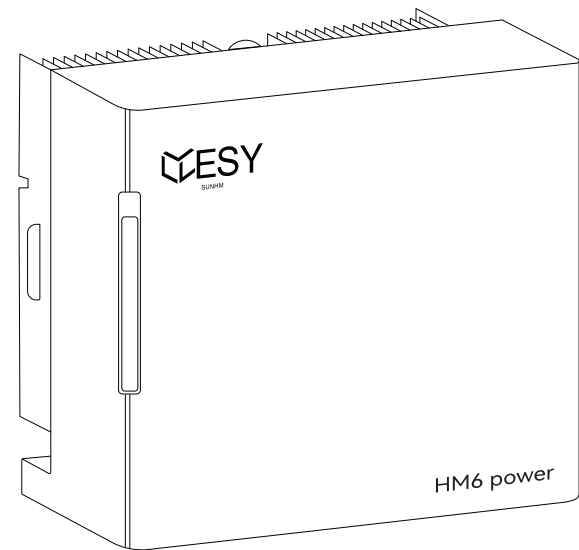


HM6 Household Inverter

User Guide & Installation Manual
(V-B02)



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Made in China

CE RoHS

ESYsunhome 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. ESY SUNHOME 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.

ESY SUNHOME 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 ESY SUNHOME'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, improper use or incorrect installation or operation may result in serious personal injury or device damage. Transportation, installation, startup, dismantling, 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 inverter 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 inverter 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 inverter, 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 inverter's PV port never exceeds the maximum value. Exceeding the maximum voltage may result in permanent damage to the inverter 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 inverter 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.

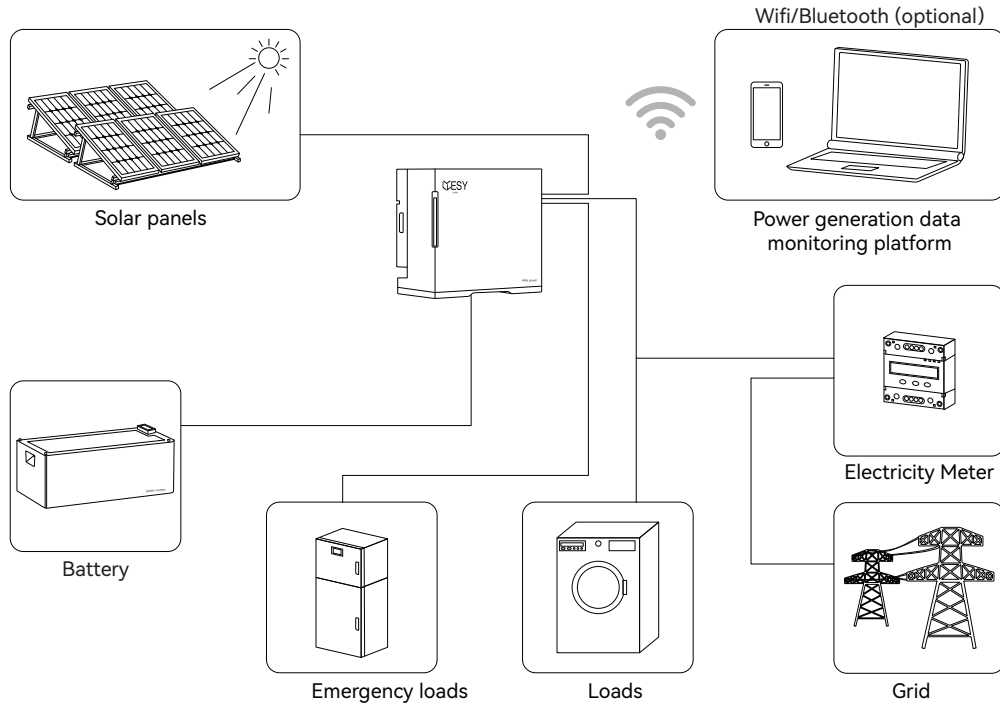
2. Safe Transportation and Storage

- When transporting the inverter, it must be packed in the original packaging to ensure the safety of the equipment during transportation.
- Upon receiving the goods, please inspect the external packaging of the inverter and then open the box for a comprehensive inspection.
- If any damage to the inverter occurs during transportation, please notify the shipping company. The shipping company is responsible for any equipment damage caused during transportation. If necessary, seek assistance from the installer or manufacturer.
- When handling inverters weighing 35 kg or more, please use appropriate equipment or work together with multiple people.
- When storing the equipment, please use the original packaging and store it in a cool, dry, and well-ventilated area to prevent damage caused by moisture.

3. Product Introduction

3.1 Overview

ESYSUNHOME HM6 Intelligent Home Inverter is a 6kW power conversion equipment. It can be connected with the battery, and the Internet, allowing connections to the grid, photovoltaic panels, and the Internet of Things. It provides electricity for homes, small businesses, farms, and other locations.



3.2 Product Parameters

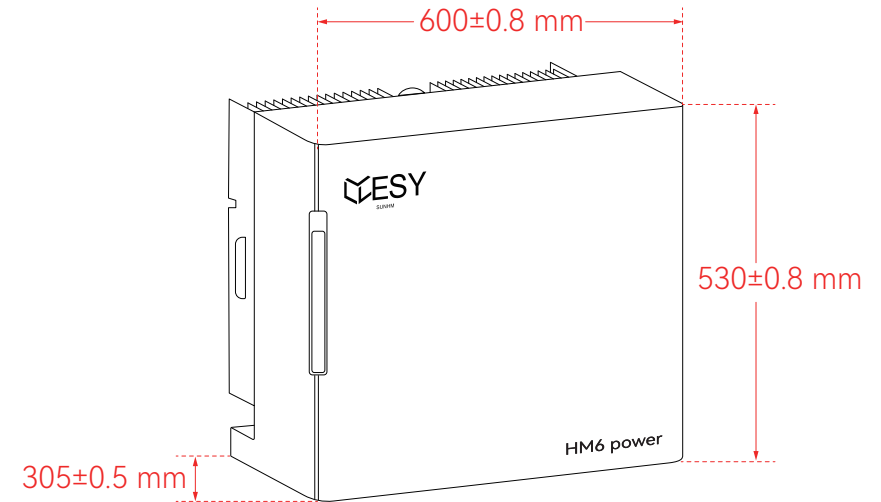
Model	ESYSUNHOME HM6
Rated power	6000 W
Operating mode	Monitoring software
PV input	
Max. input power	8000 W
Max. input voltage	550 Vd.c.
Rated input voltage	360 Vd.c.
Starting voltage	150 Vd.c.
Min. operating voltage	100 Vd.c.
MPPT operating voltage range	100 Vd.c.~540 Vd.c.
Max. input current	15 Ad.c.+15 Ad.c.
Max. short-circuit current	20 Ad.c.+20 Ad.c.
Number of MPPTs	2

PV input	
PV input operating voltage range	100~540 Vd.c.
PV input backfeed short circuit current	0 Ad.c.
Grid	
Number of phases	Single-phase (L+N+PE)
Rated input/output power	6000 W
Max. input/output apparent power	6000 VA
Rated output apparent power	6000 VA
Rated input/output voltage	230 Va.c.
Voltage range	184 Va.c.~276 Va.c. ±2%
Rated frequency	50 Hz
Frequency range	50 Hz±5 Hz
Rated input/output current	26.09 Aa.c. @ 230 V
Power factor	0.8 (leading)~0.8 (lagging)
THDI (rated power)	≤3%
Load	
Rated power	6000 W
Max. output apparent power	6000 VA
Rated voltage	230 Va.c.
Rated current	26.09 Aa.c. @ 230 V
Output voltage range	184 Va.c.~276 Va.c. ±2%
Output frequency	50 Hz ±1%
THDV	≤ 3% (linear load)
Overload capacity	105%, 60 s/120%, 30 s
Switching time	≤ 20 ms
Compatible battery specification	
Battery type	IFpP/Lithium Iron Phosphate
Grid charging	Support
Rated voltage	51.2 Vd.c.
Voltage Range	40.8 Vd.c.~ 57.6 Vd.c.
Charging current	Maximum 100 Ad.c.
Max. charging voltage	58 Vd.c.
Max. discharge current	120 Ad.c.
Rated current (Max. continuous) input and output	100 Ad.c./120 Ad.c.
Efficiency	
Maximum efficiency	97.8%
MPPT efficiency	99.9%
Others	
Topology	High frequency isolation (for battery)
Protection Rating	IP 66
Dimensions (L*W*H)	600±0.8 mm*305±0.5 mm*530±0.8 mm

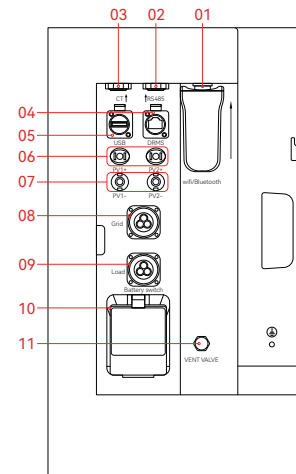
Others	
Net weight	36.4±0.5 kg
Gross weight	42.1±0.5 kg
Installation	Installation on ground
Operating temperature	-25~60 °C (derating above 45 °C)
Storage temperature	-25~70 °C
Cooling mode	Natural cooling
Altitude	<4000 m
Relative humidity	0~100%
Noise level at 1m	≤25 dB
Environmental category	Outdoor
Environment pollution degree	External: PD 3, Internal: PD 2
Communication mode	WiFi/GPRS (optional), USB/RS485
Current (inrush)	8 A.a.c.
Rated apparent power	6000 VA
Max. output fault current	44.35 A.a.c. (26.09 A.a.c.*1.7)
Max. output overcurrent protection	105 A
Grid Mains output short circuit current	157 A/ 1.8 ms
Load output short circuit current	171 A/ 108 ms
Battery output short circuit current	726 A/ 4.65 ms
AC input backfeed short circuit current	0 A.a.c.
Battery input backfeed short circuit current	0 A.a.c.
Anti-islanding method	Passive anti-islanding (method c)
Protective class (I, II or III)	I
Over voltage category Protection	OVC II (for PV/Battery); OVC III (for AC Grid Mains) 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.
Standards	IEC 62109-1/-2
EMC Standards	IEC 61000-6-1, IEC 61000-6-3
Grid-connected standards	AS 4777.2
Warranty	120 months
Country of Manufacture	China

3.3 Appearance

3.3.1 Outline Dimensions



3.3.2 Port Description













Lateral marks on the HM6 inverter chassis

Purpose of each lateral mark on the HM6 inverter chassis

S/N	Mark	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

3.3.3 Nameplate Identification




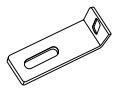

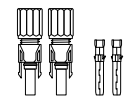
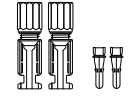




	ESYSUNHOME: brand HM6: model, indicating that the inverter specification is 6kW.
	Pay attention to safety.
	Pay attention to high surface temperature.
	Be cautious of electric shock.
	Prior to attempting any repair, electrical installation or accessing any live parts, make sure that the inverter is cut 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.
	This product is in compliance with IEC 62109 certification standards.
	This product is in compliance with RCM certification standards.


