

User Manual



S28 Series

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

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Content

1 Introduction	1
2 Symbols	1
3 Safety	3
3.1 Safety Instructions	3
3.2 Response to Emergency Situations	5
4 Product Introduction	6
4.1 System Specifications	7
5 Product Features	10
5.1 Battery System Features	10
6 Installation	13
6.1 Select an Installation Site	13
6.2 Items in the Package	15
6.3 Tools	16
6.4 Installation Steps	16
6.5 AC Electrical Connections	20
6.6 PV Electrical Connections	25
6.7 Turn on the System	28
6.8 Adding an Expansion Battery	28
7 APP Configuration	32
7.1 Download the App	32
7.2 Configuration Guide	32
7.3 Set Operation Mode	36
8 Maintenance and Troubleshooting	39
8.1 Maintenance	39
8.2 Storage with Low SOC	40

S28 Series

8.3 How Vulnerabilities are Disclosed	40
8.4 Troubleshooting	41
9 Decommissioning	45
9.1 Dismantling	45
9.2 Packaging	45
9.3 Storage and Transportation	45
10 Exclusion	46
11 Appendix	47
11.1 Quality Guarantee	47
11.2 Contact Us	48

1 Introduction

The document describes the installation, commissioning, maintenance and troubleshooting of the following micro storage system listed below.

S28 Series		
S28-M-H	S28-M-AC	S28-S
S28-0.6-M-H	S28-0.6-M-AC	S28-S
S28-0.8-M-H-IT	S28-0.8-M-AC-IT	
S28-0.8-M-H-L	S28-0.8-M-AC-L	
S28-0.8-M-H-M	S28-0.8-M-AC-M	
S28-0.8-M-H	S28-0.8-M-AC	
S28-2.4-M-H	S28-2.4-M-AC	
S28-M-MAX-H	S28-M-MAX-AC	

Please read the document carefully before you use the product to ensure that you completely understand the product and can correctly use it. After reading, please keep the document properly for future reference.

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

2 Symbols

Symbols	Explanation
	CE mark. The inverter complies with the relevant EU directives.
	Danger of high voltages. Danger to life due to high voltages in the inverter!



Do not place nor install near flammable or explosive materials.



Install the product out of reach of children.



Prohibit the use of water to extinguish fires.



Prohibition of private maintenance.



Prohibit connector reversal.



Disconnect the equipment before carrying out maintenance or repair.



Read the instruction manual before starting installation and operation.



Do not dispose of the product with household wastes.



Caution, risk of electric shock, energy storage timed discharge.



Beware of hot surface. The inverter can become hot during operation. Avoid contact during operation.

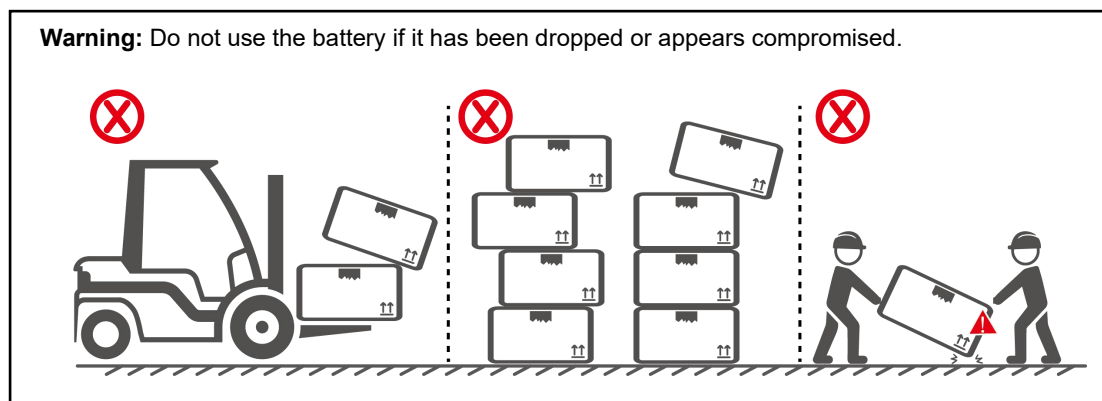
3.1 Safety Instructions

Electrical regulations vary by region. Comply with national laws and grid operator requirements when installing, commissioning, and operating. Installers should be familiar with this manual before performing any maintenance or installation on the system.

- Before installation, check whether this product may affect any relevant insurance arrangements, including your own insurance and, where applicable, insurance covering the property or building.
- Obtain all necessary planning permissions and Listed Building Consents in accordance with local regulations.
- Secure all required permissions from the property owner, landlord, freeholder, managing agent or relevant authority, and agree on the apportionment of installation-related costs.
- Confirm that the domestic electrical installation is fitted with modern residual-current circuit-breakers with over current protection (RCBO) and is in good working condition. If the electrical installation uses older-style fuse protection without RCBOs, it must be inspected and, where necessary, upgraded by a qualified electrician.
- Before installation, please confirm which wall sockets belong to the same electrical circuit. If you are not confident in identify circuits safely, seek advice from a qualified electrician.
- All household circuit modifications must be done by qualified electricians only.
- Please report and register in a timely manner in accordance with local regulatory requirements.
- Recommended practice is to check the new batteries mounted on-site comply to the warranty scope.
- Always wear insulated gloves when installing, servicing or maintaining this product.
- Do not touch leaked liquid exuding from the unit (electric shock/skin damage risk).
- Do not perform any installation or disassembly work while the product is in operation.
- Do not drag, squeeze, step on this product or place foreign objects on it.
- Do not put fingers or hands into the product.
- Do not clean the product with flammable or toxic solvents. Wipe it with a dry soft cloth.
- Recommended practice is to store the product out of reach of children and animals.
- Store in a cool and dry place with ample ventilation.
- Do not store the product near water sources.
- Do not expose the product to open flame.
- Do not open the product to repair or disassemble.
- Do not install with other batteries or cells.
- Type B RCDs are recommended for use with this product.
- Do not use any unofficial or unrecommended components and accessories.
- Recommended practice is to avoid using cables with a length of 3 meters or longer.
- Do not use any damaged cords or cables with this product.
- Recommended practice is to use matching MC4 connectors.
- The product shall not be connected to damaged, degraded or non-compliant socket outlets. Users shall be advised to seek inspection and assessment by a qualified electrician if there are any doubt regarding the condition or suitability of the

installation.

- Observe minimum clearance and position requirements for PV modules.
- Install PV modules such that fire-spread risk to neighbouring buildings via walls or balconies is not increased.
- Do not pull cables, do not bury them in soil, and do not lay them in damp bathrooms.
- Consider the wind load and snow load requirements according to the installation location.
- Do not insert the plug into the coupler socket of an extension cord.
- The plug shall not be inserted into a coupling socket or a multi hole socket.
- Do not use the product over its output rating. Overloads may result in a risk of fire or injury to persons.
- The product may feel warm when it's working. This is a normal operating condition and should not be a cause of concern.
- In case of fire, use only dry powder fire extinguisher. Liquid extinguishers should not be used.
- Do not subject this product to severe impacts, vibrations, or drops to prevent physical damage.
- 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).



3.2 Response to Emergency Situations

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

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

Fire Situation

In situations where the battery is on fire, if it is safe to do so, disconnect the battery pack by turning off the switch to shut off the power to the system (External, if any). 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.

WARNING

Batteries incorporate a thermal aerosol fire extinguishing device. This device deploys upon detection of thermal runaway and was capable of suppressing and restricting the spread of fire.

Water Situation

This product features dust protection and is resistant to powerful water jets, but it is not designed to be submerged. 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 it. Contact authorized personnel or manufacturer for further instructions.

4 Product Introduction

S28-M-H: Integrated inverter, MPPT and battery module.

S28-M-AC: Integrated inverter and battery module.

S28-S: Stand-alone battery module only.

Each system must have one S28-M-H or S28-M-AC.

The table below lists the recommended application regions, AC output power and grid-connection methods for each model.

Model	Application Regions	AC Output Power	Grid Connection Method
S28-0.6-M-AC/H	Switzerland	600W	Household socket connection
S28-0.8-M-AC/H-IT	Italy	799W	
S28-0.8-M-AC/H-L	Germany,Austria, Netherlands,Spain, Belgium,France	800W	
S28-0.8-M-AC/H-M		800W	
S28-0.8-M-AC/H		800W	
S28-2.4-M-AC/H		2400W	Dedicated plug- socket connection or distribution box connection
S28-M-MAX-AC/H		2400W	

Note: The rated output power marked on the nameplate shall match the power registered with the grid operator. Conversion from household socket connection to professional connector wiring into the distribution box must only be undertaken by qualified electricians, and grid registration shall be renewed after modification.

4.1 System Specifications

PV Input

Model	S28-0.6-M -H	S28-0.8-M -H-IT	S28-0.8-M -H-L	S28-0.8-M -H-M	S28-0.8-M -H	S28-2.4-M -H	S28-M- MAX-H
PV INPUT							
Max. input power (W)	4000		2000		4000		
Max. input voltage (V d.c.)	60						
MPPT voltage range (V d.c.)	10~60						
Nominal voltage (V d.c.)	38						
Max. input current (A d.c.)	30/30/30/30		16/16/16/16		30/30/30/30		
Isc PV (A d.c.)	40/40/40/40		20/20/20/20		40/40/40/40		

AC Input and Output

Model	S28-0.6-M -H S28-0.6-M -AC	S28-0.8-M -H-IT S28-0.8-M -AC-IT	S28-0.8-M -H-L S28-0.8-M -AC-L	S28-0.8-M -H-M S28-0.8-M -AC-M	S28-0.8-M -H S28-0.8-M -AC	S28-2.4-M -H S28-2.4-M -AC	S28-M- MAX-H S28-M- MAX-AC
AC INPUT							
Max. apparent power (VA)	2400		800	1200	2400		
Nominal voltage (V a.c.)	L/N/PE, 220/230/240						
Nominal frequency (Hz)	50/60						
Max. input current (A a.c.)	10.9		3.6	5.4	10.9	10.9	
AC OUTPUT							
Rated power (W)	600	799	800			2400	
Rated apparent power (VA)	600	799	800			2400	
Max. apparent power (VA)	600	799	800			2400	
Nominal voltage (V a.c.)	L/N/PE, 220/230/240						
Nominal frequency (Hz)	50/60						
Rated output current (A a.c.)	2.7/2.6/2.5	3.6/3.4/3.3	3.6/3.5/3.3			10.9/10.4/10.0	
Power factor	0.8 leading to 0.8 lagging						

EPS Output

Model	S28-0.6-M -H S28-0.6-M -AC	S28-0.8-M -H-IT S28-0.8-M -AC-IT	S28-0.8-M -H-L S28-0.8-M -AC-L	S28-0.8-M -H-M S28-0.8-M -AC-M	S28-0.8-M -H S28-0.8-M -AC	S28-2.4-M -H S28-2.4-M -AC	S28-M- MAX-H S28-M- MAX-AC
EPS OUTPUT							
Max. apparent power (VA)	2400		800	1200	2400		
Nominal voltage (V a.c.)	L/N/PE, 220/230/240						
Nominal frequency (Hz)	50/60						
Max. output current (A a.c.)	10.9		3.6	5.4	10.9		
Max. bypass output power (W)	2400		2200		2400		
Max. bypass output current (A a.c.)	10.9		10.0		10.9		
Power factor	0.8 leading to 0.8 lagging						

Battery

Model	S28-0.6-M -H S28-0.6-M -AC	S28-0.8-M -H-IT S28-0.8-M -AC-IT	S28-0.8-M -H-L S28-0.8-M -AC-L	S28-0.8-M -H-M S28-0.8-M -AC-M	S28-0.8-M -H S28-0.8-M -AC	S28-2.4-M -H S28-2.4-M -AC	S28-M- MAX-H S28-M- MAX-AC
BATTERY							
Battery type	LFP (LiFePO ₄)						
Expandable battery quantity	4						
Nominal energy (kWh)	2.64						
Nominal capacity (Ah)	75						
Nominal voltage (V d.c.)	35.2						
Voltage range (V d.c.)	31.9~40.1						
Max.charge/ discharge current (A d.c.)*1	75/75						
Warm up function	Optional						

*1 It depends on the charge and discharge conditions, such as temperature and SOC.

