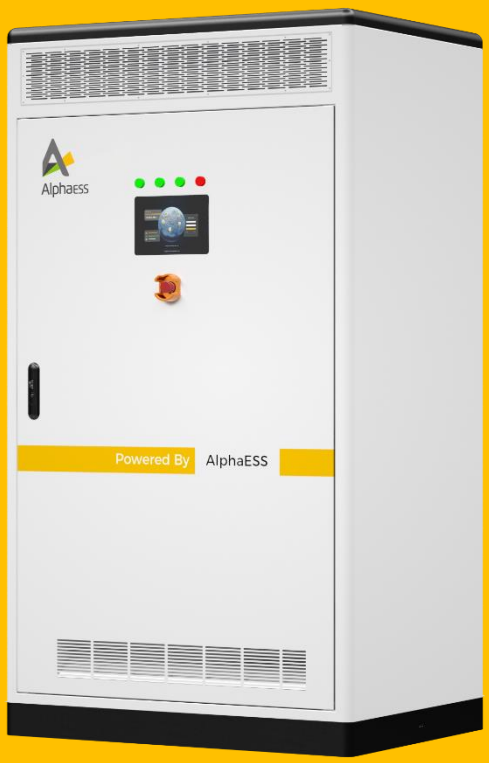
V01

INSTALLATION MANUAL OF ENERGY STORAGE SYSTEM STORION-H30-O



Copyright Statement

Please keep this manual properly and strictly follow all safety and operation instructions within it.

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Preface

After years of dedicated research and development by AlphaESS, the STORION-H30-O lithium-ion battery outdoor energy storage system has been successfully applied to many sites. This high-tech product with excellent quality and stable performance, is widely used in electric power supply industry today.

This manual is designed to provide comprehensive guidance on product installation, including safety instructions, product introduction, and installation procedures.

Symbol Convention

The following symbols may appear in this manual, and their meanings are as follows.

Symbol	Description
	Indicates a potential risk that could lead to system failure or fault alarm if not avoided.
	Indicates a medium level of risk that could lead to system damage or injury if not avoided.
	indicates a high level of potential risk that could lead to serious injury or even death if not avoided.
	Provides supplementary information about the important information in the document. 'Note' does not convey safety alarm information and is not related to information about personal injury, system damage, or environmental harm.

Terminology

1. Battery Management System (BMS)

It is used to monitor the operating information (such as voltage, current, temperature, battery protection parameters, etc.) of battery cells, battery packs, and system units, and intelligently evaluate the state of charge (SOC) and health status (SOH) and accumulated energy released to protect the safety of battery.

2. Energy Management System (EMS)

EMS encompasses data acquisition and monitoring system and is used for automatic power generation control, economic dispatch control, power system status and safety analysis.

3. Battery System (BESS)

BESS comprises battery (in series/parallel connection) and battery management system (BMS), and is used to connect DC side of H30 outdoor system.

4. Energy Storage System (ESS)

ESS is a combination of BESS and H30 outdoor system, and can function as an independent power supply or be controlled by a monitoring system.

5. Photovoltaic (PV)

PV, which refers to Photovoltaic Power System, is a new type of power generation system that converts the radiant energy of sunlight into electric energy directly by utilizing the photovoltaic effect of the semiconductor material in the solar cell.

6. Grid-connected System

A grid-connected system usually consists of a PV string, an H30 outdoor unit (battery system), and the power grid.

When the power generated by the PV string is abundant, the surplus power can be fed into the grid. Conversely, when the power generated by the PV string and the battery system is insufficient, the grid can supply power to the load.

7. Off-grid System

Off-grid systems are suitable for areas without grid or where the grid power is unstable. These systems usually consist of photovoltaic arrays, energy storage inverters, battery systems and generators. When the battery power is sufficient, the photovoltaic and battery supply power to the load. However, when the battery power is insufficient, the generator will charge the battery system and supply power to the load.

Table of Contents

1. Safety Instructions

Statement

This manual contains important information about the installation of the product, please read it carefully before operation.

Please keep this manual in a safe place for future reference during installation, operation and maintenance.

Please strictly follow the instructions in this munual for installation, operation and maintenance to avoid product damage, personal injuries and property loss.

For systems where commissioning has not been completed, please make sure to switch off the system (batteries, H30 outdoor unit, etc.) before the installer leaves the site.

In the event of a fault occurring during normal system operation, please begin by troubleshooting using the provided fault checklist. If the problem remains unresolved, please contact an AlphaESS engineer promptly and make sure to turn the system (batteries, H30 outdoor unit etc.) off before the AlphaESS engineer replies.

To ensure optimum reliability and meet warranty requirements, the energy storage system must be installed, operated and maintained in accordance with the instructions in this manual. We do not accept any liability for violations of general safety operating requirements or breaches of safety standards related to the design, manufacturing and use of our products. Please note that any damage to the product resulting from such violations will not be covered by the warranty.

1.1 Operators' Qualifications

- Operators must hold a professional qualification from AlphaESS or one authorised by AlphaESS.
- The operator must be familiar with the product, including its composition and operational principles.
- The operator must be familiar with the Product Manual and follow it strictly to install, operate and maintain the product.
- Ensure that at least two operators are present when performing any product-related work. Do not carry out maintenance work until the product has been disconnected from power.

