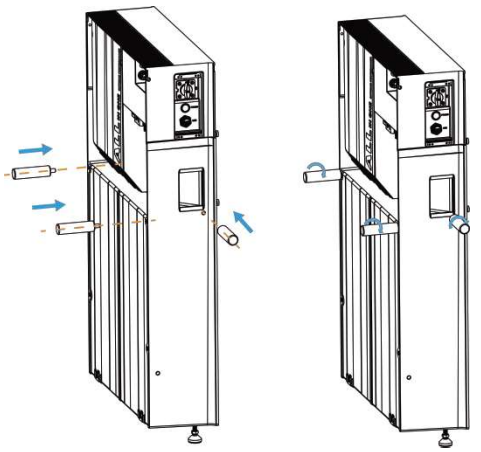
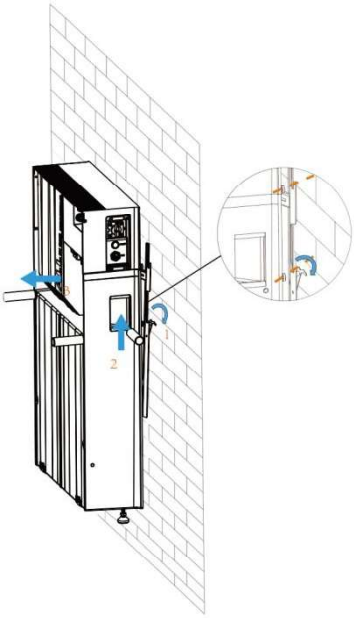
⚠ CAUTION

(1) Before installing the cover, please make sure that all wiring is completed.
(2) Before removing the unit from the wall, please dismantle the cover and the hook and install the feet.

Installation of the Cable Entry Cover	
Step 7	Tilt the cable entry cover about 30° and press the top firmly against the upper edge of the cable outlet.
	
Step 8	There is an L-shaped baffle at the bottom of the cable entry cover that can rotate freely. Manually rotate it 90 degrees so that the cover aligns with the cable outlet. Once released, the cover will automatically rotate to a vertical position due to gravity, or you can manually rotate it to the position shown in the right figure below.
	
Step 9	The installation of the cable entry cover is complete.



Removal of the All-in-one Units	
Step 10	Remove the panels on both sides of the unit. Then turn off the power, remove the top two screws, and then remove the cover.
	
Step 11	Align the four handle screws with the corresponding holes on the unit and turn to tighten.

<table>
<tr><td></td><td></td></tr>
<tr><td rowspan="2">Step 1 2</td><td>Two people stand on the left and right sides of the unit to lift and remove it outward by the handles.</td></tr>
<tr><td></td></tr>
</table>

⚠ Warning!

Operators should wear protective goggles and dust masks to prevent dust from being inhaled into the lungs or falling into the eyes when punching.

Note!

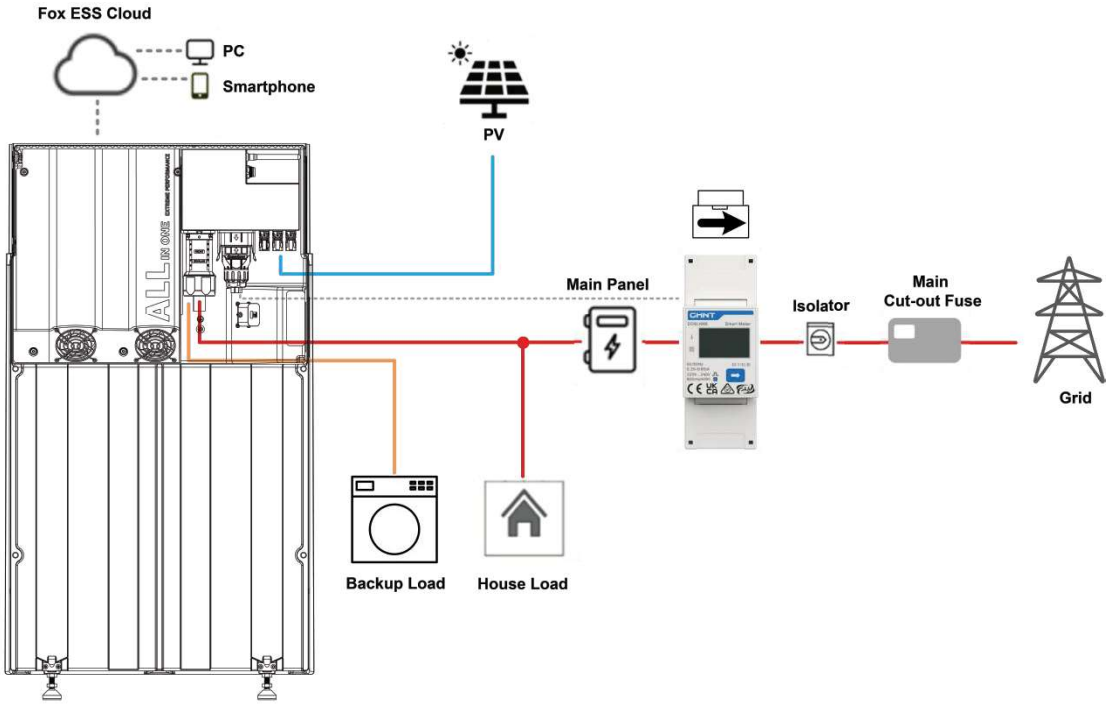
The upper face of the expansion tubes must be made sure that it is level with the concrete wall surface and does not protrude from the concrete wall surface, otherwise it will make the wall plate unevenly placed on the wall surface.

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6 Electrical Connection

6.1 Electrical Connection Overview

This series all-in-one units is designed for use with single-phase power grids. They are suitable for grids with a rated voltage of 220/230/240V and a frequency of 50/60Hz. All other technical specifications must comply with the requirements of the local public grid.



The cable colors shown in all electrical connection diagrams within this section are for reference only.

6.2 External Protective Earthing

⚠ Danger!

The protective earth wire needs to remain grounded during installation and when removing the equipment.

Note!

The grounding resistance should comply with relevant standards and regulations to ensure effective current discharge. Normally, the value of the earth resistance should be small enough to ensure that the current can be rapidly conducted to earth in the event of a fault.

- Grounding connections must be secure and reliable to avoid loosening, corrosion, or poor contact. Appropriate anti-corrosion treatment should be applied at connection points.
- The entire grounding system, including the grounding electrode, main grounding conductor, branch conductors, and connections to equipment, must be maintained intact.
- The grounding system should undergo periodic inspection and testing, checking ground resistance and connection integrity. Ensure the equipment is reliably grounded before operation, and promptly identify and repair any damage or abnormalities.
- Strictly adhere to national and industry-specific electrical wiring standards and codes during construction and installation.

Grounding Terminal Requirements

Material	Cross-Sectional Area (mm²)	External Protective Grounding Terminal & AC Side Grounding Terminal
Copper	≥10	Simultaneous grounding is recommended.
Aluminum	≥16	Simultaneous grounding is recommended.
Copper	≥10	Simultaneous grounding is mandatory.
Aluminum	≥16	Simultaneous grounding is mandatory.

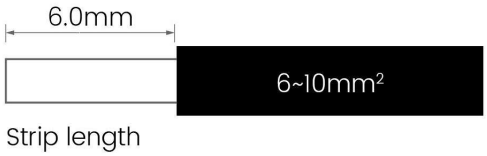
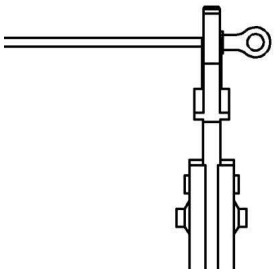
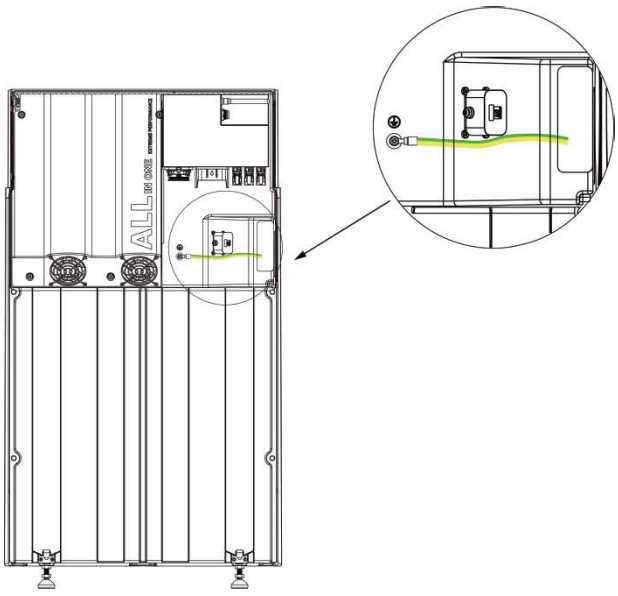
If alternative grounding methods comply with local standards and relevant safety codes, they may be implemented accordingly. The company assumes no liability for any consequences that may arise therefrom.

Grounding Cable Requirements

cross-sectional area of PE conductor	Description
half of the phase conductor	This requirement applies only when the PE conductor and the phase conductor are of the same material. If the materials differ, the PE conductor must possess an equivalent conductivity matching the specification in the table.

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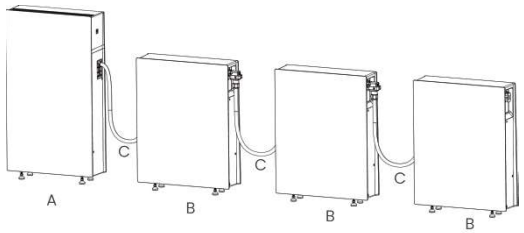
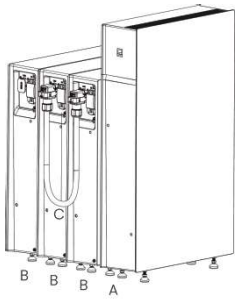
Grounding Procedures

Procedures	
Step 1	Trim 6mm of insulation from the wire end.
	
Step 2	Insert striped cable into earth terminal and ensure all conductor strands are captured in the earth terminal.
Step 3	Crimp earth terminal by using a crimping plier. Put the earth terminal with striped cable into the corresponding crimping pliers and crimp the contact.
	
Step 4	Press the ground cable into the ground terminal, screw the ground screw with screwdriver as shown below:
	

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6.3 Expansion Battery Installation

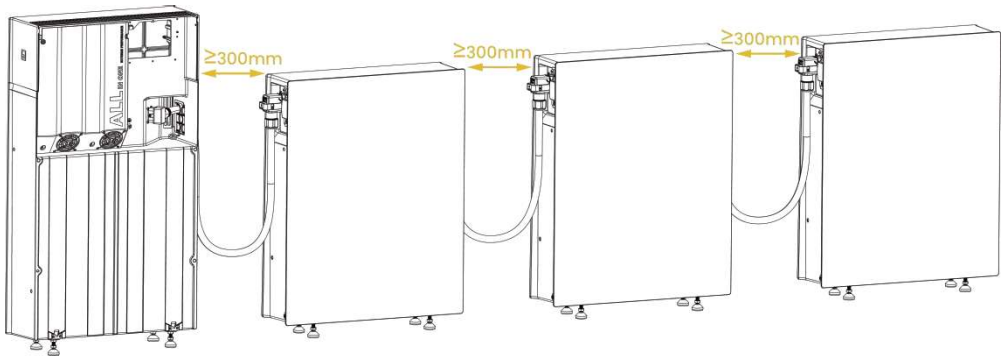
Two installation methods of expansion batteries are presented below.

Wall-mounted Configuration	Stacked Configuration
	

A. All-in-one unit B. Expansion battery unit (ET 10) C: Expansion harness

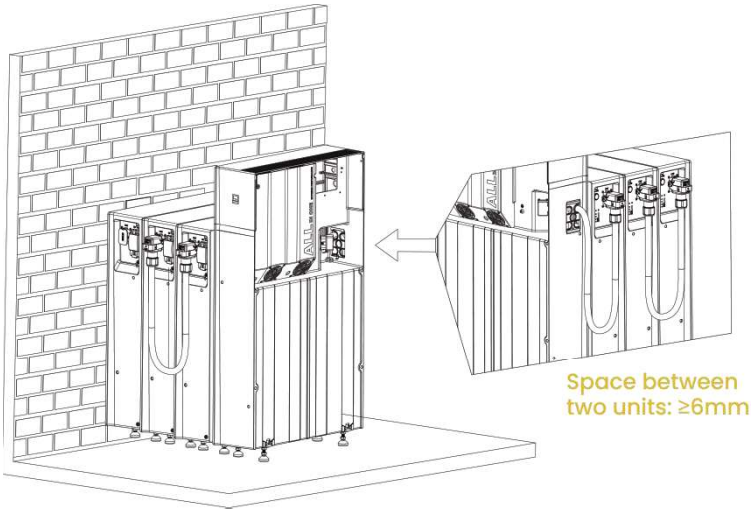
I. Wall-Mounted Configuration

Maintain a minimum clearance of 300 mm between the wall-mounted all-in-one unit and the expansion battery units.