General Data

Model	S28-0.6-M -H S28-0.6-M -AC	S28-0.8-M -H-IT S28-0.8-M -AC-IT	S28-0.8-M -H-L S28-0.8-M -AC-L	S28-0.8-M -H-M S28-0.8-M -AC-M	S28-0.8-M -H S28-0.8-M -AC	S28-2.4-M -H S28-2.4-M -AC	S28-M- MAX-H S28-M- MAX-AC
	GENERAL DATA						
Topology	Isolated						
Ingress protection	IP65						
Protective class	Class I						
Over voltage category	III (AC side), II (DC side)		II (AC side), II (DC side)			III (AC side), II (DC side)	
Communication interface	Wi-Fi,LAN,Bluetooth,RS485,USB(Optional)						
Display	APP,LCD,LED, Website						
Operating temperature range (°C)*1	-20~55						
Dimensions (W×H×D) (mm)	420×255×310						
Weight (ka)	27.6±5%						

*¹: Charge power is reduced automatically below 0°C to avoid irreversible cell damage. Performance may be de-rated at operating temperatures above 35°C. While the product is IP65 rated, avoid sustained solar irradiation leading to excessive cabinet internal temperature.

S28-S Specifications

Specifications for S28-S	
Battery type	LFP (LiFePO ₄)
Rated capacity (Ah)	75
Nominal energy (kWh)	2.64
Nominal voltage (V d.c.)	35.2
Voltage range (V d.c.)	31.9~40.1
Max.charge/discharge current (A d.c.)* ¹	60/60
Ingress protection	IP65
Protective class	Class I
Operating temperature range (°C)* ²	-20~55
Warm up function	Optional
Dimensions (W×H×D) (mm)	420×270×235
Weight (kg)	23.4±5%

*¹ : It depends on the charge and discharge conditions, such as temperature and SOC.

*²: Charge power is reduced automatically below 0°C to avoid irreversible cell damage. Performance may be de-rated at operating temperatures above 35°C. While the product is IP65 rated, avoid sustained solar irradiation leading to excessive cabinet internal temperature.

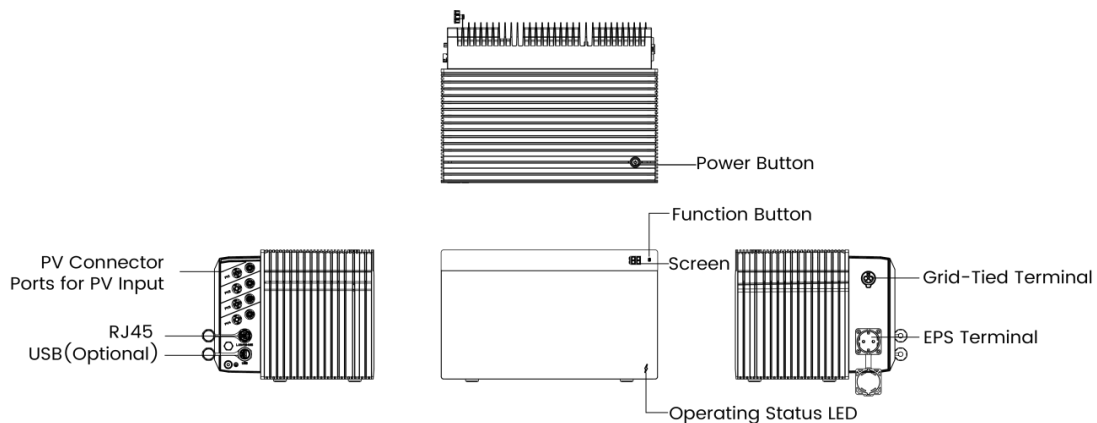
5 Product Features

5.1 Battery System Features

The product has been fitted with multiple protection systems to ensure the safe operation of the system. Some of the protection systems include:

- Inverter protection: Over voltage, Over current, External short circuit, Over temp, In rush current, Anti - is landing protection.
- Battery Protection: Over voltage, Over current, Over temp, Under voltage, Under temp.

S28-M Features:



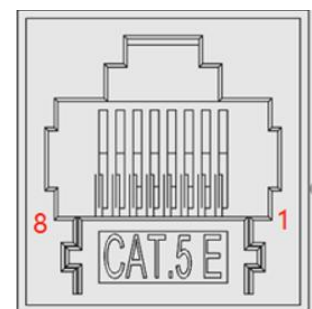
PV Connector Ports for PV Input 1~4 (Only applicable to S28-M-H)

Connect each set of PV modules to each set of PV input ports in S28-M-H.

RJ45

Connect to home network (PIN1~PIN6). No wiring required if using Wi-Fi. Connect to wired smart meter (PIN7~PIN8). No wiring required if using wireless meter.

	PIN	PIN definition
RJ45 Port	1	TD2_P
	2	TD2_N
	3	RD2_P
	4	TD2_T
	5	RD2_T
	6	RD2_N
	7	Meter_485A
	8	Meter_485B

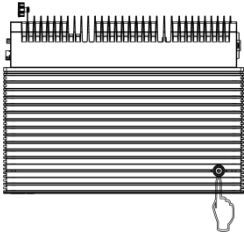
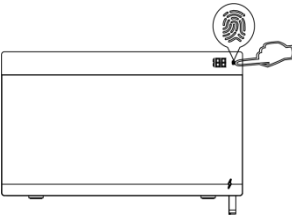


USB (Optional)

Connect to a USB flash drive to upgrade firmware.

This upgrade function is not authorized for end users and is only available to manufacturer personnel under restricted scenarios.

Power Button

Button	Action	Function
Top 	Press & Hold 2 Seconds (in power off state)	Turn on the battery
	Fast Triple Tap within 4 seconds (in power on state)	Enable/disable EPS output
	Press & Hold 5 Seconds (in power on state)	Turn off the battery
Front 	Press & Hold 2 Seconds (in screen off state)	Light up the screen
	Press & Hold 2 Seconds (in screen on state)	Switch the screen page
	Press & Hold 20 Seconds	Reset bluetooth and Wi-Fi

Screen LED

OLED screen displays inverter data, PV data, battery data, fault information, network connection status and meter connection status, etc.

After 10 minutes, the OLED screen will turn off until the function button is pressed again.

Icon	Status	Description
	100%	Battery power 0%-100%
	!	Meter is disconnected
		Wi-Fi connected and connected to the cloud
		Wi-Fi not connected or not connected to the cloud

Operating Status LED

System Status	Indicator	LED Status	User Action
Shutdown		Off	-
Self-check	  On Off	Green, fast flashing On: 0.5s, Off: 0.5s	Wait until self-check is complete
Charging	  On Off	Green, slow flashing On: 2s, Off: 1s	No action required
Discharging / Idle		Green, solid	No action required
Fault		Red, solid	Check the app for fault details

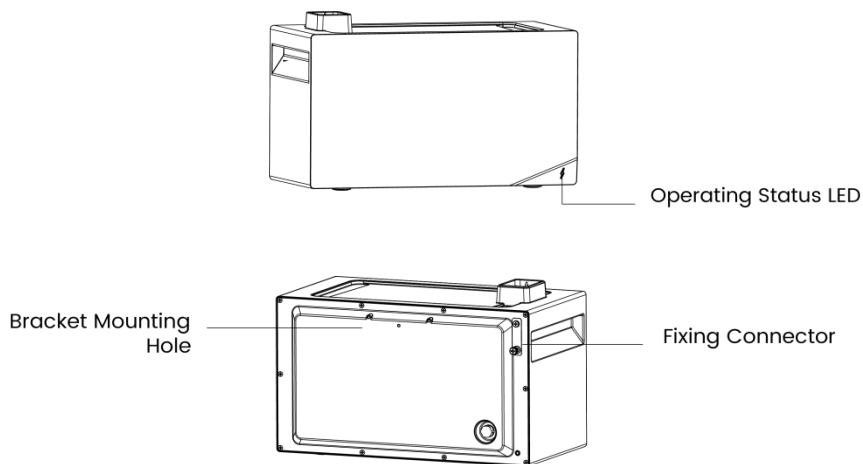
Grid-Tied Terminal

Connect to grid.

EPS Terminal

Connect to backup load.

S28-S Features:



Operating Status LED

The LED displays the running or fault status of the product. The displayed information is the same as that of the S28-M.

Bracket Mounting Hole

Fix the product to the wall together with bracket.

Fixing Connector

For securing two vertically stacked finished products to improve their stability.

6 Installation

6.1 Select an Installation Site

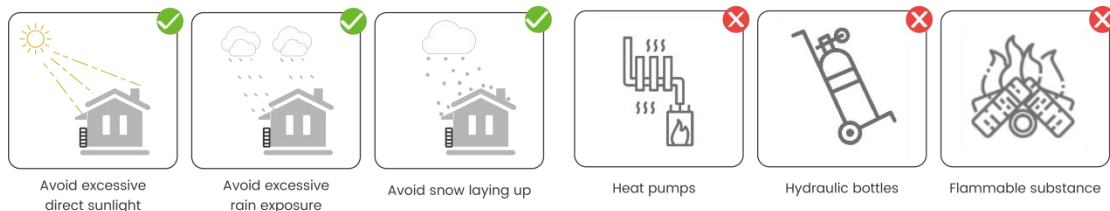
Installation Requirements

Make sure the installation site meets the following conditions:

- Keep the installation area away from high-temperature sources, flammable or explosive materials, and other potential explosion hazards such as gas valves, LPG cylinders, heat pumps, firewood stacks, etc.
- The installation area must be completely waterproof, with a hard, level floor, and the wall should not have noticeable inclined angle.
- Maintain low and stable humidity with good ventilation; dust and dirt within the installation area must be minimized.
- Position the installation area away from television antennas or antenna cables to avoid lightning strikes and electromagnetic interference.
- Avoid the presence of flammable debris around the battery, such as cotton, fabric, haystacks, etc., which may be ignited by sparks and then lead the fire source to the battery, thus causing the battery to burn.
- Avoid the presence of hot or flammable objects around the battery, such as hydraulic bottles (natural gas, oxygen, etc.), heat pumps and so on.
- Maintain a minimum clearance of 300mm between the product and any surrounding.
- Ensure good Wi-Fi signal coverage in the installation area of meter and product.
- Ensure the AC cable can reach the product.
- Ensure easy connection to PV panels.

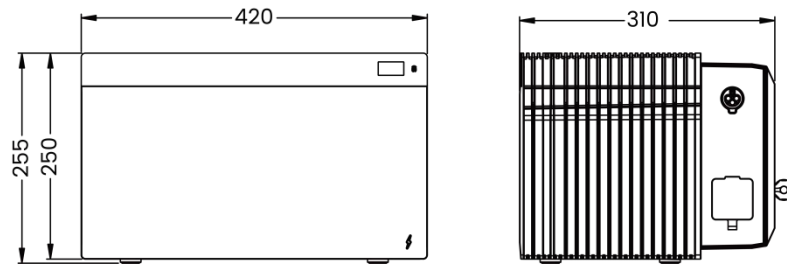
Outdoor Installation

The ingress protection rating for this product is IP65 and it is therefore suitable for outdoor use. Locations fully exposed to precipitation and/or extended periods of exposure to direct sunlight should, where possible, be avoided. A location where there is some direct exposure to the elements, or where complete protection cannot be achieved, are permissible and will not impact upon warranty claims providing reasonable measures have been taken. For more clarification, please contact your local service team.