1.2 Personal Safety

- Place clear signs next to the circuit breakers of PV, battery, H30 outdoor unit and distribution box to prevent accidents caused by accidental switching.
- Place warning signs or set up safety warning strips around the operating area.
- Ensure that the electrical parameters are in accordance with the requirements. Use a multimeter to measure the electrical components when connecting the system, doing trial operation, or maintaining the product. Please use the multimeter correctly to ensure the safety of personnel.
- High voltage in the system may have a risk of fatal electric shock if touching accidentally, so it is important to take precautions when conducting energised tests.
- Ensure that the connection and operation of the system comply with the relevant regulations to prevent arcing or electric shock.

The following installation tools and protective equipment are required for the installation, operation and maintenance process.

Table 1-1 Installation Tools

No.	Name	Model Specifications (Precision)	Unit	Quantity
1	Diagonal pliers	/	pcs	1
2	Screwdrivers	2/4/6/8mm	pcs	1
3	Cable ties	/	pcs	1
4	Multimeter	DC 1000V	pcs	1
5	Impact drills	/	pcs	1
6	Socket spanner	Socket spanner sets	pcs	1
7	Open-end spanners	Open-end spanner set	pcs	1
8	Socket torque spanners	/	pcs	1
9	PV Cable Plugging Tool	/	pcs	1

Table 1-1 Protective Equipment

No.	Name	No.	Name
1	Safety shoes	4	Protective goggles
2	Safety helmet	5	Dust masks
3	Safety gloves		

1.3 Product Safety

- Warning signs contain important information for the safe operation of the product; it is improtant to make sure they are clear and visible. Any damage should be avoided, and if any occurs, the signs should be replaced immediately.
- The key must be removed after the system has been officially operated or maintenance has been completed.

- To prevent component damage caused by touching or inappropriate operation of circuit board or other electrostatic-sensitive components, please avoid unnessary contact with the board.
- Please avoid opening the product in rainy or wet weather for maintenance or servicing, etc.

During maintenance, all products must be disconnected from power and maintained strictly in accordance with the relevant requirements of this manual.

1.4 Electrical Safety

1.4.1 Grounding Requirements

1. When installing the product, make sure to install the protective earth wire first. Likewise, when removing the product, ensure that the protective earth wire is the last component to be disconnected.
2. The system should be permanently grounded. Before operating the system, check the electrical connections to ensure the system is reliably grounded.
3. Do not damage the earth conductor.

It is strictly forbidden to install the system before grounding.

1.4.2 Wiring Requirements

1. For safety, connect the power cable from the battery to the high-voltage box before assembling the system battery following the earth wire connection.
2. Cables used in high-temperature environment may cause insulation deterioration and breakage. The distance between cable and heat-generating device or heat source area should be at least 30mm.
3. Cables of the same type should be tied together, while cables of different types should be separated by a minimum distance of 30mm, without twisting or crossing.
4. All cables used in the product must be securely connected, well insulated and of the correct gauge.
5. When the communication cable need to pass through power cables, keep the angle between the two cables to 90° as close as possible.

1.5 Installation Environment

Table 1-3 Installation Environment

Environmental Parameters				Installation Environmental Conditions	Environmental Conditions for Transport and Storage		Notes
Projects		Parameters	Unit		Storage	Shipping	
Climatic Conditions	Temperature	Low temperature	℃	-10	0	-20	
		High temperature	℃	+50	+35	+45	
	Pressure	Low pressure	kPa	79.5	/		
		High pressure	kPa	106	/		
	Humidity	Low relative humidity	%	0	0	0	At 20°C or below
		High relative humidity	%	90	80	90	
		Condensation	Yes/No	None	None		No condensation inside the product within the relative humidity range of 0 to 90%.

	Altitude	Low altitude	m	0	0	0	When the altitude exceeds 3000m above sea level, the maximum limit should be reduced according to 5.11.2 of GB/T3859.2-1993.
		High altitude	m	3000	3000	3000	
Notes	The performance of the system is restricted when the temperature is below 0 degrees and above 40 degrees centigrade.						

- **The following scenarios are not allowed for installation:**

1. High humidity, salinity (e.g. coastal, desert, etc.). area.
2. Flooded areas.
3. Earthquake zones (additional safety measures are required here).
4. Areas with frequent changes in ambient temperature.
5. Sites above 3000m altitude.
6. Places with explosive or potentially explosive atmospheres.
7. Places with highly flammable materials or gases.
8. Places close to water sources (e.g. taps, downpipes, sprinklers, etc.).
9. Sites with weak, uneven support surfaces.
10. Premises that do not meet fire protection requirements (e.g. no fire sand, no dry powder fire extinguishers, etc.).

The ideal outdoor temperature for installation should ideally be within -20°C ~ 40°C.

1.6 Transportation Requirements

When moving large products that are still in transport boxes or on pallets, use a forklift to lift the cabinet from the bottom and move it. Please refer toFigure 1.
When transporting batteries, to avoid dropping the product due to excessive weight, it is recommended to have at least 2 people carry it. Please do not transport it from positions A and B. Additionally, make sure to keep the batteries away from any liquids during transport. Please refer toFigure 1 & Figure 1.