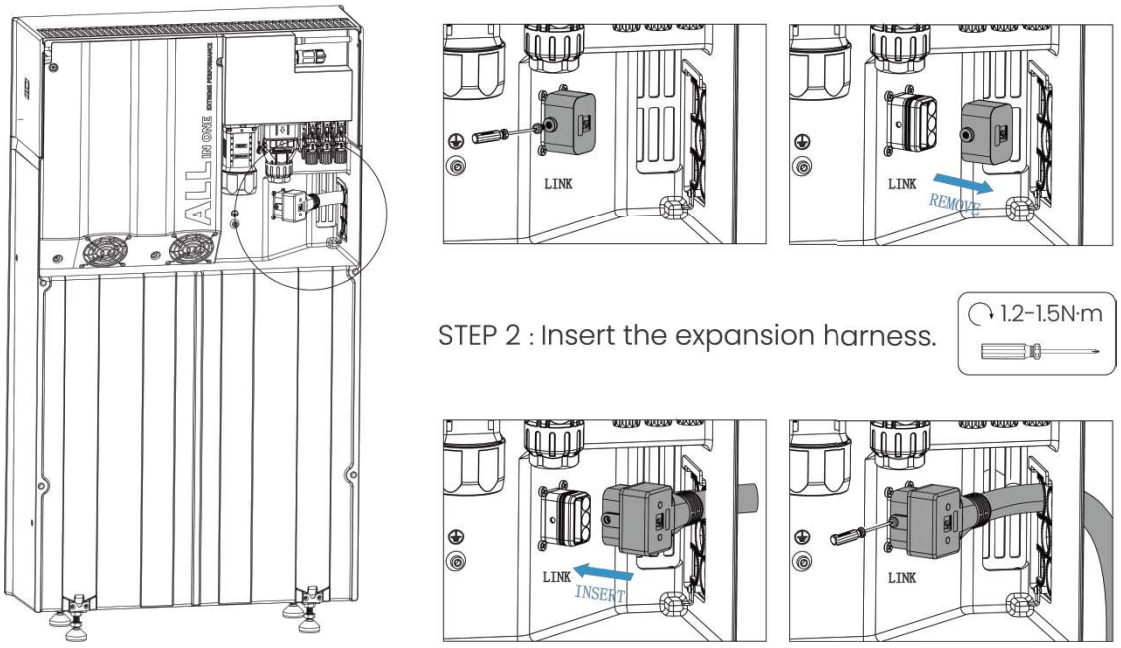
II. Stacked Configuration

Install the all-in-one unit on the outermost side for easy access and maintenance.



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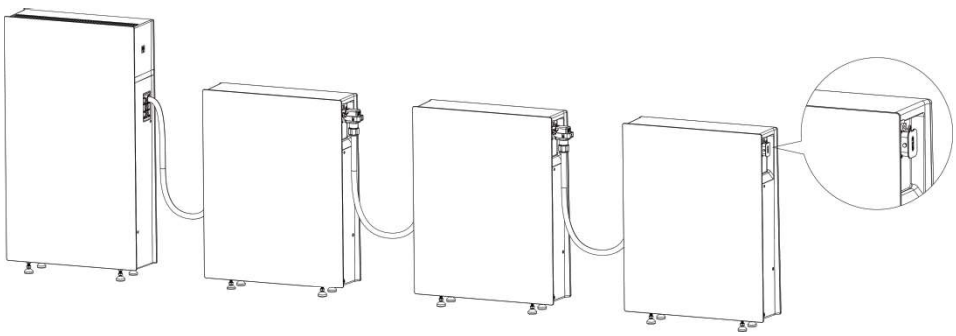
After installation is complete, proceed with the wiring operation.

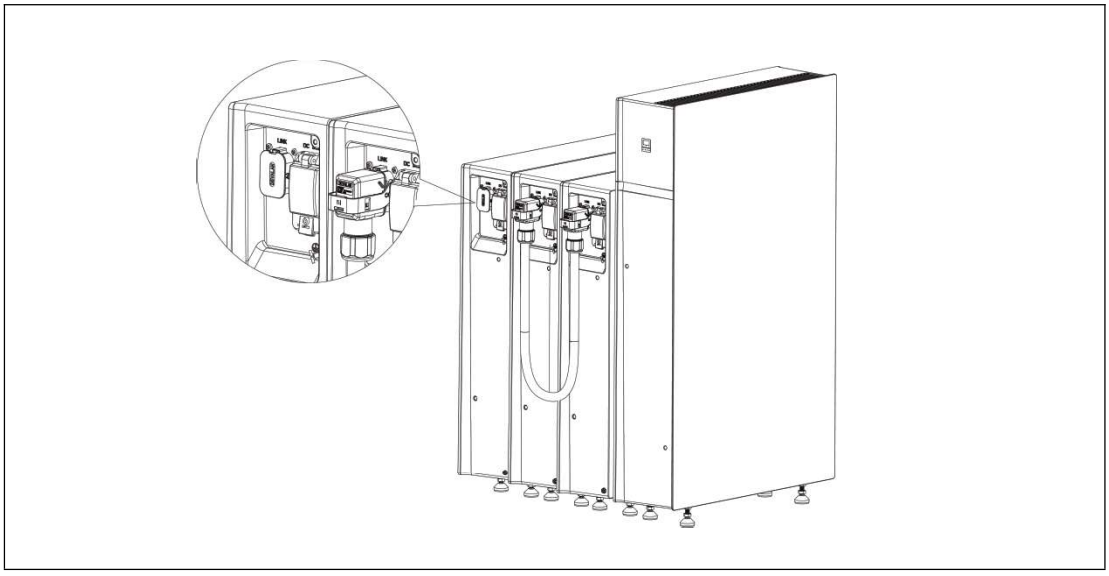


Then connect the parallel ports of the expansion battery units following the same steps.

Finally check the plug on the parallel port of the last expansion battery unit; if it has been removed, reinstall it.

*The all-in-one unit and expansion battery are fitted with the plug at the factory.

Final Check of the Link Plug




Note!

1. The expansion harness includes the grounding wire connecting the all-in-one unit and the expansion battery units.
2. The expansion harness must be the one designated by the company; extending or shortening it on your own is not allowed.

6.4 DC Connection

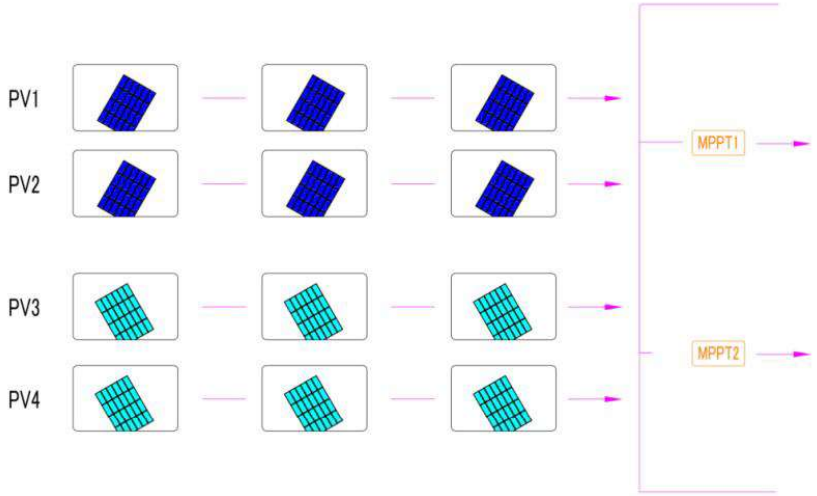
EVO 10 series all-in-one units can be connected with 1-string of PV modules. Please select highly reliable and high-quality PV modules. The open-circuit voltage of the connected module array must be less than 550 V, and the operating voltage should be within the MPPT voltage range.

PV Input Configuration

As shown in the figure below, the inverter features multiple PV inputs, with each input equipped with an independent MPP tracker.

- Each PV input operates independently, with its own dedicated MPPT. The PV strings connected to different inputs can have different configurations, including panel type, number of panels per string, tilt angle, and azimuth.
- Each MPPT can accommodate up to 2 PV strings. To maximize the power output of the PV panels, ensure that all modules within the same system are of the same type, have identical output characteristics and specifications, and share the same tilt angle.

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⚠ Danger!

Do not ground the PV positive or negative terminal.

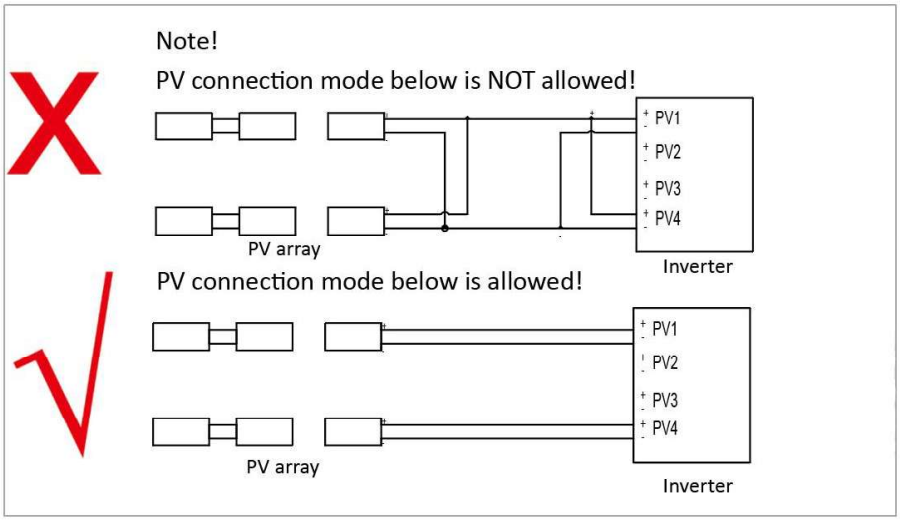
⚠ Warning!

PV modules produce high voltage, which is within the hazardous voltage range. Always adhere to electrical safety rules during connection.

Note!

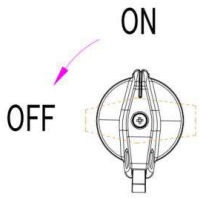
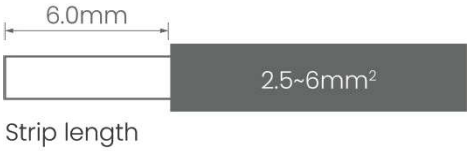
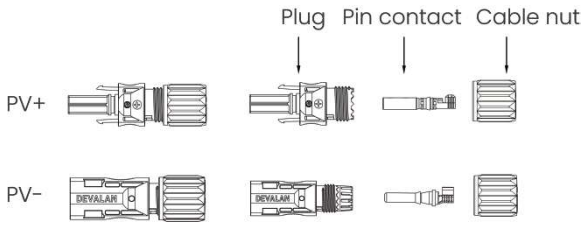
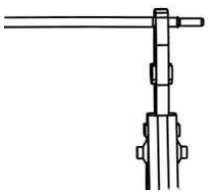
If the inverter does not have a built-in DC switch, select a suitable external DC switch.

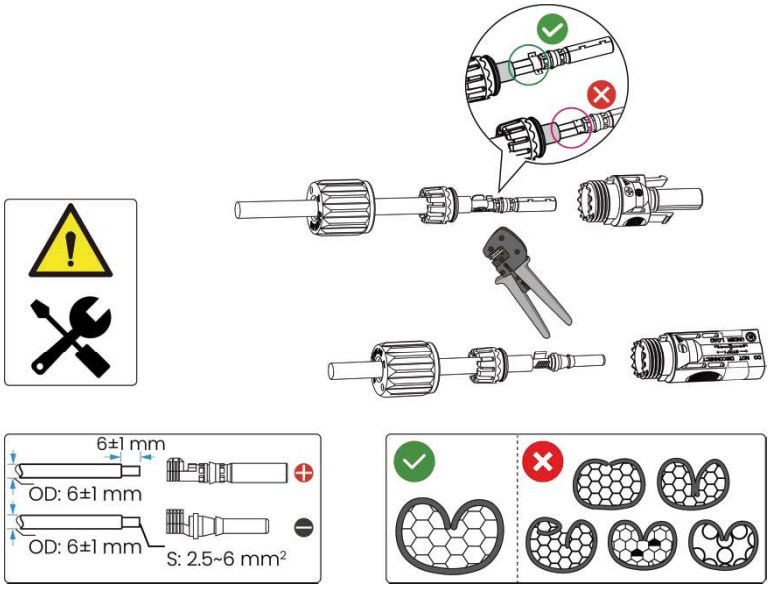
PV modules: Please ensure they are the same type, have the same output and specifications, are aligned identically, and are tilted to the same angle. To save on cable costs and reduce DC power losses, it is recommended to install the inverter as close to the PV modules as possible.



Cable specifications

Cable type	Cross-sectional area (mm^2)	Cable O.D. range (mm)
PV cables meeting 1100 V standard	2.5~6	6

Procedures	
Step 1	Turn off the DC switch.
	
Step 2	Choose 2.5~6mm^2 wire to connect the PV module. Trim 6mm of insulation from the wire end.
	
Step 3	Separate the DC connector (battery) as below.
	
Step 4	Insert striped cable into pin contact and ensure all conductor strands are captured in the pin contact.
Step 5	Crimp pin contact with crimping pliers. Put the pin contact with striped cable into the corresponding crimping pliers and crimp the contact.
	

Step 6	Insert pin contact through the cable nut to assemble into back of the male or female plug. When you feel or hear a “click”, the pin contact assembly is seated correctly.
	

Note!

When making PV terminals, please make sure that the copper cores of PV positive and PV negative terminals and the copper cores on the unit can be inserted, and use a multimeter to measure whether the positive and negative terminals are correct, otherwise the machine may not work normally or individual strings may not work.

Unlock the DC connector:

- Use the specified wrench tool.
- When separating the DC + connector, push the tool down from the top.
- When separating the DC - connector, push the tool down from the bottom.
- Separate the connectors by hand.

⚠ 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.

⚠ Warning!

Ensure 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, this may result in poor line contact and burn the terminals.

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6.5 Grid Connection

EVO 10 series all-in-one units 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.

Power (kW)	2.5	3	3.7	4	4.6	5.0	6.0	8.0	10.0
Cable (ON-GRID)	6.0 mm²							10.0 mm²	
Cable (BACKUP)	6.0 mm²							10.0 mm²	
Micro-Breaker	16A	20A	32A			40A	50A	63 A	

⚠ Warning!

A micro-breaker for max output over-current 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.

