



HM6 Residential Energy Storage System User Manual

(V-B01)



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Made in China

CE RoHS

ESY Sunhome Co., Ltd

ESY SUNHOME started out as a lithium battery business, powered by cutting-edge battery protection systems and a proficient Research & Development team. The founder, Mr. Lee, recognized the absence of energy storage choices available to households worldwide and was enthusiastic about combining photovoltaic energy storage solutions with lithium batteries. With this vision in mind, the team embarked on the development and testing of PV home energy storage products, forming an efficient, highly qualified team of Research & Development, manufacturing, and quality control professionals with distinguished backgrounds in various fields of technology. After two years of intensive effort, the team successfully developed and tested PV home energy storage products, resulting in the official launch of the HM6 series storage system products on January 14th, 2023. ESY SUNHOME now has branches in Sydney, Australia and Munich, Germany, with a long-term objective of becoming a global brand.



Mission:

To provide safe and high quality new energy products (batteries and power supplies) for every family.

Vision:

Take the sun home.

Core Values:

Unity and hard work;
 Pragmatic and far-reaching;
 Innovative research and development;
 Scientific and intelligent manufacturing;
 Creating value for customers;
 Creating opportunities;
 Contributing to society.

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1 Precautions

1.1 General Statement

Statement

This manual applies to the HM6 residential energy storage system. Please read this manual carefully and strictly adhere to all safety instructions during installation, operation, and maintenance. Esysunhome will not be liable for any consequences arising from noncompliance with the general safety requirements or safety standards of design, production and use.

It is crucial to use this product under the specified design conditions, as any damage to parts, personal injury, or property loss resulting from improper usage will not be covered by the warranty. In addition, during installation, usage, and maintenance, all local laws and regulations must be observed. The safety instructions in this manual are supplementary to local laws and regulations.

Esysunhome reserves the right not to assume any responsibility for consequences arising from the following:

- Expiration of free warranty of the product and its parts;
- Damage caused during transportation;
- Noncompliance with the installation, modification or use of national standards;
- Noncompliance with the installation and use instructions outlined in this manual;
- Operation under harsh conditions that are not specified in this manual;
- Failure or damage caused by installation, repair, modification, or disassembly by non-authorized service personnel;
- Energy storage system failure or damage caused by the use of non-standard components or software or those that are not provided by our company;
- Noncompliance with relevant international standards for design, installation and use;
- Device damage caused by abnormal natural conditions (force majeure such as lightning strikes earthquakes, fire and storms).

1.2 Requirements for Installation and Maintenance Personnel

- The personnel to be dispatched for installing or maintaining Esysunhome's devices are fully trained and knowledgeable of all safety precautions and capable of performing all operations correctly.
- Device installation, operation and maintenance must be carried out by professionals or trained personnel.
- Safety facilities must be dismantled and inspected by professionals.
- Devices or components (including software) may be replaced by professionals or authorized personnel.

NOTE

Professionals: refer to the personnel who have received training or are experienced in device operation and have professional knowledge about the sources and extents of potential hazards during device installation, operation, and maintenance.





Trained personnel: refer to the personnel who have received technical training or have the necessary experience, and are aware of possible hazards in some operations and able to take protective measures to minimize hazards to themselves and others.

Operators: refer to the personnel who have access to devices except trained personnel and professionals.



1.3 Important Safety Information






- Before device installation, operation and maintenance, please read this manual carefully.
- Make sure that the product is effectively grounded before operation. The grounding resistance should be less than 0.1Ω.
- Install all terminals of the energy storage system in accordance with the instructions in this manual.
- Follow the corresponding signs and symbols on devices during operation.
- The battery terminal may be live during operation. If the battery is not connected, please apply pearl wool inside the protective cover as a protective measure.
- The grid-connected electricity selling of the energy storage system must be approved by the local power department, or compliant with the relevant provisions of national and local laws and regulations. It must be done by qualified personnel.
- Use a dry powder extinguisher in case of fire. Do not use a liquid extinguisher.

Danger signs

	Danger! Unauthorized removal of necessary protection, improper use, incorrect installation, or incorrect operation may result in serious personal injury or equipment damage. Transportation, installation, startup, disassembly, and maintenance must be carried out by qualified or trained personnel.
	Danger! Prior to attempting any repair, electrical installation, or accessing any live parts, make sure that the power supply is cut off and wait for 5 min until internal capacitors are discharged to a safe voltage.
	Danger! Do not connect the N wire of the load to that of the power grid, or connect the power grid cable to the output end of the load. Doing so may result in serious damage to the product and load.
	Danger! The external CT must be connected to the power supply properly and securely before use. Failure to do so may result in high voltage at the CT ports.

Warning signs

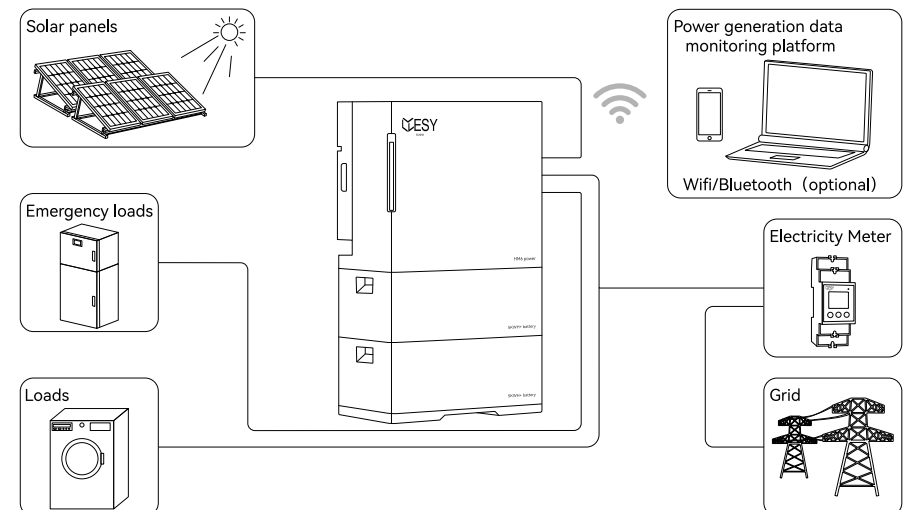
	Warning! Installation must fully comply with national and local laws and regulations.
	Warning! Since the non-isolated topology is applied on the PV and grid side of the power supply, please use monocrystalline silicon or polysilicon battery panels (the negative PV must not be grounded).

	Warning! When exposed to sunlight, the PV array will generate a high DC voltage. For installation safety, please make sure that the entire PV panel is covered with an opaque cover before it is connected.
	Warning! Make sure that the input voltage of the power's PV port never exceeds the maximum value. Exceeding the maximum voltage may result in permanent damage to the power supply or other losses, [please consider the influence of temperature; and the voltage of the PV module is about 15% higher in winter at -20°C compared to summer at 30°C]. Do not connect any energy source other than the PV module at the PV input port.
	Warning! Do not change the internal circuit of the power supply without permission.
	Warning! Prior to power grid connection, the product must be securely grounded. Please follow the instructions in this manual. Improper operation may cause serious losses.
	Warning! Please install a lightning protection device in the power distribution box.

2 Product Introduction

2.1 Overview

The ESYSUNHOME HM6 smart home system is a 6kW solar storage charging system. It integrates power, battery, and the internet, and can connect to the grid, photovoltaic panels, and the Internet of Things to provide electricity for homes, small supermarkets, farms, and other places.



2.1.1 Structural Features

- The vertical all-in-one structure can be installed quickly without complex wiring.
- The battery capacity ranges from 5 KWH to 30 KWH. The number of stacked batteries can be increased or decreased quickly and easily to meet the power demands of different scenarios, providing quick and easy adaptability.
- The design of the power supply seamlessly combines both security and aesthetics, featuring a simple and stylish look with a linear light bar and no visible buttons. Additionally, the power supply is waterproof with an IP66 rating, enhancing safety and increasing its overall lifespan.
- The power supply uses natural heat dissipation to reduce the noise from air cooling. The noise measured at 1m is not greater than 25dB in the non-alarm mode.

2.1.2 Functional Features

- This product has a variety of working modes (e.g. normal mode, emergency mode and electricity selling mode) to meet the needs of different scenarios.
- The detailed energy management solution is conducive to more economical and efficient use of solar energy.
- When used with PV panels, this product utilizes solar energy to generate power, which can then be stored and used for household needs.
- Support grid-connected and off-grid modes. This product can be used as a backup emergency power supply, which can be immediately turned on in case of power outages.
- The working mode of the energy storage system can be changed by AI cloud depending on the power grid, load, electricity price and weather, to ensure a stable power supply.
- PV power generation, energy storage in batteries and peak-to-valley regulation of electricity consumption can result in reduced electricity costs and added value.
- The ESYSUNHOME APP allows for real-time monitoring of power generation and consumption, as well as the setting of operating modes, enabling users to monitor and control the system's operation.

2.2 Product Parameters

2.2.1 Parameter of Power Supply

Model	ESYSUNHOME HM6
Rated power	6000W
Operating mode	Monitoring software
PV input	
Max. input power	8000 W
Rated input voltage	360 Vd.c.
Max. input voltage	550 Vd.c.
Starting voltage	150 Vd.c.
Minimum operating voltage	100 Vd.c.
MPPT voltage range	100 Vd.c.~540Vd.c.
MPPT voltage range (full load)	250 Vd.c.~450 Vd.c.
Max. input current	15 Ad.c./15 Ad.c.
PV short circuit current	20 Ad.c./20 Ad.c.
Number of MPPTs	2
Battery input/output rating	
Battery type	Li-ion
Rated voltage	51.2 Vd.c.

Battery input/output rating	
Battery voltage range	40.8 Vd.c.~57.6 Vd.c.
Max. charging power	5000 W
Max. charging current	100 Ad.c.
Max. discharging power	6000 W
Max. discharging current	120 Ad.c.
Backup load output rating	
Rated output voltage	230 Va.c L/N/PE
Rated output frequency	50/60 Hz
Rated output power	6000 W
Max. apparent output power	6000 VA
Max. output current	26.09 Aa.c.
Efficiency	
Maximum efficiency	97.8%
MPPT efficiency	99.9%
Grid rating	
Rated voltage	230 Va.c L/N/PE
Rated frequency	50/60 Hz
*Rated input/output power	6000 W
*Max. apparent power	6000 VA
*Max. output/input current	26.09 Aa.c.
Power factor range	0.8 leading~0.8 lagging
* Local grid parameters	
Germany	4600 W/VA 230 Va.c. 20.00 Aa.c. 50 Hz
Italy	6000 W/VA 230 Va.c. 26.09 Aa.c. 50 Hz
Belgium	5000 W/VA 230 Va.c. 21.74 Aa.c. 50 Hz
Australia	6000 W/VA 230 Va.c. 26.09 Aa.c. 50 Hz
South Africa	4600 W/VA 230 Va.c. 20.00 Aa.c. 50 Hz
General parameter	
Protection rating	Class I
Ingress protection rating	IP66
Ambient temperature range	-25 °C to 60 °C (Derating above 45 °C)
Altitude	≤4000 m
Others	
Protection	Over/under-voltage, over /under-frequency, overload, short circuit, over-temperature, reverse polarity of PV module and battery, leakage current, insulation resistance, anti-island protection
Topology	High frequency isolation (for battery)
Communication mode	WiFi/GPRS (optional), USB/RS485 (optional)
Cooling mode	Natural cooling

Others	
Installation	Installation on ground
Relative humidity	0~100%
Storage temperature	-25~70 °C
Noise level at 1m	≤25 dB
Size(LxWxH)	600 mm×305 mm×530 mm
Gross weight	42.1 kg
Net weight	36.4 kg