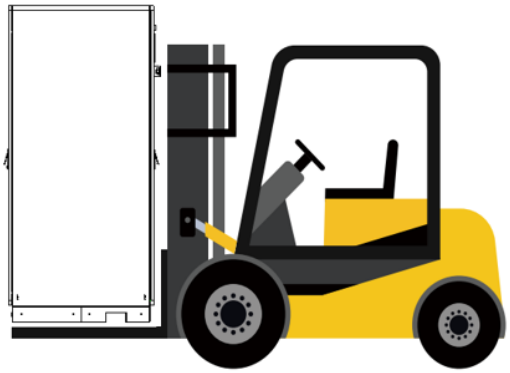


Figure 1-2 Large product transport

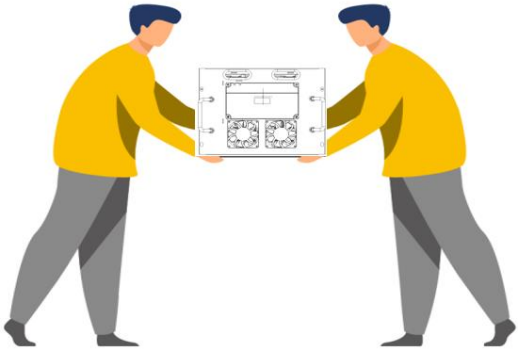


Figure 1-3 Small product transport

Figure 1-4 Schematic diagram of the location of the NO HANDLING points A and B

Do NOT grab the components in the red circle while transporting the battery.
When handling the battery, do not handle the connectors marked as A and B. Instead, apply force to the front handle and the box when handling it. Please

ensure that the product is fixed securely before moving. During transportation, keep the product in an upright position, avoid stacking it or turning it upside down, and maintain a vertical tilt of no more than 30°, ensuring there are no other objects on top.

When installing and maintaining the battery, please take care and prevent the battery module from falling. It is recommended that all operators wear protective footwear with high safety factor and strong protective capabilities to avoid foot injuries.

1.7 Mounting Position

1.7.1 H30 Outdoor Unit

When installing the H30 outdoor unit, ensure that there is sufficient space for ventilation and heat dissipation as well as installation and maintenance. For detailed installation requirements please refer toFigure 1.

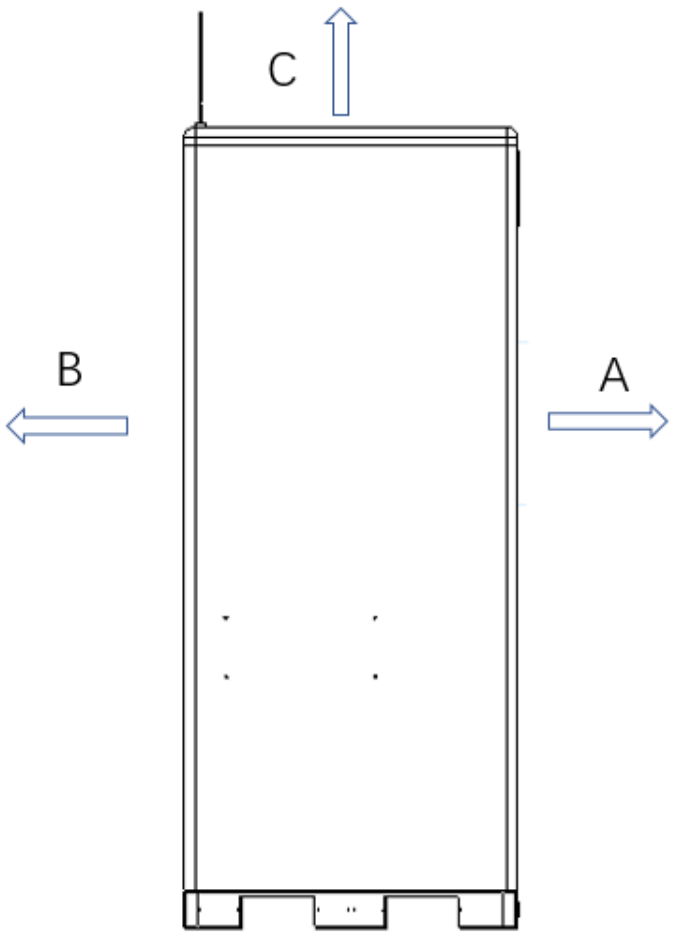


Figure 1-5 H30 outdoor unit installation location

A ≥ 1200mm, ensure that the front door of the cabinet can be fully opened to ensure ventilation and heat dissipation, with sufficient space for operation and maintenance.
B ≥ 1200mm, ensure that the rear door of the cabinet can be fully opened to ensure ventilation and heat dissipation, with sufficient space for operation and maintenance.
C ≥ 300mm, ensure installation space above the cabinet and antenna height.

Please ensure that the H30 outdoor unit is installed with the A/B/C mounting distance.