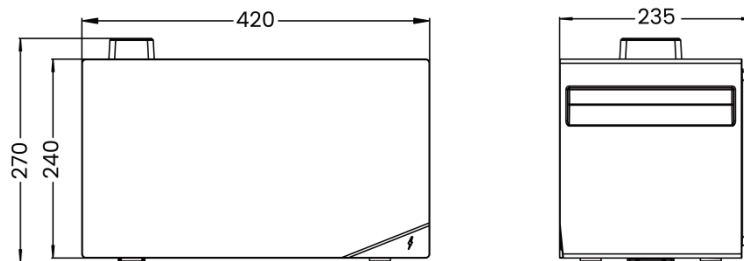


Product Dimensions

S28-M: 420 (W) × 255 (H) × 310 (D) mm

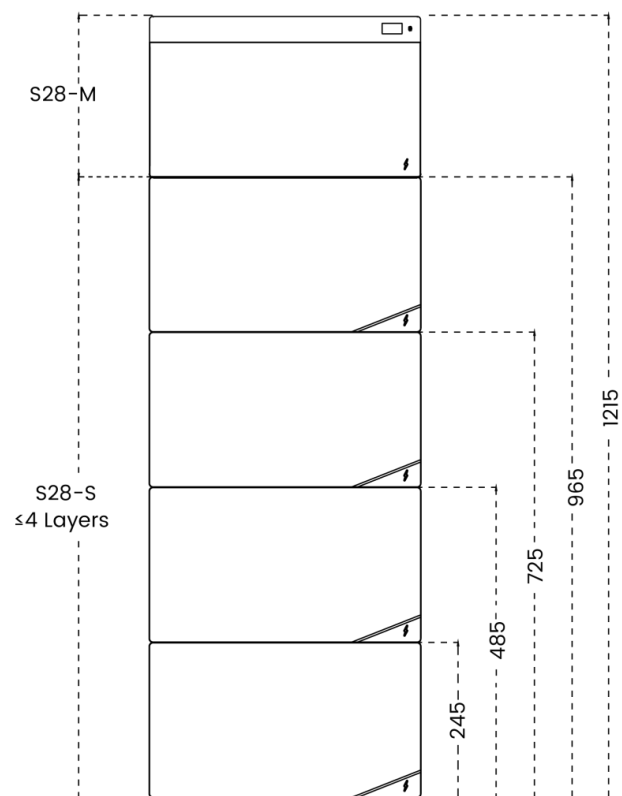


S28-S: 420 (W) × 270 (H) × 235 (D) mm



Stacking Requirements

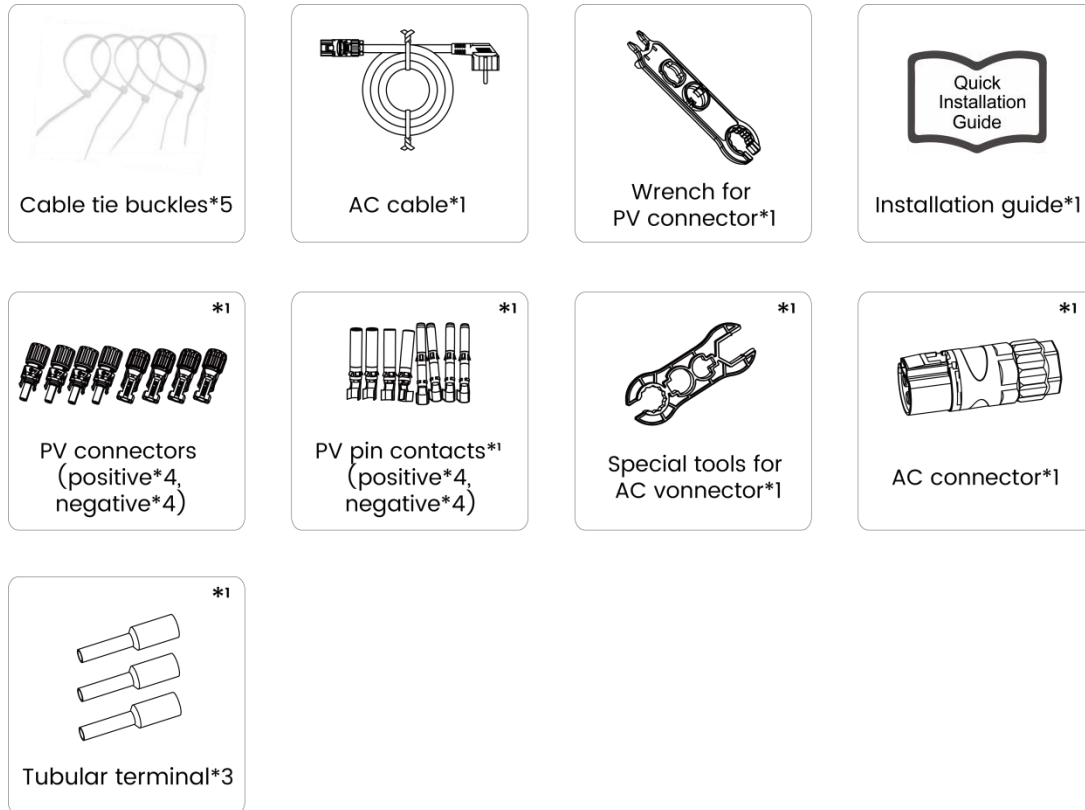
Ensure that each system has only one unit of S28-M and a maximum of four units of S28-S.



6.2 Items in the Package

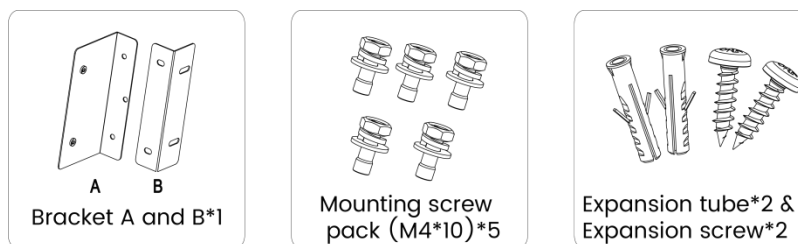
The following tools are required for installation.

For S28-M



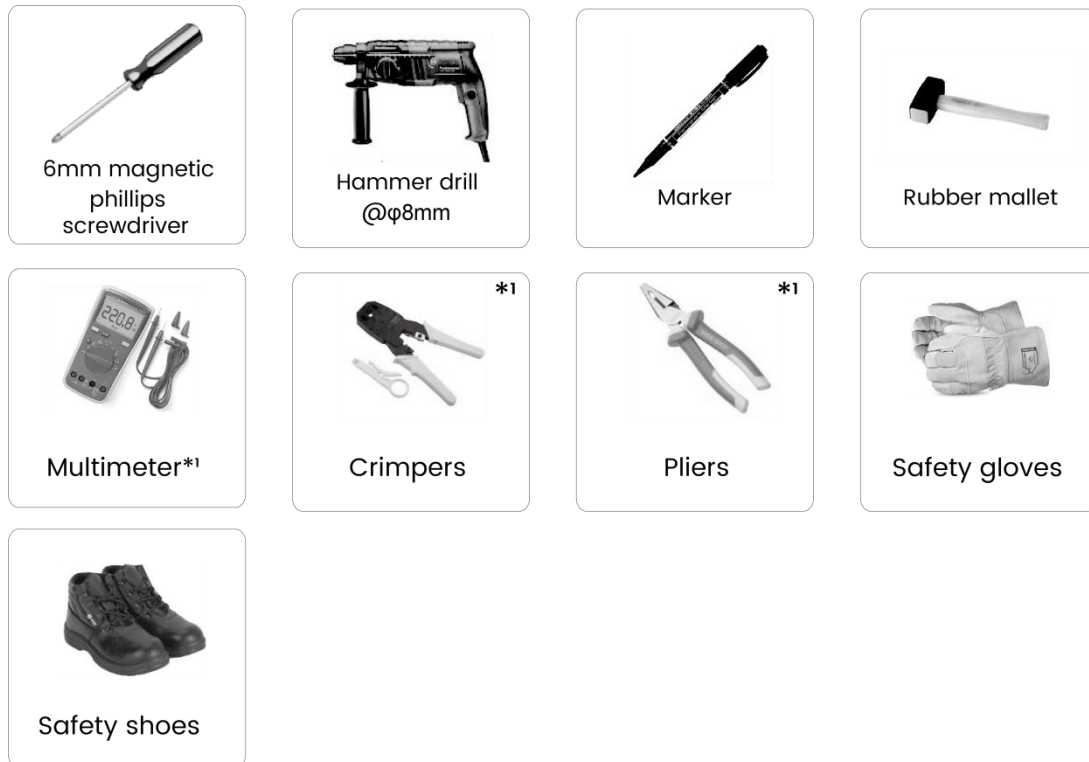
*1: Optional accessories.

For S28-S



6.3 Tools

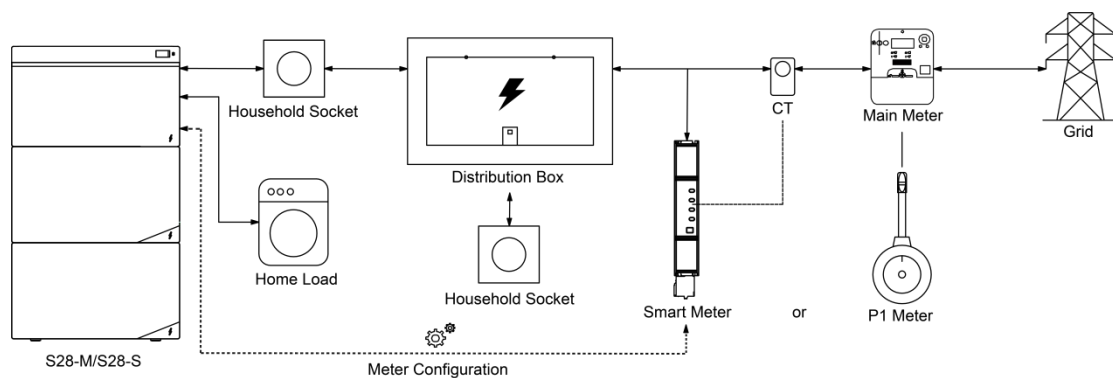
The following installation tools are required.



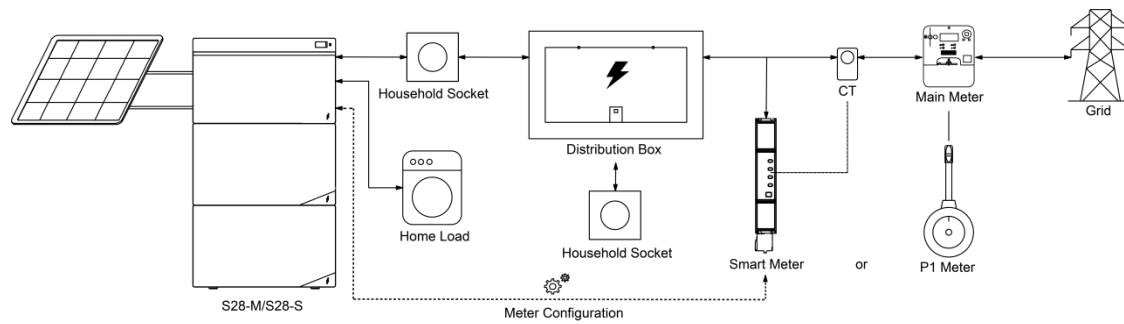
*1: For AC wiring and PV wiring.

6.4 Installation Steps

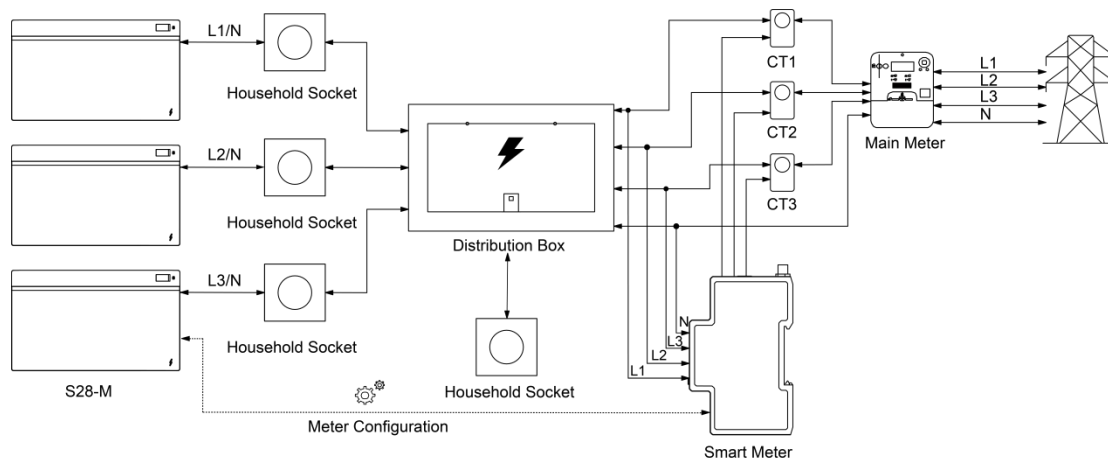
Scenario 1 - AC Model Application Scenario



Scenario 2 - PV Model Application Scenario



Scenario 3 - Parallel Application Scenario



WARNING

All the following conditions shall be met simultaneously. Otherwise, the system will report AC parallel alarm and stop charging and discharging.

- (1) No more than three systems shall be connected to the same Wi-Fi network.
- (2) Only one smart meter may be configured among the three systems. The other systems must select "No Meter" in the APP configuration.
- (3) The work mode of all three systems must be set to self-use mode, and the scheduler mode must be turned off.
- (4) It is suggested that the three systems be connected to different phases of the three-phase power supply. Connecting multiple systems to the same circuit can cause the circuit to overload, leading to potential safety risks.