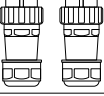
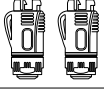



4. System Installation

4.1 Packing List




4.1.1 Packing List of HM6 Residential Energy Storage System

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

Name	Specifications	Quantity	Schematic Diagram
Inverter	HM6 inverter	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	


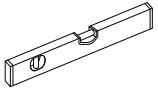
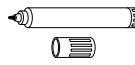
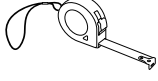
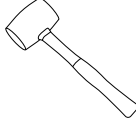
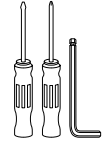
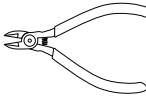
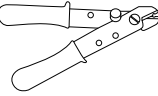
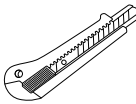
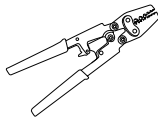
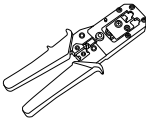
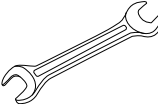

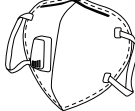

Name	Specifications	Quantity	Schematic Diagram
Ring-shaped crimp cable lug	RNB5.5-6,48 A, Φ=6.5 mm,5.6×23 mm	1	
AC output terminal	3-core waterproof male connector+crimped 10 mm ² cable LT28J3TP2	2	
LAN port connector	Waterproof protection plug of LAN port communication cable (meter communication cable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

4.1.2 HM6 Inverter Base Packing List

Name	Specifications	Quantity	Schematic Diagram
Bracket	600mmx305mmx28mm	1	
Waterproof connector cover	Silicone, black, matte, 110x39.9x9 mm (installed on the base)	1	
Bracket mounting screws	M4x8mm	4	

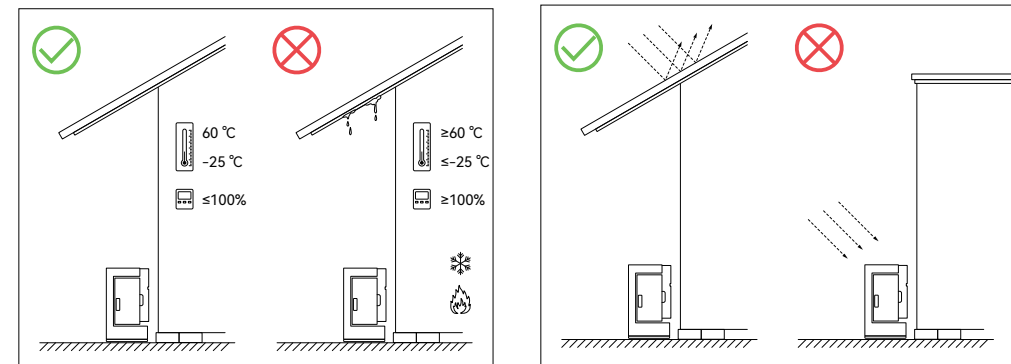
4.2 Preparation before Installation

4.2.1 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

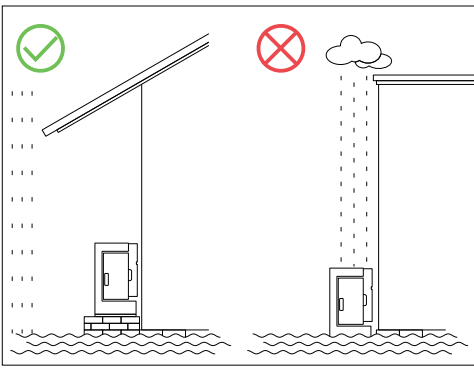
4.2.2 Selection of the Installation Environment

Please select the site according to the relevant requirements.

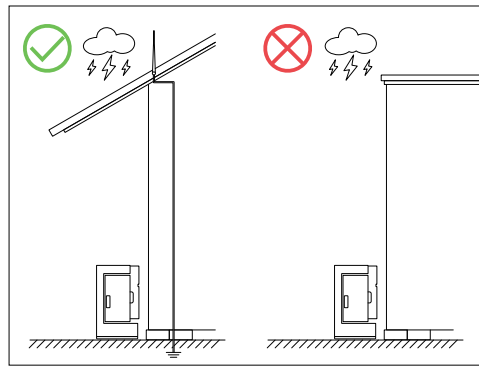


The ambient temperature should be -25 °C to 60 °C and the relative humidity should be 0% to 100% (no condensation).

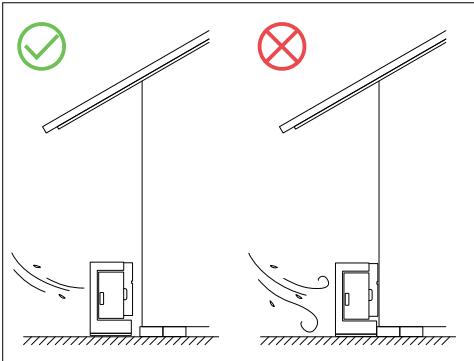
It can be installed outdoors, but must not be directly exposed to sunlight.



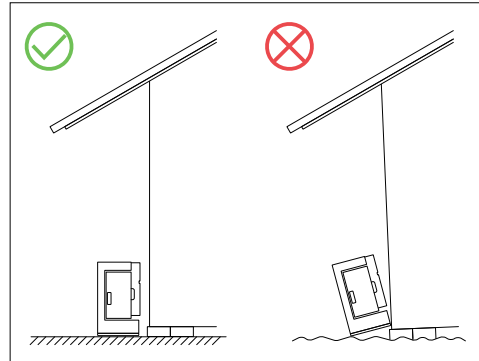
Do not install it in a wet place or in water.



Do not install it in areas prone to lightning strikes.



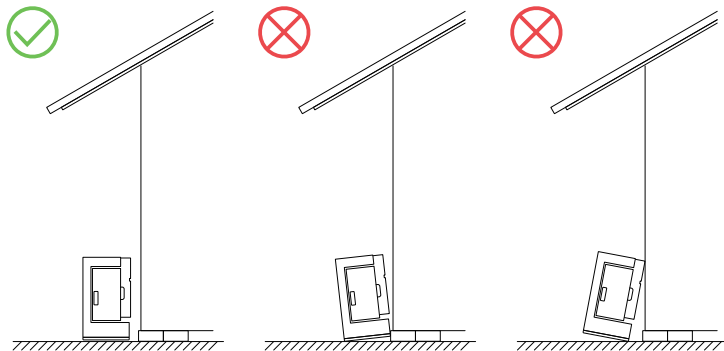
This product is self-cooled. To ensure proper heat dissipation, please install it in a well-ventilated place.



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

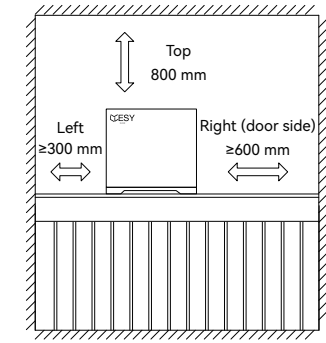
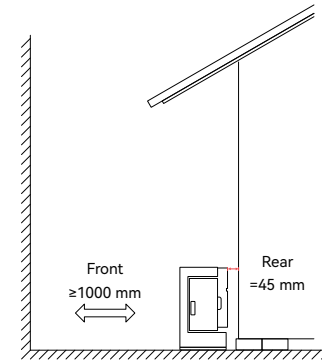
4.2.3 Selection of Installation Location

Vertical installation, without forward or backward tilting.



The clearances around the inverter must not be less than the following:

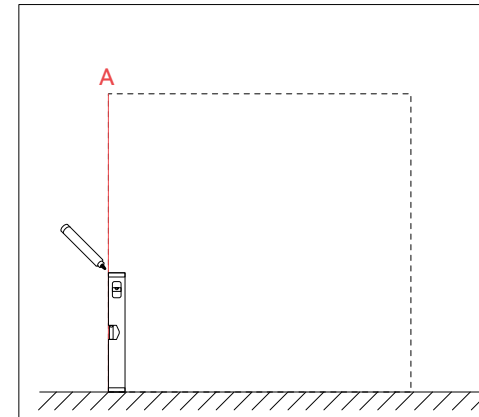
Top	Front	Rear	Left	Right (door side)
≥800 mm	≥1000 mm	=45 mm	≥300 mm	≥600 mm



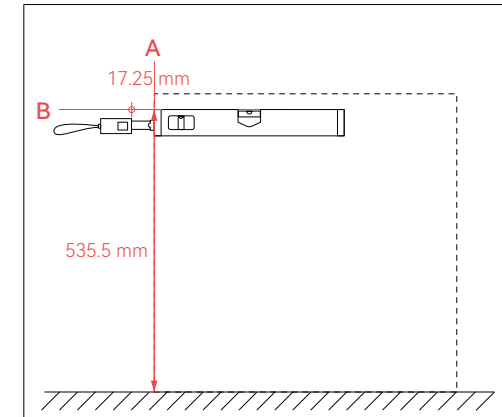
4.3 Installation

4.3.1 Location

Tools: spirit level, marker, ruler



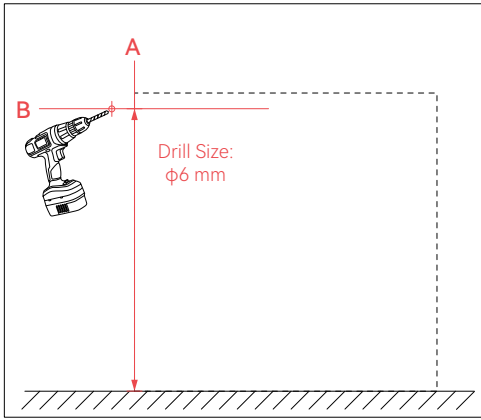
Select the left boundary of the chosen equipment and mark it. Fix the Y-axis of the level to the left side of the equipment and draw reference line A. The reference line should be perpendicular to the ground.