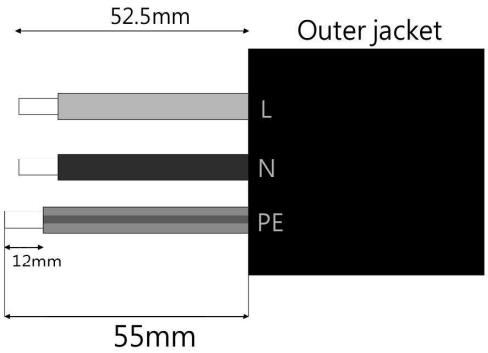
Wires preparation

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:

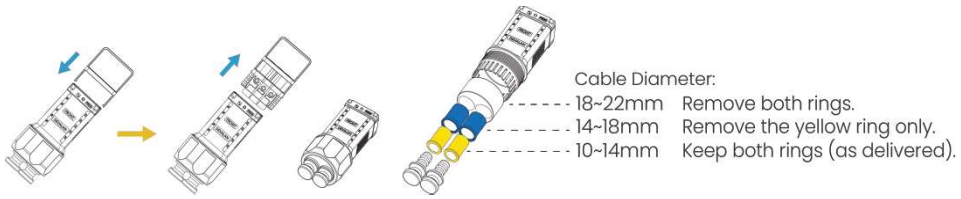
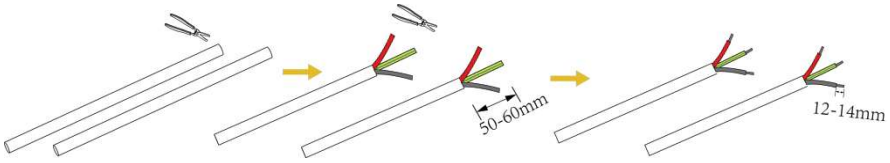
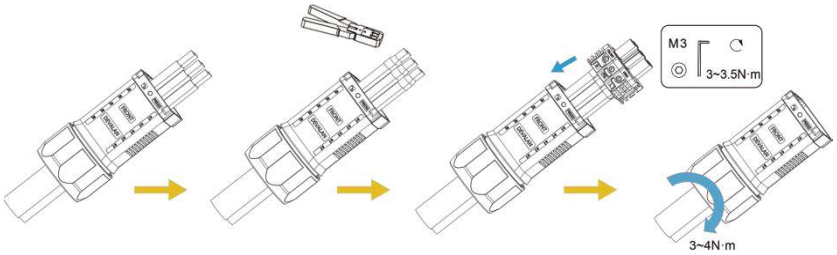
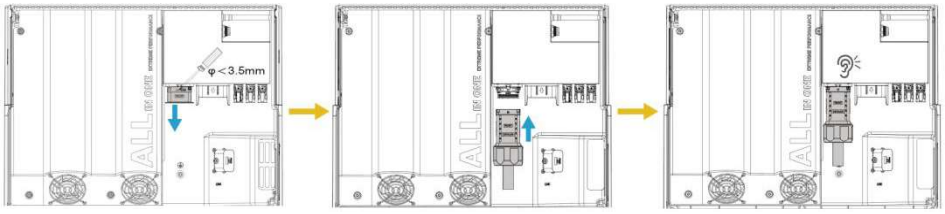
- Trim all the wires to 52.5mm and the PE wire to 55mm.
- Use the crimping pliers to trim 12mm of insulation from all wire ends as below.



Wires	Colors
L	Black/Brown/Grey Wire
N	Blue Wire
PE	Yellow & Green Wire

Note!

Please refer to local cable type and color for actual installation.

GRID & BACKUP Connector Installation Procedures	
Step 1	Pull out the internal terminal of the AC connector with the removal tool. Remove the plug before passing through the cable.
	
Step 2	Prepare two three-core cables. Strip 50 to 60 mm of the outer sheath from each cable, then strip 12 to 14 mm of insulation from the end of each wire.
	
Step 3	Thread the cables into the connectors respectively, then sleeve the sleeves on the cables with the stripped insulation layer, then insert them into the terminal strips, and finally put them into the connectors and tighten the nuts.
	
Step 4	Plug the connector into the Grid & BACKUP port on the board end of the all-in-one unit.
	

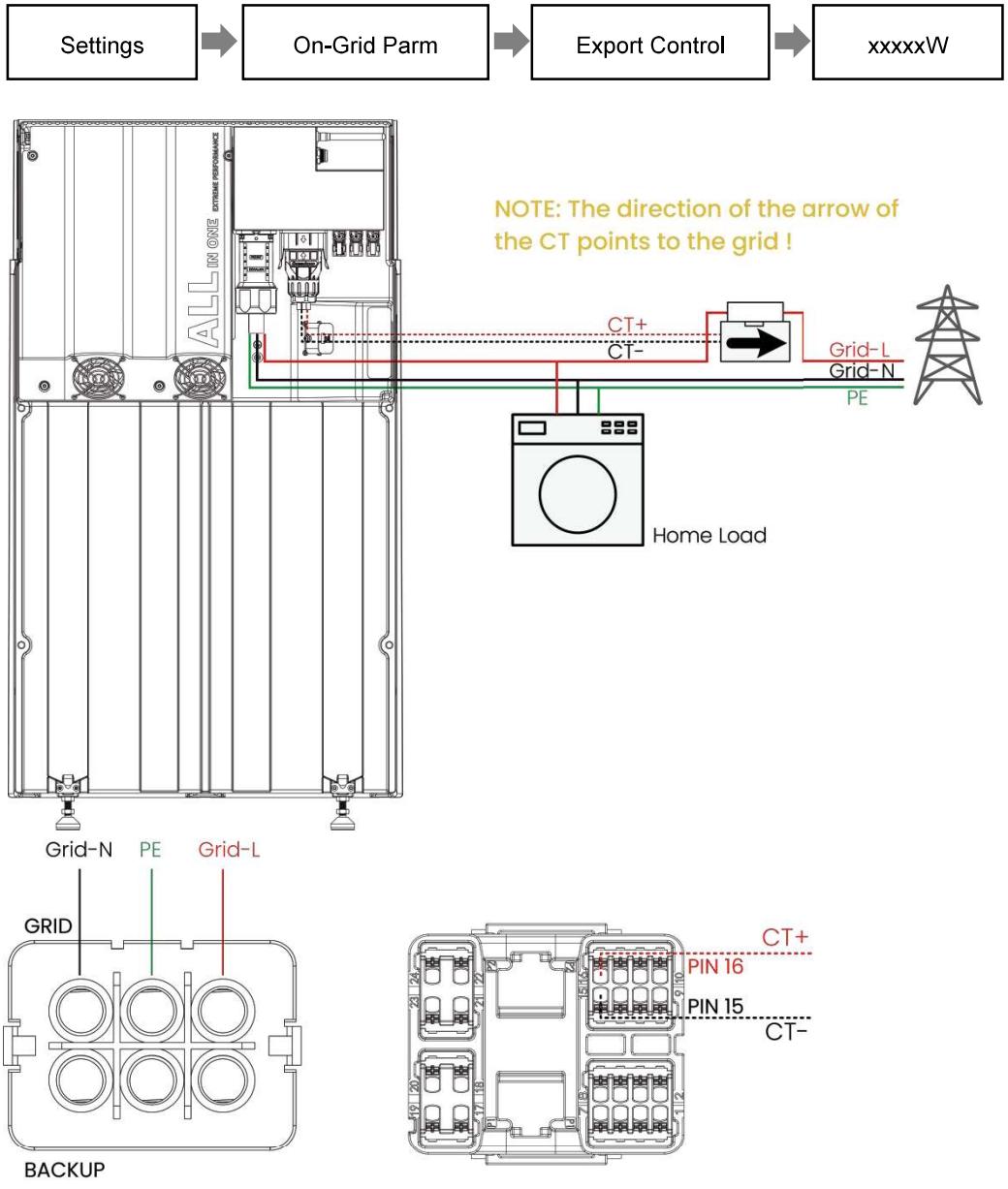
6.6 CT / Meter Connection

The unit 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!

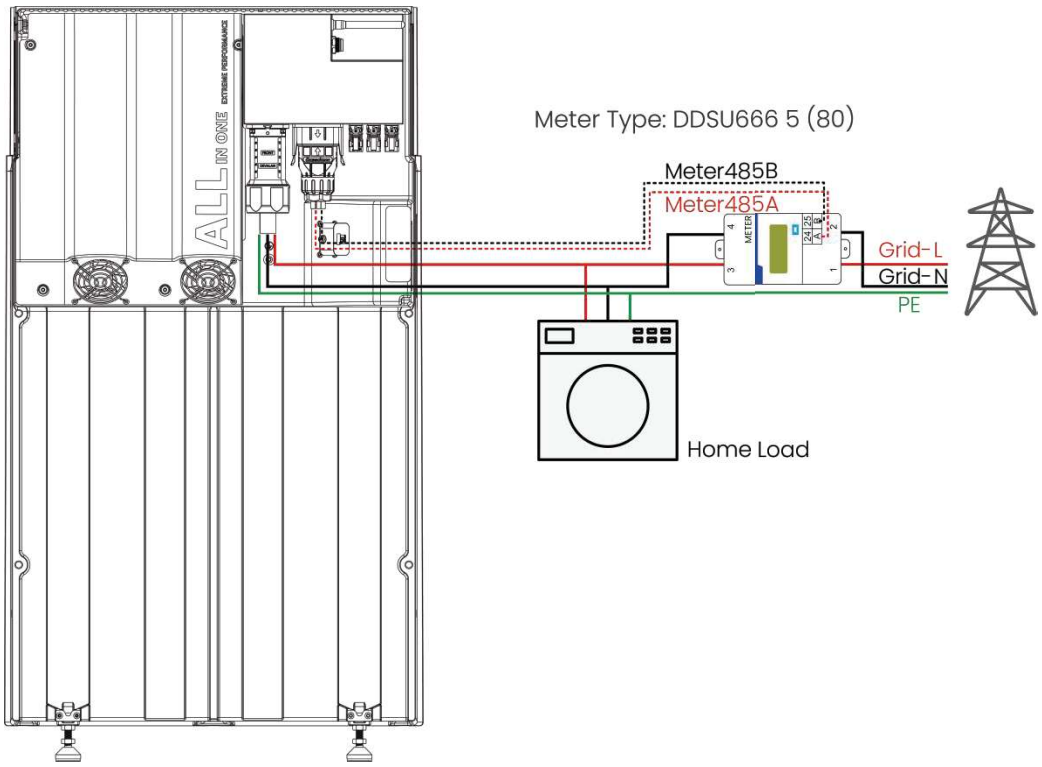
When connecting the electricity meter, please make sure that the way of the electricity meter is correct. Otherwise, it will affect the size of the load obtained by the unit and affect the normal operation of the unit. When the battery is available and can work normally, the unit provides the self-test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

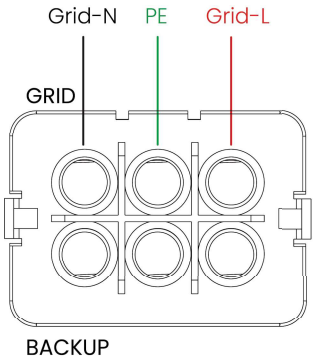
Export control setting:

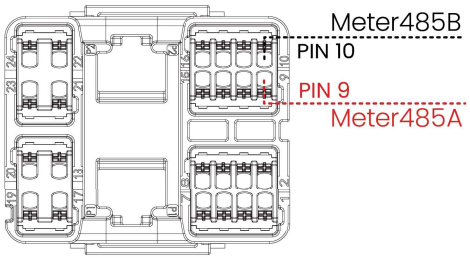


The electricity meter is connected as follows:

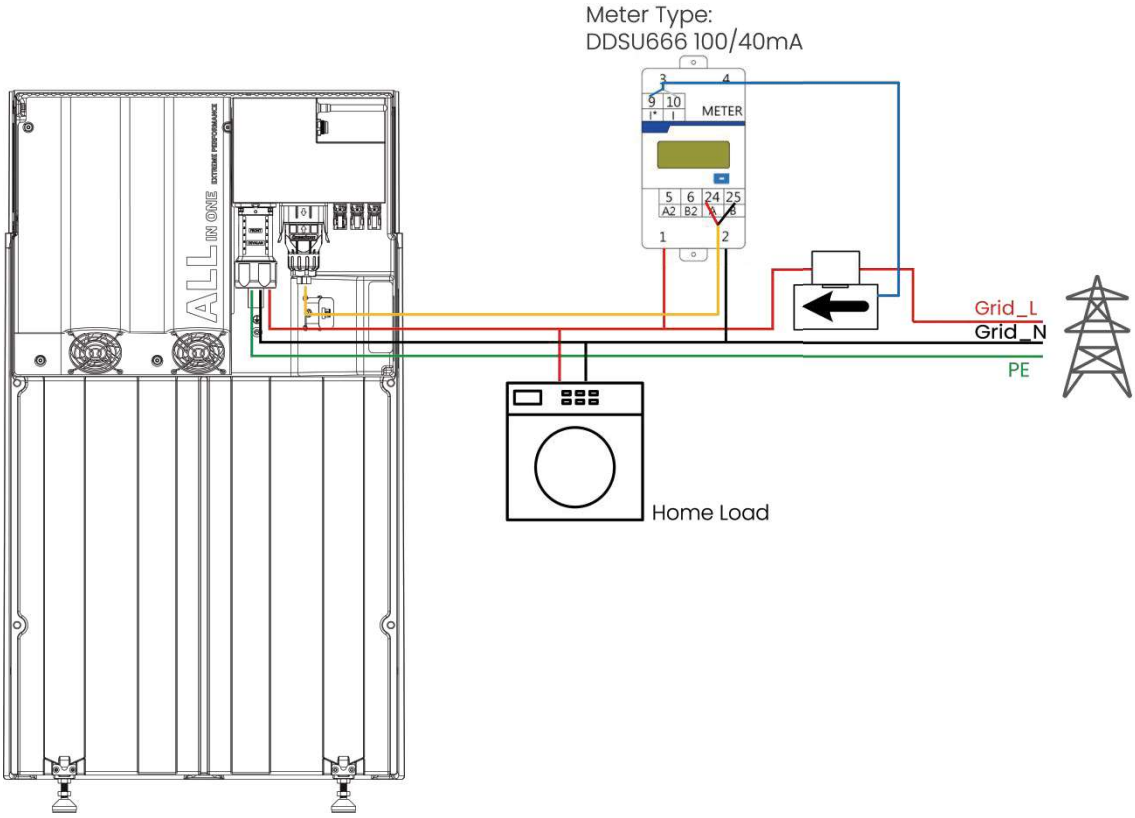
Meter Type: DDSU666 5(80)