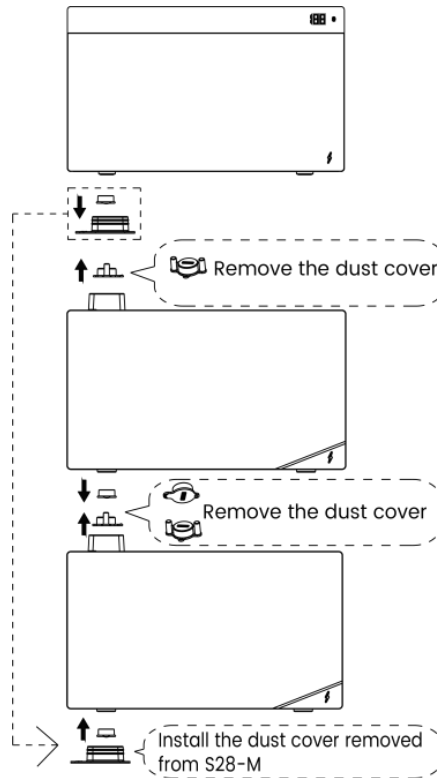
NOTE

Before installing the system, familiarize yourself with local regulations and consult a qualified professional. All installation or operation must be performed safely and in compliance with applicable laws and regulations.

The following installation steps are applicable for installing extended batteries.

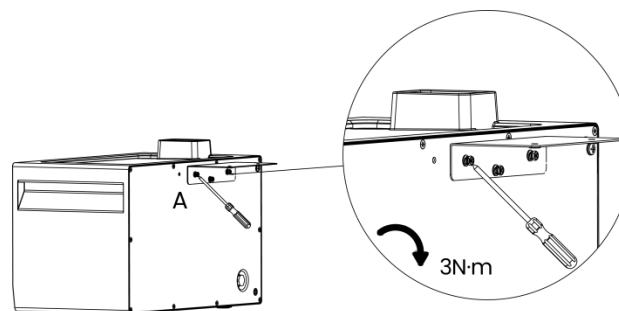
Step 1

Install the dust cover of the bottom S28-S and remove the dust covers from the other units.



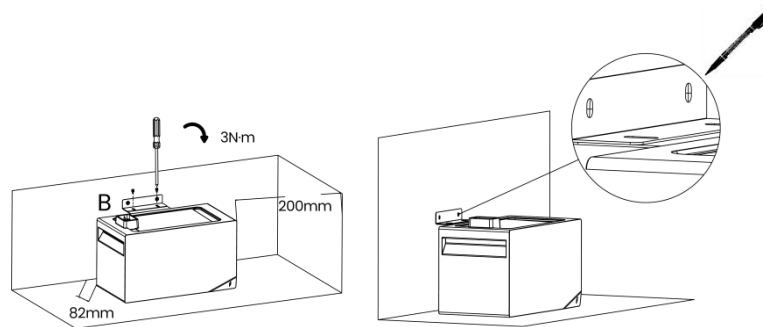
Step 2

Lock bracket A to the rear cover of the battery with screws (M4*10).



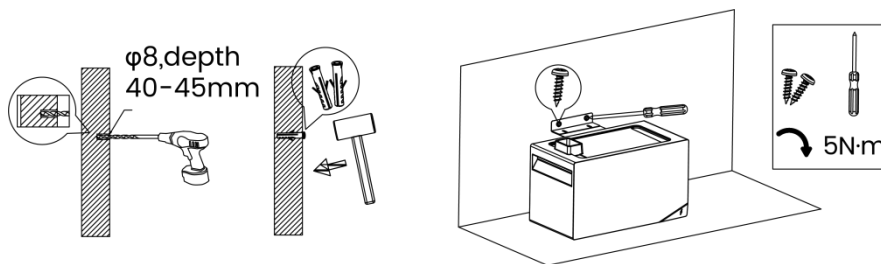
Step 3

Lock bracket B to bracket A and move the battery to a suitable position against the wall and mark the bracket holes on the wall with a marker.



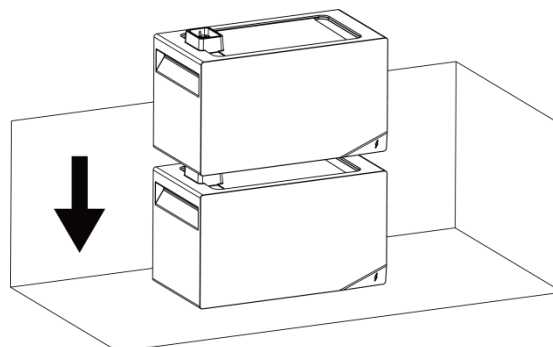
Step 4

Remove the battery before drilling. Drill $\phi 8 \times 40$ mm or deeper holes at the two marks, hammer the expansion tubes into the holes, and then use a screwdriver to fasten the two M6*40 expansion screws to the bracket B.



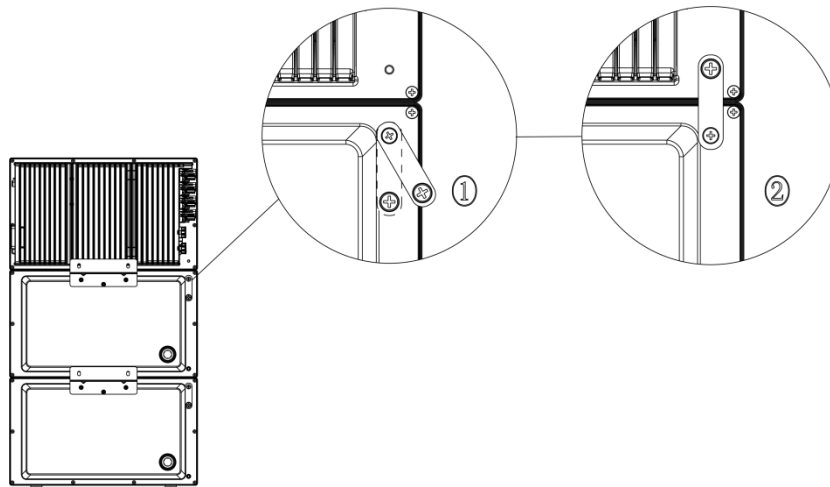
Step 5

Install the required stacked battery in the orientation shown in the figure.

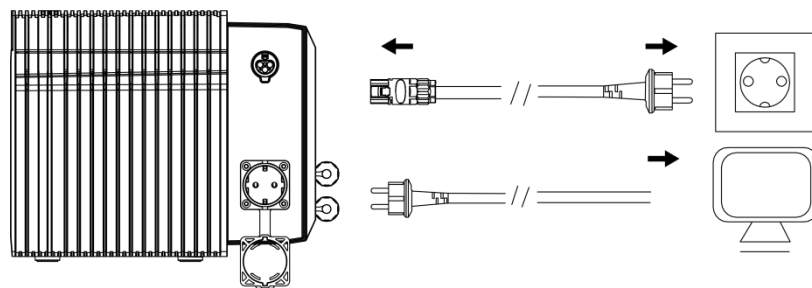


Step 6

Rotate the fixing connector to the corresponding hole of the upper battery and tighten the screw to fix it.

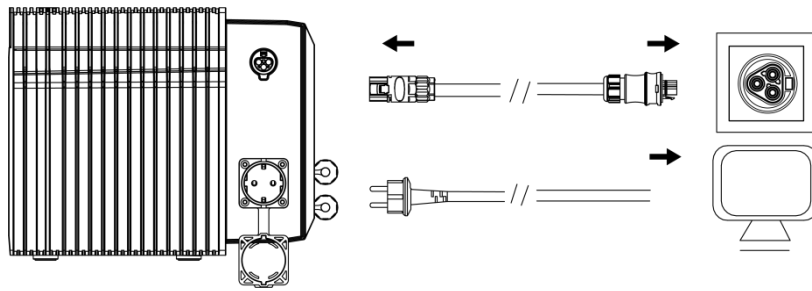
**6.5 AC Electrical Connections**

The product supports three grid-connection wiring options: via household socket connection, via dedicated plug-socket connection, and via distribution box connection.

Scenario 1 - Via Household Socket Connection**NOTE**

- (1) Applicable conditions (Germany): AC output power ≤ 800 VA, and the total power of connected PV modules ≤ 960 W.
- (2) Do not use any unofficial or unrecommended components and accessories.
- (3) For outdoor use, connect the device to an IP68-rated weatherproof power outlet.
- (4) Do not insert the plug into the coupler socket of an extension cord.
- (5) The plug shall not be inserted into a coupling socket.
- (6) Do not exceed 3.5 A a.c. for the accessory-pack AC cable.

Scenario 2 - Via Dedicated Plug-Socket Connection



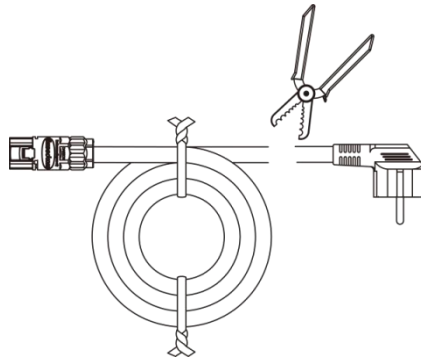
NOTE

- (1) Applicable conditions (Germany): AC output power > 800 VA, or the total power of connected PV modules: $960\text{ W} < P \leq 2000\text{ W}$.
- (2) Check that all connections are safe and correct before powering up the system.
- (3) A dedicated feed-in socket complying with DIN VDE V 0628-1 shall be used (e.g. Wieland).

The following steps must be performed by qualified professional electricians and comply with relevant local regulations.

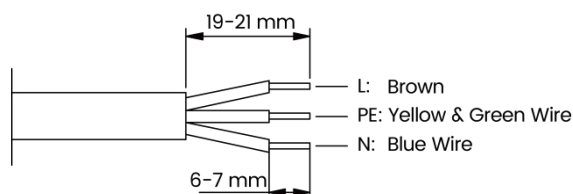
Step 1

Take out the AC wire harness from the accessory package and cut off the Schuko plug with tools.



Step 2

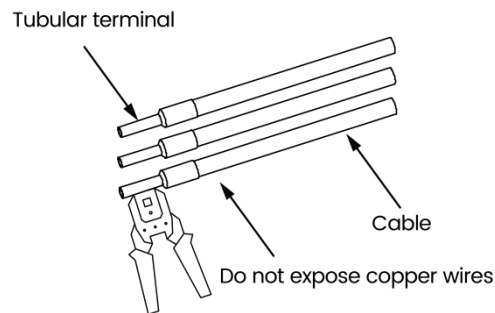
Use a wire stripper to strip the cable: strip 6-7 mm of conductor and 19-21 mm of outer insulation.



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

Step 3

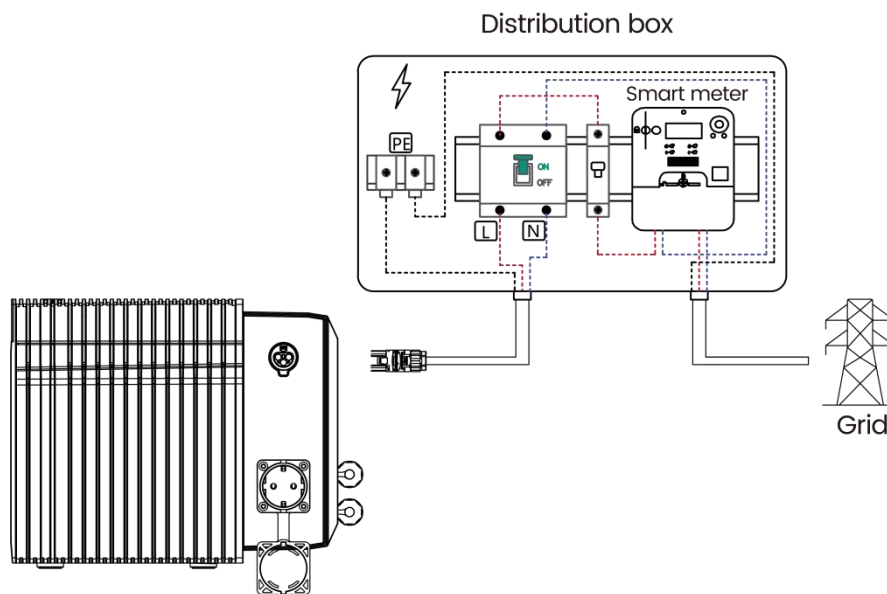
Insert the stripped wires into the tubular terminal and crimp securely using a crimping tool. Ensure the crimp is fully seated.



Step 4

For wiring instructions regarding the dedicated connectors and sockets, please refer to the instruction manual provided with the accessories.

Scenario 3 - Via Distribution Box Connection



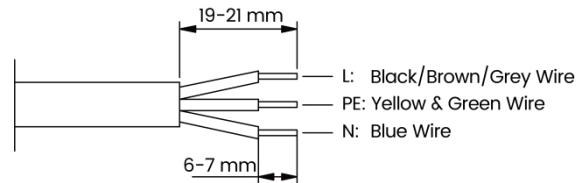
NOTE

- (1) Applicable conditions (Germany): AC output power > 800 VA, or the total power of connected PV modules > 2000 W.
- (2) Ensure system is powered off during installation.
- (3) Wear insulated gloves and turn off the main breaker.
- (4) Verify that there is no voltage at the terminals using a multimeter.
- (5) Check that all connections are safe and correct before powering up the system.