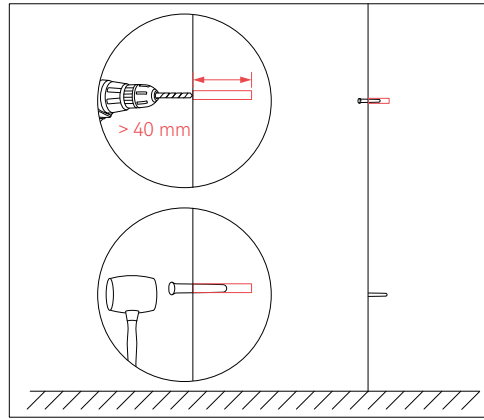
Perpendicular to reference line A, use a ruler and level to measure and draw reference line B. The distance between line B and the ground is 535.5 mm. Starting from point A, mark the position of the inverter angle iron screw hole at 28 mm on line B.

4.3.2 Drilling

Tools: electric drill (bit size: $\phi 6$ mm), hammer, expansion tube (6x40 mm) with screws.



Use a $\phi 6$ mm drill bit to drill holes at the marked positions.

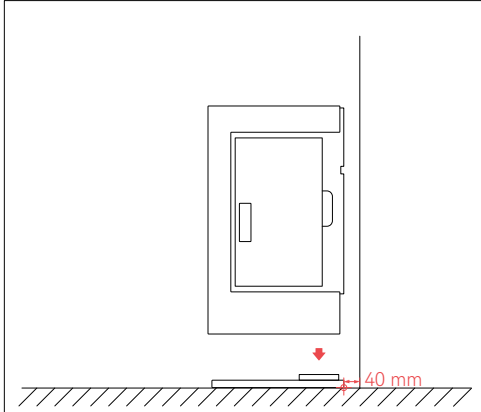


Hammer the expansion tubes into the holes.

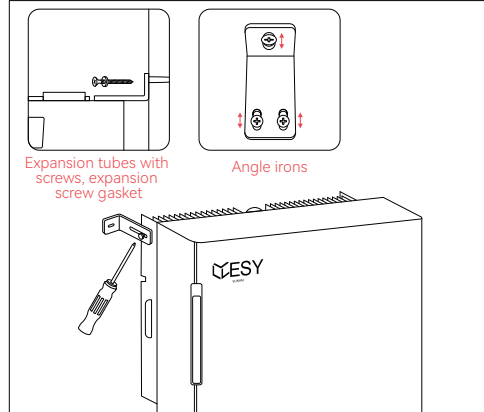
4.3.3 Installation

Note: Please use the provided base for installation of the HM6 inverter.

Tools: Ruler, screwdriver, angle iron screws (M4x12 mm), inverter angle iron, wall plugs and screws (6x40 mm).



Mark the position at 40 mm from the wall, place the base parallel to the wall (the waterproof sleeve for the connector is already installed on the base, do not remove it). Align the bottom connection port of the inverter with the anti-falling slot on the base and place it on the base.



Align the inverter angle iron with the right screw hole of the inverter and fix it with a screw. Do not overtighten the screw. Thread the expansion screw through the washer, fix the angle iron to the wall, and adjust the position of the angle iron screw. Tighten the screw.

4.3.4 Inspection

Check each of the previous steps one by one. Installation is complete.

5. Electrical Connection

5.1 Instructions before Wiring

5.1.1 Cable Requirements

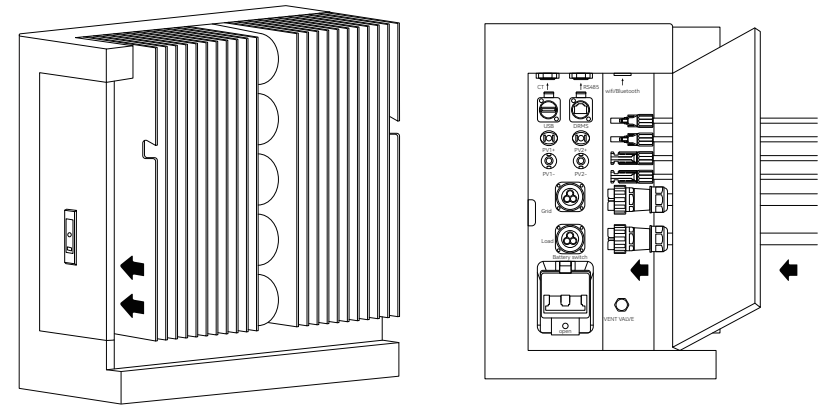
When using external wiring cables, the current and system overload capacity through the cables, as well as the ambient temperature, should be considered. The following table shows recommended cables. Engineers should refer to local standards and the following table when selecting cables. The cable length is generally 2-10 m. 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	RCD
Grid/ AC Input (L, N, PE)	4 ~ 6 mm ²	400 V.a.c./40 A	Type B
EPS/Load Output (L, N, PE)	4 ~ 6 mm ²	-	Type B
PV1/PV2/PV Input (+, -)	4 ~ 6 mm ²	600 V.d.c./20 A	-

5.1.2 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 inverter. 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.

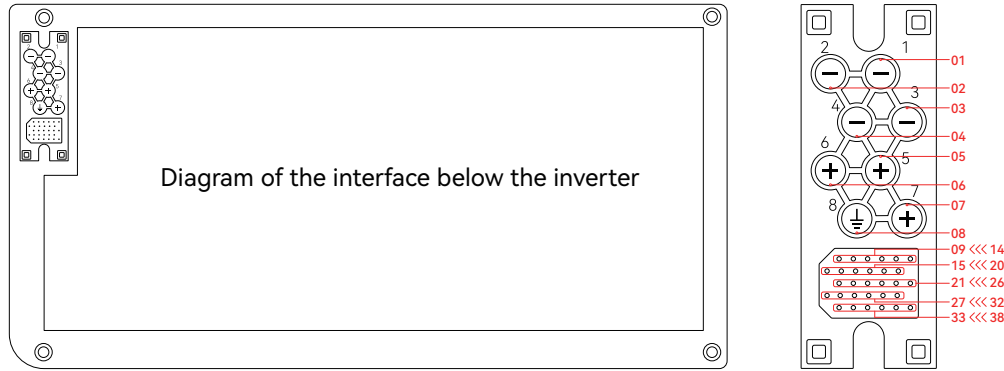
The capacity of the load output terminal of the inverter is as follows:

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 6 KVA.
2. Capacitive loads (e.g. computers and switching power supplies): the total maximum power is 6 KVA.

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.

5.1.3 Connection with Battery

This product can be connected to a battery. The interface diagram and definitions for the bottom interface are as follows:



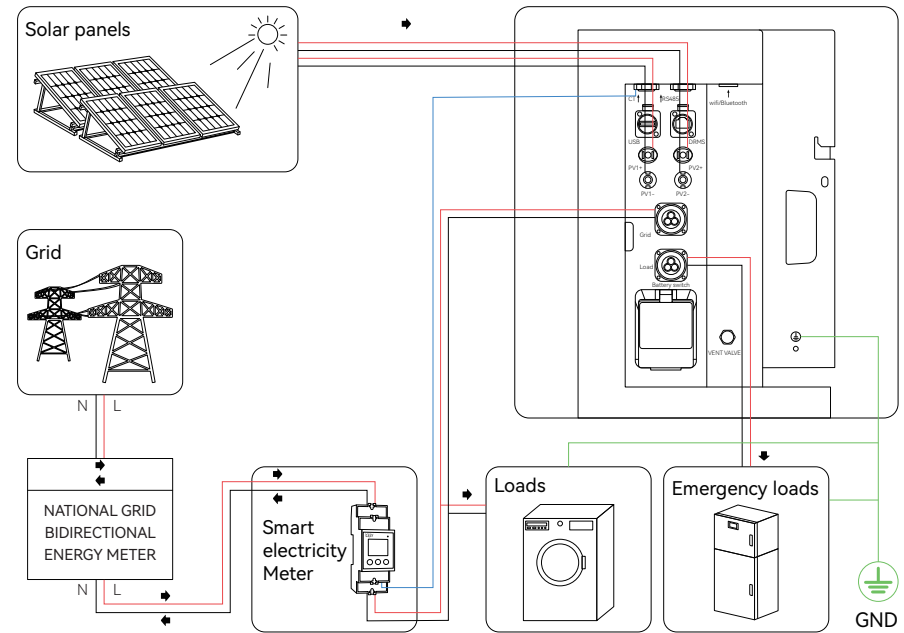
S/N	Mark	Purpose	S/N	Mark	Purpose
01	PACK-	Battery cathode	18	NC	Reserved interface
02	PACK-	Battery cathode	19	NC	Reserved interface
03	PACK-	Battery cathode	20	NC	Reserved interface
04	PACK-	Battery cathode	21	NC	Reserved interface
05	PACK+	Battery anode	22	NC	Reserved interface
06	PACK+	Battery anode	23	NC	Reserved interface
07	PACK+	Battery anode	24	NC	Reserved interface
08	Ground wire	Ground wire of the chassis	25	NC	Reserved interface
09	RS485-B2	Battery and inverter communication port	26	NC	Reserved interface
10	RS485-A2	Battery and inverter communication port	27	NC	Reserved interface
11	GND	Ground wire	28	NC	Reserved interface
12	GND	Ground wire	29	NC	Reserved interface
13	SW-air switch	Signal cable for enabling battery discharge	30	NC	Reserved interface
14	SW-air switch	Signal cable for enabling battery discharge	31	NC	Reserved interface
15	NC	Reserved interface	32	NC	Reserved interface
16	NC	Reserved interface	33	NC	Reserved interface
17	NC	Reserved interface	34	NC	Reserved interface
			35	NC	Reserved interface
			36	NC	Reserved interface
			37	NC	Reserved interface
			38	NC	Reserved interface

5.1.4 Temperature Sensing Device

During the operation of the inverter, temperature monitoring and control can be remotely conducted using the backend management system. When the inverter is stacked with a battery, the inverter can communicate with the battery's BMS through the communication port below the inverter, and read and control the battery temperature according to instructions from the backend management system.