1.7.2 External ATS Installation

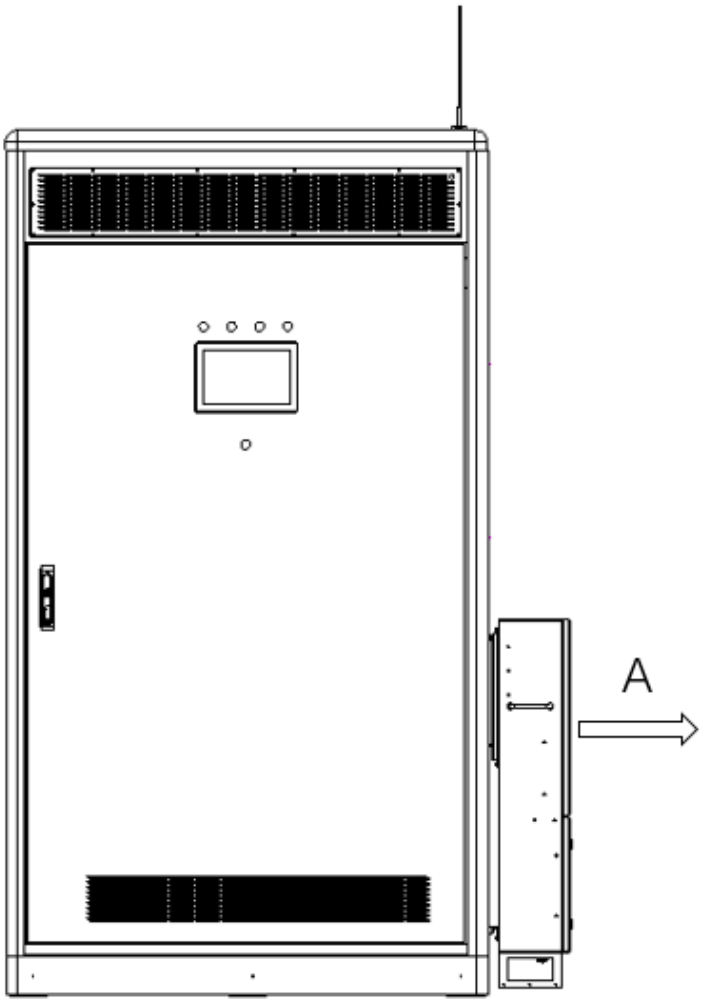


Figure 1-6 ATS wall-mounted solution installation position

A ≥ 600mm, ensure that ATS has sufficient space for operation and maintenance.

2. Product Introduction

2.1 Product Description

2.1.1 Schematic Diagrams of the Grid-Connected System

The H30 energy storage system supports grid-connected application modes. The diagrams of the grid-connected system are shown below:

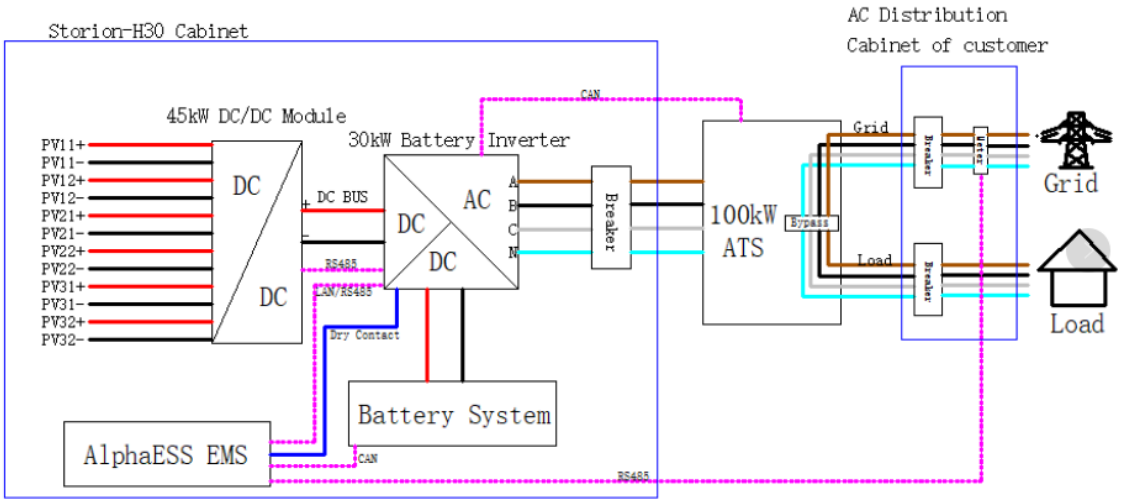


Figure 21 Schematic diagram of the DC grid-connected system

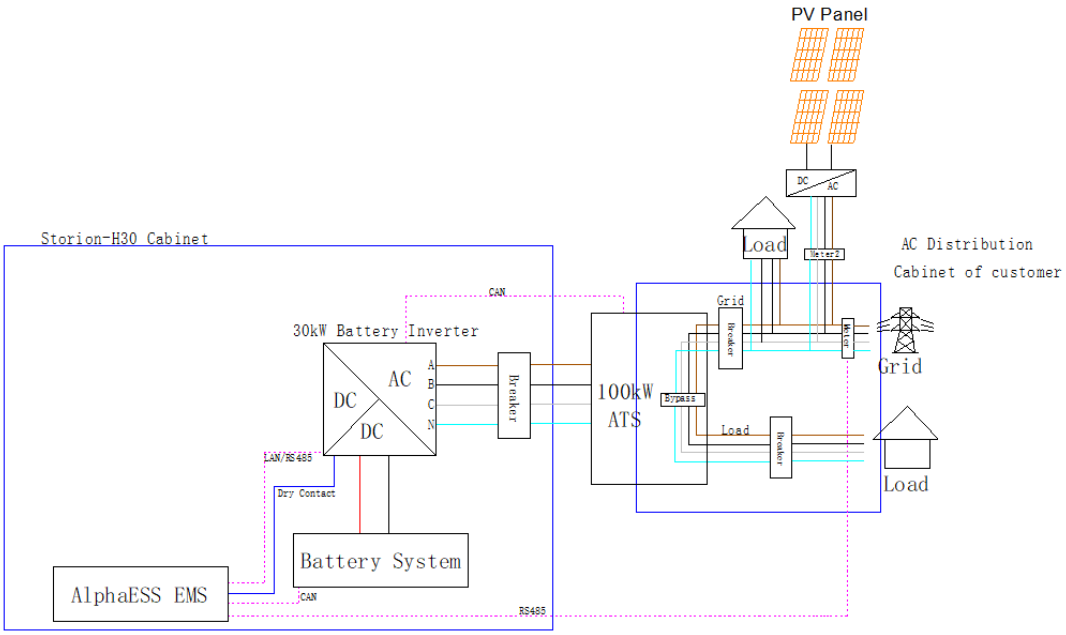


Figure 2-2 Schematic diagram of the AC grid-connected system

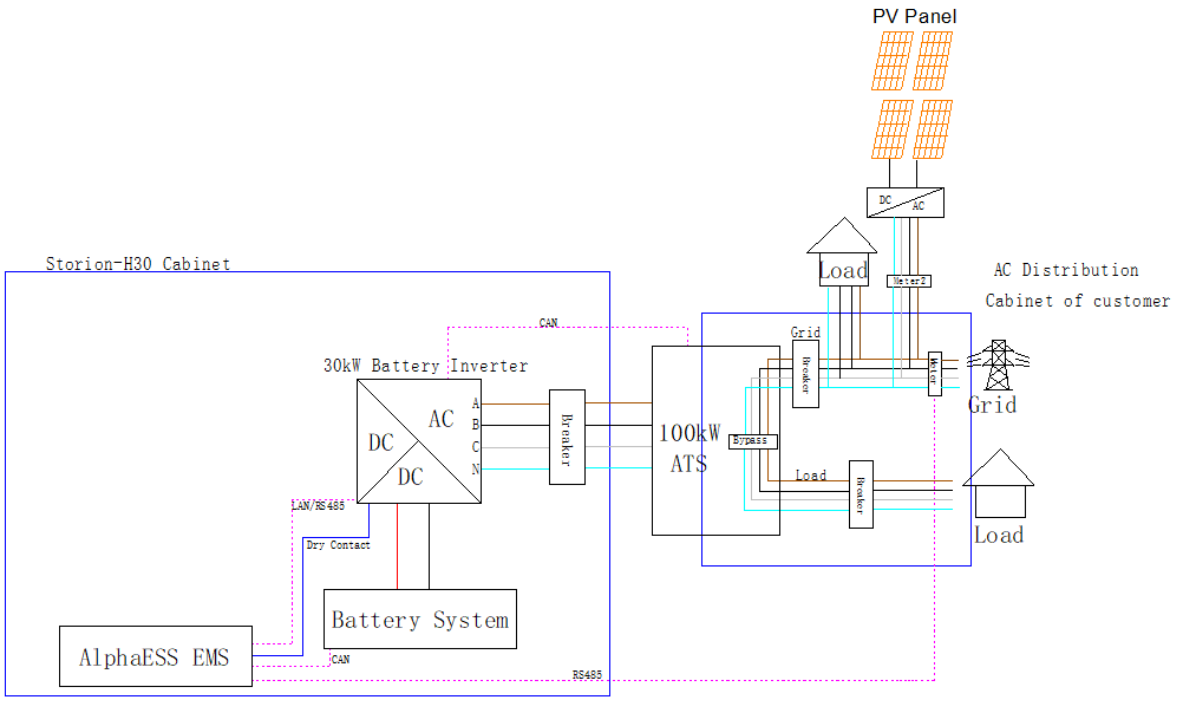


Figure 2-3 Schematic diagram of the Hybrid grid-connected system

The dotted lines indicate the communication lines, the solid lines indicate the power lines.

2.2 Product Features

Lithium iron phosphate batteries produced by AlphaESS are characterised by their long life and high reliability and are capable of meeting the requirements of a wide range of energy storage systems.

The system is highly modular design, and is easy to assemble, transport and maintain.

The system uses real-time equalisation technology to ensure a high degree of consistency between battery modules.

The system is designed as a detachable structure, compact, flexible, easy to install and test and is able to meet the needs of different working environments and types of work applications.

The system is equipped with advanced thermal management technology to enable the system to operate in the optimum temperature environment.

The system is equipped with local and remote monitoring and control functions. The system enables flexible scheduling of the power system through communication between the BMS, the H30 outdoor unit and the monitoring system.

2.3 Product Composition

2.3.1 Appearance

For the appearance of the H30 energy storage system, please refer toFigure 2.