The following steps must be performed by qualified professional electricians and comply with relevant local regulations.

Step 1

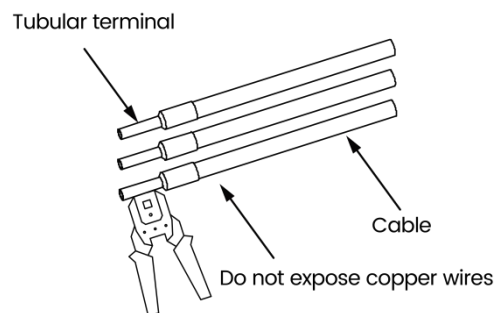
Strip the cable with a wire stripper to 6-7 mm for conductors and 19-21 mm for outer insulation, Only use conductors with cross-sectional area of 1.5~2.5mm² and outer cable diameter of 10~11.5mm.



Note: Connect the wires according to the cable colour markings.

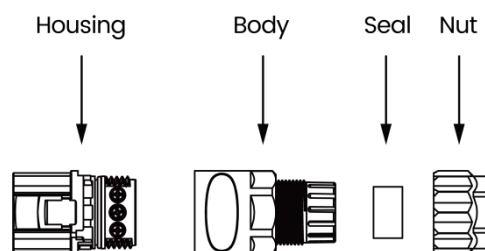
Step 2

Insert the stripped wires into the tubular terminal and crimp securely using a crimping tool. Ensure the crimp is fully seated.



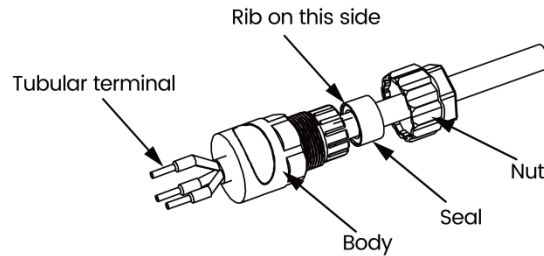
Step 3

Separate the AC connector as shown below.



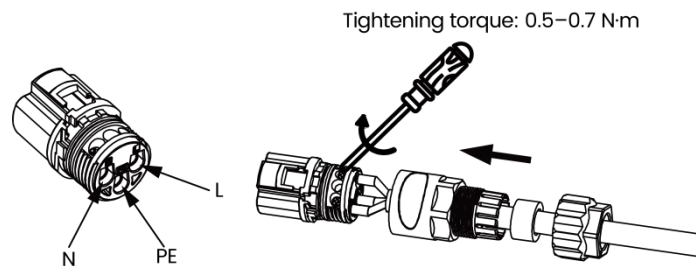
Step 4

Slide the connector accessories (nut, seal) onto the crimped cable in sequence. Ensure the ribbed side of the seal faces the connector body.



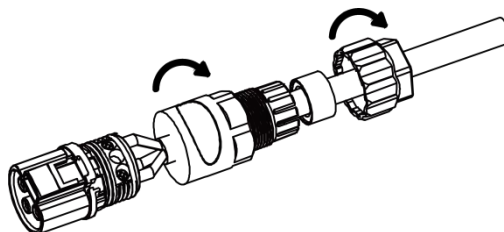
Step 5

Insert the crimped L, N and PE wires into their corresponding marked pin positions in the connector. Tighten each terminal screw with a Phillips screwdriver to a torque of 0.5~0.7 N·m.



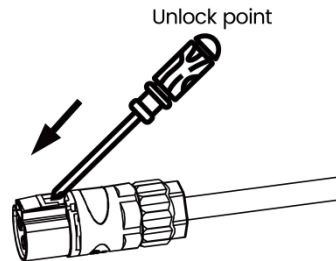
Step 6

Screw the seal into the connector body (max. 0.8 N·m), then tighten the cable gland nut onto the body (max. 1.5 N·m). Fully tighten the connector nut to maintain the IP rating.



Step 7

If you want to disconnect the AC connector: After ensuring the system is turned off, press the release tab with a tool to unlock the connector safely. Do not force or pry the connector.



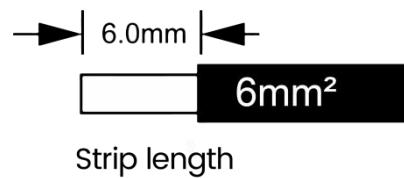
6.6 PV Electrical Connections

PV Wiring (Optional)

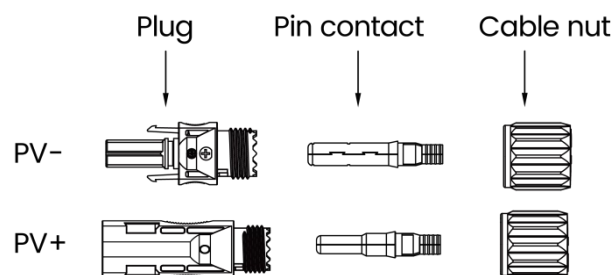
The requirements for photovoltaic wiring should be evaluated based on local regulations and on-site application conditions. All of the following procedures must be performed by a licensed electrician.

Step 1

Choose 6mm² wire to connect the PV module. Trim 6mm of insulation from the wire end.

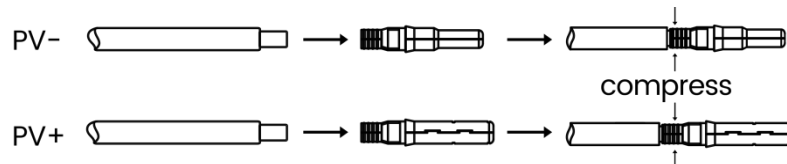
**Step 2**

Separate the DC connector (PV) as below.

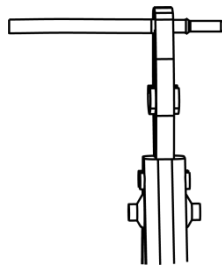


Step 3

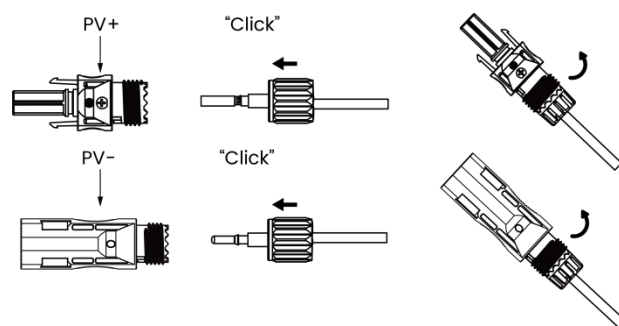
Insert stripped cable into pin contact and ensure all conductor strands are captured in the pin contact. Crimp pin contact by using a crimping plier. Put the pin contact with stripped cable into the corresponding crimping pliers and crimp the contact.

**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 inverter 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.

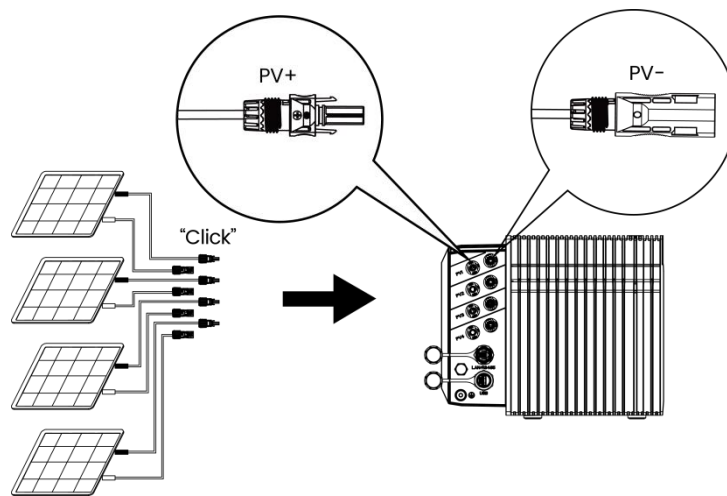
**Step 4**

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.



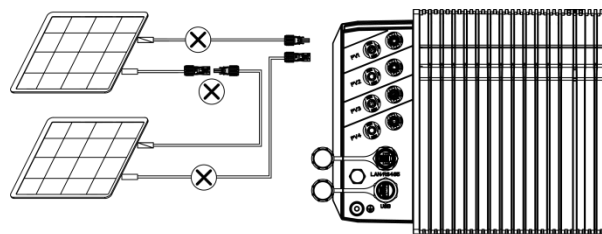
PV-Harness Connection

Connect each PV module directly to the same set of PV input ports.



WARNING

- (1) Never connect the same set of PV connectors to different sets of PV input ports.
- (2) When connecting PV modules in parallel, please check the specifications of the PV modules and ensure that the total short-circuit current does not exceed 40A.
- (3) Never connect PV modules in series because this causes the input voltage to exceed 60V and will damage the equipment.

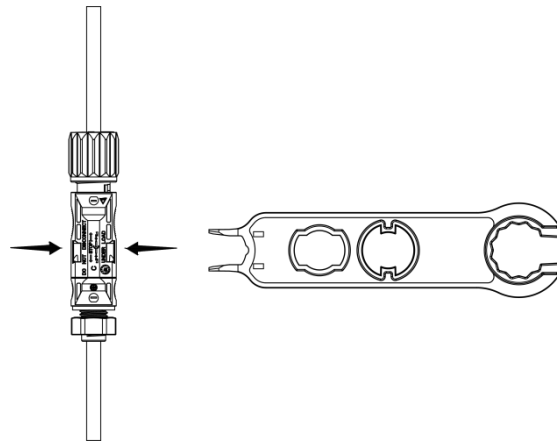


NOTE

- (1) Not recommended to use cables with a length of 3 meters or longer.
- (2) Ensure that unused PV ports on the product are sealed with waterproof caps.
- (3) Recommended that the power of a single module should be ≤ 500 W, and the number of modules connected in parallel ≤ 2 .
- (4) In Germany, if the AC-side plug device is connected to the household installation in accordance with DIN VDE 0100-551-1 and a dedicated energy socket-outlet complying with DIN VDE 0628-1 is used, the maximum total power of the connected photovoltaic system shall not exceed 2000 W.
- (5) In Germany, if the plug device for the AC-side connection to the household installation is a standard household socket, the maximum total power of the connected photovoltaic system shall not exceed 960 W.

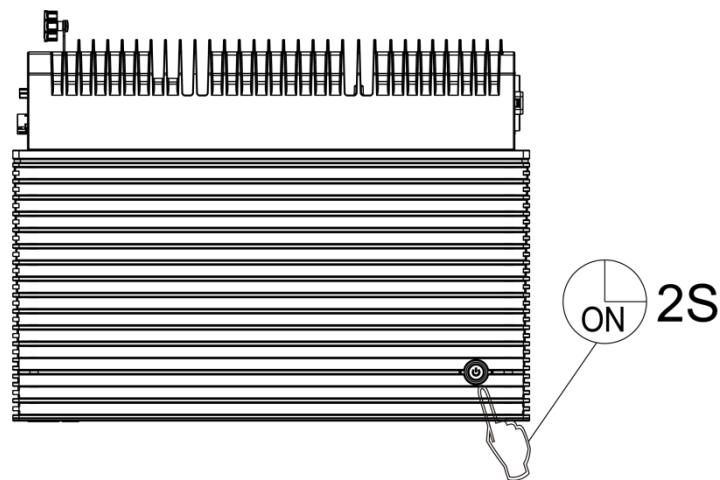
How to Disconnect PV Connector

If you want to unplug the PV connector: After ensuring the system is turned off, use the included wrench to safely remove the PV connector.



6.7 Turn on the System

Press and hold the power button on the S28-M for 2 seconds to power on and enable network pairing. If pairing is successful, the "Wi-Fi" icon on the screen will switch to the normal connected status.