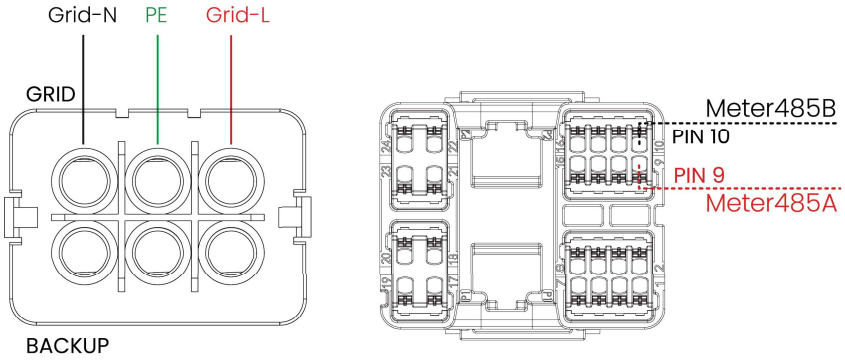




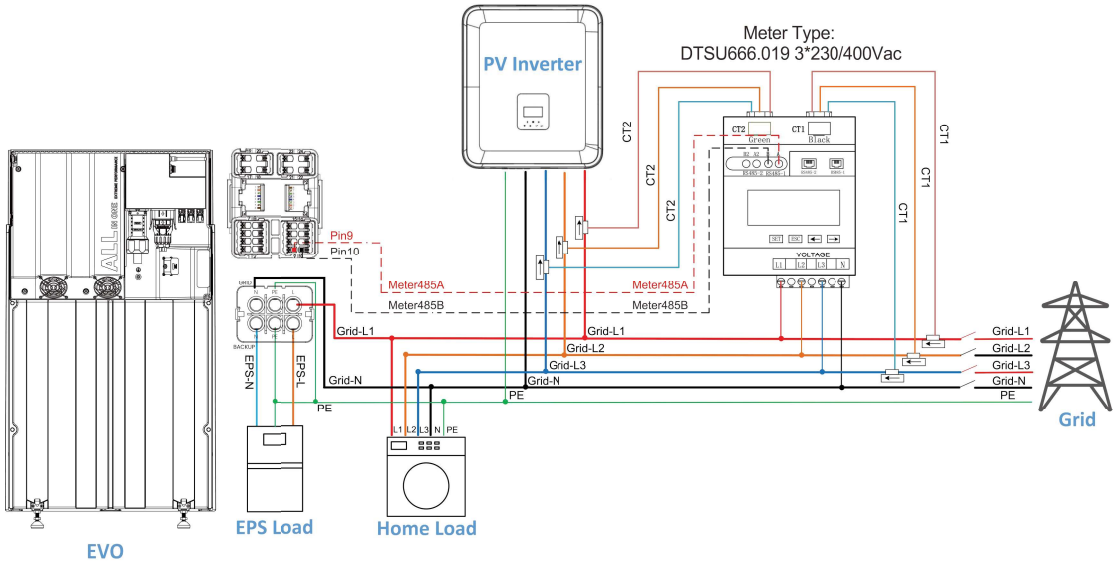


Meter Type: DDSU666 100/40mA





Meter Type: DTSU666.019 3*230/400Vac

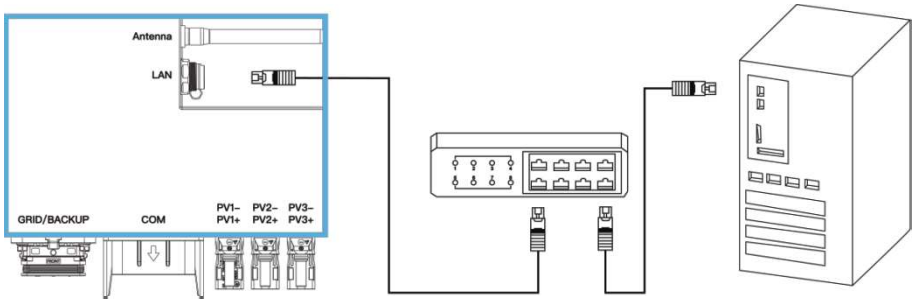


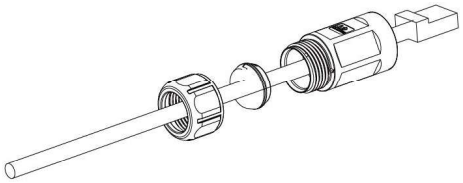
6.7 Communication Interfaces

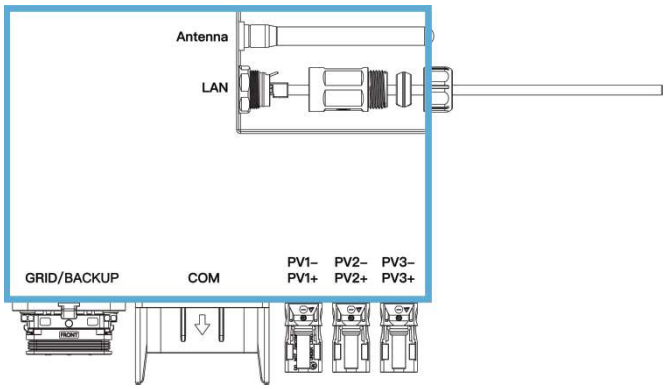
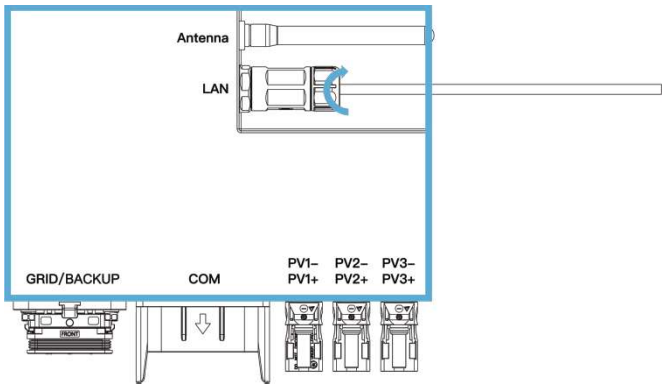
LAN connection

The LAN interface can be adapted to conventional T586A and T586B network cables.

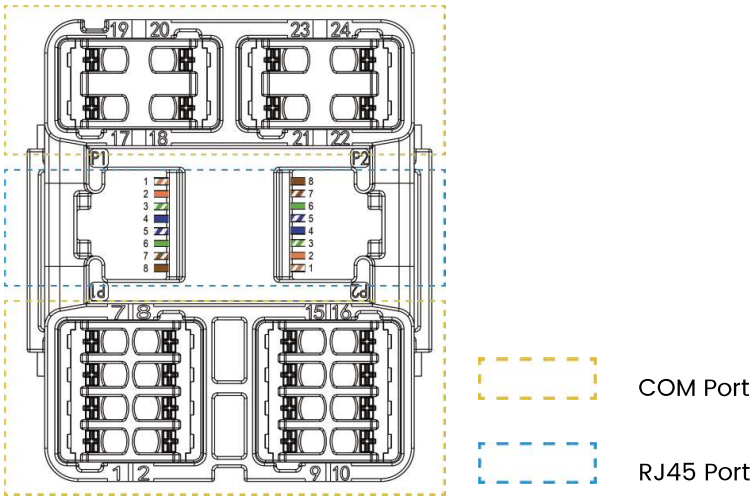
The wiring method is as follows.



Ethernet Connector Installation Procedures	
Step 1	Insert the network cable into the wire-locking nut, sealing plug and mainbody in turn.
	
Step 2	Insert the network cable plug into the matched RJ45 panel mount connector.

<table>
<tr><td></td><td>
</td></tr>
<tr><td rowspan="2">Step 3</td><td>Tighten the connector mainbody by an open-ended wrench into the RJ45 panel mount connector with a torque 1.2±0.2N·m. Then insert the sealing plug into the main body of RJ45 cable end connector. Finally, tighten the connector's nut by an open-ended wrench with a torque 1.2±0.2N·m.</td></tr>
<tr><td>
</td></tr>
</table>

Pin assignment of the RJ45 port and COM port



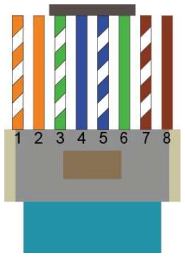
	PIN	PIN Definition	PIN	PIN Definition
RJ45 port	1	Paralle_CANH	5	Wifi_485A
	2	Paralle_CANL	6	DI
	3	Wifi_485A	7	GND
	4	Wifi_485B	8	12V
COM port	PIN	PIN Definition	PIN	PIN Definition
	1	DRM1/5	13	CT2+
	2	DRM2/6	14	CT2-
	3	DRM3/7	15	CT1-
	4	DRM4/8	16	CT1+
	5	Ref	17	K1
	6	Com	18	K2
	7	GND	19	K3
	8	Estop	20	K4
	9	Meter_485A	21	Termina_H
	10	Meter_485B	22	Termina_L
	11	485B	23	BMS_CANH
	12	485A	24	BMS_CANL

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RJ45 Network Connector Wiring Standard (T568B)

The RJ45 network connector provided is for standard Ethernet connections. To ensure proper network communication and device functionality, you must use the T568B wiring standard when terminating the RJ45 connector on the connecting Ethernet cable.

T568B Wiring Standard

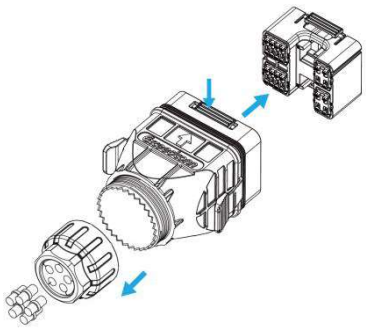


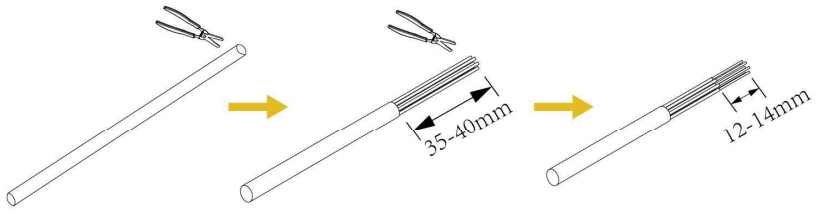
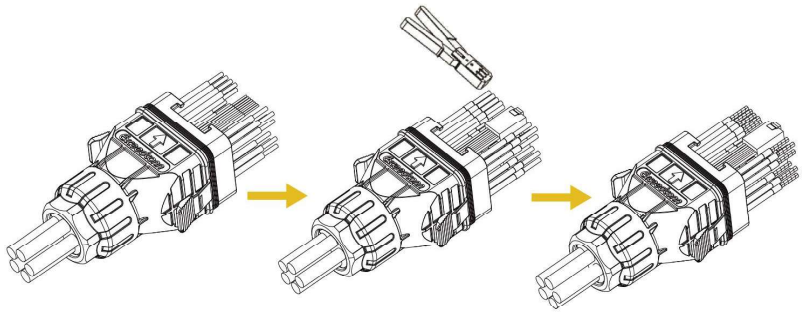
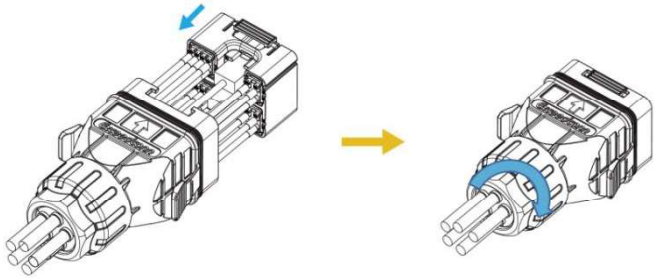
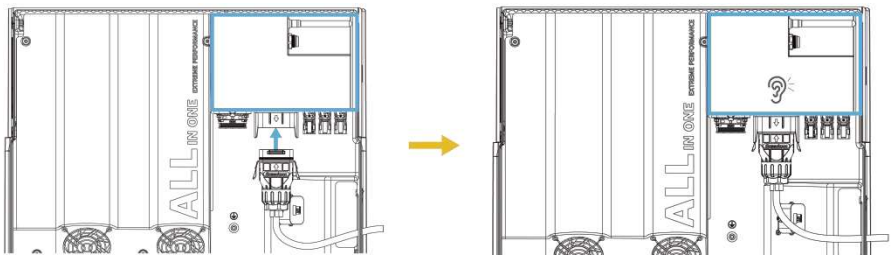
PIN	1	2	3	4	5	6	7	8
Wire Color	White & Orange	Orange	White & Green	Blue	White & Blue	Green	White & Brown	Brown

1 and 2 are used for transmitting, 3 and 6 are used for receiving. 4, 5, 7, and 8 are bi-directional lines.

Wires 1 and 2 must form a twisted pair, as must 3 and 6, 4 and 5, and 7 and 8.

Note: The sequence listed above is when viewing the connector with the plastic latch facing downward and the metal contacts facing upward.