2.2.2 Parameters of 5KWH+ Residential Energy Storage Battery

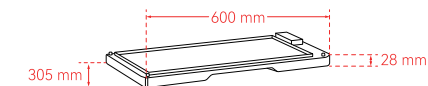
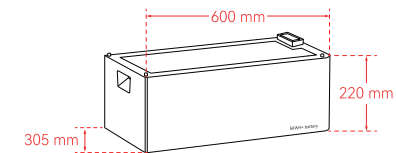
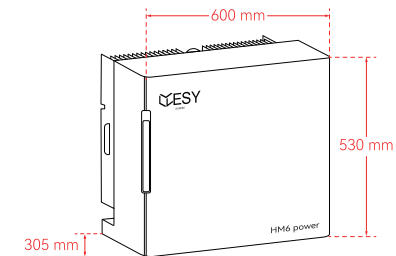
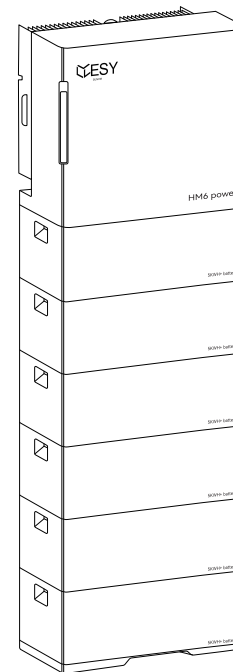
Model	ESYSUNHOME 5KWH+
Rated voltage	51.2 Vd.c.
Voltage range	40.8Vd.c.~57.6Vd.c.
Max. charge current	95 Ad.c.
Max. discharge current	95 Ad.c.
Rated capacity	100 Ah
Rated energy	5.12 kWh
Operating temperature	-20~58°C
Battery type	IFpP
Battery designation	IFpP48/125/173[1P16S]M/-20+40/95
Encoding rule	EA.LESY.5kWh-16A0
Protection rating	IP66
Protection class	I
Standard temperature range for charging	3 °C~55 °C
Standard temperature range for discharging	-20 °C~58 °C
Size(LxWxH)	600 mmx305 mmx227 mm
Gross weight	52.1 kg
Net weight	49.55 kg

2.2.3 Module Models

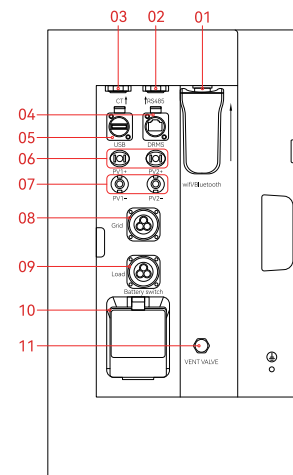
Module Model	HM6-05	HM6-10	HM6-15
Number of batteries	1	2	3
Maximum output power	5	6	6
Battery capacity (kWh)	5.12	10.24	15.36
Size (LxWxH) (mm)	600x305x778	600x305x998	600x305x1218
Weight (Kg)	93	143	193
Module Model	HM6-20	HM6-25	HM6-30
Number of batteries	4	5	6
Maximum output power	6	6	6
Battery capacity (kWh)	20.48	25.6	30.72
Size (LxWxH) (mm)	600x305x1438	600x305x1658	600x305x1878
Weight (Kg)	243	293	343

2.3 Appearance

2.3.1 Outline Dimensions



2.3.2 Port Description

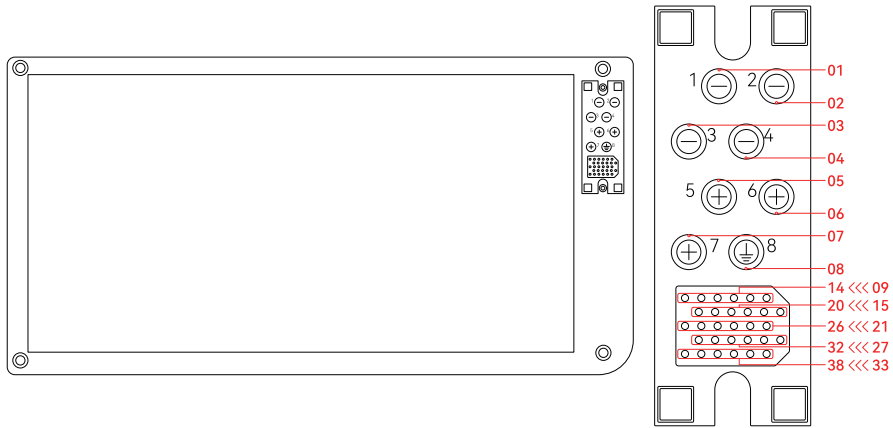


Lateral marks on the Power Supply chassis

Purpose of each lateral mark on the Power Supply chassis

S/N	S/N	Purpose
01	WiFi-IOT Pro port	Optional
02	RS485 port	Upper computer connection to control the product
03	CT port	Connection of external CT or electricity meter signal
04	DRM port	DRM port
05	USB port	USB upgrade interface
06	Positive PV port	Positive PV terminal connection
07	Negative PV port	Negative PV terminal connection
08	Grid port	Grid connection
09	Load port	Load connection
10	Battery Switch	Battery switch
11	VENT VALVE	Pressure relief valve

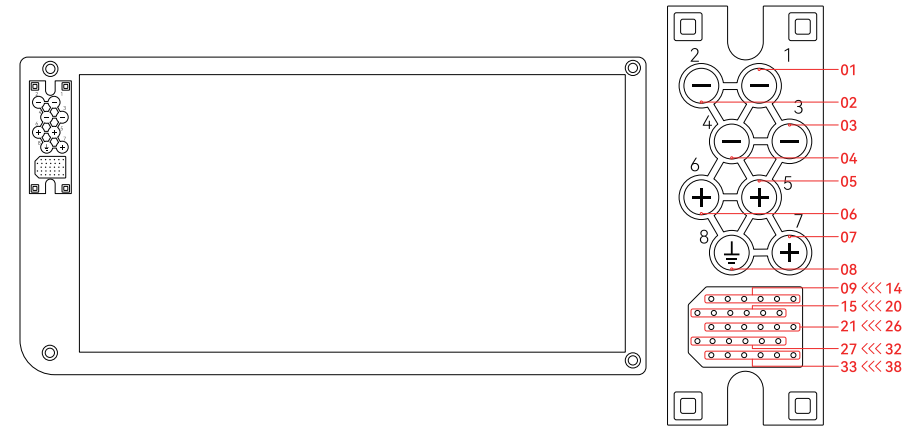
Schematic diagram of top port arrangement for 5KWH+ household energy storage battery.



S/N	Mark	Purpose
1	PACK-	Battery cathode
02	PACK-	Battery cathode
03	PACK-	Battery cathode
04	PACK-	Battery cathode
05	PACK+	Battery anode
06	PACK+	Battery anode
07	PACK+	Battery anode
08	Ground wire	Ground wire of the chassis
09	RS485-B2	Battery and power supply communication port
10	RS485-A2	Battery and power supply communication port
11	GND	Ground wire
12	GND	Ground wire
13	SW-air switch	Signal cable for enabling battery discharge
14	SW-air switch	Signal cable for enabling battery discharge
15	RS485-A2	Battery and power supply communication port
16	RS485-B2	Battery and power supply communication port

S/N	Mark	Purpose
17	NC	Reserved interface
18	GND	Ground wire
19	CAN-H2	Communication Interface
20	CAN-H2	Communication Interface
21	CAN-L2	Communication Interface
22	CAN-L2	Communication Interface
23	NC	Reserved interface
24	NC	Reserved interface
25	NC	Reserved interface
26	GND	Ground wire
27	CAN-H1	Communication Interface
28	CAN-H1	Communication Interface
29	CAN-L1	Communication Interface
30	CAN-L1	Communication Interface
31	NC	Reserved interface
32	NC	Reserved interface
33	12V+	12V+
34	12V+	12V+
35	NC	Reserved interface
36	NC	Reserved interface
37	GND	Ground wire
38	GND	Ground wire










Schematic diagram of bottom port arrangement for 5KWH+ household energy storage battery.



S/N	Mark	Purpose
01	PACK-	Battery cathode
02	PACK-	Battery cathode
03	PACK-	Battery cathode
04	PACK-	Battery cathode
05	PACK+	Battery anode
06	PACK+	Battery anode
07	PACK+	Battery anode
08	Ground wire	Ground wire of the chassis
09	RS485-B2	Battery and power supply communication port
10	RS485-A2	Battery and power supply communication port
11	GND	Ground wire
12	GND	Ground wire
13	SW-air switch	Signal cable for enabling battery discharge
14	SW-air switch	Signal cable for enabling battery discharge
15	NC	Reserved interface
16	NC	Reserved interface
17	NC	Reserved interface

S/N	Mark	Purpose
18	NC	Reserved interface
19	NC	Reserved interface
20	NC	Reserved interface
21	NC	Reserved interface
22	NC	Reserved interface
23	NC	Reserved interface
24	NC	Reserved interface
25	NC	Reserved interface
26	NC	Reserved interface
27	NC	Reserved interface
28	NC	Reserved interface
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35	NC	Reserved interface
36	NC	Reserved interface
37	NC	Reserved interface
38	NC	Reserved interface

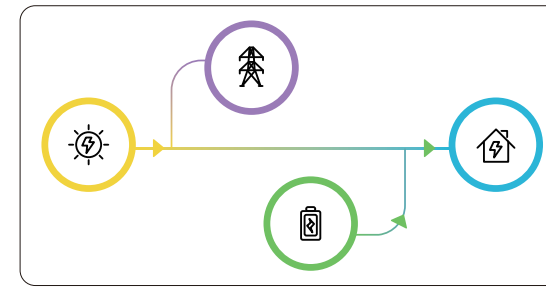
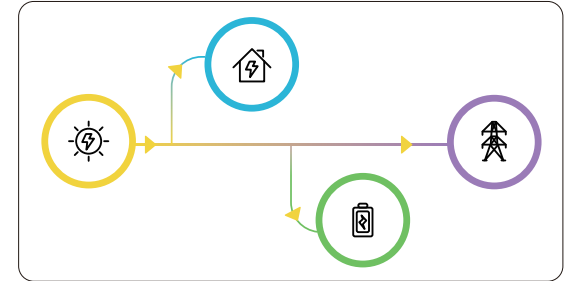
2.3.3 Nameplate Identification

	ESYSUNHOME: brand HM6: model, indicating that the power supply specification is 6KW
	ESYSUNHOME: brand 5KWH+: model, indicating that the battery specification is 5KWh
	Pay attention to safety.
	Pay attention to high surface temperature.
	Be cautious of electric shock.
	Prior to attempting any repair, electrical installation or accessing any live parts, make sure that the power supply is cut off and wait for 5 min until internal capacitors are discharged to a safe voltage.
	Professional recycling is required.
	Please read this manual before using the product.
	Compliant with CE safety certification standards.

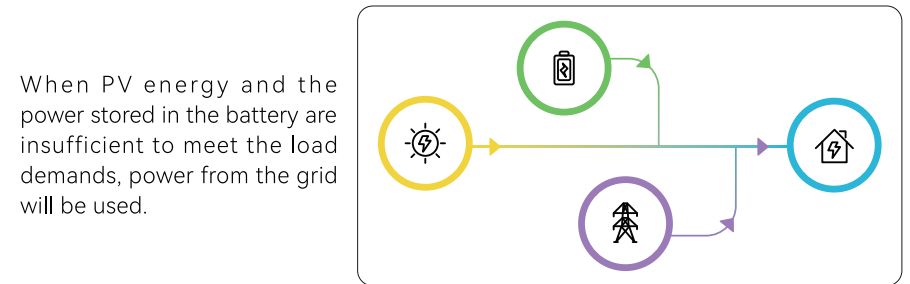
2.4 Working Modes

2.4.1 Normal Mode

When there is sufficient PV energy, priority is given to supplying backup loads and household loads, followed by charging the battery. Any excess energy is then sold to the power grid.

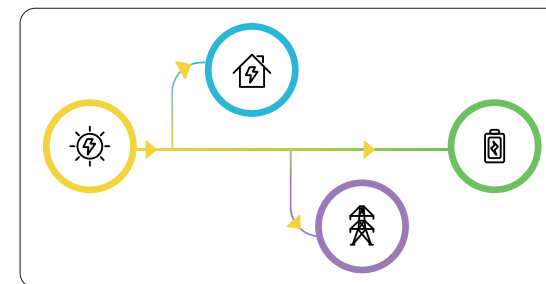


When the PV energy is insufficient to meet the load demands, the power stored in the battery will be used as a priority.



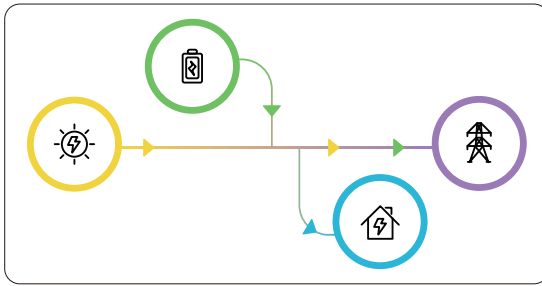
When PV energy and the power stored in the battery are insufficient to meet the load demands, power from the grid will be used.