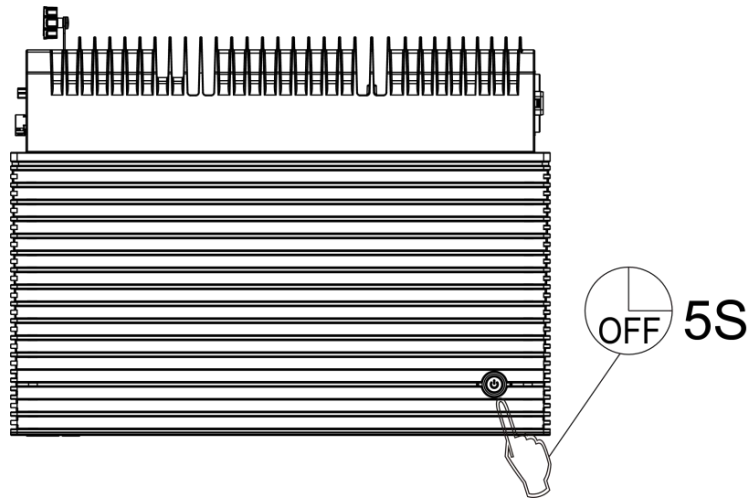
6.8 Adding an Expansion Battery

To protect yourself and the equipment, ensure the system is powered off before installing or adding expansion batteries. Installation while the system is powered on is not covered under warranty.

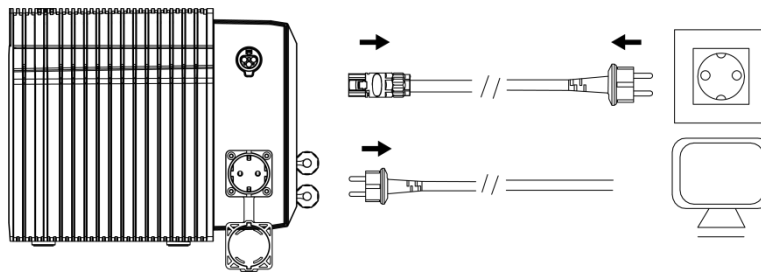
Follow the steps below to add an expansion battery to the system. The example system includes one S28-M and two expansion batteries.

Step 1: Disassemble the System.

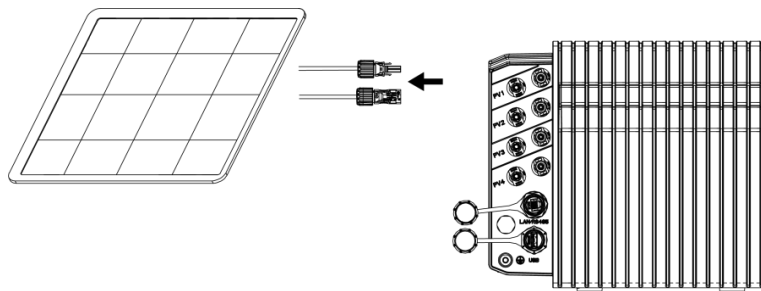
1. Ensure S28-M is turned off. To turn it off, press the power button for 5 seconds.



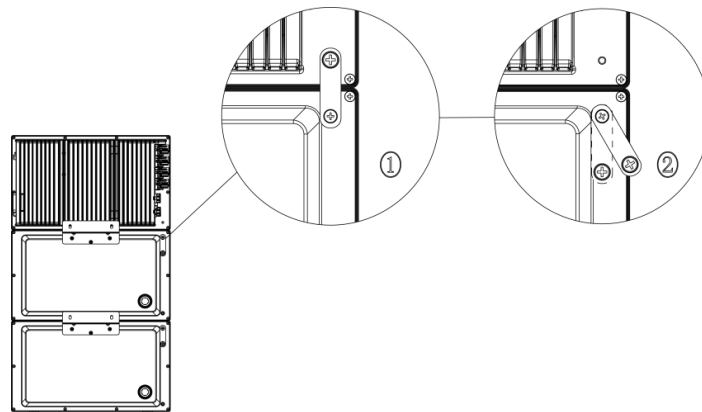
2. Unplug S28-M from the home outlet and any connected device.



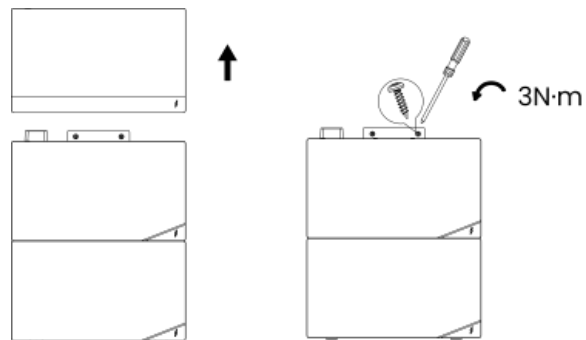
3. Disconnect S28-M-H from PV.



4. If applicable, remove the wall-mounted bracket from the first expansion battery cover below the S28-M.

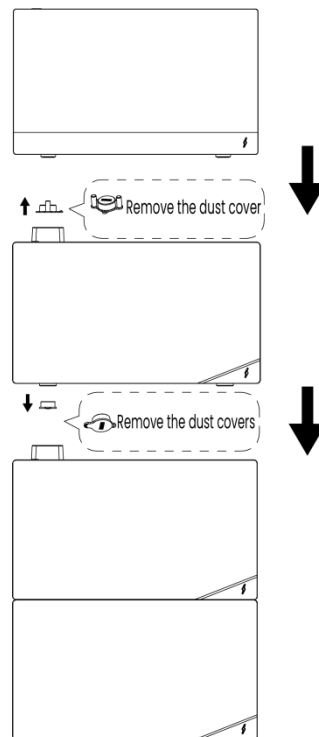


5. If applicable, remove the fixing bracket from the back cover of the extended battery.



Step 2: Mount the Expansion Battery.

1. Unfasten the screws(if applicable) and remove the dust cover.
2. Stack the new expansion battery under S28-M.
3. Follow the assembly procedures specified in Section 6.4 to complete installation.



7 APP Configuration

Use the FoxCloud2.0 application to remotely monitor and control your storage system. Please note that the user interface images displayed are for illustration purposes and may differ from your actual view based on the software version.

7.1 Download the App

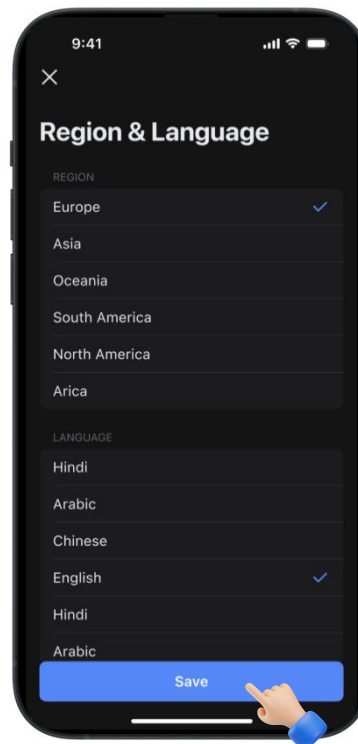
Download the FoxCloud2.0 on App Store and Google Play.



7.2 Configuration Guide

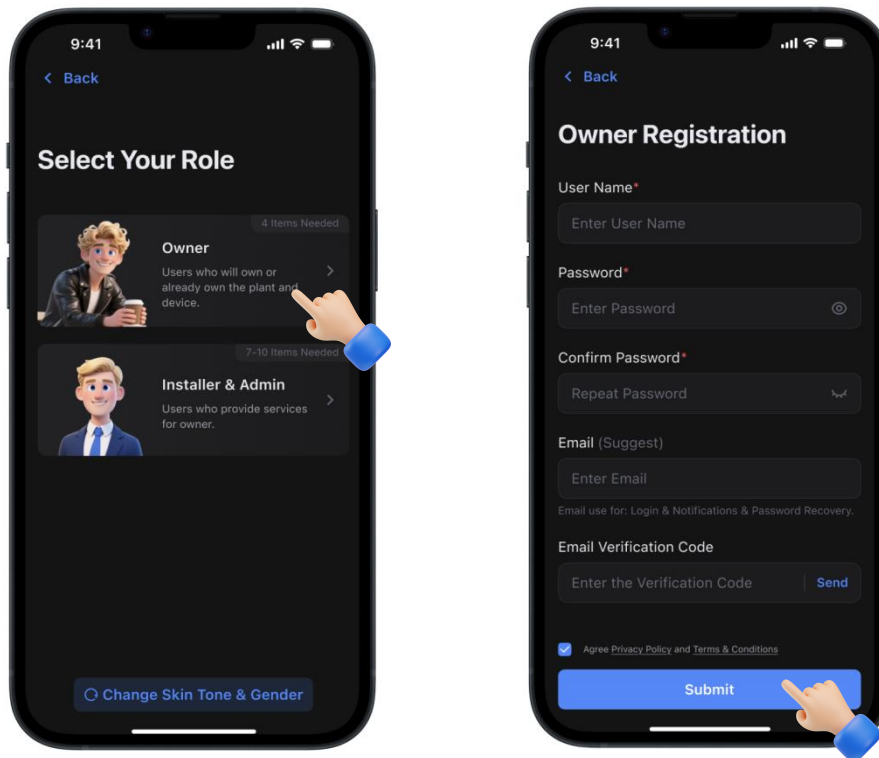
Step 1: Select your Region

Open FoxCloud2.0, tap "Register", choose your region and language, then tap "Save".



Step 2: Create an Account

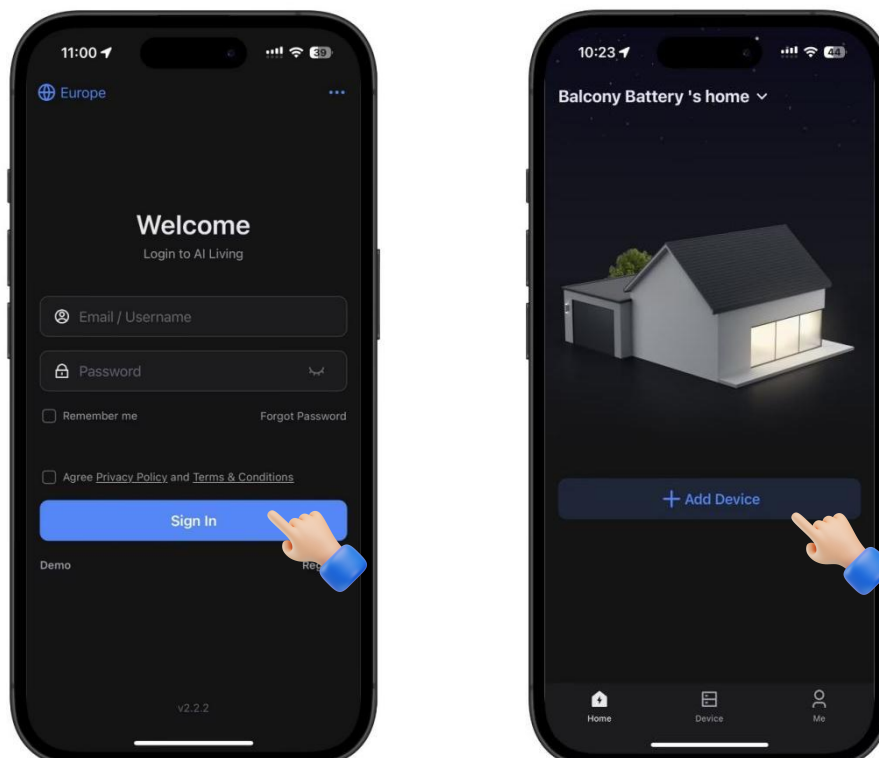
Select your role (End user or Installer), fill in the required information and tap "Submit" to finish registration.



Step 3: Sign in and Add Devices

Sign in to your account, then tab "Add Device".

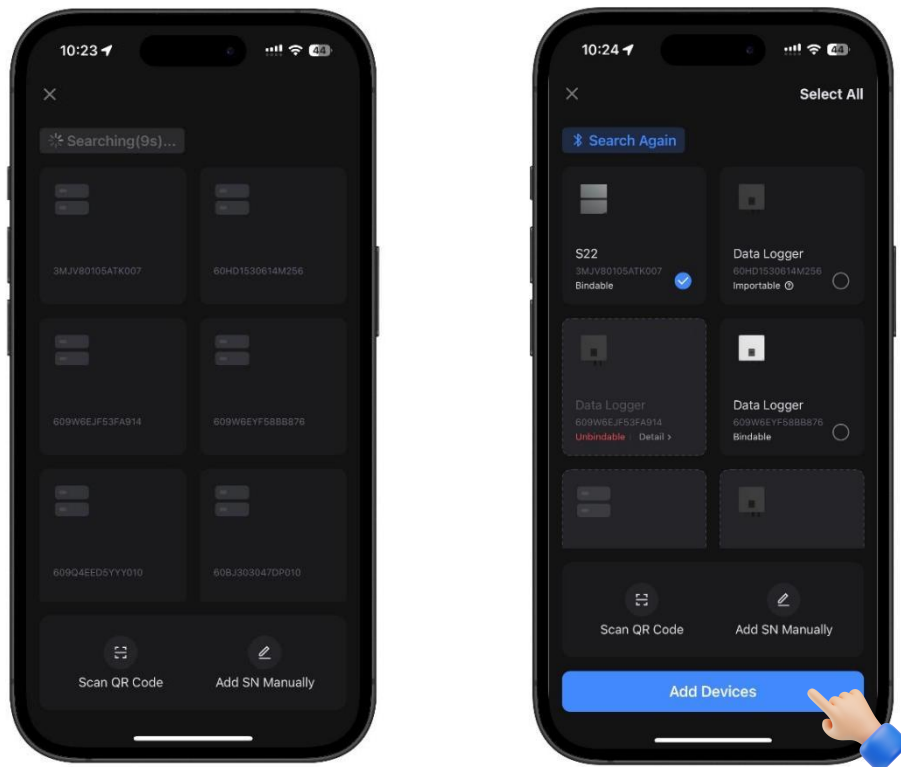
Upon completion of registration, the system will automatically create a plant named "[Username]'s home" for end users. Devices can be directly added to this ready-to-use plant.