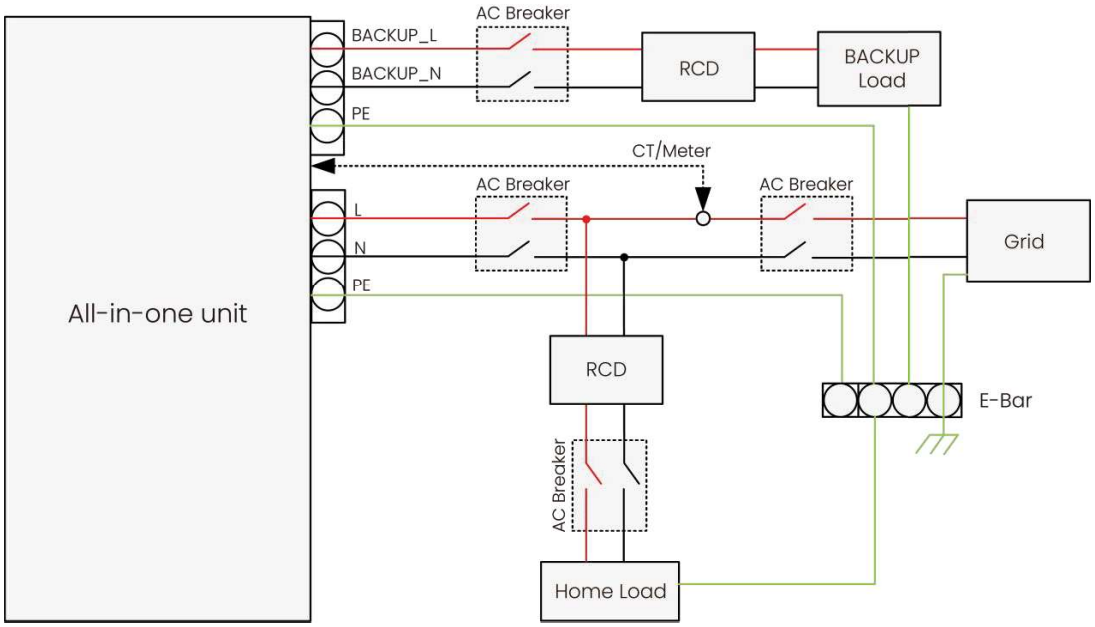
COM Connector Installation Procedures	
Step 1	Unscrew the screw at the rear end of the COM connector, unplug the waterproof plug, press the position marked by the arrow and pull it out, and remove the terminal block.
	

Step 2	Prepare five CAT5E network cables. Peel 35 to 40 mm of the outer skin of the network wires, and then peel 12 to 14 mm of the insulation from the front ends of the wires.
	
Step 3	Unplug the waterproof plug, thread the cables into the connectors respectively, then sleeve the sleeves on the cables with the insulation stripped off, and crimp the sleeves with sleeve crimping pliers.
	
Step 4	Insert the crimped connector into the terminal block and tighten the nut. The COM connector assembly is completed.
	
Step 5	Plug the wired connector into the communication port on the board end of the all-in-one unit.
	

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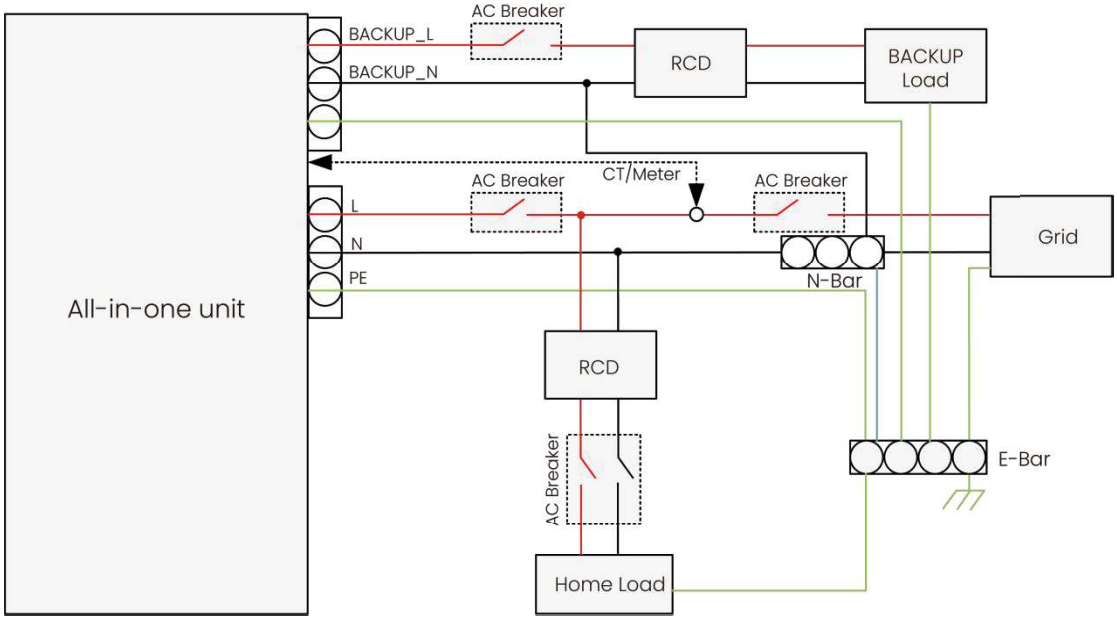
6.8 System Connection Diagrams

Neutral line of alternative supply must be disconnected after the grid is off. For countries such as China, Germany, the Czech Republic, Italy, etc., please follow local wiring regulations!



*Recommended RCD specification: 300mA RCD

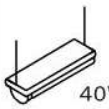
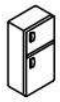
Neutral line of alternative supply must not be isolated or switched. For countries such as Australia, New Zealand, South Africa, etc., please follow local wiring regulations!



*Recommended RCD specification: 300mA RCD

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	X 1	X 1	 Incandescent lamp TV	 100W Incandescent lamp	100VA (W)	100VA (W)
Capacitive load	X 2	X 1.5	 Fluorescent lamp	 40W Fluorescent lamp	80VA (W)	60VA (W)
Inductive load	X 3~5	X 2	  Fan Fridge	 150W Fridge	450-750VA (W)	300VA (W)

*Unipolar load half-wave load are not supported.

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

6.9 System Start-up and Shutdown

System start-up

Please refer to the following steps to start up the all-in-one unit.

- Ensure the unit is securely fixed in place.
- Verify all DC and AC connections are properly completed.
- Confirm the CT/meter is correctly connected.
- Ensure the external BACKUP contactor is connected (if applicable).
- Turn on the DC Switch.
- Access the settings menu(default password: 0000), select START/STOP and set to START.

*For parallel systems (All-in-one unit + Expansion battery):

- First, turn on the DC switch on each expansion battery unit;

• Then, follow the steps above for the all-in-one unit.

Note!

• When starting the unit for the first time, the country code will be set by default to the local settings. Please check if the country code is correct.

• Set the time on the inverter using the button or by using the APP.

*For parallel systems (All-in-one unit + Expansion battery):

The all-in-one unit will automatically detect all expansion battery units during startup; this may take a few extra seconds.
If an expansion battery unit is not detected after startup, check the expansion harness connections and the DC switch on that unit. Then, follow the steps above for the all-in-one unit.

System shutdown

Please refer to the following steps to switch off the all-in-one unit.

• Access the settings menu, select START/ STOP, and set it to STOP.

• Access the menu settings, enter the Feature page, select BMS Power Ctrl, and choose OFF.

• Turn off the DC Switch on the all-in-one unit. For parallel systems, after the all-in-one unit is completely off, turn off the DC switch on each connected expansion battery unit.

• Wait 5 minutes before opening the enclosure cover (if required for maintenance).

6.10 System Black Start

In special cases, such as when the grid and solar panels are not in use, the battery can be activated through the "Black Start" function. This means that our energy storage inverter and battery can continue to operate. The startup steps for black start are as follows.

• First turn on the DC Switch.

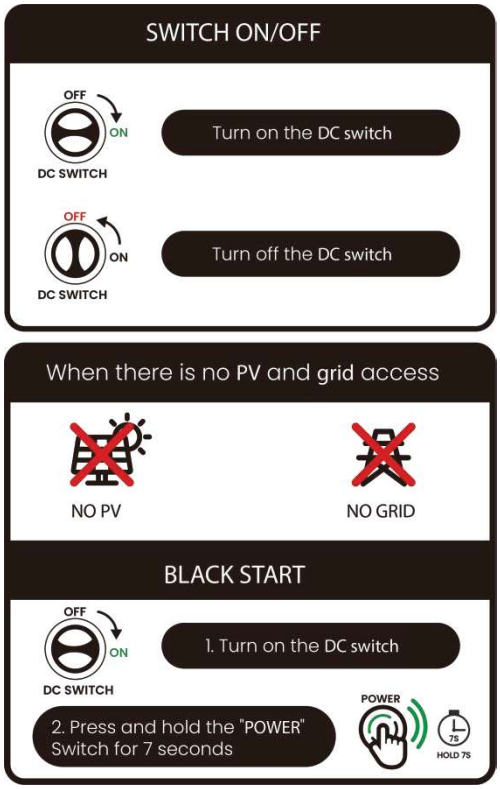
• Please press and hold the“POWER" Switch for 7 seconds.

*For parallel systems (All-in-one unit + Expansion battery):

• First, turn on the DC switch on each expansion battery unit;

• Then, follow the steps above for the all-in-one unit.

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Note!

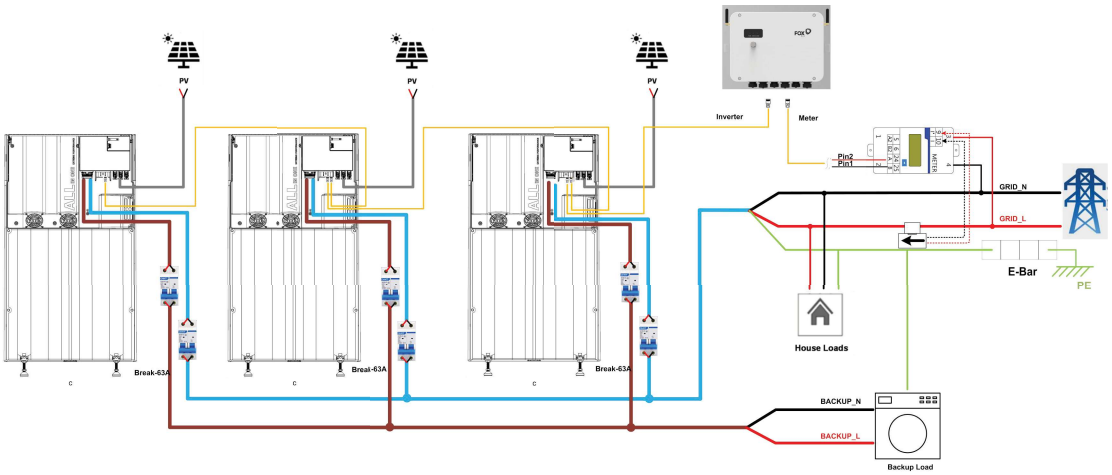
Ensure all connections are correct prior to Black Start. No wiring modifications during black start.

7 Main Function Implementation

7.1 Parallel System Wiring and Setting

Each unit supports Max.3 units parallel connection for on-grid system and off-grid system.

System Diagram



Note!

1) Parallel systems allow for the connection of devices with varying power and capacity levels.

2) For "On grid parallel with BACKUP load" , "On&off grid parallel " scene, each unit must be connect ed to the Battery.

3) The cable length from each inverter's grid port to the grid connection point must be the same, and the cable length from each unit's BACKUP port to the common load connection point must also be the same.

⚠ Warning!

On & off grid parallel must ensure that the BACKUP port and GRID port of each machine are connected one by one. That is, BACKUP port L of each unit must correspond to L on the network side, and N must correspond to N on the network side.

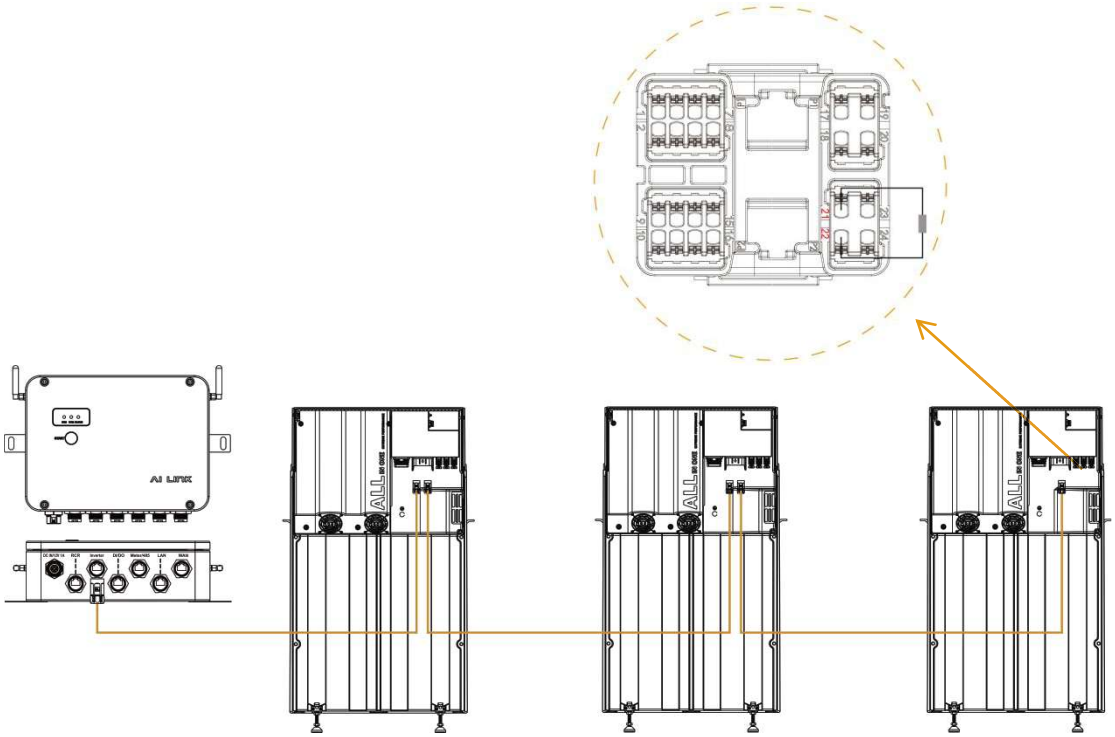
Our company will not assume any responsibility for machine damage or safety accidents caused by Wiring error for offline and parallel operation.