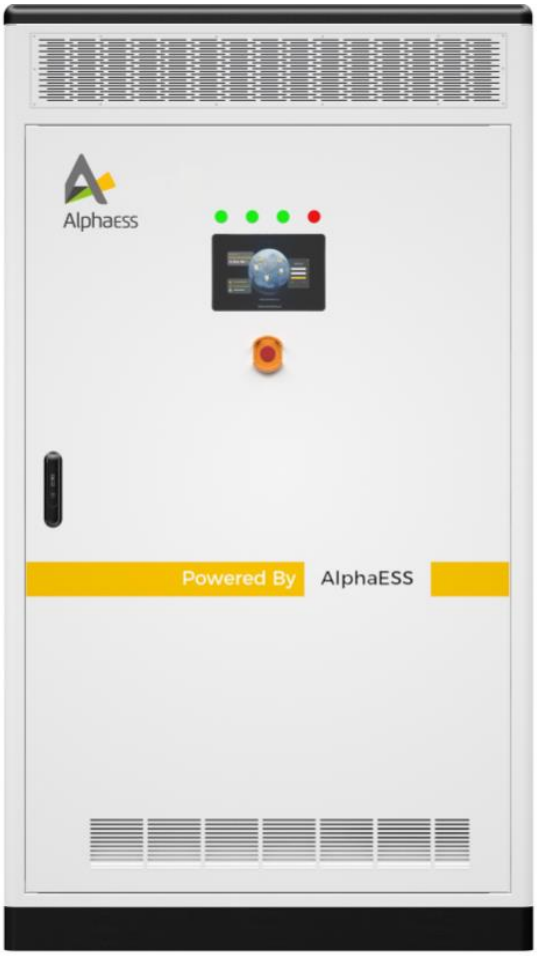
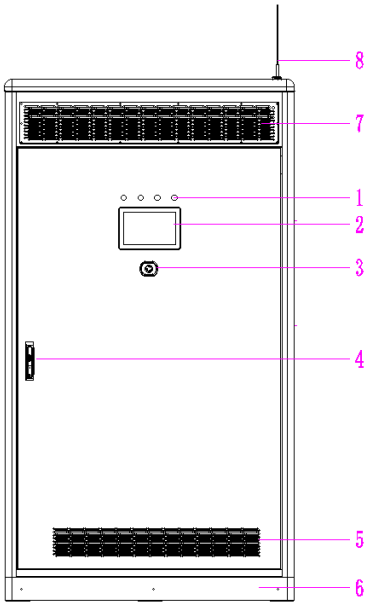
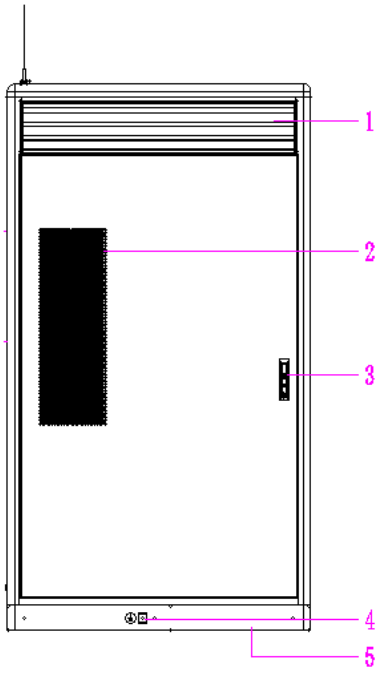


Figure 2-4 H30 energy storage system

***The above picture is for reference only, please refer to the actual product received!**

Table 2-1 Product appearance of H30

View	Description
	Front view 1. Indicators 2. HMI 3. Emergency stop button 4. Door locks 5. PCS equipment compartment air inlet 6. Decorative covers 7. Air conditioning inlet 8. Antennas
	Rear view 1. Air conditioning vents 2. PCS equipment compartment air outlet 3. Door locks 4. General earthing of the equipment 5. Decorative cover plate

***The above pictures are for reference only, please refer to the actual product received!**

2.3.2 Description of the Function of the Indicator Light

At the top of the outdoor cabinet HMI, there are four indicators showing the main operation status of the system: POWER, RUN, ON-GRID, and FAULT.

Table 2-2 Description of LED indicators

Status	Color	Description
POWER	Red	Always on when the system is powered, always off when the system is not powered
RUN	Green	Always on when the system is operating normally with power output, always off when the system is in standby or switched off
ON-GRID	Yellow	Always on when the system is connected to the grid, always off when the system is off-grid or shut down
FAULT	Red	When the system is running, the light flashes slowly (5S/time); when the system has fault, the light is always on; at other times it is always off

Table 2-3 Description of each LED display status and operation

LED Display	Description
POWER on, RUN on, ON-GRID off, FAULT off	System is in normal operation
POWER on, RUN on, ON-GRID off, FAULT always on or flashing	FAULT flashes during system operation to indicate a system alarm, constant light indicates a system fault
POWER on, RUN off, ON-GRID off, FAULT off	System in standby mode