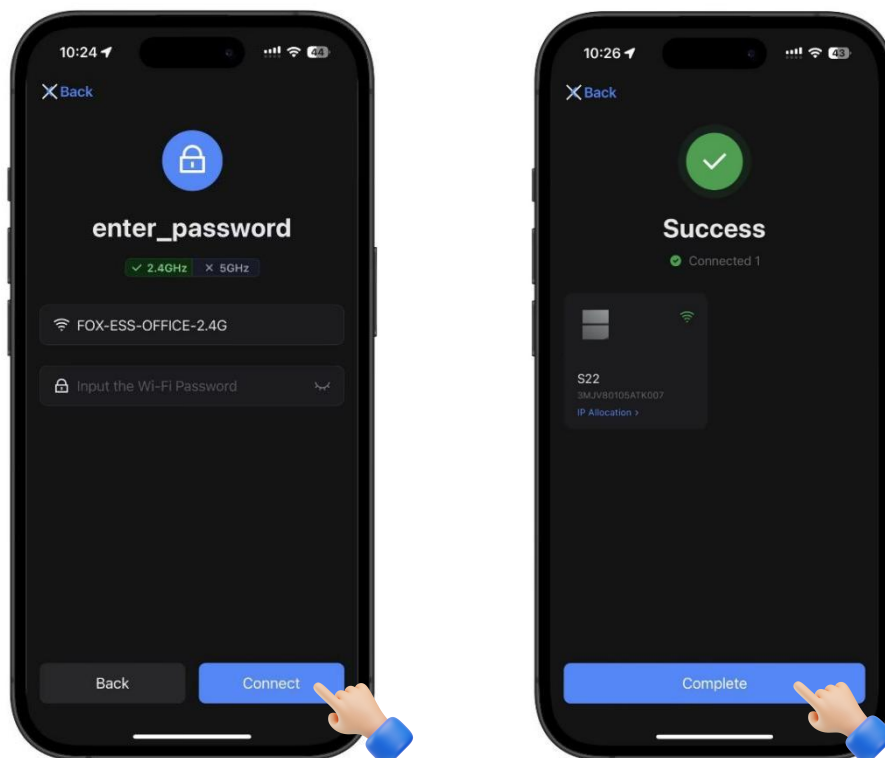
Step 4: Connect to Network

Wait for the system to search for devices.

Once the search is complete, tap "Add Devices".



Select the Wi-Fi and enter password. Please wait for a while during the connection process. After successfully adding the device(s), tab "Complete".

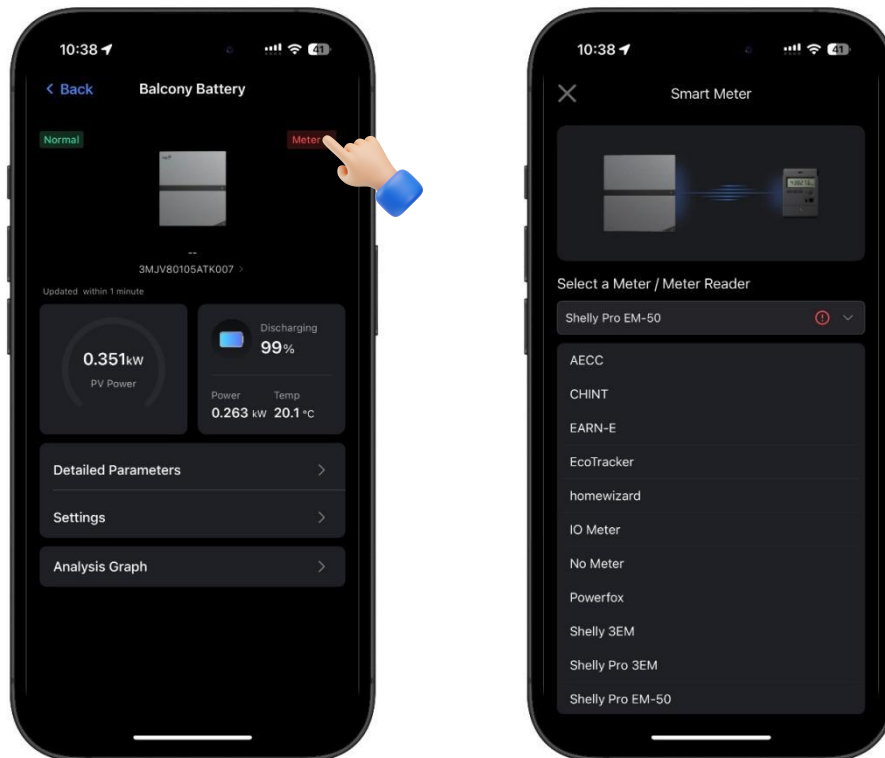


Step 5: Configure the Meter

Select a wireless meter/ meter reader. Then tab "Confirm" .

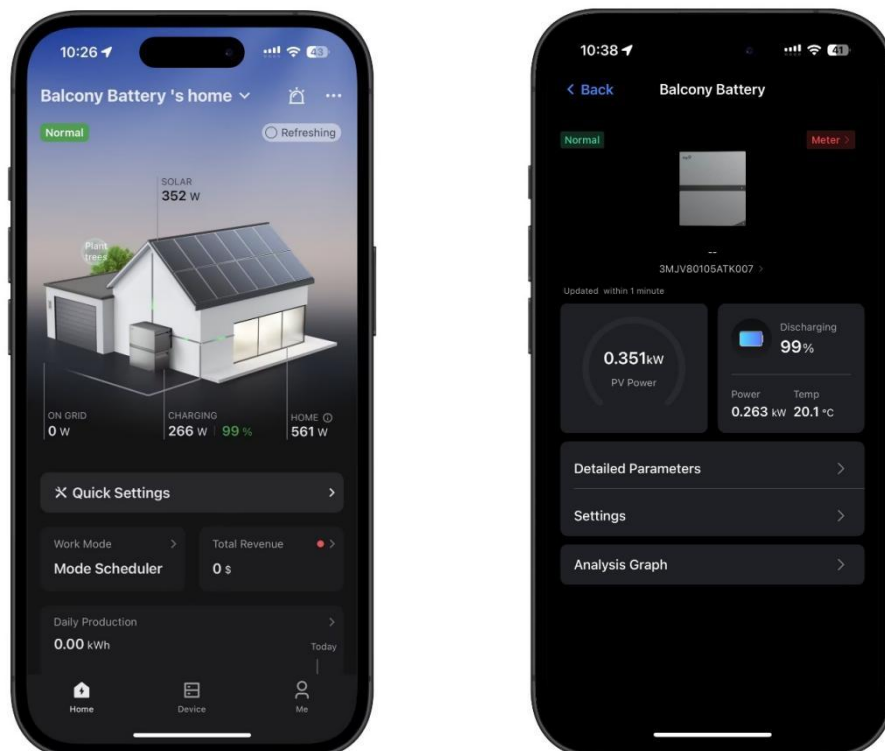
For wired smart meter, please select "No Meter".

*Compatibility with Shelly, EverHome, Homewizard,EARN-E and more.



Step 6: Finish

Device data will appear online within 5 seconds. Please wait, then swipe down to refresh the page.

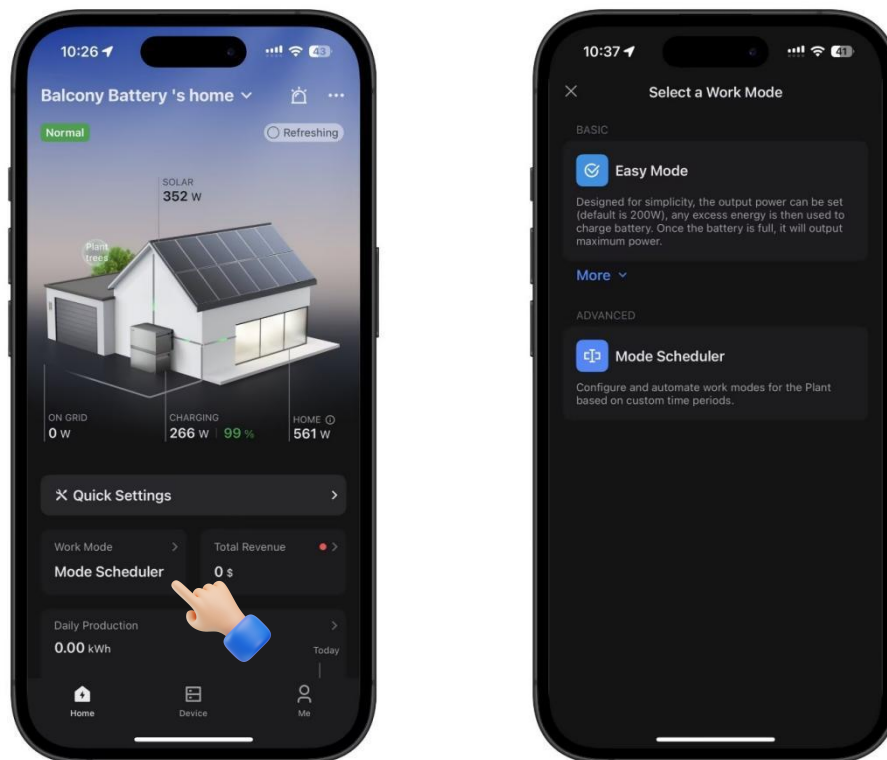


7.3 Set Operation Mode

Basic Work Modes

User can set different work modes for the system.