2.4.2 Electricity Selling Mode

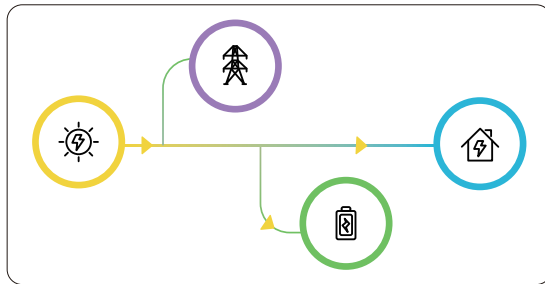


Loads are given priority for power supply and any excess electricity is sold to the power grid at maximum output.

When PV energy is insufficient, the power stored in the battery will be sold as a supplement to the power grid.

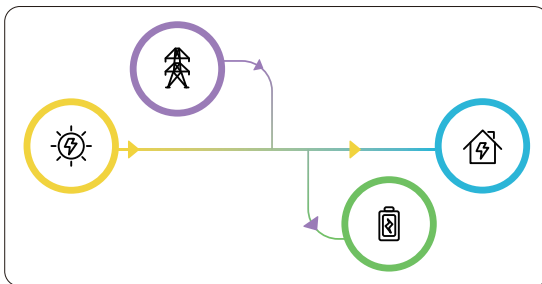


2.4.3 Emergency Mode

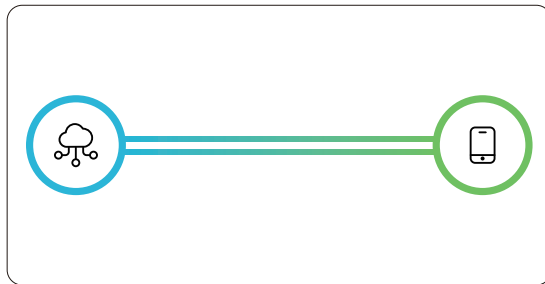


PV energy is prioritized for charging the batteries.

If PV energy is insufficient, batteries will be charged from the power grid. This is particularly suitable for charging the battery in advance in preparation for an emergency. It is recommended to use this mode when the electricity price is low.



2.4.4 AI Mode



The system will intelligently select the optimal mode depending on the user's environment.


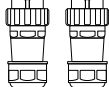
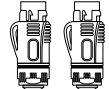



3 System Installation

3.1 Packing List

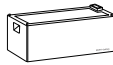


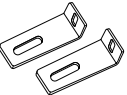
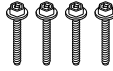

3.1.1 Packing List of Power Supply

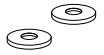
Before installation, please carefully check the product and its accessories against the packing list.

Name	Specifications	Quantity	Schematic Diagram
Power Supply	HM6 power supply	1	
Expansion tubes with screws	M6x40 mm (guide rail*2 angle iron*1)	3	
Expansion screw gasket	Inner diameter: 5 mm, outer diameter: 12 mm, SUS304 gasket	1	
Angle iron	L79.5x32x25 mm	1	
Angle iron screws	Cross recessed outer hexagonal double-gasket screw, M4x12mm	1	
PV+ connector	VP-D4B-CHSM4 external terminal casing, including metal terminal	2	
PV- connector	VP-D4B-CHSF4 internal terminal casing, including metal terminal	2	
Smart electricity Meter	English	1	
Electricity meter guide rail	DIN35 mm	1	
Communication cable	Single bare copper wire, with one RJ45 crystal head and two pins (pin 4, pin 5) on one end, and 40 mm outer insulation and 5 mm core insulation stripped, 3m long, for connection between the HM6 residential energy storage system and electricity meter.	1	
Ground wire screw	Cross recessed outer hexagonal double-gasket screw, M6x12 mm	1	




Name	Specifications	Quantity	Schematic Diagram
Ring-shaped crimp cable lug	RNB5.5-6,48A, Φ=6.5 mm,5.6×23 mm	1	
AC output terminal	3-core waterproof male connector+crimped 10 mm ² cable LT28J3TP2	2	
LAN port connector	Waterproof protection plug of LAN port communication cable (meter communication cable *1, spare *1)	2	
Key		1	
Manual	HM6, English(V-B01)	1	
WiFi-IOT Pro	LSW-5A7153,5-12Vdc	1	

3.1.2 Packing List of 5KWH+ Residential Energy Storage Battery

Name	Specifications	Quantity	Schematic Diagram
Battery	5KWH+ residential energy storage battery	1	
Fixing angle iron screws	M4x8 mm	2	
Waterproof connector cover	Silicone, black, matte, 110x39.9x9 mm	1	
Corner angle irons	L79.5x32x25 mm	2	
Handlebar screws	M4x30 mm flange hex screws	4	
Expansion tubes with screws	M6x40 mm	2	


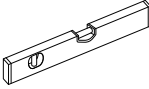
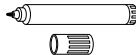
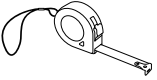
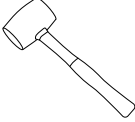
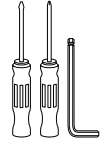
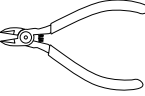
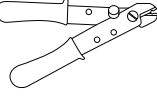
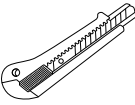
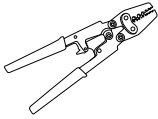
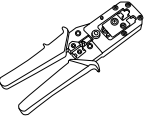
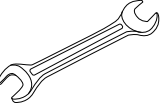



Name	Specifications	Quantity	Schematic Diagram
Expansion screw gaskets	Inner diameter: 5mm; outer diameter: 12mm; SUS304 gasket	2	

3.1.3 Base of 5KWH+ Residential Energy Storage Battery

Name	Specifications	Quantity	Schematic Diagram
Bracket	600mmx305mmx44.1mm	1	
Waterproof connector cover	Silicone, black, matte, 110x39.9x9 mm (installed on the base)	1	
Bracket mounting screws	M4x8mm	4	

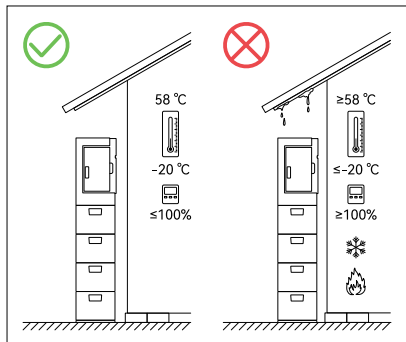
3.2 Preparation before Installation

3.2.1 Preparation of Installation Tools

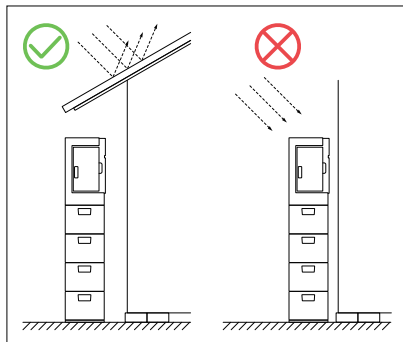
Type	Tools and Descriptions			
Installation	 Electric drill with φ6	 Spirit level	 Marker	 Ruler
	 Hammer	 Screwdriver Phillips PH1 Slotted SL2.5 Allen M2	 Diagonal pliers	 Stripping pliers
	 Utility knife	 Crimping pliers	 Network cable crimping pliers	 Open-end wrench S=7mm
Safety	 Safety gloves	 Dust mask	 Goggles	

3.2.2 Selection of the Installation Environment

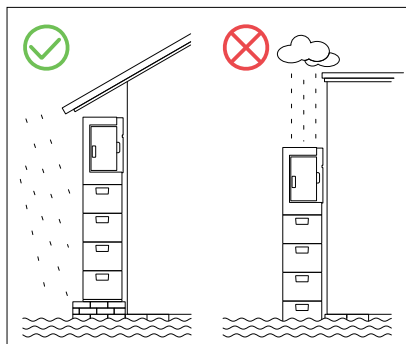
Please select the site according to the relevant requirements.



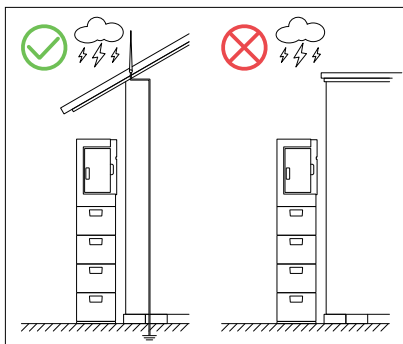
The ambient temperature should be -20 °C to 58 °C and the relative humidity should be 0% to 100% (no condensation).



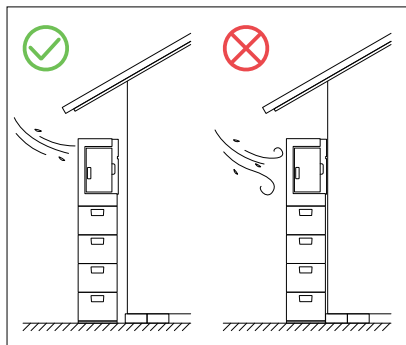
It can be installed outdoors, but must not be directly exposed to sunlight.



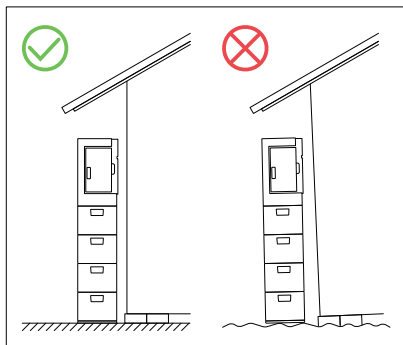
Do not install it in a wet place or in water.



Do not install it in areas prone to lightning strikes.



This product is self-cooled. To ensure proper heat dissipation, please install it in a well-ventilated place.



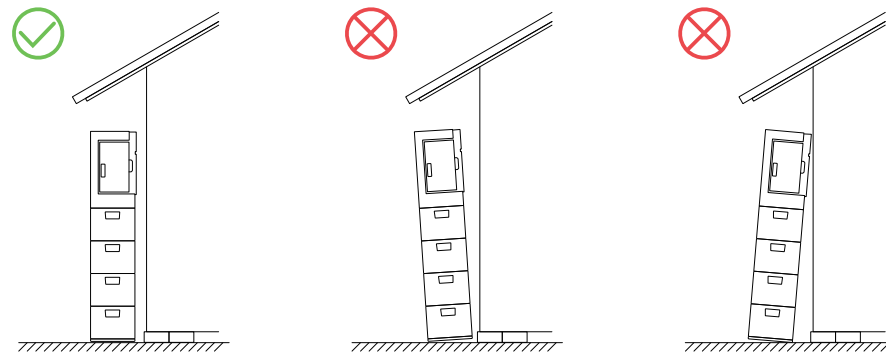
For stability, the product should be installed on solid and flat ground, with the wall being perpendicular to the ground.

3.2.3 Selection of Installation Location

The Power Supply should be installed on solid and flat ground that is able to support its weight.

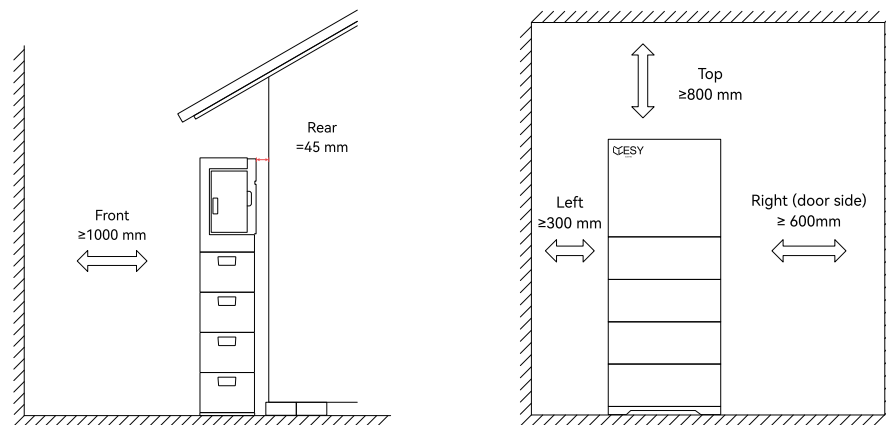
Module Model	HM6-05	HM6-10	HM6-15
Number of batteries	1	2	3
Weight (Kg)	93	143	193
Size (LxWxH) mm	600x305x778	600x305x998	600x305x1218
Module Model	HM6-20	HM6-25	HM6-30
Number of batteries	4	5	6
Weight (Kg)	243	293	343
Size (LxWxH) mm	600x305x1438	600x305x1658	600x305x1878

Vertical installation, without forward or backward tilting.