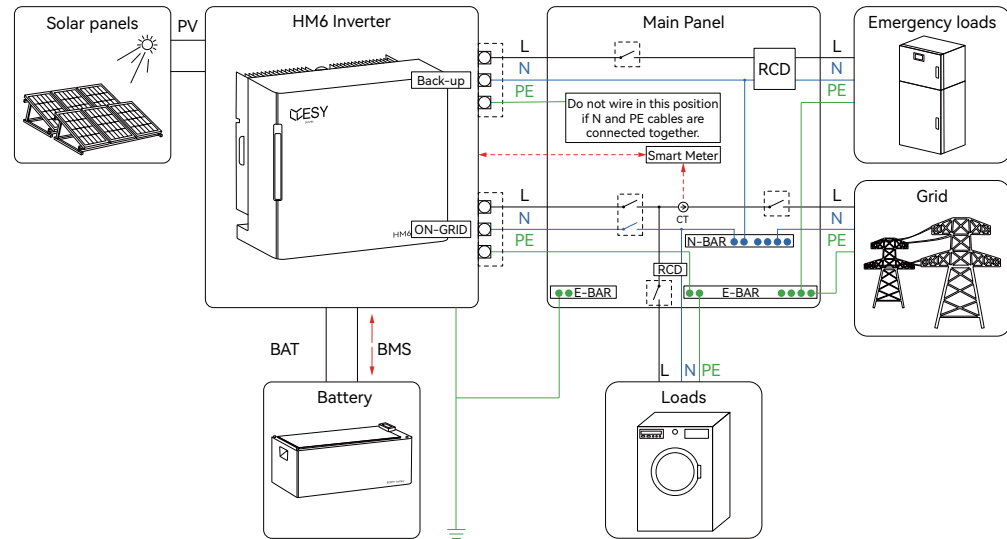
NOTE This function requires the use of a Wi-Fi communication dongle (optional).

5.2 Schematic Diagram of System Connection

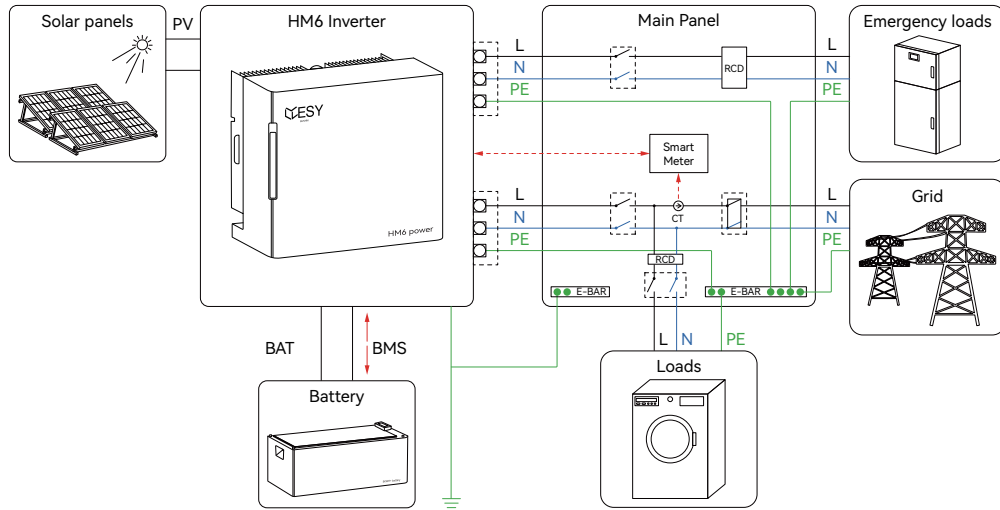


5.3 RCD Wiring Diagram

The following wiring diagram is applicable to Australia, New Zealand, South Africa, and other regions:



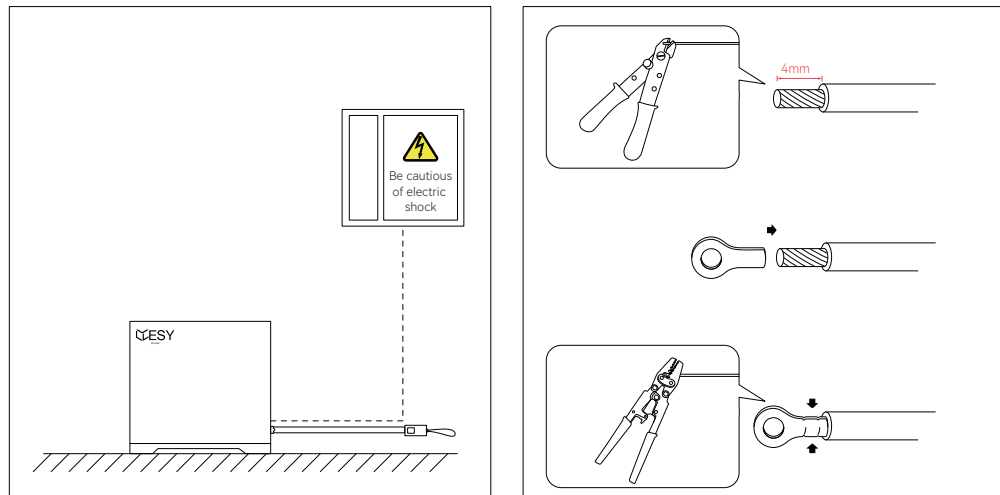
The following wiring diagram is applicable to regions other than Australia, New Zealand, and South Africa:



RCD Specifications requirements			
RCD Type	Action current	Rated continuous current	Rated continuous current
B	30mA	≥40Aa.c.	≥400Va.c.

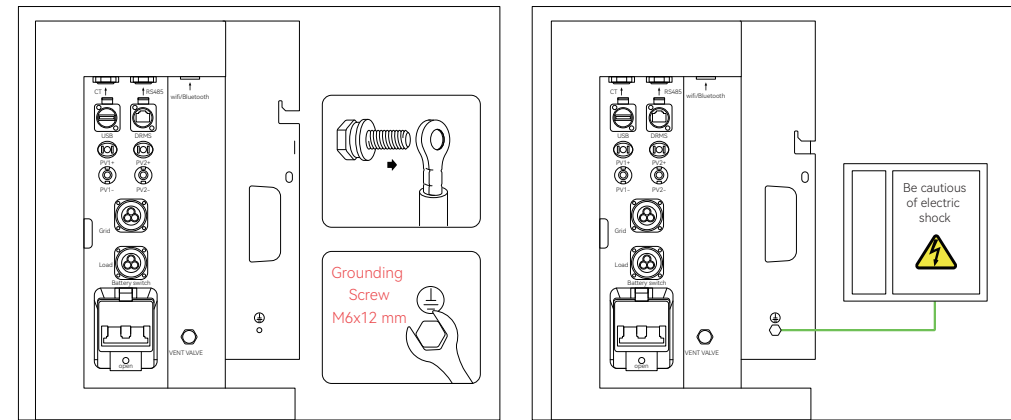
5.4 Ground Wire Connection

Tools: screwdriver, ground wire screw ($\phi 6$ mm), 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 inverter using the ground wire screw ($\phi 6$ mm), and ensure that the other end of the wire is properly grounded with the grounding impedance of 0.1Ω or less.

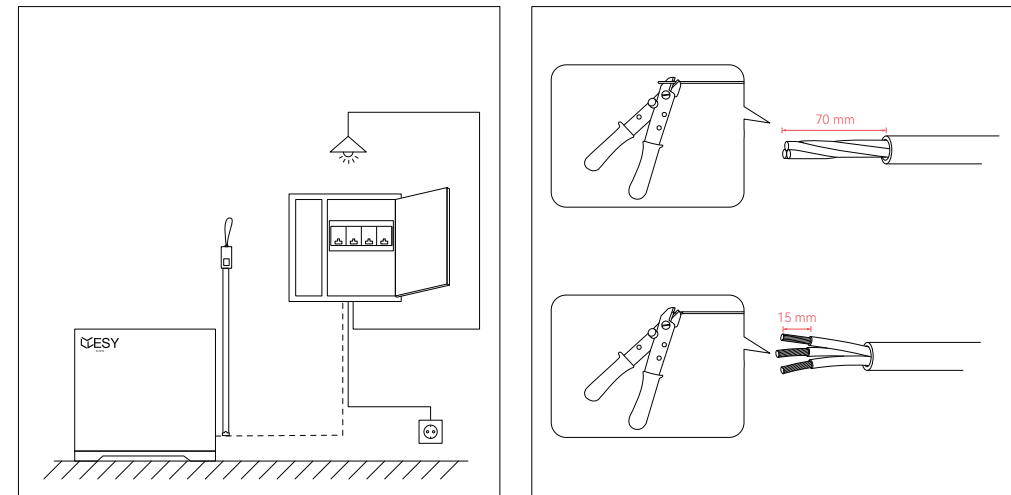
Ensure the ground wire is properly connected to ensure safety in installation and use.