2.3.3 Outdoor Cabinet Size Parameters

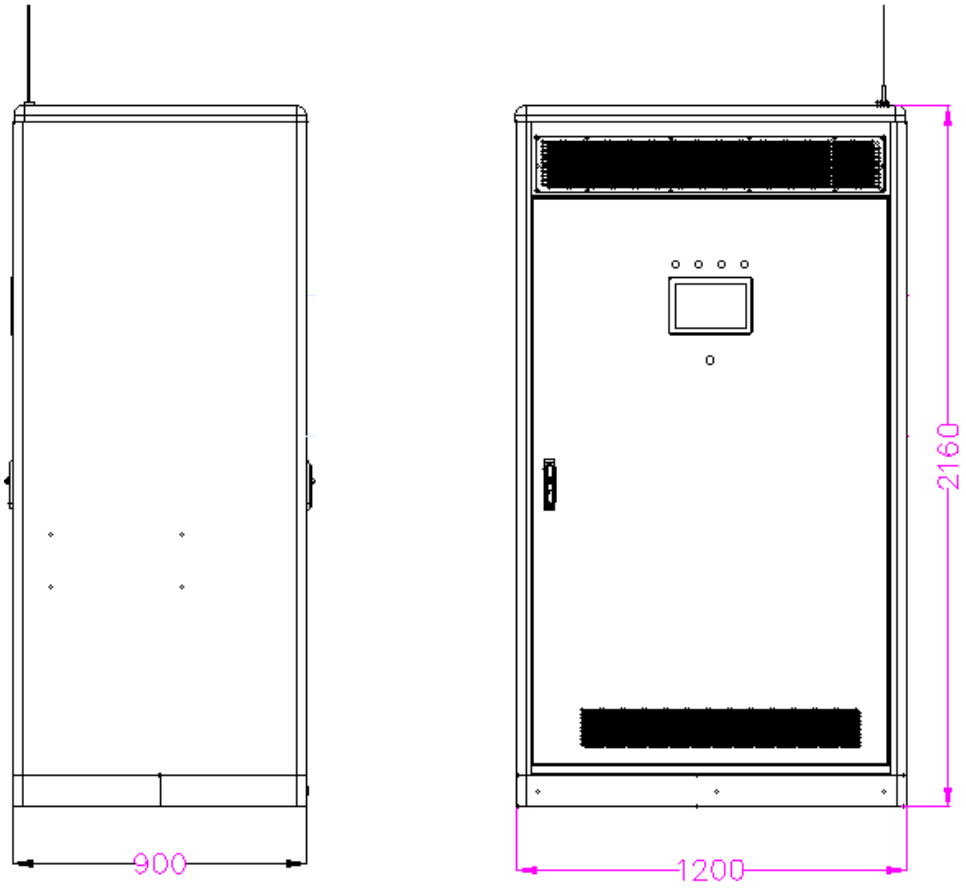
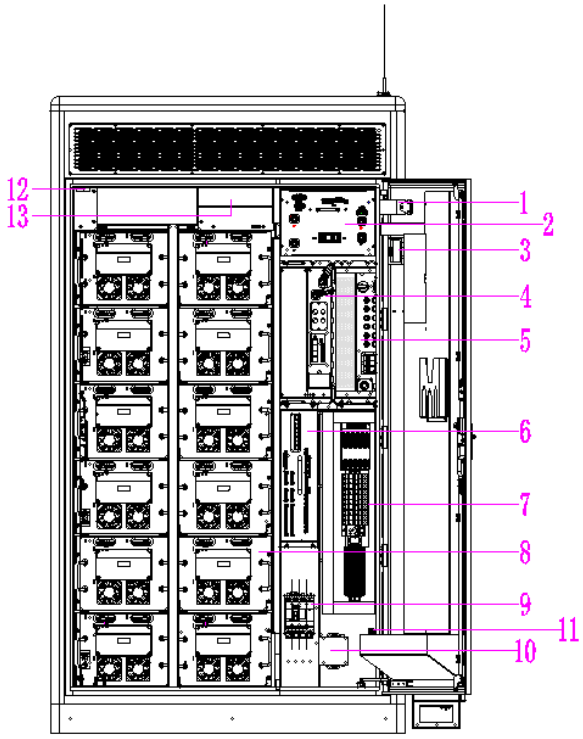
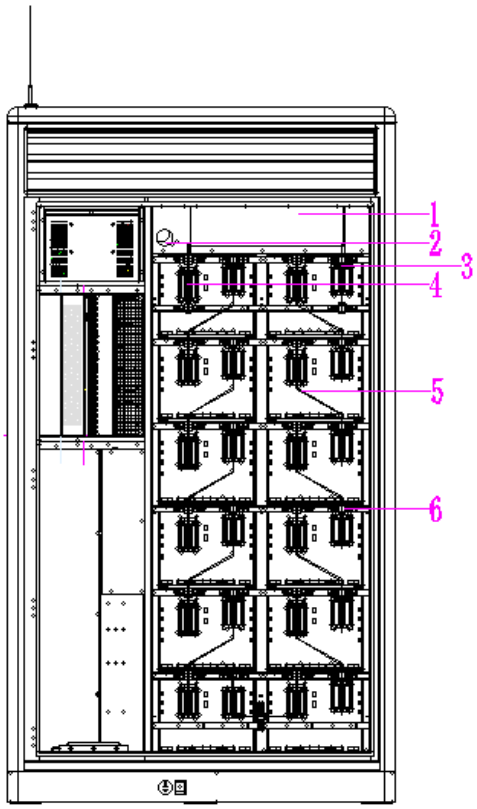


Figure 2-5 Outdoor unit dimensions

2.3.4 Interior Design of Outdoor Cabinets

The system is an all-in-one design, combining the DC/AC module, DC/DC module, ATS module and energy storage battery system into one system, with the ATS module being an external wall-mounted solution (described in the installation section).

Table 2-4 System configuration description

View	Description
	Front view 1. LED lighting 2. Air conditioning operating panel 3. High pressure box 4. DC/AC modules 5. PCS output switch 6. EMS 7. Terminal blocks and open sections 8. Batteries 9. AC plastic case 10. 4G wireless router 11. Surge 12. Door travel switch 13. Aerosol firefighting
	Rear view 1. Air conditioning air supply outlets 2. Total positive and negative inlet holes 3. Total negative copper busbar 4. Total positive copper busbar 5. Copper strand (jumper) between batteries 6. Copper busbar

2.3.5 Overview of System Operating Switches

The H30 outdoor system contains the relevant operating switches, the high voltage box plastic case switch, the DC/DC module manual switch and the PCS output switch, the operating position of each switch in the system is shown in Figure 2-6, the function of each switch in the system is described in Table 2-5.