The recommended clearance distances for the system are as follows:

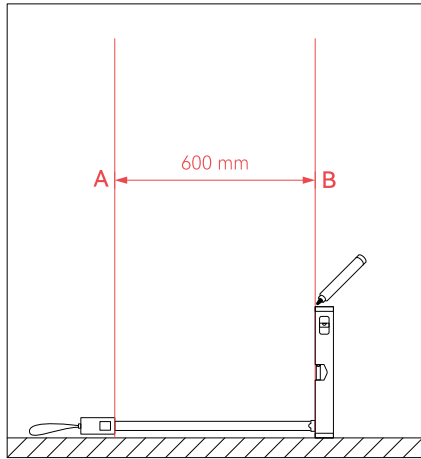
Top	Front	Rear	Left	Right (door side)
≥800 mm	≥1000 mm	=45 mm	≥300 mm	≥600 mm



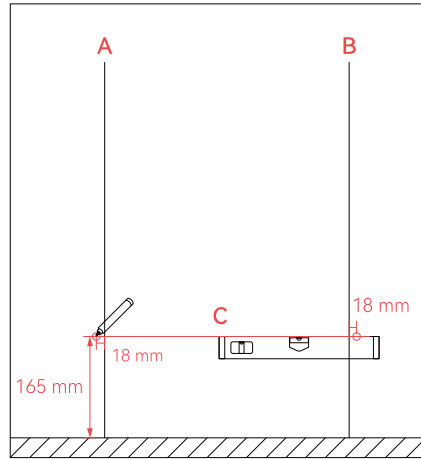
3.3 Installation

3.3.1 Location

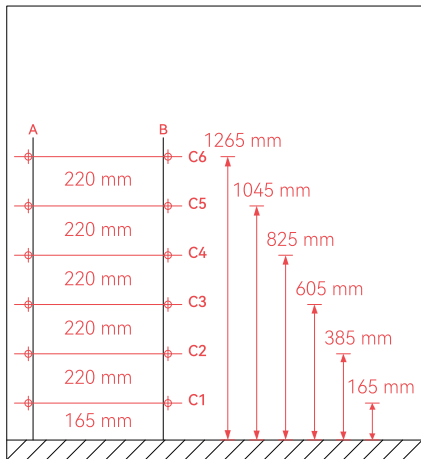
Tools: spirit level, marker, ruler



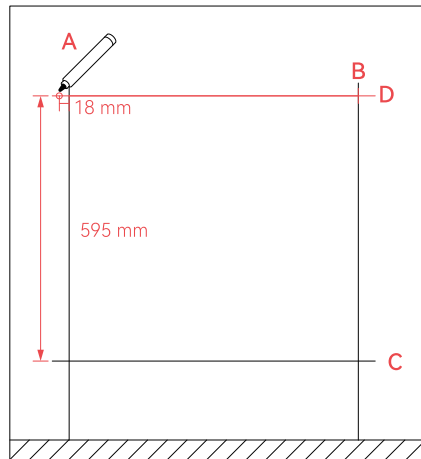
Mark and designate the left and right boundaries of the selected equipment, with a distance of 600 mm between points A and B. Secure a spirit level vertically on each side of the equipment to draw marking lines A and B, ensuring that the lines are perpendicular to the ground.



Perpendicular to marking line A, use a ruler and a Laser Level to measure and draw marking line C. The distance between line C and the ground is 165 mm. Mark screw hole positions on the outer side, 18 mm away from the intersection of A, B, and C, and use a Bubble Level to check if the two hole positions are in a straight line.



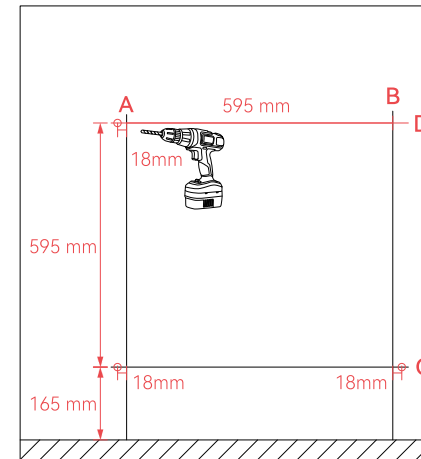
For each additional battery, add 220 mm to the existing base and make corresponding markings.



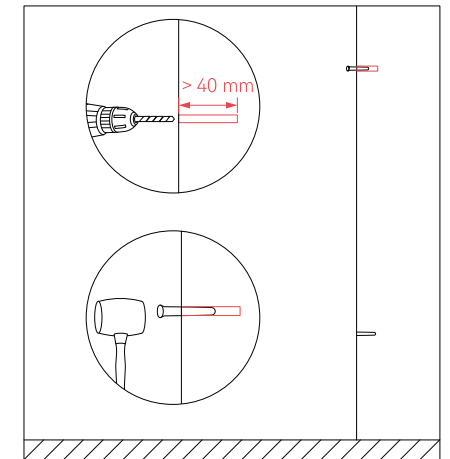
Above marking line C, 595 mm from the top, mark line D. Starting from point A, mark the power supply screw hole position 18 mm to the left of D. Check the distances between each hole position and ensure they are horizontal.

3.3.2 Drilling

Tools: electric drill (bit size: $\phi 6\text{mm}$), hammer, expansion tube (M6x40 mm) with screws



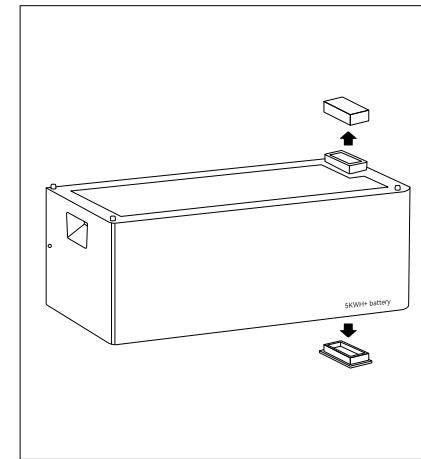
Drill three holes using the electric drill with $\phi 6\text{ mm}$ bit as indicated in the figure.



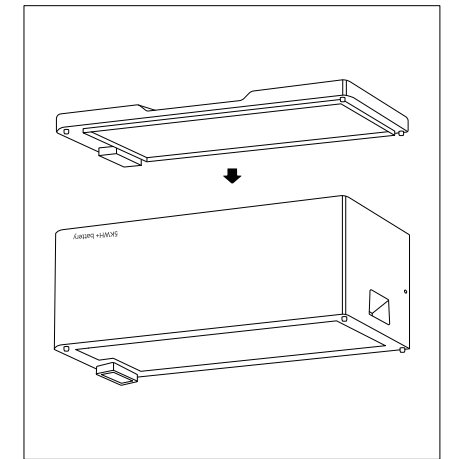
Hammer the expansion tubes into the holes.

3.3.3 Bracket Installation

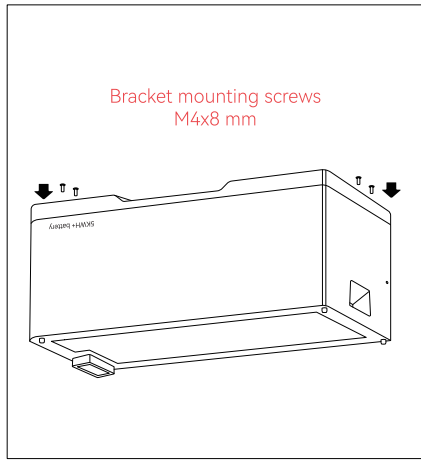
Tools: screwdriver, screws (M4x8 mm)



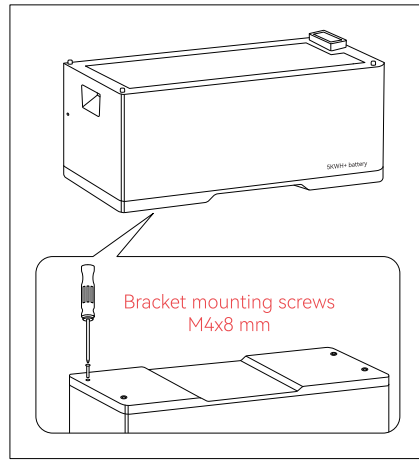
Before installation, remove the dust cover on the top and bottom to avoid damage during installation.



It is recommended to place the battery upside down on a soft surface to avoid scratches. Align the bracket's fool-proof port with the battery (Do not remove the waterproof connector cover on the bracket), and fasten the bracket with the battery.



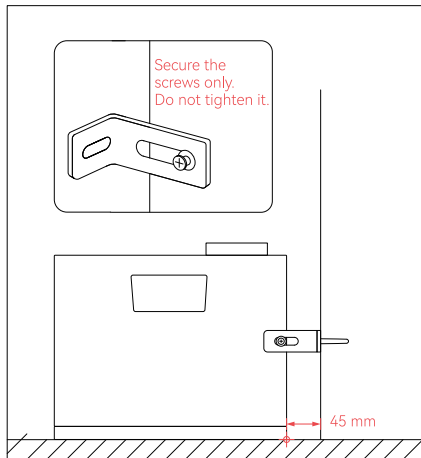
Secure four screws using the screwdriver



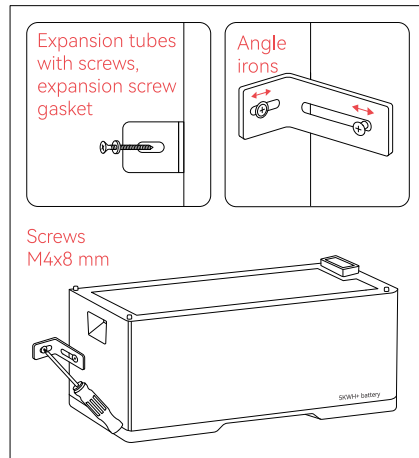
Once the installation location has been determined, tighten all screws. Ensure the bracket is properly fitted with the battery.

3.3.4 One Battery Installation

Tools: ruler, screwdriver, screws (M4x8 mm), angle iron (L79.5x32x25 mm), expansion tubes (M6x40 mm) with screws, gasket (SUS304)



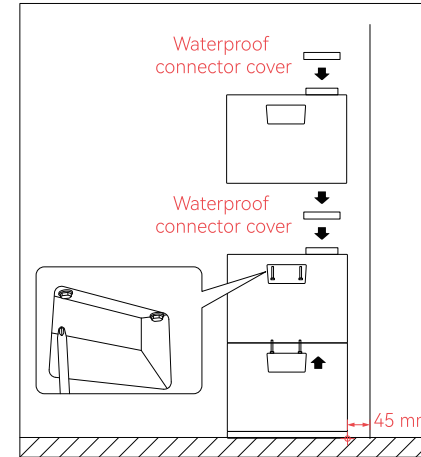
Make a mark of 45mm from the wall, and align the battery (including the bracket) with the mark, fix the angle iron to the battery, align the other end with the hole in the wall (Do not tighten the screws).



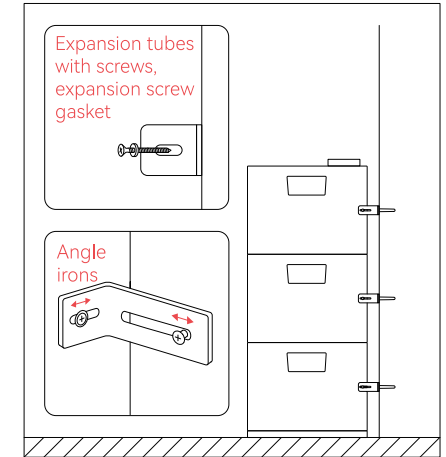
After adjusting the position of the angle iron, pass the expansion screw through the gasket and angle iron, fix it on the wall, after the angle iron is adjusted, then tighten the screws respectively.

3.3.5 Stacking of Multiple Batteries

Tools: ruler, screwdriver, open end wrench (7 mm), angle iron screws (M4x10 mm), angle iron (L79.5x32x25 mm), expansion tube (M6x40 mm) with screw, handlebar screws (M4x30 mm), waterproof connector cover, gasket (SUS304)



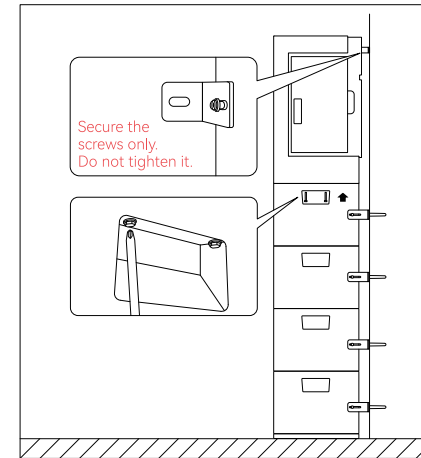
Make a mark 45 mm from the wall, align the battery with the mark. Install the waterproof connector cover, and then stack the next battery. Once a battery is installed, secure its two sides with handlebar screws, and stack them as required.