Note:

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

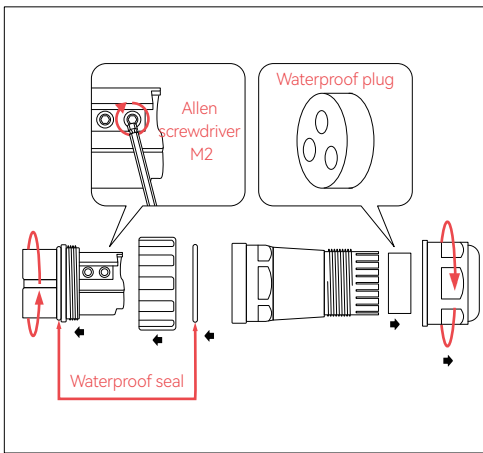
5.5 Load Connection

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

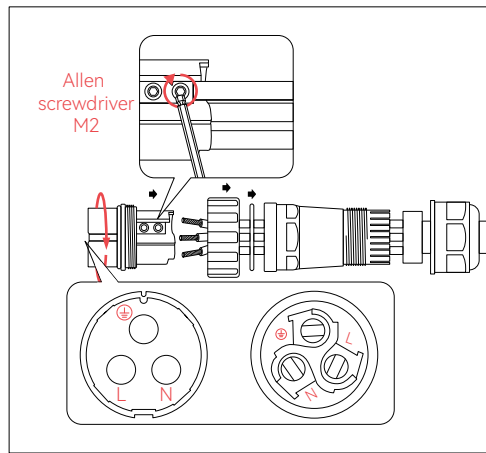


Measure the distance between the product and the power distribution box or load terminal using the tape, and select a cable of the appropriate length.

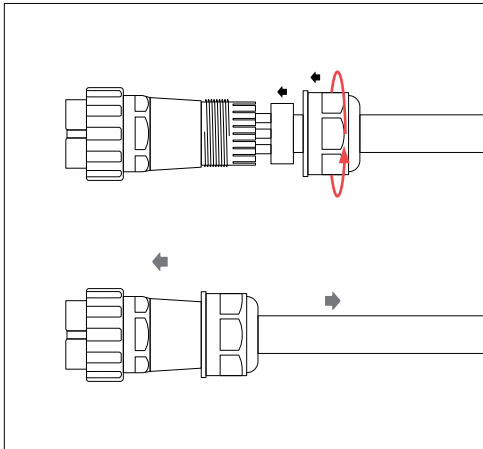
Strip the cable sheath by 70 mm and core insulation by 15 mm using the stripping pliers.



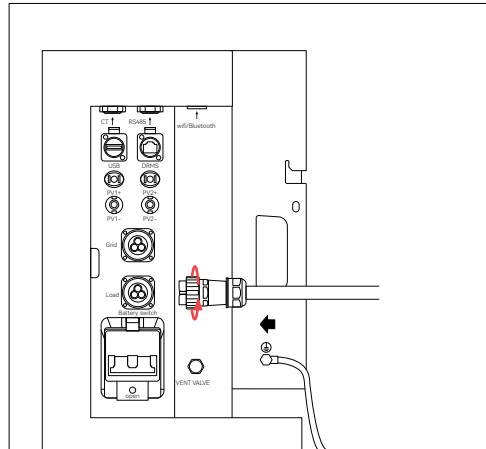
Unscrew the AC output terminal. Remove the white waterproof seal and waterproof plug, and keep them properly to avoid loss. Loosen the fixing screws of the waterproof terminal using the Allen screwdriver M2. Remove the rear waterproof plug.



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.

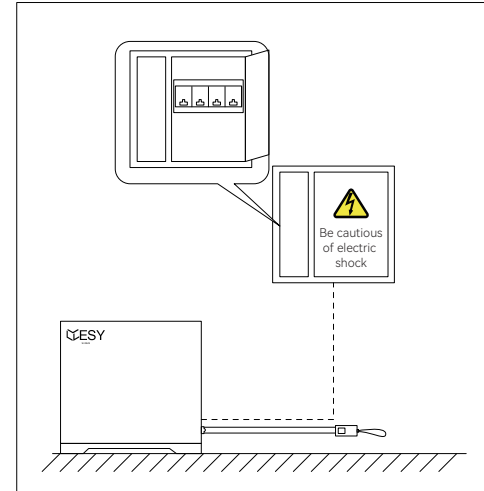
Warning!

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

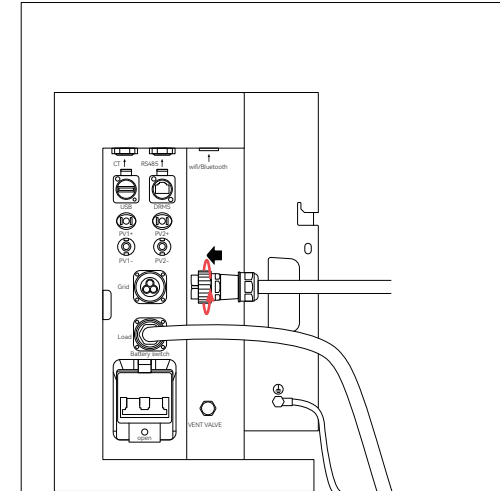
The HM6 inverter does not support parallel operation. Do not connect the load terminals in parallel.

5.6 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 5.5.



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

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



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

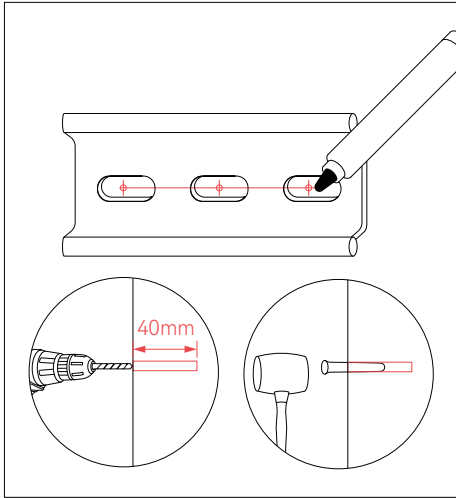
The HM inverter is a single-phase inverter and cannot be used in combination with multiple inverters (AS/NZS).

The inverter has not been tested to AS/NZS 4777.2:2020 for multiple inverter combinations so combinations should not be used or external devices should be used in accordance with the requirements of AS/NZS 4777.1.

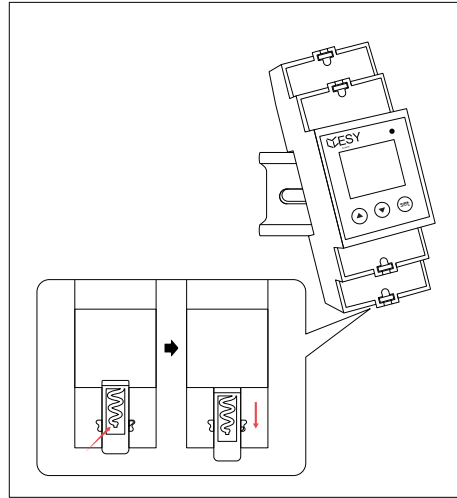
5.7 Electricity Meter Connection

5.7.1 Electricity Meter Installation

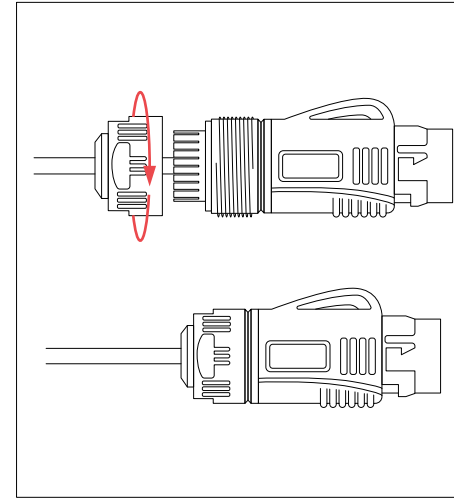
Tools: screwdriver (small cross), network cable, network cable pliers, stripping pliers, tape, electricity meter guide rail, slide rail screws, marker, hammer, electric drill, expansion screws, electricity meter screws.



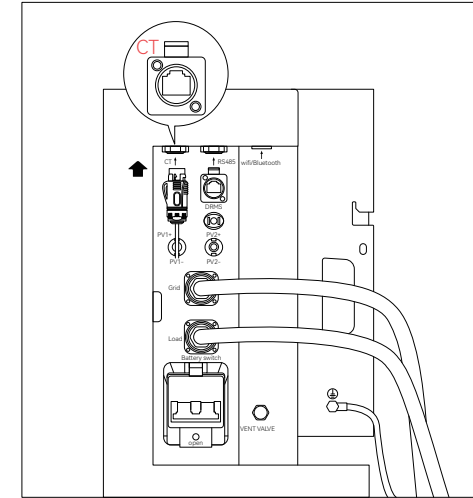
Select the installation position for the electric meter and mark it according to the screw holes on the meter slide rail. Use a power drill to drill holes and insert expansion pins.



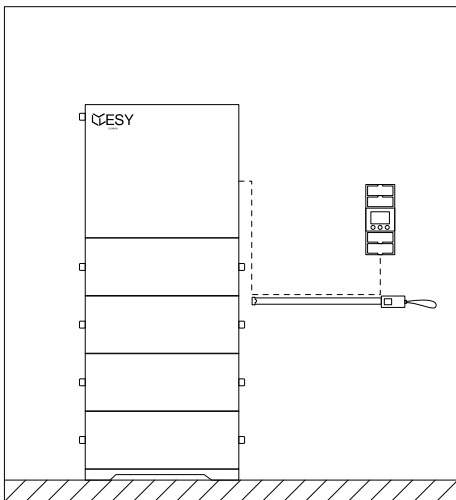
Lift the latch switch at the rear of the electric meter, pull it down to secure the meter on the guide rail, and the latch will automatically lock into place once the position is adjusted.



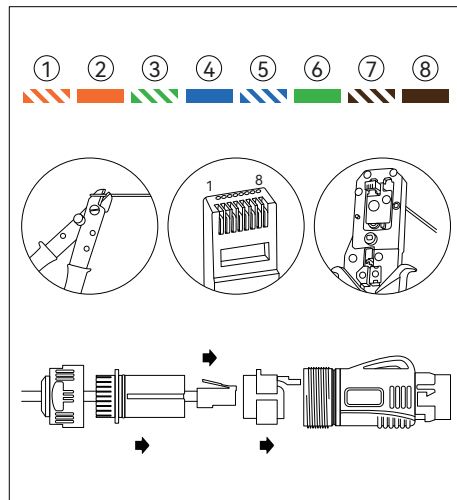
Tighten the end of the terminal and ensure the cable is connected securely.