Wire Connection

Step1 Parallel Power wiring

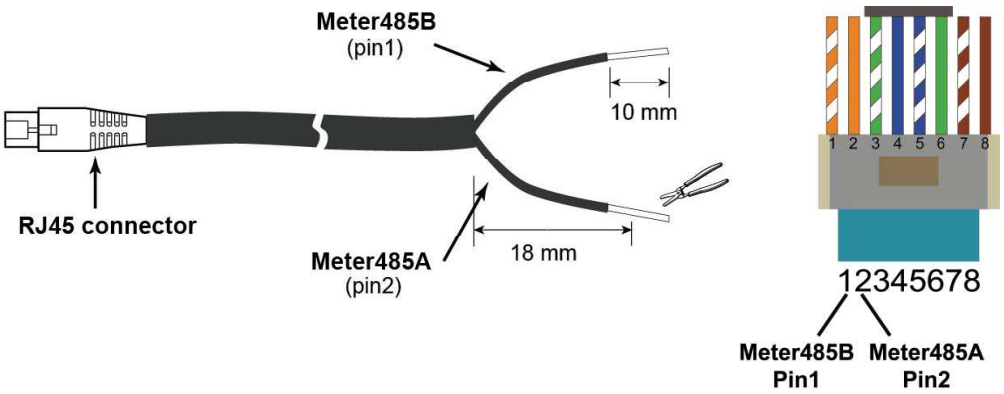
Please select the corresponding power wiring method according to different scenarios.

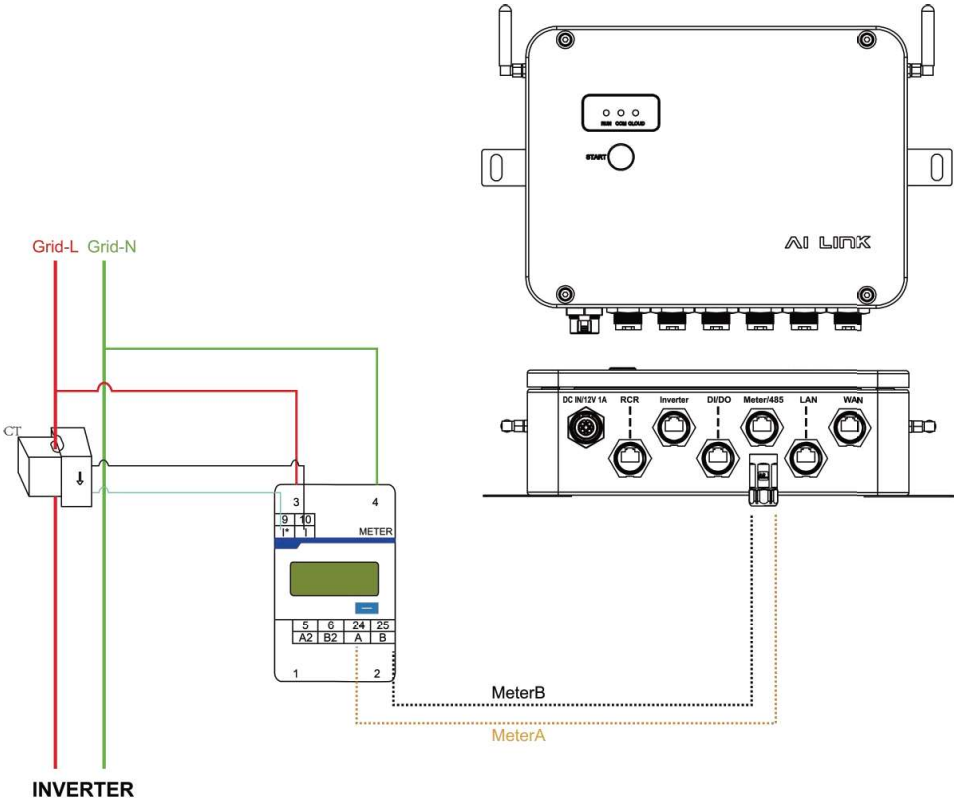
Step2 Unit communication wiring



The EVO device farthest from the AI Link requires a terminal resistor of 120Ω.

Step3 Meter wiring



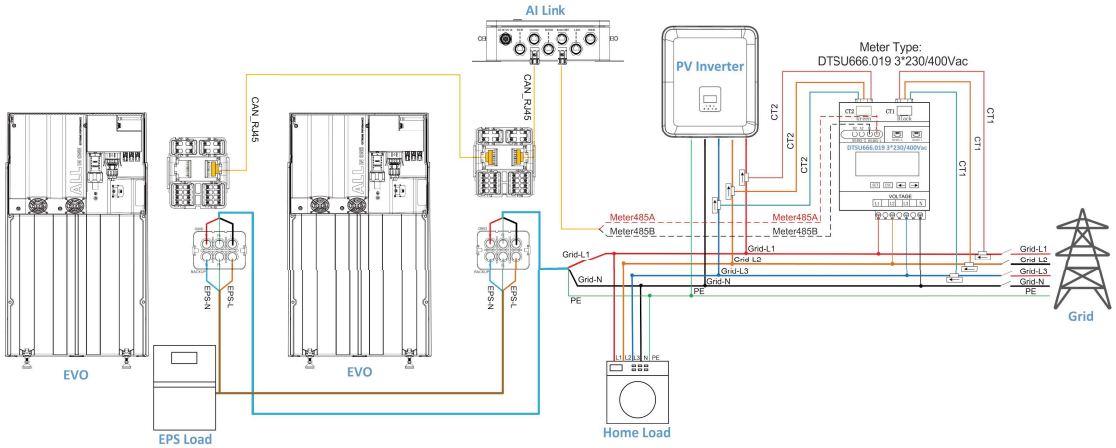


Note!

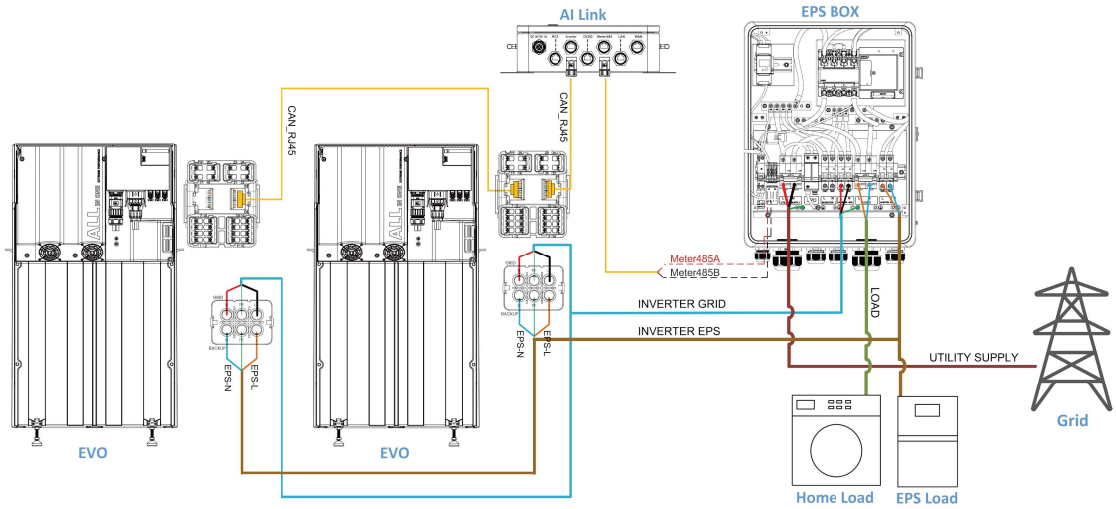
(1) For an energy meter with an external CT type, note that the CT direction should face the inverter.

(2) As for the meter model, there are two types available for selection, which are DDSU666 230V 5(80)A (PN: 30-803-00026-00) and DDSU666 230V 100A/40mA (PN: 30-803-00032-00). The meter used in the illustration above is the second type.

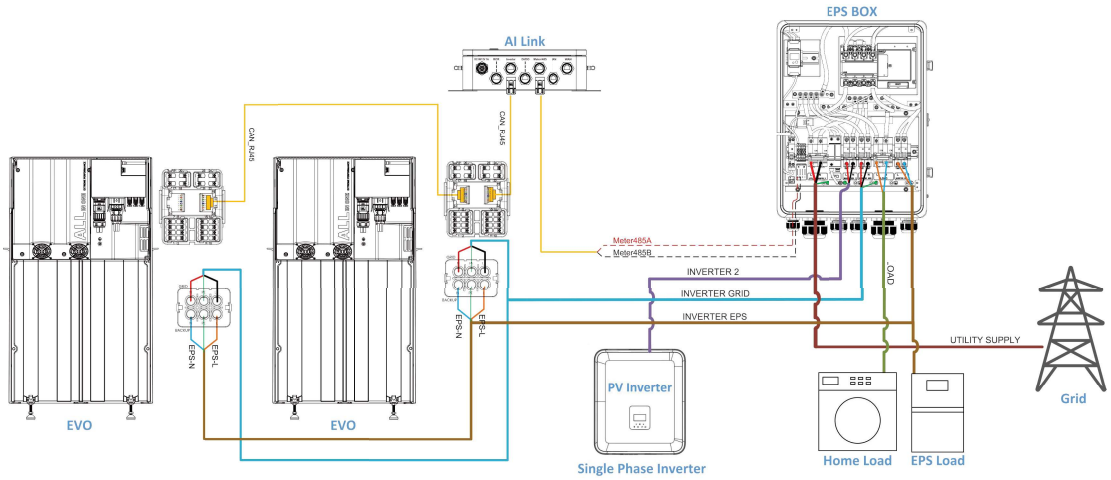
The following diagram shows the wiring of two all-in-one units in parallel with AI LINK communication and dual-CT meter.



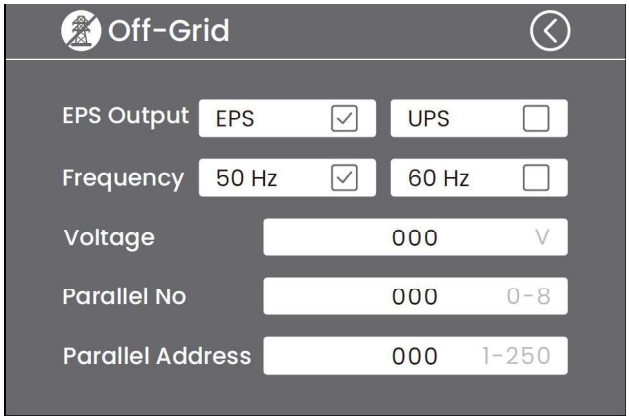
The following diagram shows EPS output wiring of two parallel all-in-one units via AI LINK, connected to an EPS box.



The following diagram shows complete system wiring of two parallel all-in-one units with AI LINK, grid-tied inverter, and EPS box.

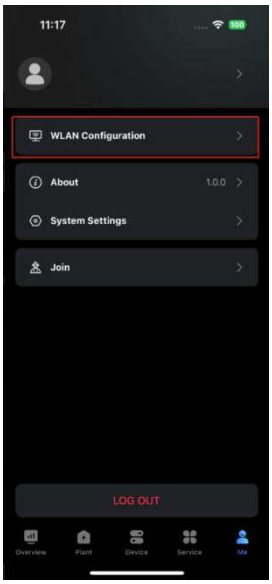
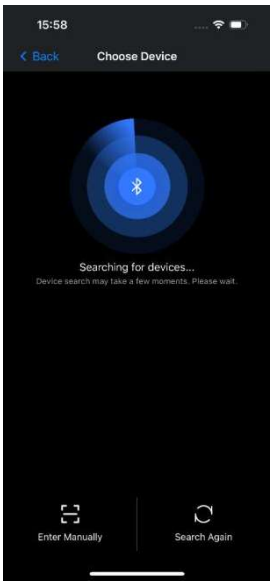
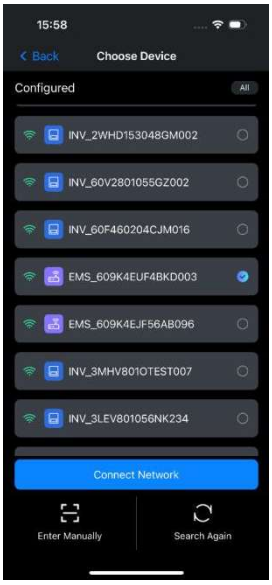


If off-grid parallel operation is required, set the number of parallel units and parallel addresses under the Off-grid parameters. For three parallel units, set the Num value to 3 for each unit, and assign any non- repeating Address values between 1 and 249 to complete the setup. To exit off-grid parallel operation and switch to standalone mode, set Num to 8 and Address to 250.



7.2 AI Link Network Configuration and Parameters Setting

AI Link can quickly achieve network configuration and parallel connection via the FoxCloud2.0 app.

<table>
<tr><th colspan="2">Procedures</th></tr>
<tr><td>Step 1
On the personal center page, click "WLAN Configuration" to enter the network configuration page.