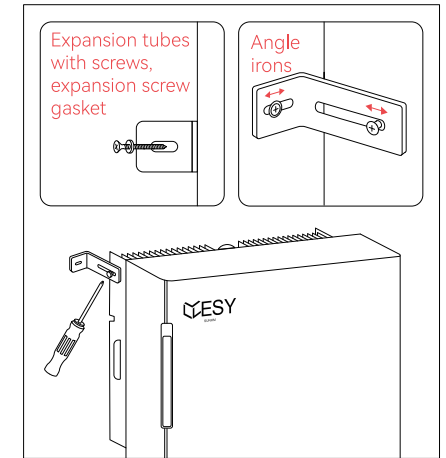
After stack all the batteries, install the angle iron on the battery, and then fix the expansion screws through the gasket and angle iron onto the wall. Fix each battery first, adjust the angle iron position, and then tighten the screws separately.

3.3.6 Power Supply Installation

Tools: ruler, screwdriver, angle iron screws (M4x12 mm), angle iron of HM6 power, expansion tube (M6x40 mm) with screw, handlebar screws (M4x30 mm flange hex screws), waterproof cover, open end wrench (7mm)



Connect the power and batteries, fixed them with handlebar screws, then fix the angle iron onto the left cooling fin of the power. (Do not tighten the screws).



Align the angle iron of power with the hole in the wall, pass the expansion screw through the gasket and angle iron, fix it on the wall, after the angle iron is adjusted, then tighten the screws respectively.

4 Electrical Connection

4.1 Instructions before Wiring

4.1.1 Cable Requirements

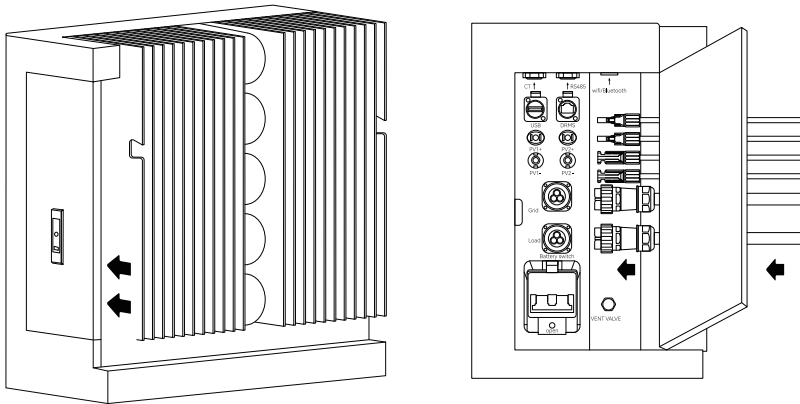
When using external wiring cables, the current and system overload capacity through the cables, as well as the ambient temperature, should be considered. The following table shows recommended cables. Engineers should refer to local standards and the following table when selecting cables. The cable length is generally 2-10m. Cables that are too long may cause deviation from the rated voltage. In this case, the cross-sectional area of the cables should be increased accordingly. See the following table.

Category	Cross-sectional Area of Conductor	Type of Circuit Breaker
Grid/ AC Input (L, N, PE)	4 ~ 6 mm ²	400V.ac/40A
EPS/Load Output (L, N, PE)	4 ~ 6 mm ²	-
PV1/PV2/PV Input (+, -)	4 ~ 6 mm ²	600V.dc/20A

4.1.2 Precautions

Install insulation terminals (with accessories) where the grid input cable, AC load output cable, PV input cable and battery input cable are connected to the power supply. Secure the terminals with tools such as pliers. This can make system connections more secure and reliable.

Install all cables through the back of the door to avoid safety hazards.



Caution

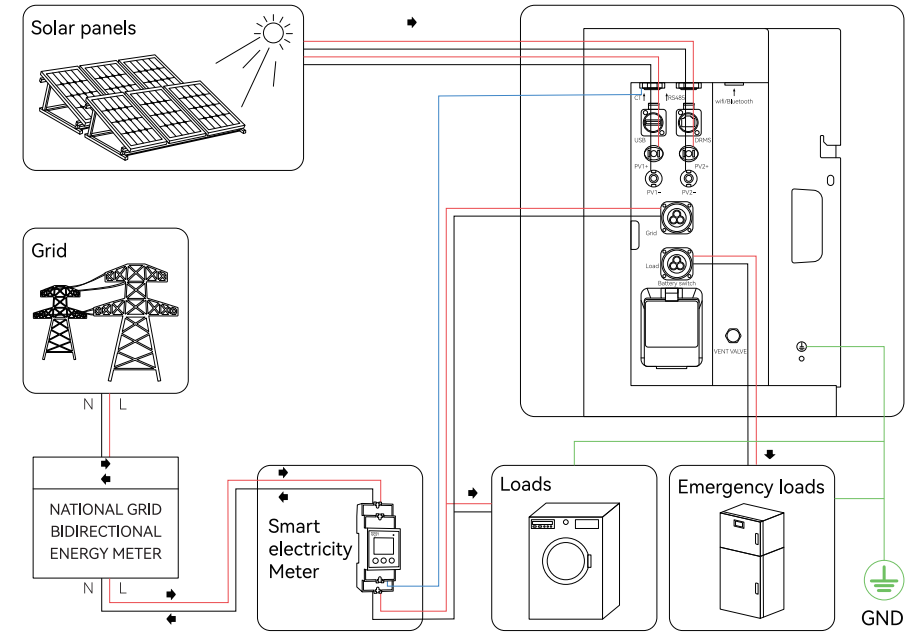
Before installation and use, use a wire (4-6 mm²) with lug as the ground wire.

The capacity of the load output terminal of the power supply is as follows:

1. Inductive loads (e.g. air-conditioners, washing machines and motors): the individual maximum power is 2.2 KVA, and the total maximum power is 6KVA.
2. Capacitive loads (e.g. computers and switching power supplies): the total maximum power is 6KVA.

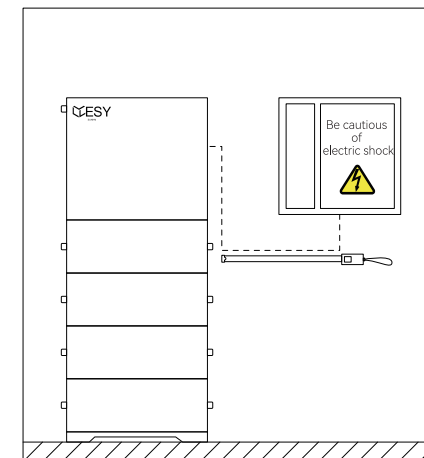
The above capacity is based on the system being connected to a power grid or battery with sufficient power. If the power is supplied solely by the PV module, the maximum single off-grid load is usually half of the real-time power of the PV module.

4.2 Schematic Diagram of System Connection

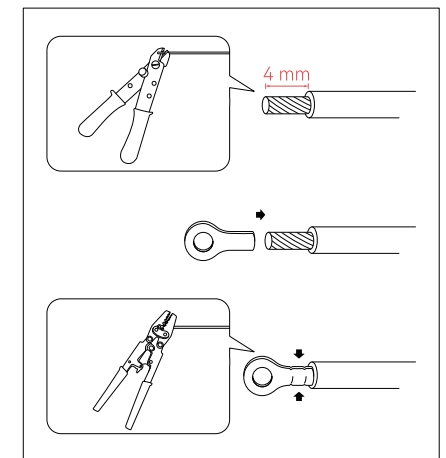


4.3 Ground Wire Connection

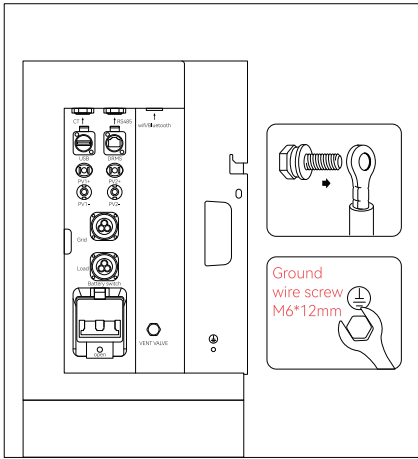
Tools: screwdriver, ground wire screw (ij 6mm), stripping pliers, crimp cable lug, crimping pliers, tape, ground wire



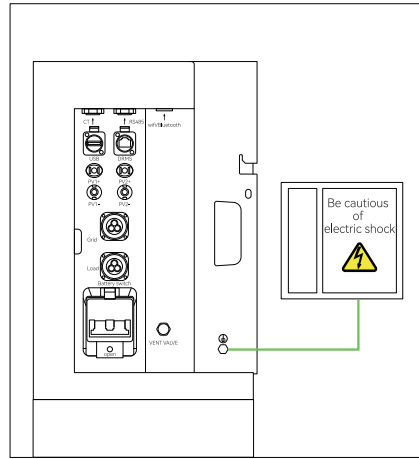
Measure the distance between the product and the power distribution box using the tape, and select a ground wire of appropriate length.



Strip the ground wire insulation by 4 mm using the stripping pliers, install the ground wire terminal, and press it tightly with crimping pliers.



Fasten the ground wire terminal to the right radiator of the power supply using the ground wire screw (φ6mm), and ensure that the other end of the wire is properly grounded with the grounding impedance of 0.1Ω or less.



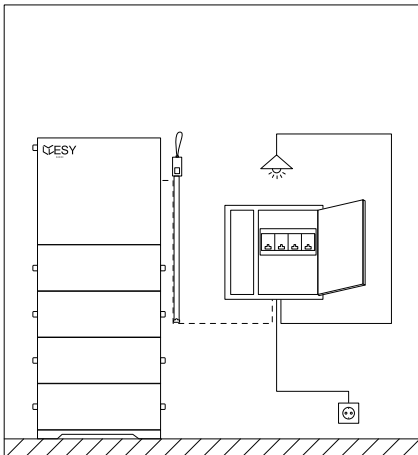
Ensure the ground wire is properly connected to ensure safety in installation and use.

Note:

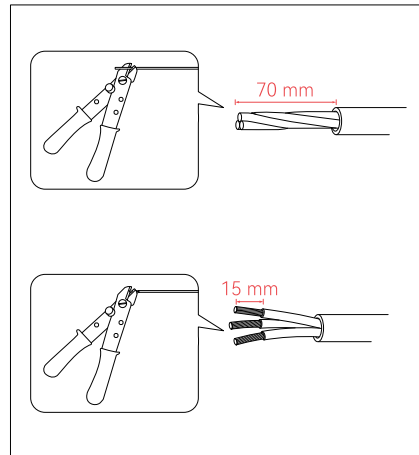
The power is neutral continuity maintained internally. Please ensure correct external grounding connection for the power. If the power shows a 'ground fault' after system installation, please check if the grounding is compliant with the requirements.

4.4 Load Connection

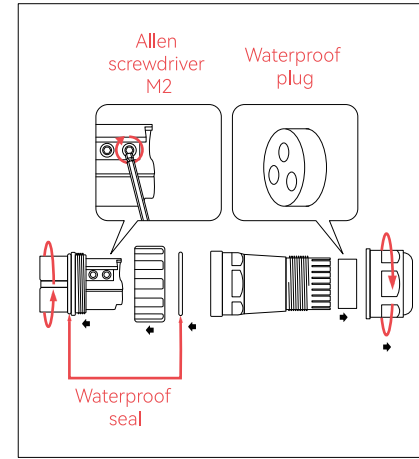
Tools: Allen screwdriver (φ2 mm), cable terminal (single-phase three-wire), stripping pliers, tape, cable (L, N, PE)



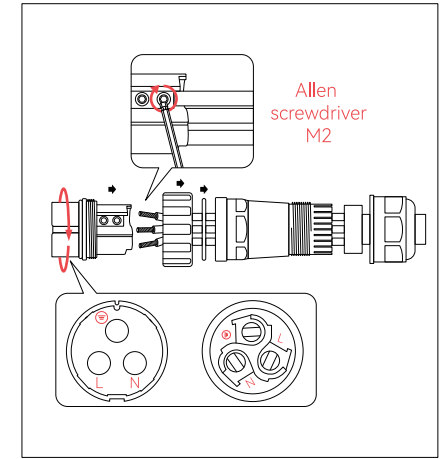
Measure the distance between the product and the power distribution box or load terminal using the tape, and select a cable of the appropriate length.