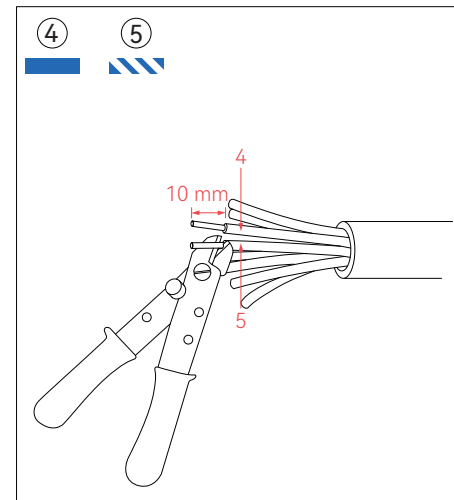
Connect the network cable with the waterproof terminal to the CT port of the inverter housing.



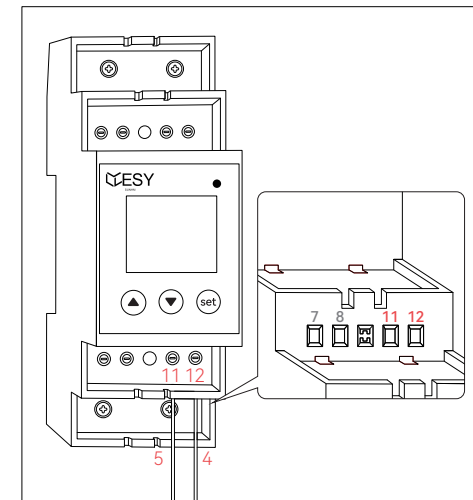
Measure the distance between the product and the electricity meter using the tape, and select a network cable of the appropriate length.



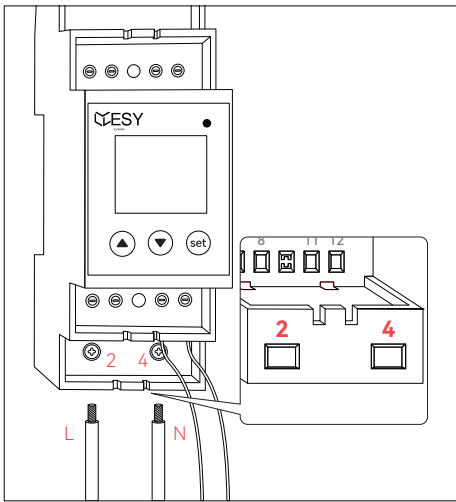
Strip the network cable using the stripping pliers and install it through parts as shown in the figure. Fit crystalhead to the network cable according to the color sequence (1-8). Clamp the crystal head to the terminal, and insert the terminal plug.



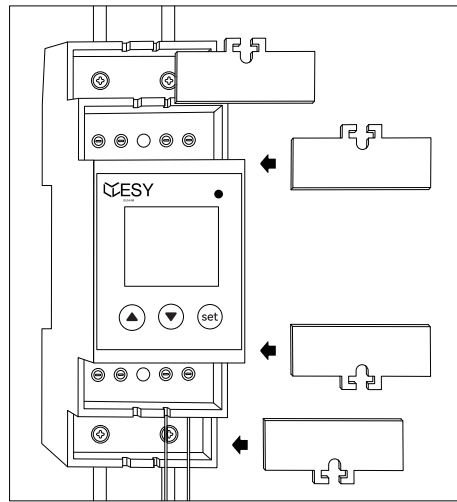
Strip the insulation of 4# (blue) and 5# (blue and white) wires at the other end of the network cable by 10 mm.



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.



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.

5.7.2 Use of Electricity Meter

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




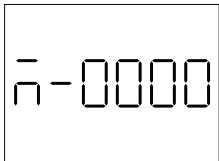
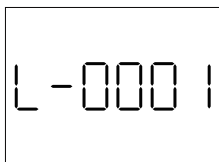

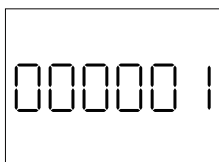
- ▲: Move the screen upward; when setting data, increment the value by one.
- ▼: Move the screen downward; when setting data, switch to the next data digit.
- set: Enter the next level screen; when setting data, confirm or modify the data.


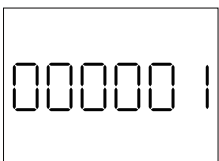




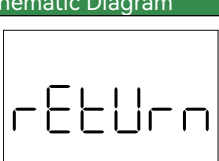
By operating the buttons, you can access different screens, which are explained as follows:

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	

5.7.3 Electricity Meter Configuration

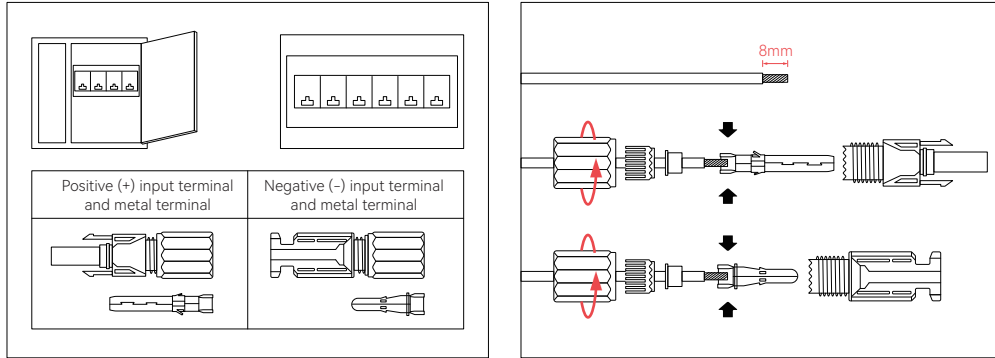
Password Setting	Schematic Diagram
<p>Press and hold the "SET" button for 3 seconds to enter the password input page. Press "▲" to adjust the number size and "▼" to switch the numbers. Set the PD password as 3366. Press "SET" to save and enter the settings page.</p>	
DL/T645-2007 address setting	Schematic Diagram
<p>In the settings page, press "▲" or "▼" to select "645.Ad." Press the "set" button to enter the DL/T645-2007 address settings page.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
CT setting	Schematic Diagram
<p>In the settings page, press "▲" or "▼" to select "CT." Press the "set" button to enter the CT settings page.</p>	
<p>Press "▲" to adjust the value and "▼" to switch the numbers. Set CT as "000001" Press "set" to save.</p>	

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

5.8 PV Connection

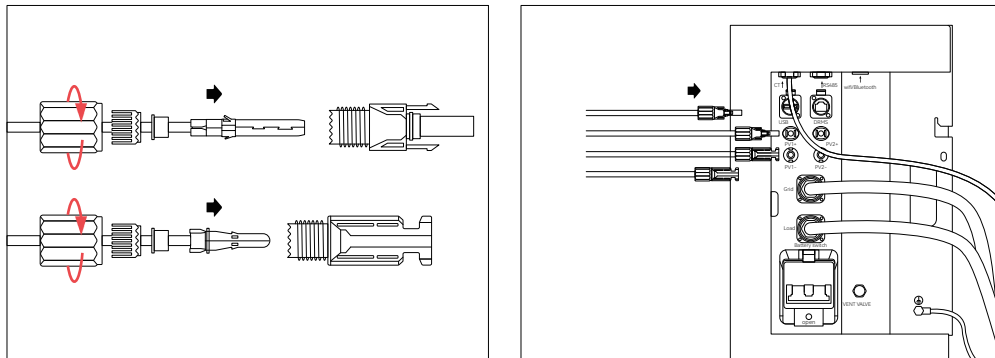
Tools: PV+ connector, PV- connector, PV crimping pliers

Before wiring, cover the shading plate and ensure that the photovoltaic components are within a safe voltage range.



Disconnect all circuit breakers of the inverter and PV module. Make sure that the cables of the inverter 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 inverter and that of the machine. Connect the PV input cable to the inverter. Ensure the cables are connected properly.

Caution



Make sure that the maximum input voltage of the HM6 residential energy storage system does not exceed 550 V (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 500 V or below).

All PV modules must be of the same type and mounting angle.

The input voltage and current range of the PV modules used should meet the parameter requirements of ESY SUNHOME.

Warning

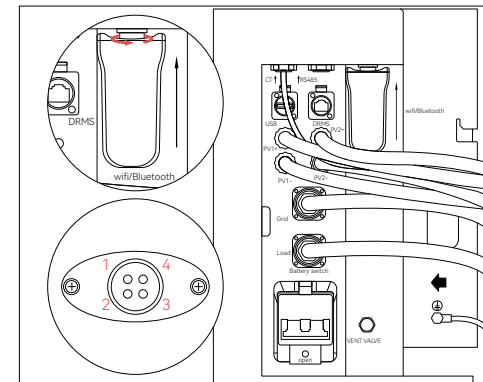


Since the non-isolated topology is applied to the circuit between the inverter's PV modules and the power grid, please use monocrystalline silicon or polysilicon PV modules only.

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 1,000 V), 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 inverter. Otherwise, the voltage of the PV array may exceed the maximum input voltage of the inverter at low temperatures, which may cause damage to the inverter.

5.9 Communication Interface

5.9.1 WiFi-IoT Pro Communication Interface (optional)



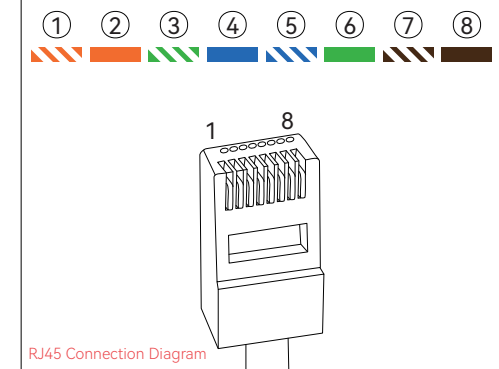
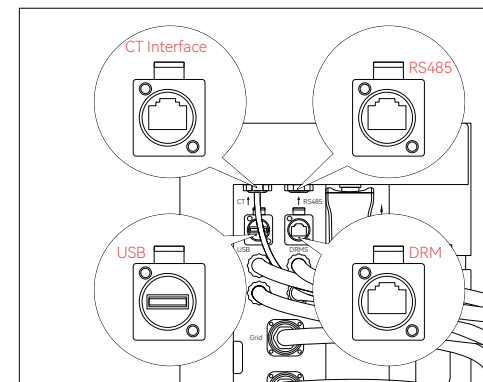
Pin definitions

- 1 Inverter 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.