</td><td>Step 2
On the network configuration page, search for devices.

</td></tr>
<tr><td>Step 3
After the search is completed, a device list will be displayed. Select the device and click "Connect Network."

</td><td>Step 4
Choose a WiFi network, enter the password, and click "Next."

</td></tr>
</table>

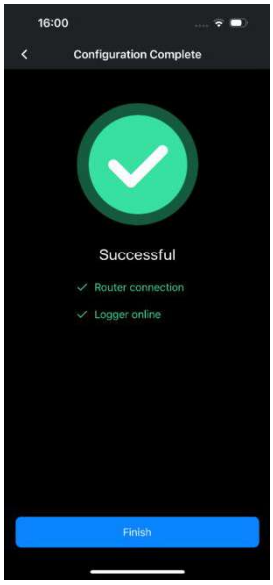
Step 5

Wait for the device to connect to the network.



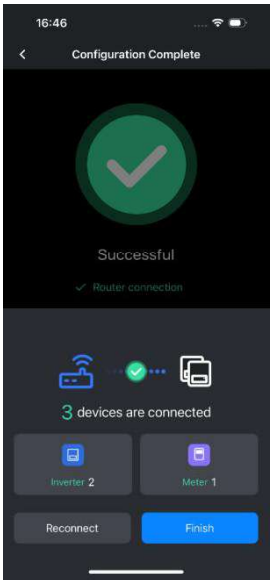
Step 6

The device successfully connects to the network.



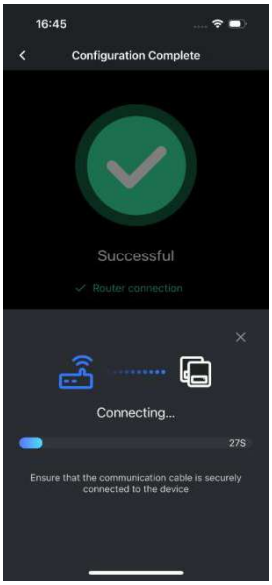
Step 7

Click "Finish" to open the network setup pop-up, which displays the device type and quantity.



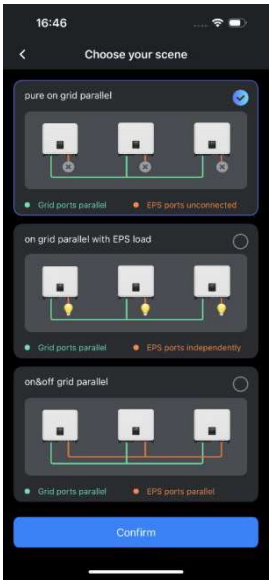
Step 8

If the displayed devices do not match the actual ones, check the on-site machines and wiring issues. Click "Reconnect" to reconfigure the network until all devices are displayed.



Step 9

After the network setup is successful, click "Finish" to enter the mode selection page. Choose the device connection method and click "Confirm."



- "Pure on grid parallel" and "On grid parallel with BACKUP load" are used for grid-tied parallel connection scenarios, corresponding to the "on grid mode" in the machine.
- "On&off grid parallel" is used for off-grid parallel connection scenarios, corresponding to the "on&off grid mode" in the machine.

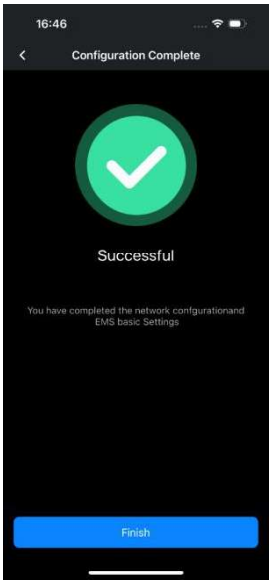
Step 10

A secondary confirmation pop-up will appear. Check if the connection method is correct. Click "Go back to check" to return to the mode selection page. If the selection is correct, click "Confirm."



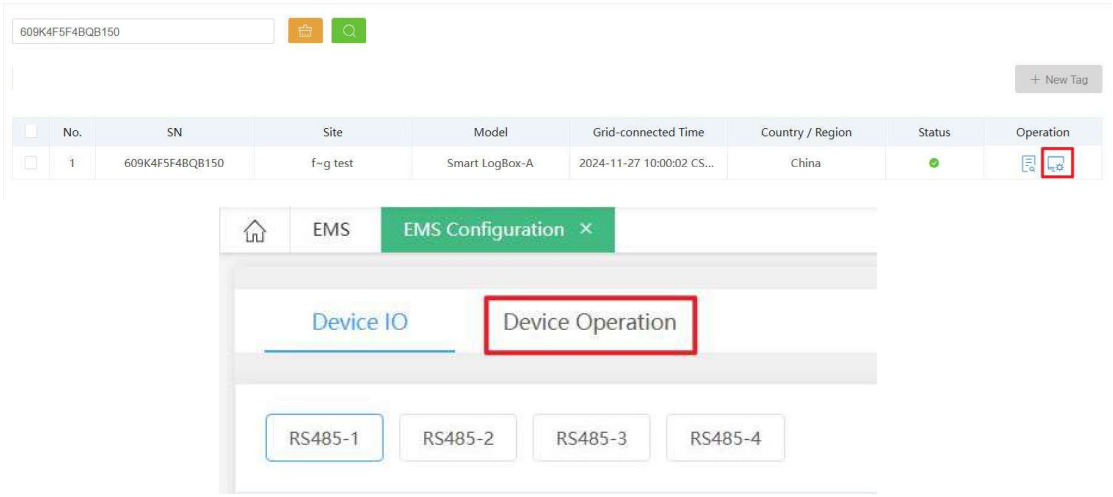
Step 11

The parallel connection is completed. Network configuration and parallel connection are fully accomplished.

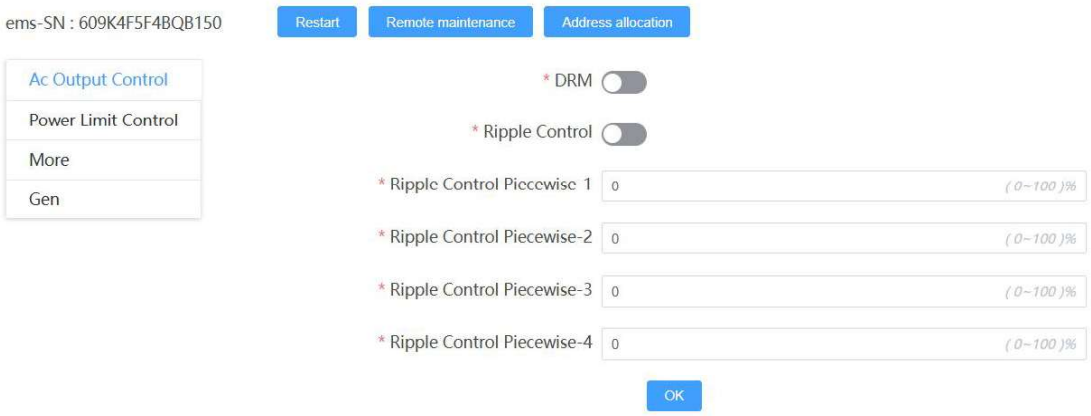


Instructions for parameter settings of AI Link on the Fox ESS Cloud platform

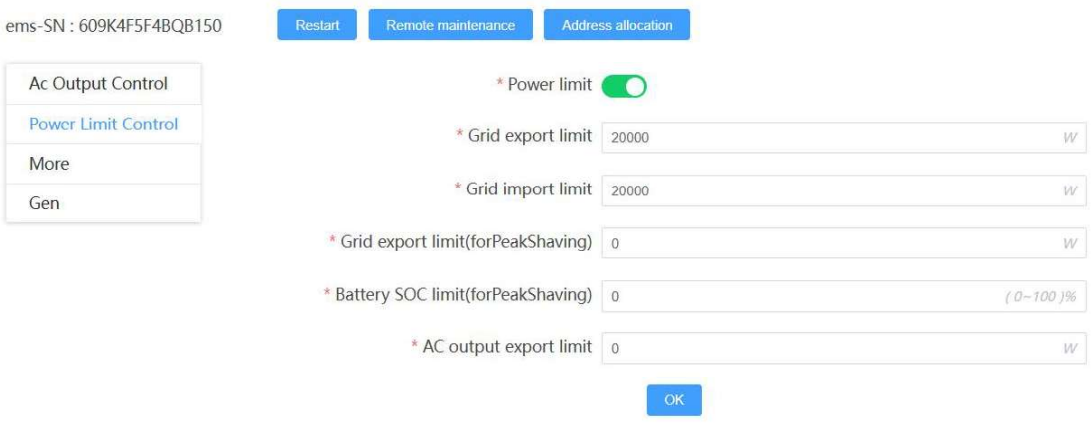
Accessing Settings Search for the AI Link using its Serial Number (SN), click the Settings button, and select Device Operation to enter the parameter configuration interface.



(1) AC Output Control: DRM/Ripple Control



(3) Power Limit Control



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8 Firmware Upgrading

Users can upgrade the unit's firmware via a U-disk.

• Safety check

Please ensure the unit is steadily powered on.

Please keep the battery on through the 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.

Note!
Please DO NOT apply USB3.0 U-disk on inverter USB port, the inverter USB port only support for USB2.0 U-disk.

• Upgrading steps:

Step 1: Please contact our service support to get the update files, and extract it into your U-disk as follows:

update/master/ 812_Master_Vx.xx.bin

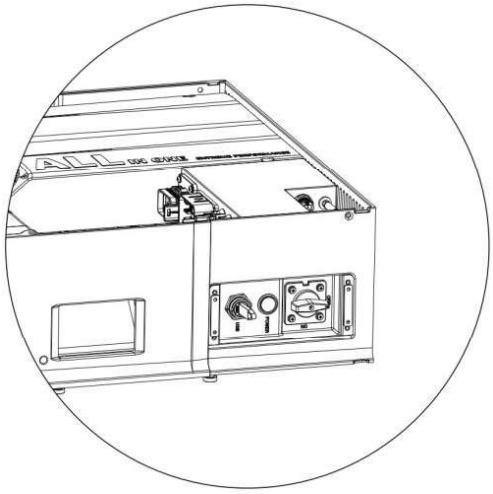
update/slave/ 812_Slave_V.xx.bin

update/manager/ 812_Manager_Vx.xx.bin

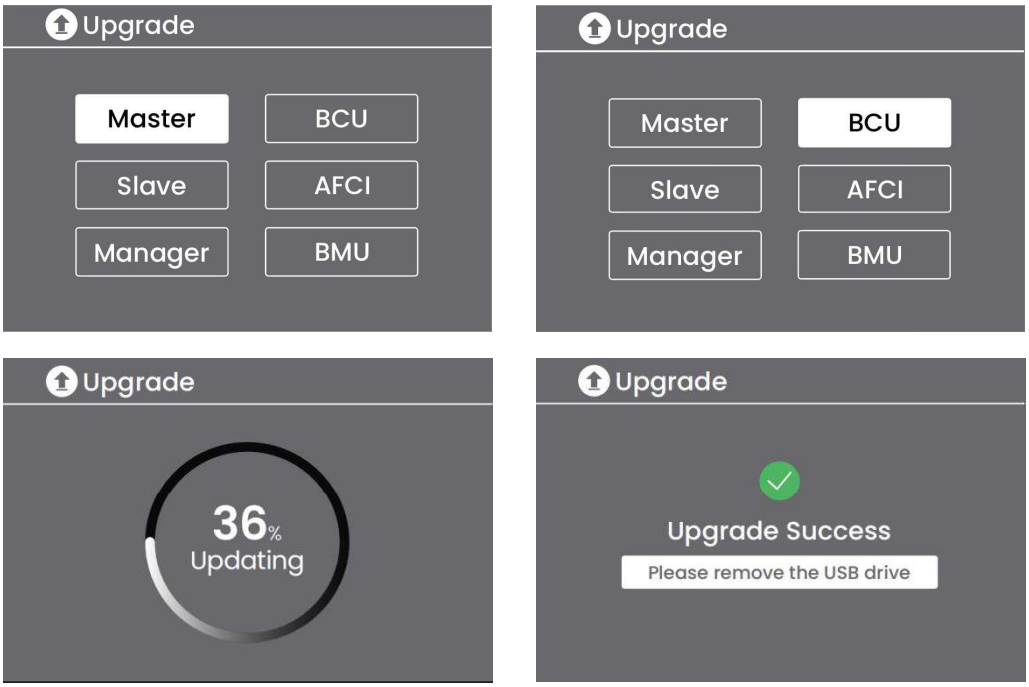
Note: vx.xx is version number.

Warning: Make sure the directory is in accordance with above form strictly! Do not modify the program file name, or it may cause the inverter not work anymore!

Step 2: Unscrew the waterproof lid and insert U-disk into the "USB" port on the unit.

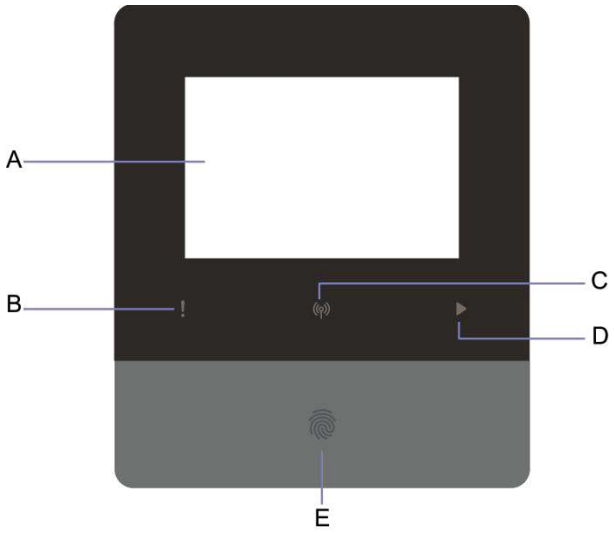


Step 3: Upon inserting a USB flash drive, the firmware update page will automatically pop up. Click on different icons to switch views; the option with a white background indicates selection.