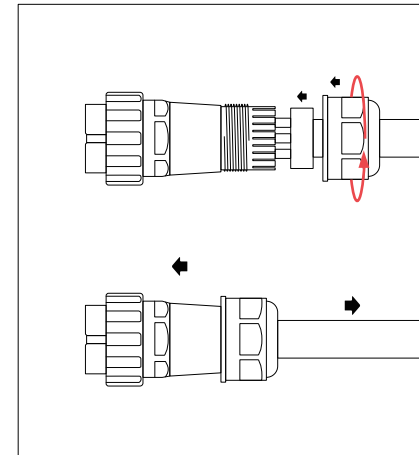
Strip the cable sheath by 70 mm and core insulation by 15 mm using the stripping pliers.



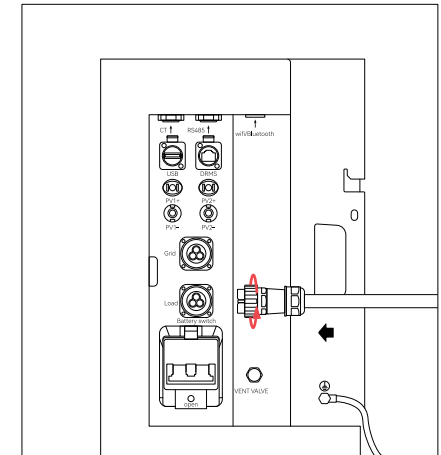
Unscrew the AC output terminal. Remove the white waterproof seal and waterproof plug, and keep them properly to avoid loss. Loosen the fixing screws of the waterproof terminal using the Allenscrewdriver M2. Remove the rear waterproof plug.



Install the wire cores through the waterproof plug and cable terminal: L, N, and PE wires. Tighten the fixing screws of the waterproof terminal using the Allenscrewdriver M2. Tighten the front end of the terminal (with the waterproof seal in the correct position).



Insert the waterproof plug into the terminal, and tighten the tail part of the terminal. Ensure the terminal is securely connected with the wires and that the L, N, PE wires are properly connected.



Insert the terminal into the Load interface, rotate and tighten the terminal head securely to the equipment and check again.

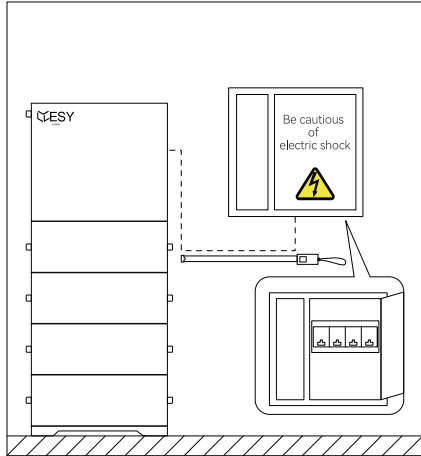
Warning!

While the power supply is in operation, there will be voltage at the output terminal of the load. For this reason, do not use the power supply without the protective cover at the load's output terminal or touch the load's output terminal and connecting cable.

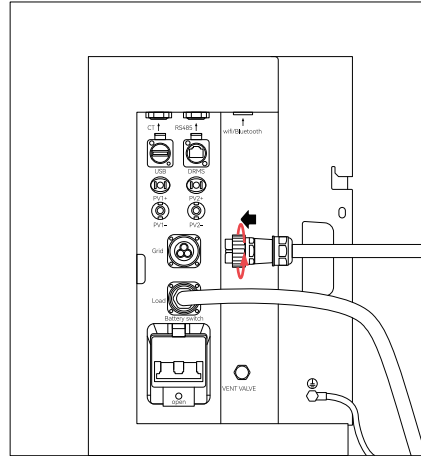
The power supply does not support parallel operation. Do not connect the load terminals in parallel.

4.5 Power Grid Connection

Tools: Allen screwdriver ($\phi 2$ mm), cable terminal (single-phase three-wire), stripping pliers, tape, cable (L, N, PE)



Turn off the circuit breaker of the power grid. Measure the distance to the power distribution box using the tape, and select a cable of appropriate length. Secure the terminal according to the load connection steps in 4.4.



Insert the terminal into the Grid interface, and rotate the tail part of the terminal until it is secured, and check.

Caution

Make sure that the power supply is properly grounded before operation. Do not connect important backup loads to the Grid side whether the power supply is connected to the grid or not. Doing so may result in the power supply failing if the power grid is cut off.



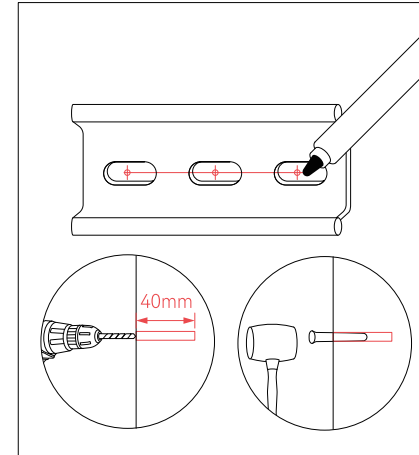
Install an AC circuit breaker between the power supply and the power grid before connecting the power grid.

The grid voltage and frequency should be within the permissible range of the power supply.

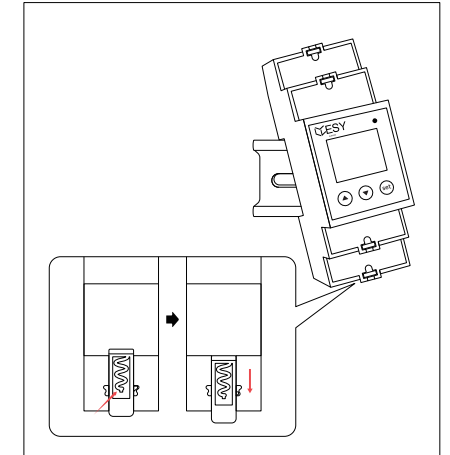
4.6 Electricity Meter Connection

4.6.1 Electricity Meter Installation

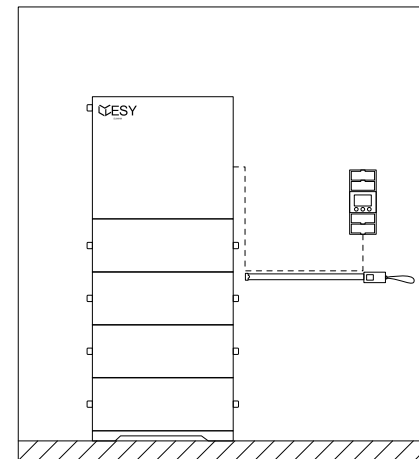
Tools: screwdriver (small cross), network cable, network cable pliers, stripping pliers, tape, electricity meter guide rail, slide rail screws, marker, hammer, electric drill, expansion screws, electricity meter screws



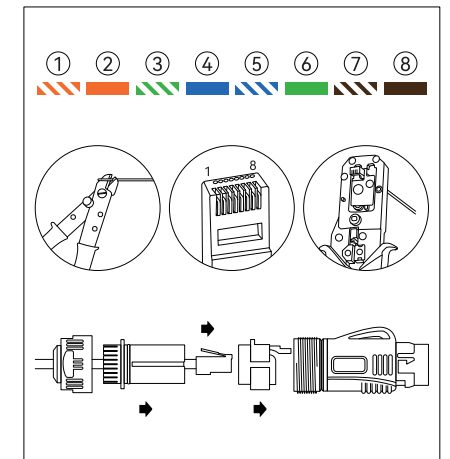
Select the installation position for the electric meter and mark it according to the screw holes on the meter slide rail. Use a power drill to drill holes and insert expansion pins.



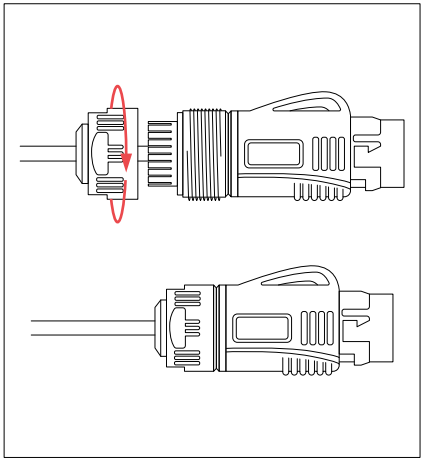
Lift the latch switch at the rear of the electric meter, pull it down to secure the meter on the guide rail, and the latch will automatically lock into place once the position is adjusted.



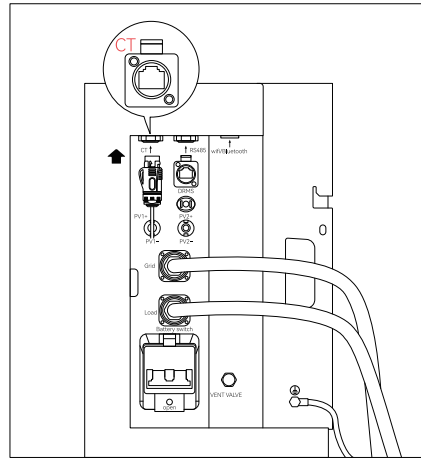
Measure the distance between the product and the electricity meter using the tape, and select a network cable of the appropriate length.



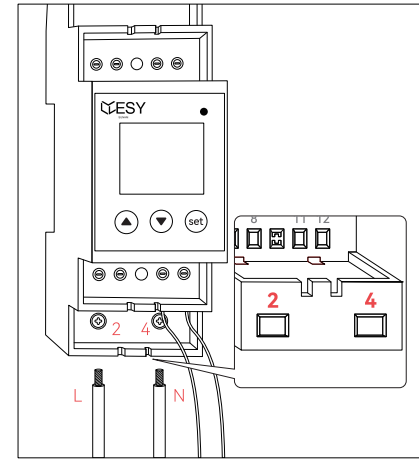
Strip the network cable using the stripping pliers and install it through parts as shown in the figure. Fit crystalhead to the network cable according to the color sequence (1-8). Clamp the crystal head to the terminal, and insert the terminal plug.



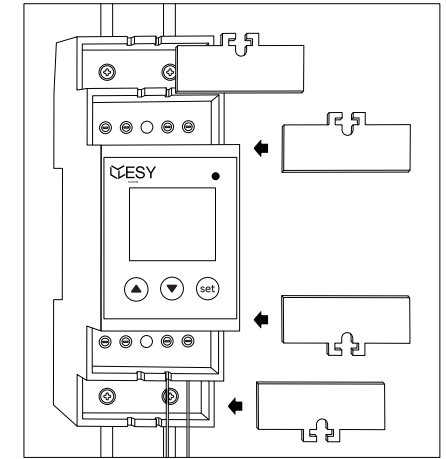
Tighten the end of the terminal and ensure the cable is connected securely.



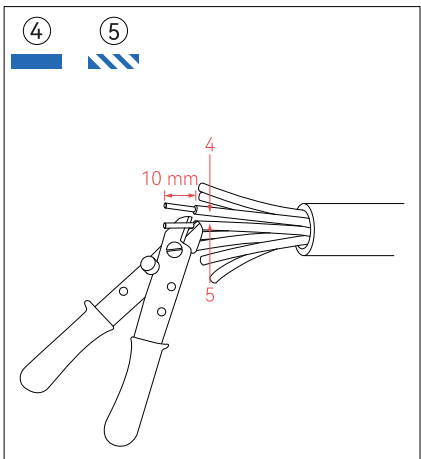
Connect the network cable with the waterproof terminal to the CT port of the power supply housing.



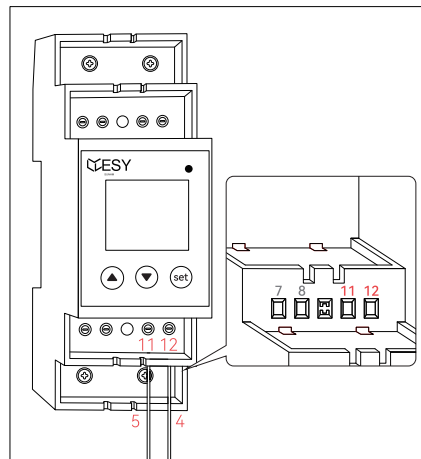
Connect the L-line of the grid circuit breaker to the 1st port of the electric meter, and connect it from the 2nd port to the power. Connect the N-line of the grid circuit breaker to the 3rd port and connect it from the 4th port to the power (at this point, the grid-side circuit breaker can be closed to power the electric meter and perform configuration; refer to section 4.6.3 for meter configuration. After the meter configuration is completed, disconnect the grid-side circuit breaker to proceed with the operation).