5.9.2 Interface Description

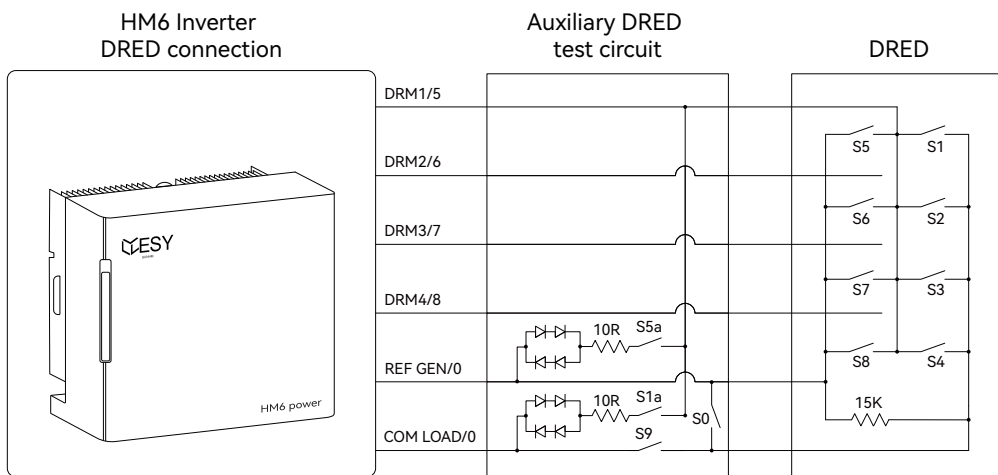


RJ45 Connection Diagram

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	This interface is only for Australian products. DRED control (for Australia & New Zealand only) 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.
Pin Definitions	1: DRM1/5 2: DRM2/6 3: DRM3/7 4: DRM4/8 5: REF GEN/0 6: COM LOAD/0 7: Reserved V+ 8: Reserved V-
USB	(USB Interface)
Pin Definitions	Reserved communication interface for device maintenance

5.9.3 DRM Mode Illustration

Illustration of the connection method between inverter DRM and DRED.



Refer to the table below for DRM mode explanation. This product is only applicable to DRM0 mode.

Mode	Requirement
DRM0	Operate the disconnection device
DRM1	Do not consume power
DRM2	Do not consume at more than 50% of rated power
DRM3	Do not consume at more than 75% of rated power AND supply reactive power if capable
DRM4	Increase power consumption (subject to constraints from other active DRMs)
DRM5	Do not generate power
DRM6	Do not generate at more than 50% of rated power
DRM7	Do not generate at more than 75% of rated power AND absorb reactive power if capable
DRM8	Increase power generation (subject to constraints from other active DRMs)

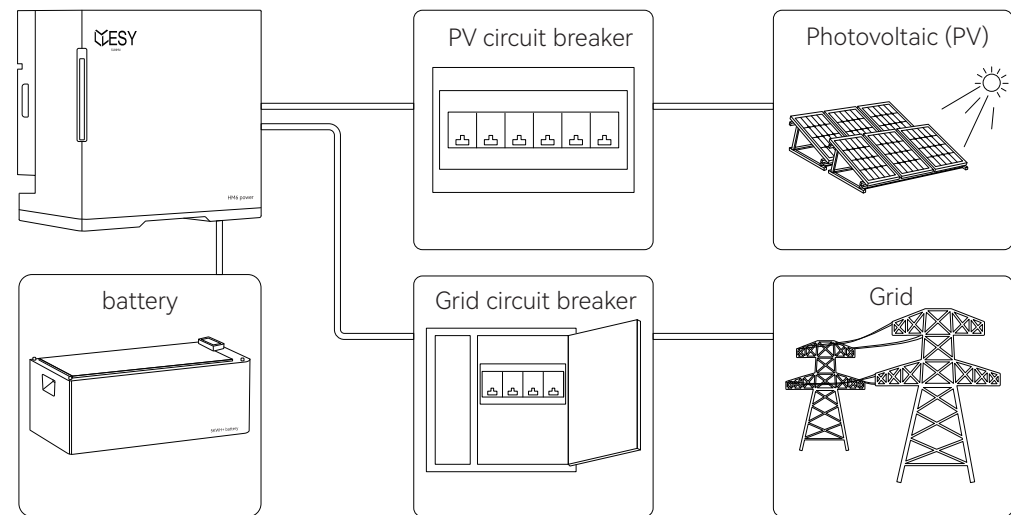
5.10 Startup

Please follow the sequence below to switch the breakers for Startup check (the LED strip on the left side of the inverter will continuously flash and emit a buzzing sound, indicating that the inverter has started):

Grid: Switch the grid breaker to power on and start the device. At this time, you can use the APP for network configuration and check the system parameters. Network configuration methods are described in Chapter 6, Section 2.

Battery: In the case of using a battery, switch the battery breaker on the inverter to power on and start the device.

Photovoltaic: Switch the photovoltaic breaker to power on and start the device.



5.11 Switching Country Code

Factory default country code is set to Australia.

To switch, authorized personnel from the manufacturer or authorized personnel should use the upper computer or management platform to change the country code. Country code table.

Country	Grid-connection standard
DE	DIN VDE V 0124-100:2020, VDE-AR-N 4105:2018
IT	CEI 0-21
BE	C10/11:2021
AUS	AS4777.2

WARNING

Ensure to select the correct country code after system installation.
Consult the local electrical safety department when selecting the country code.

6. ESYSUNHOME APP

ESYSUNHOME APP features include: viewing inverter status and power generation data; real-time viewing and switching of inverter operation modes; scheduling inverter operation modes; turning on/off operations, etc.

User permission: End users of the inverter.

6.1 ESYSUNHOME APP

6.1.1 Download Address

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



iOS



Android

6.1.2 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.

6.2 Network Configuration

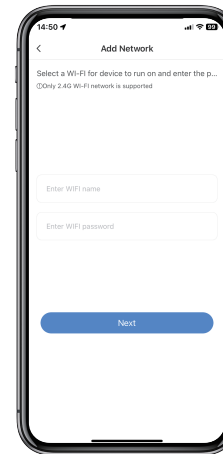
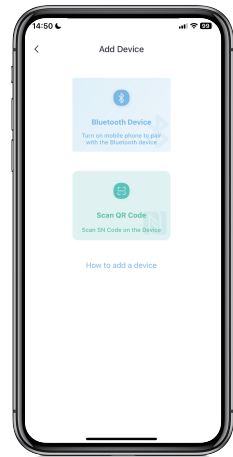
6.2.1 Install New Device

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

6.2.2 Add New Device

Open the APP, click “My Device” and “Add device”, 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.



6.2.3 Device Network Configuration

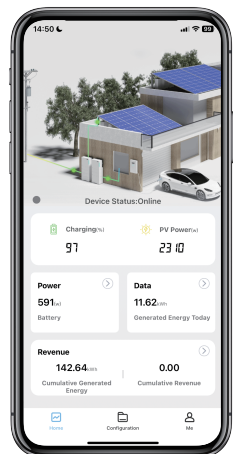
Open the APP, log in to the account, click “Me” and configure the network for the device. The APP will request you to give Bluetooth permission. Once you have given the Bluetooth permission Click “ESYSUNHOME_ + SN code” and enter your WIFI name and password in the pop-up interface. Click “Next” to configure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

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

6.3 Data Monitoring

6.3.1 3D Scene Graph

After successful device linking, when entering the app homepage, you can see a 3D scene diagram containing the grid, load, and photovoltaic elements. The direction of the green cursor movement represents the direction of energy flow, allowing you to see the real-time status of the entire system in this diagram.



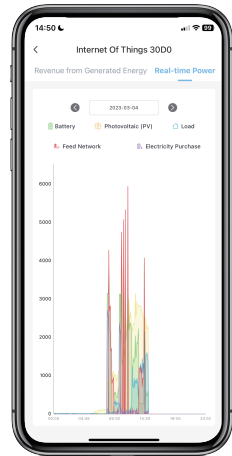
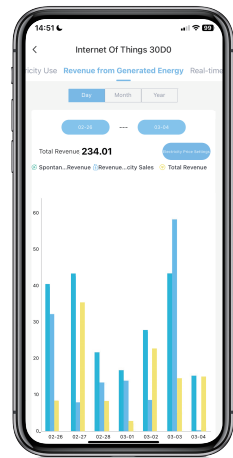
6.3.2 Energy Flow Diagram

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.



6.4.3 Revenue Data

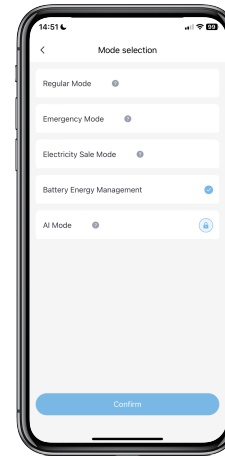
Click "Revenue" on the home page to enter the revenue display interface. In the statistical chart, you can view the daily, monthly, and yearly data, including the revenue of power generation, the revenue of sold electricity, and average revenue. Click the bar charts to see the details. Click the electricity 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.



6.4 Data Statistics

6.4.1 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.



6.5 Inverter Control

6.5.1 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.

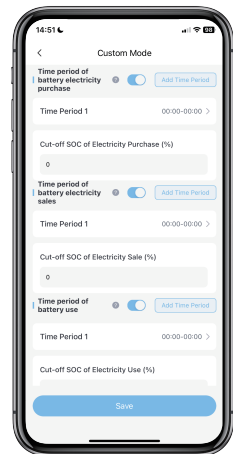
6.4.2 Electricity Consumption Data

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.



6.5.2 Battery Energy Management

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.



6.5.3 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.