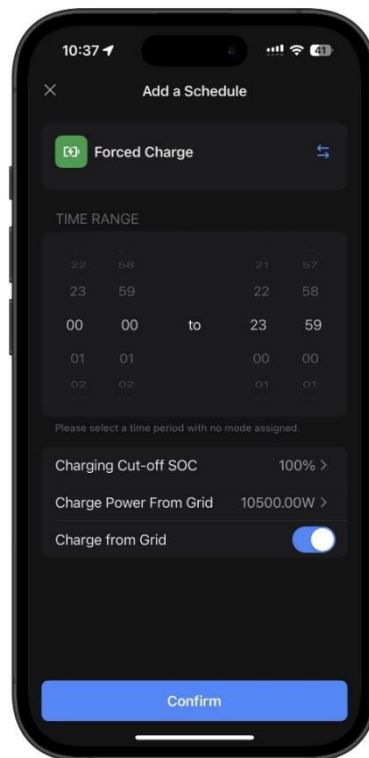
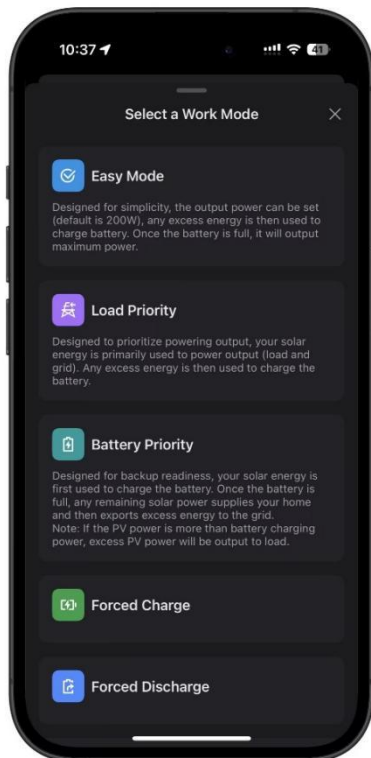
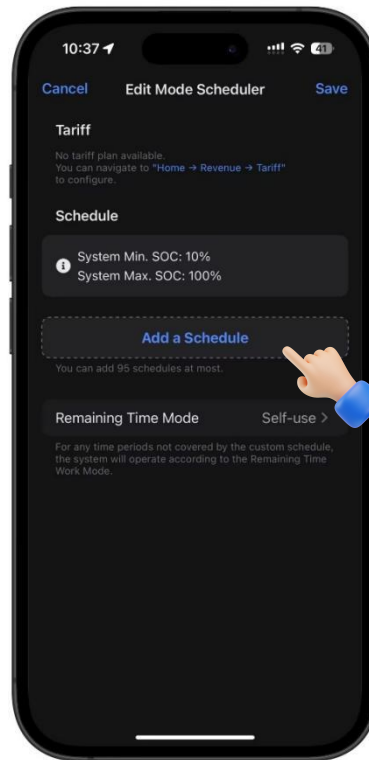
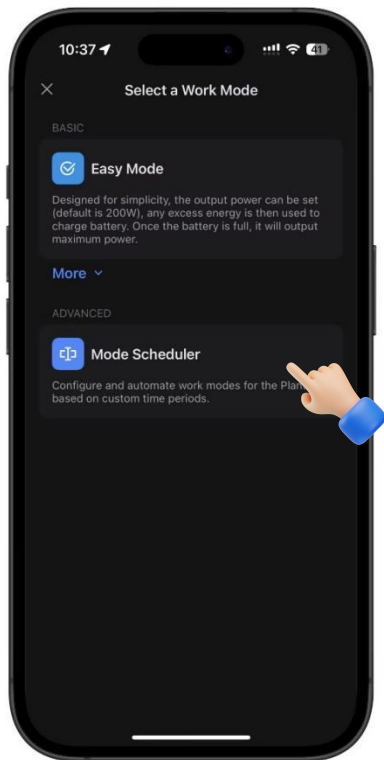
Work Mode	Description
Easy Mode	1. Easy mode is only for use when there is no electricity meter. The default virtual load power is 200W, and the virtual load power can be set; its operating logic is consistent with that of Self-use.
Load Priority	Priority: Load > Grid > Battery 1. When there is PV power, the PV power is prioritized for use by the load. After meeting the load's usage requirements, excess power is prioritized for grid connection. When there is excess PV power after grid connection, charge the battery. When the PV power is insufficient for the load power, the remaining power is supplied from the battery. 2. When there is no PV power or AC mode, the load power is provided by the battery.
Battery Priority	1. On-grid state, PV power is given priority to charging the battery. When the PV power is higher than the charging power, the remaining PV power is used by the load. When there is excess PV power, it will be fed to the grid. When the remaining power of the PV system after deducting the charging power is lower than the load power or when there is no PV power, the battery does not discharge. 2. Off-grid state, the battery discharges normally to supply power to the EPS load.
Self-use	Priority: Load > Battery > Grid 1. When there is PV power, the PV power is prioritized for use by the load. After meeting the load power, the excess power is used to charge the battery, and when there is more excess PV power, it is fed back to the grid. When the PV power is insufficient for the load power, the remaining power is supplied from the battery. 2. When there is no PV power or AC model, the load power is provided by the battery. 3. When multiple systems are paralleled on the AC side, only Self-use mode is available.



Mode Scheduler

Mode Scheduler supports configuration of multiple time periods and various operating modes. The system will run automatically in accordance with your custom time settings.

Work Mode	Description
Easy Mode	For details, refer to the Section "Basic Work Modes".
Load Priority	
Battery Priority	
Self-use	
Forced Charge	During this time period, prioritize charging the battery, and the charging power of the inverter is the set power. Battery won't discharge during charging time period.
Forced Discharge	During this time period, set the inverter to discharge at the set power. Battery won't charge during discharging time period.



8 Maintenance and Troubleshooting

8.1 Maintenance

1. Please use non flammable and non-toxic solvents to clean the product, wipe with a dry soft cloth.
2. Please recharge batteries that have been stored for more than 6 months in a timely manner.
3. For the first installation, the interval among manufacture dates of battery modules shall not exceed 3 months.
4. Regularly check whether the service environment of the battery meets the requirements, and the installation position should be far away from the heat source.
5. The battery module should be stored in an environment with a temperature range between -20°C~55°C, and charged regularly according to the table below with no more than 0.5 C(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.

Storage Environment Temperature	Relative Humidity of the Storage Environment	Storage Time	SOC
Below -20°C	/	Not allowed	/
-20~0°C	10%~90%	≤ 1 months	20%≤SOC≤50%
0~35°C	10%~90%	≤ 6 months	20%≤SOC≤50%
35~55°C	10%~90%	≤ 1 months	20%≤SOC≤50%
Above 55°C	/	Not allowed	/

NOTE

If the battery is stored over one year, 5% - 8% of the capacity may lose irreversibly.

6. Every 6 months after installation. The connection of power connector, power cable and screw are suggested to be checked. Make sure there is no loose, no broken, no corrosion at connection point. Check the installation environment such as dust, water, insect etc.

8.2 Storage with Low SOC

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

Storage in low SOC may occur in the following scenarios:

- The power button on the power control module is 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 and long-term mains failure.

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

Storage Environment Temperature	Power-Off SOC Before Storage	Maximum Charge Interval
0~35°C	$0\% \leq \text{SOC} < 5\%$	7 days

WARNING

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

8.3 How Vulnerabilities are Disclosed

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

8.4 Troubleshooting

When the red/green LED is flashing or normally on, it does not mean that the product is abnormal, it may be just an alarm or protection. Please check the fault information in the below table for the detailed faulty definition before any troubleshooting steps. In general, the alarm indication is normal without manual intervention. When the alarm triggering state is removed, product will automatically return to normal use.

Fault Code	Fault Definitions	Solutions
7181	AC parallel alarm	Ensure all the following conditions are met simultaneously: 1. No more than three systems shall be connected to the same Wi-Fi network. 2. Only one smart meter may be configured among the three systems. The other systems must select "No Meter" in the APP configuration. 3. It is suggested that the three systems be connected to different phases of the three-phase power supply. 4. The workmode of all three systems must be set to self-use mode, and the scheduler mode must be turned off.
7047	INV OT	After waiting for the battery to cool down naturally, it will automatically restore. If the fault persists for more than 3 hours, please contact the local dealer and the technical team.
7132/7124/ 7164/7156	PV OT	
7175	Battery temperature difference fault	
7194	Battery over temperature protection	
7224	Battery pre-charge resistor temperature high	
7225	Battery balance resistor temperature high	
7226	Battery cell temperature super high	Please contact the local dealer and technical team.
7173	Battery fuse fault	
7184	Battery type not match	
7231	Battery SOH low	Restart the product, if this phenomenon appears repeatedly after restoring for several times, please contact the local dealer and technical team.
7015	INV OP	
7048	INV temperature sample fail	
7052	INV BAT sample fail	
7097	INV relay2 adjoin	

S28 Series

7098	INV relay1 adjoin	Restart the product, if this phenomenon appears repeatedly after restoring for several times, please contact the local dealer and technical team.
7099	INV bypass relay adjoin	
7117/7149	MPPT BAT short current	
7121	PV2 current sensor abnormality	
7129	PV1 current sensor abnormality	
7153	PV4 current sensor abnormality	
7161	PV3 current sensor abnormality	
7180	Communication failure between battery and MPPT	
7186	Battery current sensor fault	
7187	Battery temperature sensor fault	
7188	Battery volt sensor fault	
7189	Battery other fault	
7199	Battery internal communication fault	
7200	Communication failure between battery and PCS	
7217	Battery parallel address fault	
7222	Battery AFE communication fault	
7228	Battery permanent failure of battery under voltage	
7232	Battery relay drive failure	
7240	PV4 NTC abnormality	
7247	PV3 NTC abnormality	
7256	PV2 NTC abnormality	
7264	PV1 NTC abnormality	
7014	INV CBC	Restore automatically, if this phenomenon appears repeatedly after restoring for several times, please contact the local dealer and the technical team.
7016	INV OC	
7022	DCDC pre-charge fail	
7023	DCDC start fail	
7024	PFC start fail	

S28 Series

7027	Grid OC	Restore automatically, if this phenomenon appears repeatedly after restoring for several times, please contact the local dealer and the technical team.
7028	Grid OFF	
7029	Grid UF	
7030	Grid OF	
7031	Grid UV	
7032	Grid OV	
7038	Bus HW OV	
7039	Bus UV	
7040	Bus OV	
7050	INV BAT ODC	
7051	INV BAT OCC	
7054	INV BAT DOV	
7055	INV BAT CUV	
7056	INV BAT COV	
7061	INV bypass OC	
7062	INV bypass UV	
7063	INV bypass OV	
7064	INV PLL fail	
7066	Offgrid reverse flow	
7067	Off grid start fail	
7068	Off grid OP	
7069	Off grid short current	
7070	Off grid OC	
7071	Off grid UV	
7072	Off grid OV	
7100	INV AC HW OV	
7101	INV supply UV	
7102	INV supply OV	
7103	INV CT OC	

S28 Series

7104	INV self check fail	Restore automatically, if this phenomenon appears repeatedly after restoring for several times, please contact the local dealer and the technical team.
7119	MPPT1 BAT UV	
7118/7150	MPPT BAT OC	
7120/7152	MPPT BAT OV	
7134/7126/ 7166/7158	PV OC	
7135/7127/ 7167/7159	PV UV	
7172	Battery pre-charge fault	
7177	Battery parallel power fault	
7179	Battery force charge unresponsive	
7185	Battery relay fault	
7191	Battery hardware protect	
7195	Battery discharging over current	
7196	Battery charging over current	
7198	Battery over voltage	
7221	Battery AFE UV/OV/UT/OT fault	
7223	Battery short current	Please ensure timely recharging.If the problem persists after 2-3 hours of recharge, please contact the local dealer and the technical team.
7227	Battery cell voltage super high	
7053	INV BAT DUV	Please check if the insulation of electric wires is damaged.
7197	Battery under voltage	
7112/7144	MPPT insulation fault	Wait for the battery to balance automatically. If the fault persists for more than 7 days, please contact the local dealer and technical team.
7192	Battery cell unbalance	
7193	Battery under temperature protection	Please move the product to a warmer spot or connect it to PV power before use.

9Decommissioning

9.1 Dismantling

- Press the power button to turn off the product.
- Disconnect from AC output and DC input. Wait for 5 minutes for the product to fully de-energize.
- Disconnect communication and optional connection wiring. Remove the product from the bracket.
- Remove the bracket if necessary.

9.2 Packaging

If possible, please pack the product with the original packaging. If it is no longer available, you can also use an equivalent box that can fully enclose the product and all accompanying accessories.

9.3 Storage and Transportation

Store the product in dry place where ambient temperatures are always between 0°C ~ 35°C. Take care of the product during the storage and transportation. When the product or other related components need to be disposed of, please strictly follow the local electrical equipment waste disposal requirements.

10Exclusion

The warranty shall not cover the defects caused by normal wear and tear, inadequate maintenance, handling, storage faulty repair, modifications to the product by a third party other than manufacturer or agent, failure to observe the product specification provided herein or improper use or installation, including but not limited to the following.

- Damage during transport or storage.
- Incorrect Installation of battery into product or maintenance.
- Use of product in inappropriate environment.
- Improper, inadequate, or incorrect charge, discharge or production circuit other than stipulated herein.
- Incorrect use or inappropriate use.
- Insufficient ventilation.
- Ignoring applicable safety warnings and instructions.
- Altering or attempted repairs by unauthorized personnel.
- In case of force majeure (ex: lightning, storm, flood, fire, earthquake, etc.).
- There are no warranties-implied or express-other than those stipulated herein. Manufacturer shall not be liable for any consequential or indirect damages arising or in connection with the product specification, inverter,MPPTs, battery or pack.

11 Appendix

11.1 Quality Guarantee

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

Supporting Documentation Required

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

Relevant Conditions

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

Warranty Exclusions

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

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

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

Other Provisions

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

11.2 Contact Us

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

- Fox ESS Headquarters: No.939, Jinhai Third Road, New Airport Industry Area, Longwan District, Wenzhou, Zhejiang, China.
- Wuxi R&D Center: No. 97 Huaqing Avenue, Wuxi Economic Development Zone (Intersection of Huaqing Avenue and Huayun Road)
- Wuhan R&D Center: No.5, Jiayuan Road, Hongshan District, Wuhan, Hubei, China
- Shanghai R&D Center: No.1255, Jinhai Road, Pudong New Area, Shanghai, China
- After-Sales Service Hotline: 400 1888 900
- Contact Telephone (Wenzhou): 0577-88159999
- Contact Telephone (Wuxi): 0510-68092998
- Contact Us: info@fox-ess.com
- Contact Us (EV Charger): ev@fox-ess.com
- After-Sales Service: service@fox-ess.com