Check if all the wire connections are secure and cover with a protective cover.



Strip the insulation of 4# (blue) and 5# (blue and white) wires at the other end of the network cable by 10 mm.



Insert the number 4 (blue) wire into the 12th port of the electric meter, and the number 5 (blue and white) wire into the 11th port of the electric meter. Tighten the screws and check if the network cable is secure. Cover with a protective cover.






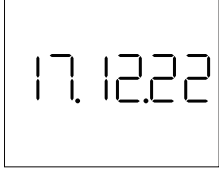
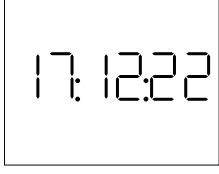
4.6.2 Use of Electricity Meter

The keyboard consists of 3 buttons: "▲", "▼", and "set." Their functions are as follows:


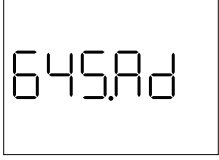
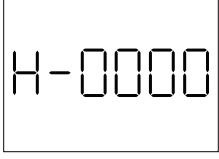
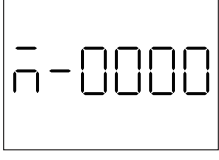



- ▲: Move the screen upward; when setting data, increment the value by one.
- ▼: Move the screen downward; when setting data, switch to the next data digit.
- set: Enter the next level screen; when setting data, confirm or modify the data.








By operating the buttons, you can access different screens, which are explained as follows:

Symbol	Description	Schematic Diagram
1	Current active total energy	
2	Current voltage	

Symbol	Description	Schematic Diagram
3	Current current	
4	Current active power	
5	Current reactive power	
6	Current apparent power	
7	Current power factor	
8	Date	
9	Time	

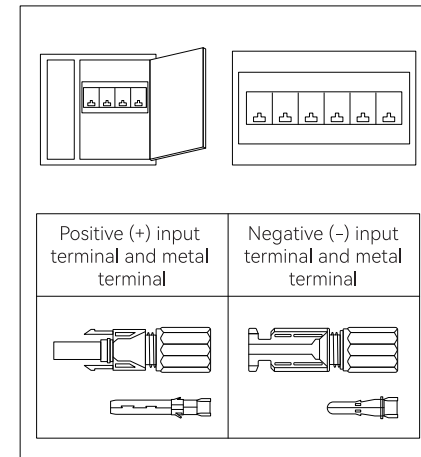
4.6.3 Electricity Meter Configuration

Password Setting	Schematic Diagram
Press and hold the "SET" button for 3 seconds to enter the password input page. Press "▲" to adjust the number size and "▼" to switch the numbers. Set the PD password as 3366. Press "SET" to save and enter the settings page.	
DL/T645-2007 address setting	Schematic Diagram
In the settings page, press "▲" or "▼" to select "645.Ad." Press the "set" button to enter the DL/T645-2007 address settings page.	
Press "▲" to adjust the value and "▼" to switch the numbers. Set the high 4 bits of the DL/T645-2007 address as "H-0000." Press "set" to save.	
Press "▲" to adjust the value and "▼" to switch the numbers. Set the middle 4 bits of the DL/T645-2007 address as "M-0000." Press "set" to save.	
Press "▲" to adjust the value and "▼" to switch the numbers. Set the low 4 bits of the DL/T645-2007 address as "L-0001." Press "set" to save.	
CT setting	Schematic Diagram
In the settings page, press "▲" or "▼" to select "CT." Press the "set" button to enter the CT settings page.	
Press "▲" to adjust the value and "▼" to switch the numbers. Set CT as "000001" Press "set" to save.	

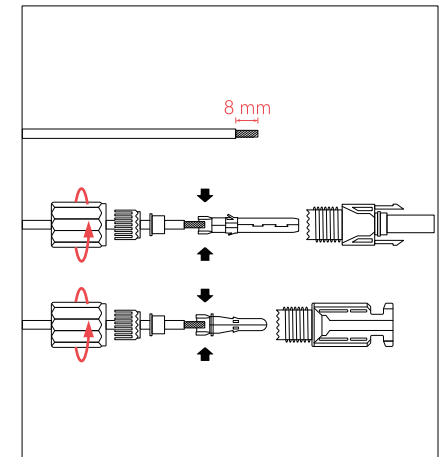
<p>PT setting</p> <p>In the settings page, press "▲" or "▼" to select "PT." Press the "set" button to enter the PT settings page.</p>	<p>Schematic Diagram</p> 
<p>Press "▲" to adjust the value and "▼" to switch the numbers. Set PT as "000001." Press "set" to save.</p>	
<p>Baud setting</p> <p>In the settings page, press "▲" or "▼" to select "bAUd." Press the "set" button to enter the baud rate settings page.</p>	<p>Schematic Diagram</p> 
<p>Press "▲" or "▼" to select the baud rate. Set the baud rate as "09600n." Press "set" to save.</p>	
<p>Modbus-RTU address setting</p> <p>In the settings page, press "▲" or "▼" to select "M.Adr" Press the "set" button to enter the Modbus-RTU address settings page.</p>	<p>Schematic Diagram</p> 
<p>Press "▲" to adjust the number size and "▼" to switch the numbers. Set the Modbus-RTU address as "002." Press "set" to save.</p>	
<p>Return to the main menu display</p> <p>In the settings page, press "▲" or "▼" to select "return." Press the "set" button to return to the main menu display.</p>	<p>Schematic Diagram</p> 

4.7 PV Connection

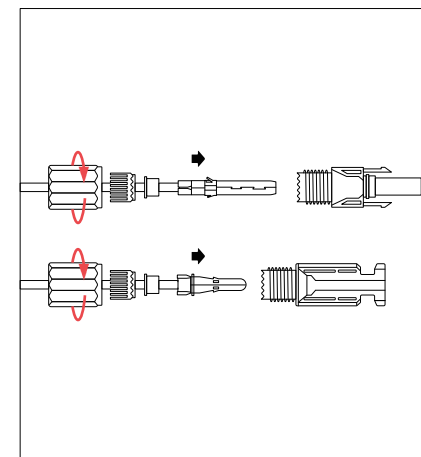
Tools: PV+ connector, PV- connector, PV crimping pliers



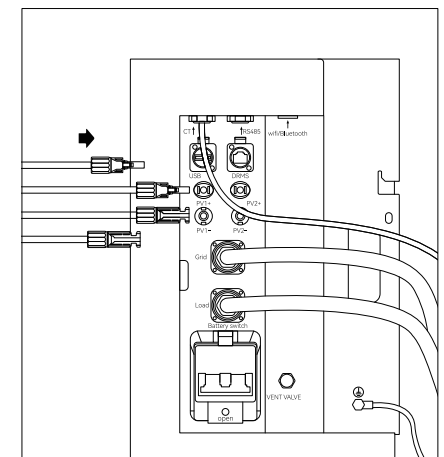
Disconnect all circuit breakers of the power supply and PV module. Make sure that the cables of the power supply and PV module are connected in a power-off condition. Check the external input terminal of the PV module for damage, and confirm its polarity.





Strip the DC cable insulation of the PV module by about 8 mm to expose the copper wire. Install the copper wire through parts as shown in the figure above. Insert the metal core of the connector and tighten it with crimping pliers.



Insert the terminal into the wiring slot, until you hear the sound indicating a proper connection. Tighten the end of the terminal. Ensure the cable and terminals are connected securely.



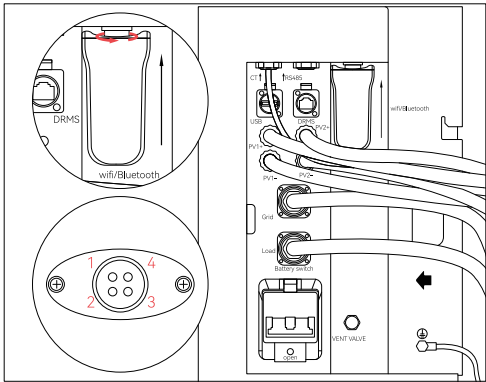
Determine the polarity of the PV input terminal of the power supply and that of the machine. Connect the PV input cable to the power supply. Ensure the cables are connected properly.

Caution	
	<p>Make sure that the maximum input voltage of the HM6 residential energy storage system does not exceed 550V (since the open circuit voltage of the PV module is higher at low temperature than that at normal temperature; and the recommended power at normal temperature is 500V or below).</p> <p>All PV modules must be of the same type and mounting angle.</p> <p>The input voltage and current range of the PV modules used should meet the parameter requirements of ESYSUNHOME.</p>
Warning	
	<p>Since the non-isolated topology is applied to the circuit between the power supply's PV modules and the power grid, please use monocrystalline silicon or polysilicon PV modules only.</p> <p>PV modules must be installed by professionals. After PV modules are installed, ensure the polarity of the connected cable of the PV array is correct using a voltmeter (DC voltage range: above 1,000V), and make sure that the open-circuit voltage does not exceed the specified value. When the ambient temperature is higher than 10°C, the open-circuit voltage of the PV array must not exceed 90% of the maximum DC voltage of the power supply. Otherwise, the voltage of the PV array may exceed the maximum input voltage of the power supply at low temperatures, which may cause damage to the power supply.</p>

CT	(RJ45 Interface)	
Interface Description	Electricity meter connection.	
Pin Definitions	4: blue data communication CT_RS485- 5: blue-white data communication CT_RS485+	
RS485	(RJ45 Interface)	
Interface Description	Device Interface	
DRM	(RJ45 Interface)	
Interface Description	<p>This interface is only for Australian products.</p> <p>DRED control (for Australia & New Zealand only)</p> <p>DRED means the demand response enabling device. According to the requirements of AS/NZS 4777.2:2010, the user should support the demand response mode (DRM), which is applicable to inverters conforming to RJ45 requirements of the AS/NZS 4020 standard. This mode is for DRMS connections.</p>	
Pin Definitions	1: DRM1/5 3: DRM3/7 5: REF GEN/0 7: Reserved V+	2: DRM2/6 4: DRM4/8 6: COM LOAD/0 8: Reserved V-
USB	(USB Interface)	
Pin Definitions	Reserved communication interface for device maintenance	

4.8 Communication Interface

4.8.1 WiFi/Bluetooth Communication Interface (Optional)



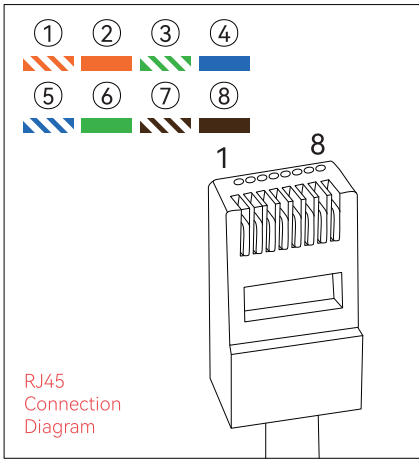
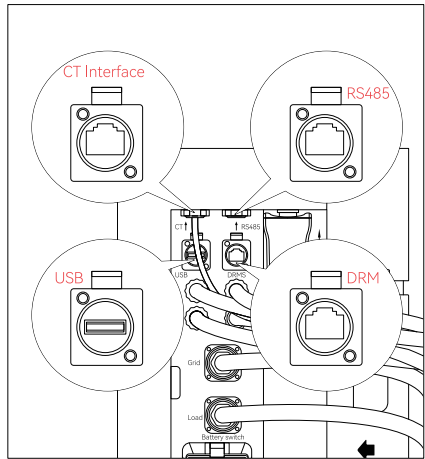
Pin definitions

- 1 Power Supply VCC
- 2 Ground wire GND
- 3 Data communication A
- 4 Data communication B

Connection

Align the slot of the WiFi module with that of the WiFi/Bluetooth interface, and insert and secure the WiFi communication module.