9 Operation

9.1 Control Panel



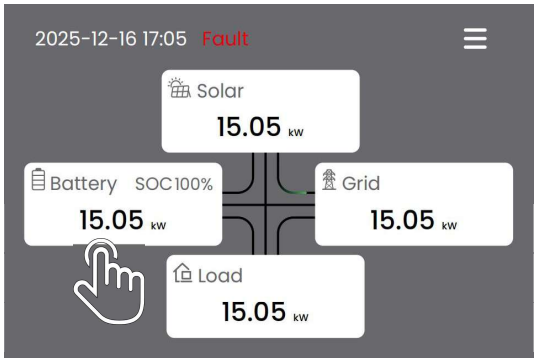
Object	Name	Function
A	LCD screen	Display the information of the inverter.
B	Indicator LED	Red: The inverter is in fault mode.
C		Blue: Light off- No network connection. Blink- connect to the internet. Light on- connection successful.
D		Green: The inverter is in normal state.
E	Function button	**Touchscreen 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".

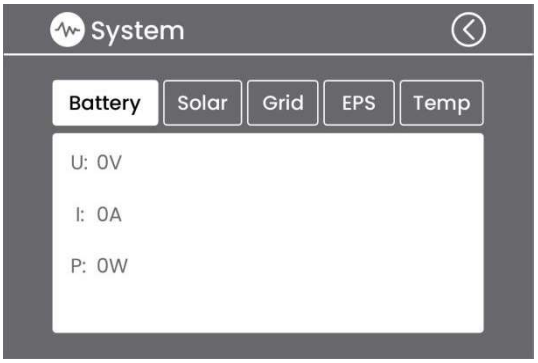
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		Wilan Reset Screen on: While the screen is on, the user long-presses for 25 seconds. Upon releasing the finger, a Wilan reset is triggered.

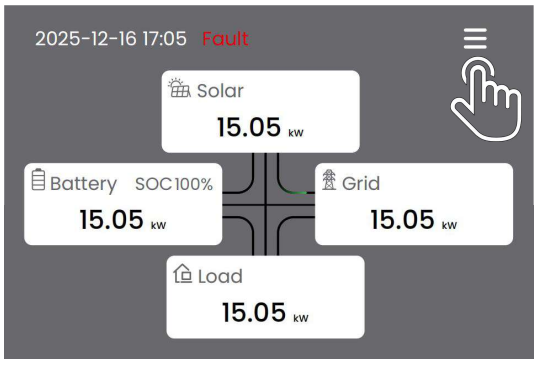
9.2 Introduction to the User Interface (UI)

On the Home screen, tap any area block to jump directly to details where you can view information such as Battery, Solar, Grid, BACKUP, and Temperature.





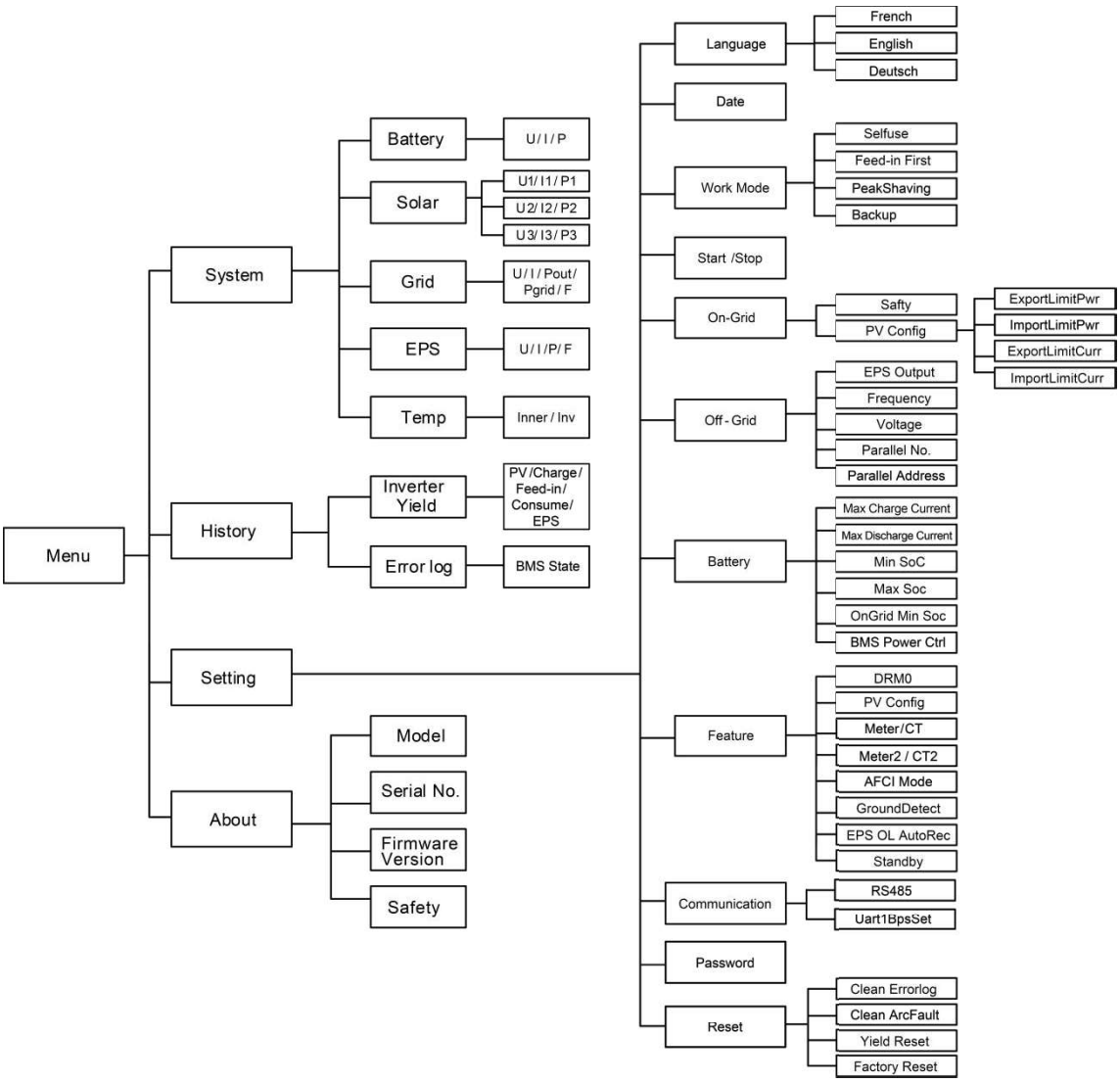
Click the icon in the upper-right corner of the Home screen to access the menu page. Select Settings and enter your password to enter the password-protected sub-menu.







Function Tree:



10 Maintenance

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

10.1 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.

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	• 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.
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.

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	• 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. • 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.
Eps Over Load	Over load in off grid mode. • Please check if the eps 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.

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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. • 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.

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	• Or seek help from us, if not go back to normal state.
Bat Boost Fault	The battery boost circuit mosfet is fail. • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
Eps Relay Fault	The eps 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. • 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.

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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.
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.
RDSP SPI Fault	The communication between master and slave is fail. • Disconnect PV, grid and battery, then reconnect. • Or seek help from us, if not go back to normal state.
RDSP Smpl Fault	The slave sample detection circuit is failed. • 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.

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EPS Vol Fault	EPS voltage out of range. • Please check the output voltage of EPS 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.

BMS State

Example of non-quick fault identification:

BS1 E03: EXT COM (communication fault with PCS) and INT COM (internal communication fault)



bit: b6 b5 b4 b3 b2 b1 b0

0 0 0 0 0 1 1

BMS State	Quick Identification	bit (b0 - b7)	Fault Description
BS1	E01	b0	Communication fault with PCS (EXT COM)
	E02	b1	Internal communication fault (INT COM)
	E04	b2	Over voltage fault (OV)
	E08	b3	Under voltage fault (UV)
	E10	b4	Charge over current (OCC)
	E20	b5	Discharge over current (OCD)
	E40	b6	Over temperature fault (OT)
	E80	b7	Under temperature (UT)
BS2	E01	b0	Cell imbalance alarm (CB)

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	E02	b1	Hardware Protect
	E04	b2	Reserve
	E08	b3	BMS Other Fault
	E10	b4	Voltage Sensor Fault
	E20	b5	Temperature Sensor Fault
	E40	b6	Current Sensor Fault
	E80	b7	Relay Fault
BS3	E01	b0	Inconsistent cell capacity fault (BMS_Typc_Unmatch)
	E02	b1	Reserve
	E04	b2	Reserve
	E08	b3	Reserve
	E10	b4	Reserve
	E20	b5	Unanswered charging request (BMS_MR_Unmatch)
	E40	b6	Reserve
	E80	b7	Reserve
BS4	E01	b0	Reserve
	E02	b1	Reserve
	E04	b2	Reserve
	E08	b3	Reserve
	E10	b4	Pre-charge fault
	E20	b5	Reserve
	E40	b6	Reserve
	E80	b7	Reserve
BS5	E01	b0	Relay drive circuit failure (Actor_Fault)
	E02	b1	SOH_LOW
	E04	b2	Reserve
	E08	b3	Reserve
	E10	b4	Single cell "0V" fault (SUV)
	E20	b5	Extreme overvoltage fault (CellVolt R&H Invalid)

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	E40	b6	Cell Temperature High Invalid
	E80	b7	Balance Temperature High
BS6	E01	b0	Precharge resistor overtemperature (PreChg_Restemperature High)
	E02	b1	Hardware overcurrent fault (short_current)
	E04	b2	AFE Communication Fault
	E08	b3	AFE Fault（AFE UT/OT/UV/OV ）
	E10	b4	IVU Communication fault
	E20	b5	Reserve
	E40	b6	Module addressing fault
	E80	b7	Reserve

10.2 Troubleshooting and Routine Maintenance

- **Troubleshooting**

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

b. Attempt the solution indicated in the table above.

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 unit 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.

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- **Safety check**

A safety check should be performed at least every 12 months by a qualified technician who has adequate training, knowledge and practical experience to perform these tests. The data should be recorded in an equipment log. If the device does not function properly or fails any of the tests, the device has to be repaired. For safety check details, please refer to Chapter 2 of this manual.

- **Maintenance checking list**

During operation of the unit, the responsible personnel shall examine and maintain the device regularly. The required actions are as follows:

- Check that if the cooling fins at the rear of the units are collecting dust, and the unit should be cleaned when necessary. This work should be conducted periodically.

- Check that if the indicators of the unit are in normal state, check if the display of the unit is normal. These checks should be performed at least every 12 months.

- Check if the input and output wires are damaged or aged. This check should be performed at least every 12 months.

- Get the panels of the unit cleaned and their security checked at least every 6 months.

- Regularly check whether the service environment of the unit meets the requirements, and the installation position should be far away from the heat source.

- The unit should be stored in an environment with a temperature range between 0℃ ~ +35℃, and charged regularly according to the table below with no more than 0.5 C (A C-rate is a measure of the rate at which a battery is discharged relative to its maximum capacity) to the SOC of 50% after a long time of storage.

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Storage environment temperature	Relative humidity of the storage environment	Storage time	SOC
Below -20℃	/	Not allowed	/
-20~0℃	10%~90%	≤ 1 month	20%≤SOC≤50%
0~35℃	10%~90%	≤ 6 months	20%≤SOC≤50%
35~55℃	10%~90%	≤ 1 month	20%≤SOC≤50%
Above 55℃	/	Not allowed	/

*If the unit is stored over one year, 5% - 8% of the capacity will lose irreversibly.

- Regularly check whether the unit and its supporting terminals, connecting cables and indicator lights are normal.

Note: Only qualified individuals may perform the works mentioned above.

- **Storage with Low SOC**

After power-down, internal module quiescent current and battery self-discharge may gradually deplete energy reserves. To prevent potential over-discharge damage, please:

- recharge the battery promptly;

- avoid prolonged storage at low State of Charge (SOC).

Storage in low SOC may occur in the following scenarios:

· After using the System Black Start (off-grid mode), the DC Switch is not turned off.

· 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 or long-term mains failure.

Under all conditions, batteries must be recharged within the maximum allowable period corresponding to the SOC at the time of power disconnect. Failure to recharge within the specified duration may cause damage due to over-discharge.

Storage environment temperature	Power-Off SOC before storage	Maximum charge interval
0~35℃	0% ≤ SOC<5%	7 days

Note: If the battery SOC drops to 0%, it must be recharged within seven days. Permanent battery failures resulting from delayed charging due to customer-related causes are not covered under warranty.

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11 Inverter Storage and Disposal

11.1 Disassembling the Inverter

- Disconnect the inverter from the DC input and AC output. Wait for 5 minutes to ensure the inverter is completely powered down.
- Disconnect communication cables and any optional monitoring modules. Remove the inverter from the wall mounting bracket.

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

- Capable of bearing a weight of 130 kg.
- Includes handles.
- Can be fully enclosed

11.2 Storing the Inverter

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

- Regularly inspect the storage condition of the inverter. 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 0°C and 35°C, and a relative humidity range of 5% to 95%. 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 ground 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 inverters, 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.

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

11.3 Transporting the Inverter

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

11.4 Decommissioning/Scrapping the Inverter

- Certain components of the inverter may cause environmental pollution. When disposing of the inverter or its related components, ensure compliance with local

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waste disposal regulations.

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12 Appendix

12.1 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.

Hereby, FOXESS CO., LTD. declares that the radio equipment type EVO 10 is in compliance with Directive 2014/53/EU.

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12.2 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 City, Hubei Province, P.R. 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-esscom
- Contact Us (EV Charger): ev@fox-esscom
- After-Sales Service: service@fox-esscom

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