6.5.4 Inverter shutdown

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

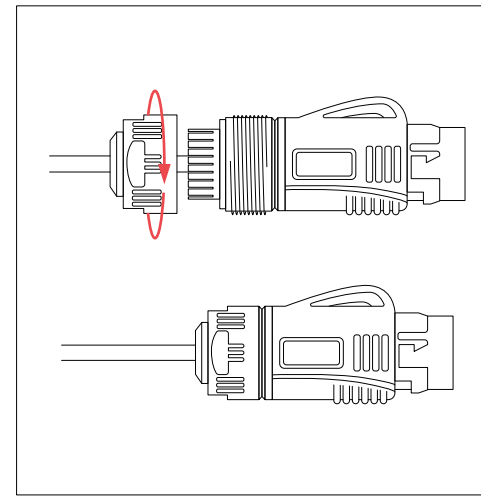
6.6 Remote Monitoring

6.6.1 Alarm Information Monitoring

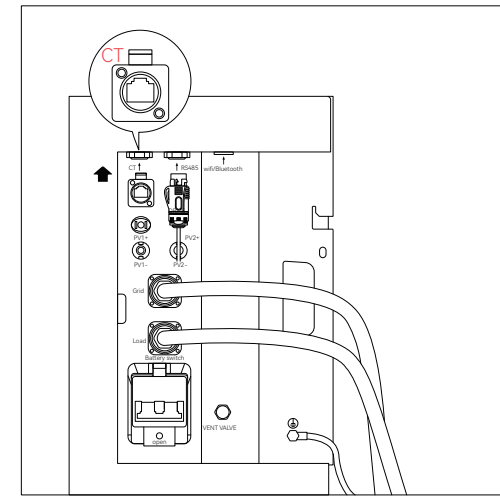
When the energy storage system sends an alarm, a reminder will pop up on the home page of the APP.

6.6.2 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.



Tighten the end of the terminal and check if the connection is secure.



Connect the Ethernet cable with waterproof connectors to the RS485 interface on the inverter casing.

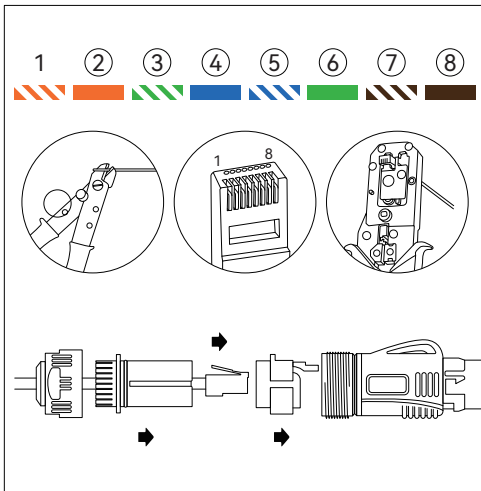
7. ESYSUNHOME Tool

ESYSUNHOME Tool is an upper computer software designed for HM6 inverter. It includes functions such as inverter parameter viewing, inverter settings modification, fault alarm viewing, battery parameter and status viewing, etc.

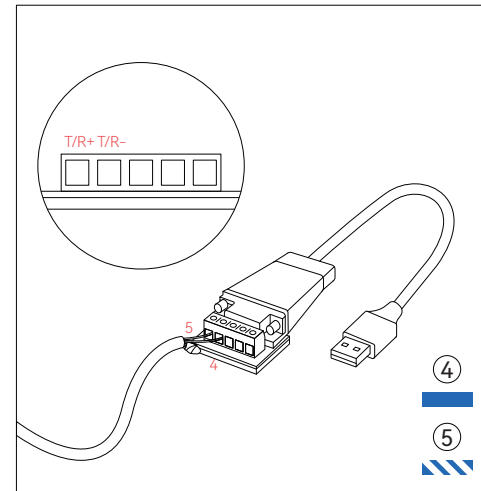
User permission: Inverter manufacturers or authorized maintenance personnel.

7.1 ESYSUNHOME Tool Connection

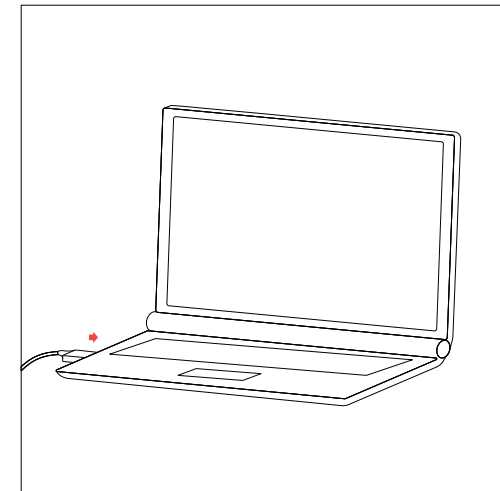
Tools: Screwdriver (small cross), Ethernet cable, Ethernet crimper, wire stripper, RS485 TO USB connector.



Use a wire stripper to separate the Ethernet cable and pass the wires through the corresponding parts in the sequence shown in the diagram. Press the wires into the crystal head in the order of colors 1 to 8 using an Ethernet crimper. After firmly securing the crystal head on the terminal, insert it into the terminal head.

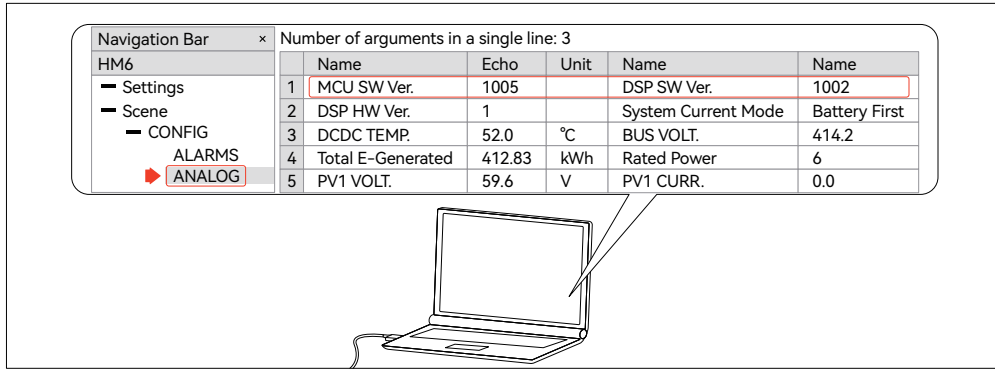


On the other end of the Ethernet cable, strip the insulation layer of wires 4 (blue) and 5 (blue-white) by 10mm. Connect wire 4 (blue) to the B (T/R-) port of the RS485 TO USB connector, and connect wire 5 (blue-white) to the A (T/R+) port of the RS485 TO USB connector.



Connect the USB interface of the adapter to the computer. Use the ESYSUNHOME Tool software provided with the inverter to operate.

7.2 ESYSUNHOME Tool Functions



View Firmware Version: On the ANALOG page of the upper computer, check the MCU SW Ver. and DSP SW Ver. to obtain Firmware Version information.

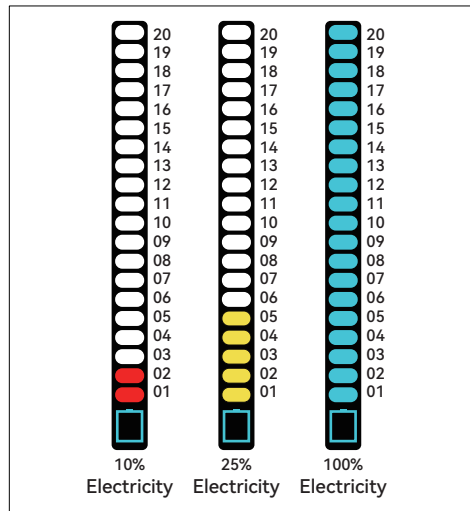
User permissions: only inverter manufacturers or authorized maintenance personnel can access ESYSUNHOME Tool to view or modify the setting parameters.

Country Code: On the ANALOG page of the upper computer, check the country code to obtain country code information.

Generation Limit Control: On the CONFIG page of the upper computer software, modify the value of Max Output Power Percent to be (Generation limit/6000W) %.

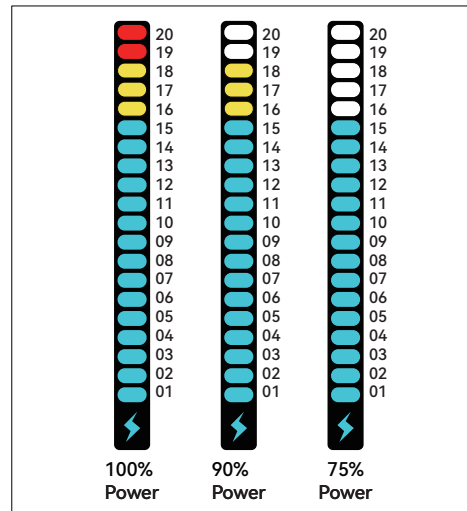
Export Limit Control: On the CONFIG page of the upper computer software, set ON-OFF Grid Mode to ANTI, then modify the value of Backflow Prevent Power Percent to be (Export limit/6000W) %.

8. Light Bar Indication



8.1 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.



8.2 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.

8.3 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		Troubleshooting
2	Major	Silent	Top two red indicators ON		Troubleshooting
3	Minor	Silent	Top three yellow indicators ON		60 s
4	Upgrading	Silent	Top three blue indicators ON		Upgrade Completed

Note: "Earth Fault" alarm is a Level 2 important alarm. When the inverter is not properly grounded, the top two red lights on the indicator will remain lit. Please ensure proper grounding to eliminate the alarm. This indication complies with the Earth Fault alarm requirements of AS/NZS 5033.

9. System Maintenance

9.1 Shutdown Procedure and Periodic Maintenance

To ensure reliable and long-term service of the system, perform the following steps to check and power off the system once a month:

Step1: Turn off the device and disconnect the breakers for battery, photovoltaic, grid, and load.

Step2: Ensure there is not too much dust on the device surface.

Step3: Ensure the device is in a non-humid environment.

Step4: Close the breakers for load, grid, photovoltaic, and battery, and start the device.

9.2 Precautions for Long-Term Non-Use

If the inverter is not used for more than 7 days, please disconnect the circuit breakers for the battery, photovoltaic system, grid, and load.

If the inverter is equipped with a battery and the system is not used for more than 3 months, please switch the circuit breakers for the grid and battery and start the system to charge the battery once.

10. After-sales Service

Service email: support@esysunhome.com

Or, contact the local installer.