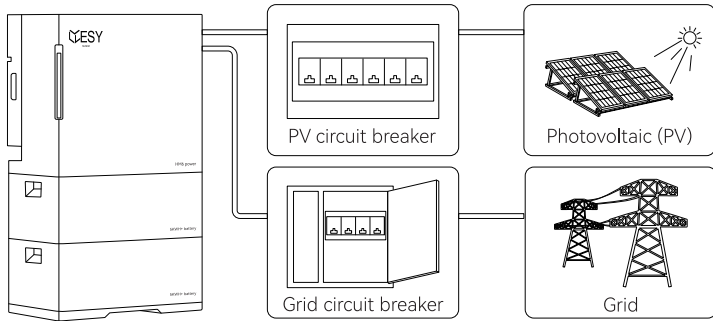
4.8.2 Interface Description



4.9 Power-on

Close the circuit breakers and conduct a power-on check according to the following steps.

1. Power grid: after the circuit breaker of the power grid is closed, the device will be powered on and started. Then you can configure the network and check the system parameters using the APP. See Chapter 5 for network configuration.
2. HM6 power supply: when the battery circuit breaker of the power supply is closed, the left light bar of the power supply will flicker continuously and emit a buzzing sound, indicating that the power supply has been started.
3. PV: when the PV circuit breaker is closed, the device will be powered on and started.



5 ESYSUNHOME APP

5.1 ESYSUNHOME APP

5.1.1 Download Address

Please download it at www.esysunhome.com or Scan QR Code.



iOS



Android

5.1.2 Registration and Installation

Download and install ESYSUNHOME, enter the APP, complete the registration with your email address, and log in.

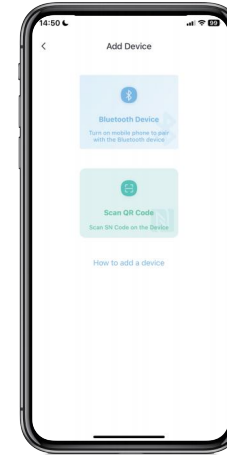
An authorization code is required for operator registration. Contact the manufacturer to get the authorization code.

After registration, the user should contact the operator to confirm that the APP is installed before using the APP.

5.2 Network Configuration

5.2.1 Install New Device

Please install the device according to the above instructions and Ensure the device works properly.



5.2.2 Add New Device

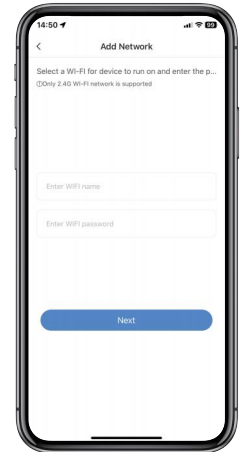
Open the APP, click "My Device" and "Add", and select Bluetooth or scan the SN code to pair the device.

You can scan the QR code of WiFi-IOT Pro to get the SN code.

5.2.3 Device Network Configuration

Open the APP, log in to the account, click "Me" and configure the network for the device. The APP will request you to give Bluetooth permission. Once you have given the Bluetooth permission Click "ESYSUNHOME_ + SN code" and enter your WIFI name and password in the pop-up interface. Click "Next" to configure the network, as shown below.

Return to the home page of the APP, and wait for a moment to view the system data.

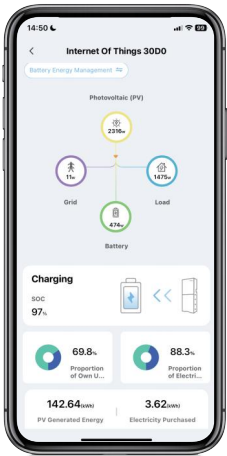


5.3 Data Monitoring



5.3.1 3D Scene Graph

Once the device has been successfully paired, enter the home page of the APP to view the 3D scene graph, including the power grid, HM6 residential energy storage system and load. The direction in which the green cursor moves indicate the flow of energy, and you can monitor the real-time status of the entire system from this view.



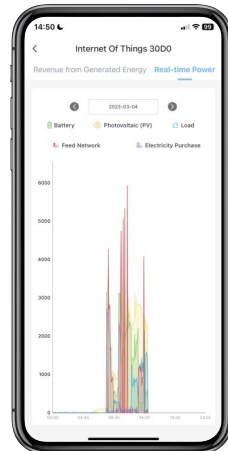
5.3.2 Energy Flow Diagram

Click the 3D scene graph to enter the energy flow interface, which shows the energy flow direction and real-time power of the PV module, power grid, battery and load, as well as other important information such as battery status, self-consumption ratio, and proportion of sold electricity.

5.4 Data Statistics

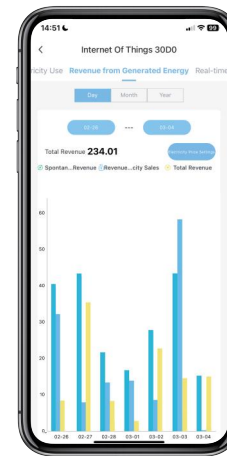
5.4.1 Real-time Power

Click "Power" on the home page to enter the real-time power display interface. In the statistical chart, you can see the real-time power of the battery, PV module, load, sold power and purchased electricity in the curve form. You can also view the one-day real-time power curve.



5.4.2 Electricity Consumption Data

Click "Data" on the home page to enter the electricity consumption data interface. The statistical chart displays bar graphs of daily, monthly, and yearly electricity consumption, load capacity, PV power generation, grid power sold, and purchased electricity. You can view the details by clicking on the respective items.



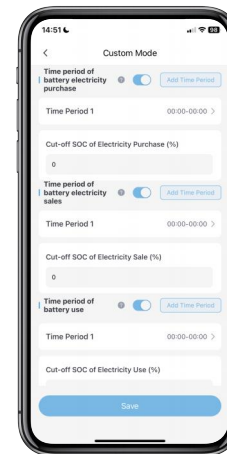
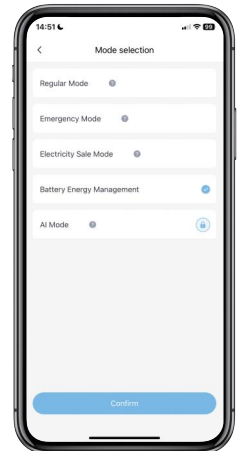
5.4.3 Revenue Data

Click "Revenue" on the home page to enter the revenue display interface. In the statistical chart, you can view the daily, monthly, and yearly data, including the revenue of power generation, the revenue of sold electricity, and average revenue. Click the bar charts to see the details. Click the electricity price settings to set the electricity purchase and sales prices for different time periods in a day. If you do not change settings, the price will be 1 by default.

5.5 Power Supply Control

5.5.1 Mode Switching

Open the client APP, log in and enter the home page. Click the 3D scene graph to enter the energy flow diagram page. The current working mode will be shown in the upper left corner. You can click it to enter the mode list and select an appropriate mode.



5.5.2 Electricity Consumption Data

Click the battery energy management options in the column of the mode list. You can set the battery's electricity purchase time, electricity selling time, and service time based on your electricity needs. The electricity purchase time of the battery refers to when electricity is bought from the power grid to recharge the battery when the PV is insufficient for battery charging. The electricity selling time of the battery refers to when the electricity of the battery is sold when the PV electricity is insufficient for sales at the maximum output power of the system.

5.5.3 Cold Resistance Mode (Cold Mode)

In the Cold Mode, the charging and discharging strategy specially designed by the manufacturer for the battery will enable the battery to work efficiently even in low temperature and cold weather.

5.5.4 Power-on/off

This function is used to remotely turn on and off the power supply. The power supply will be on standby if it is turned off.

5.6 Remote Monitoring

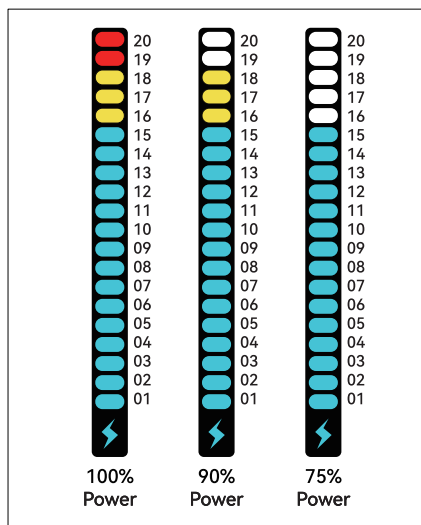
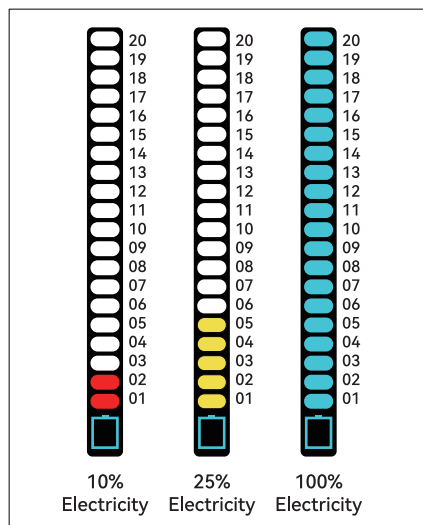
5.6.1 Alarm Information Monitoring

When the energy storage system sends an alarm, a reminder will pop up on the home page of the APP.

5.6.2 OTA Upgrade

In the OTA upgrade state, the system will be in standby status without any output. Please use the power grid to supply power.

6 Light Bar Indication



6.1 Battery Status

The symbol "□" at the bottom of the light bar indicates the power level. It consists of 20 divisions, which represent 5% of electricity, respectively. As long as the power changes by 5%, the light will be ON for 60 s and then OFF.

6.2 Power Status

The symbol "⚡" at the bottom of the light bar indicates the power. It consists of 20 divisions, which represent 5% of the power, respectively. As long as the power changes by 5%, the light will be ON for 60 s and then OFF.

6.3 Alarm Status

When the indicator at the bottom of the light bar is OFF and the top three indicators are ON, it means that the device has an alarm or fault. If the device is faulty, please contact professionals for solutions in time.

Alarm Level	Definition	Buzzer	Light	Schematic Diagram	Alarm Signal Recovery Condition
1	Emergency	Buzzing by default	Top three red indicators ON	20 19 18	Troubleshooting
2	Major	Silent	Top two red indicators ON	20 19 18	Troubleshooting
3	Minor	Silent	Top three yellow indicators ON	20 19 18	60 s
4	Upgrading	Silent	Top three blue indicators ON	20 19 18	Upgrade Completed

7 System Maintenance

7.1 Routine Maintenance

To ensure reliable and efficient performance over the long term, please check the system once a month according to the following steps:

- Step 1: Turn off the system, and disconnect the circuit breakers of the power supply, PV module, power grid and load.
- Step 2: Ensure that the surface of the system is not heavily coated with dust.
- Step 3: Make sure that the system is not in a wet place.
- Step 4: Close the circuit breakers of loads, power grid, PV module and power supply, and start the system.

7.2 Precautions for Long-Term Non-use

If the system is not in use for more than 7 days, disconnect the circuit breakers of the power supply, PV module, power grid and load.
If the system is not in use for more than 3 months, close the circuit breakers of the power grid and power supply, and start the system to recharge the battery.

7.3 Battery Maintenance

Caution



- Keep the battery clean. Clean the terminals and connectors in time.
- Do not use batteries with different types and capacities together. Instead, use batteries of the same model.
- Before installing or replacing the batteries, removing metal objects from your hands, such as watches and rings, can help prevent short circuits and potential burns.

Warning



Battery maintenance should be performed or supervised by those with relevant knowledge. In addition, necessary precautions should be taken.

Batteries may cause electric shock and high short-circuit current.

Prohibition throw the batteries into fire. They may explode.

Prohibition disassemble or destroy batteries. The electrolyte released is harmful to the skin and eyes. It may be toxic.

8 After-sales Service

Service email: support@esysunhome.com

Or, contact the local installer.

9 Certification Standards:ertification Standards

HM6 Home System Integrated Machine Certification Standards

EMC Standards	EN 61000-6-2, EN 61000-6-3
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Power Supply Certification Standards

Grid-connected standards	AUS AS 4777.2, CEC+RCM, IEC62109/AS62109 DE DIN VDE V 0124-100:2020, VDE-AR-N 4105: 2018 IT CEI 0-21 UK G99/1-8 type A BE C10/11:2021 ES NTS 631 V2.1 SEPE(type A), UNE 217001 UNE 217002
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Power Supply Certification Standards

Standards	IEC 62109-1/-2
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EMC Standards	IEC 61000-6-1, IEC 61000-6-3
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5KWH+ Household Energy Storage Battery Certification Standards

Standards	IEC62619, ISO 13849, IEC/EN62040-1, CEC+RCM
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EMC Standards	IEC 61000-6-1, IEC/EN 61000-6-3
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