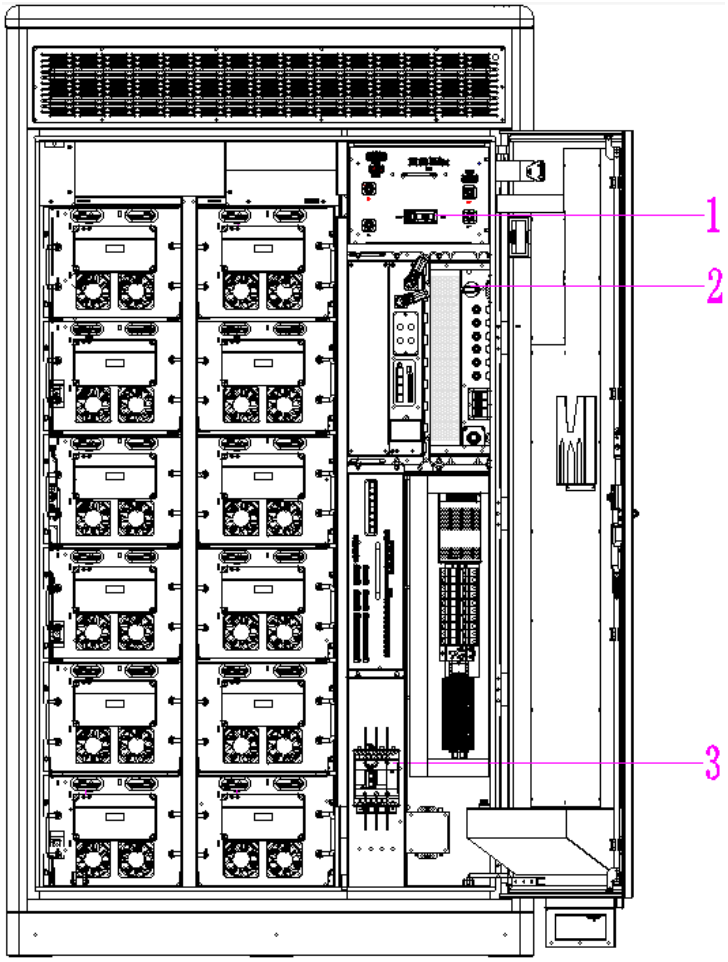


Figure 2-6 Dimensions of outdoor units

Table 2-5 Description of system switches

No.	System Switches	Description
1	High voltage box plastic case switch	Control of battery DC system power-up
2	Manual switching of DC/DC modules	Control the input to the PV
3	PCS output switch	Control PCS AC output

2.3.6 Cable Entrance Design

For easy cable connection on site, all cables between the devices inside the outdoor unit have been connected prior to delivery.

The cables connecting the outdoor unit to the external equipment can enter the interior through the bottom cable entry or the side cable entry of the outdoor unit.

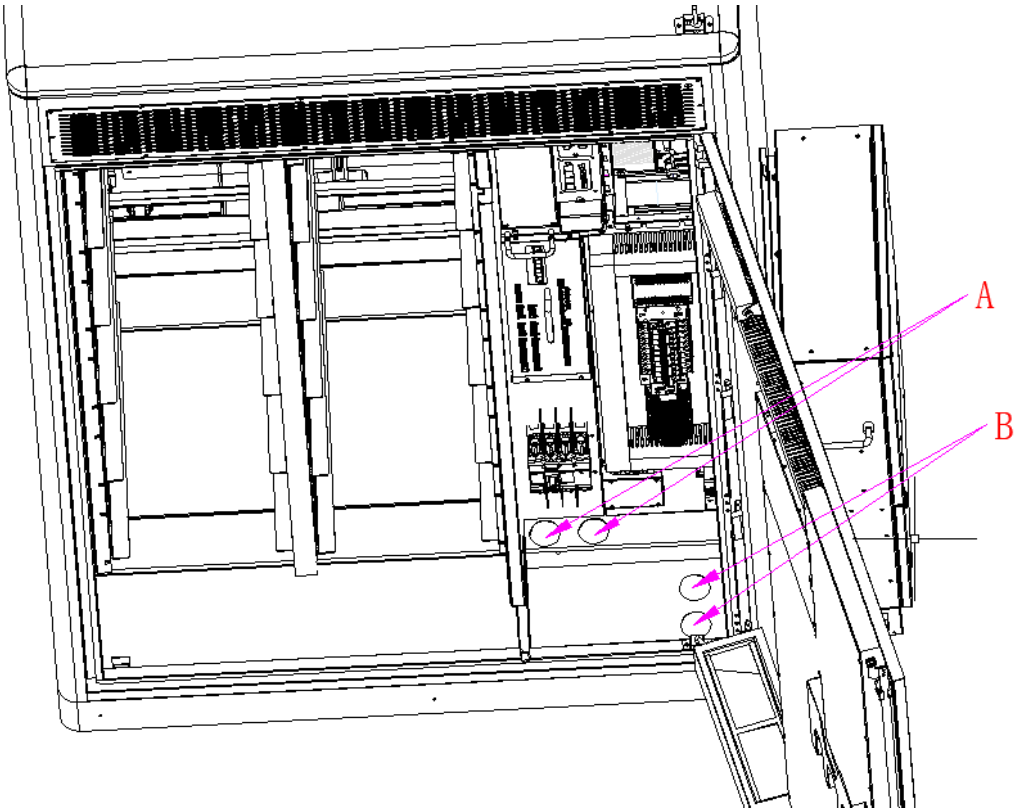


Figure 2-7 Diagram of the system inlet and outlet holes

Table 2-6 Appearance

No.	Description	Size
A	System AC outlet hole x 2	50mm diameter
B	System PV inlet hole x 2	50mm diameter

3. Product Components Introduction

3.1 M38210-S Quick-Insert Back-Plug Battery

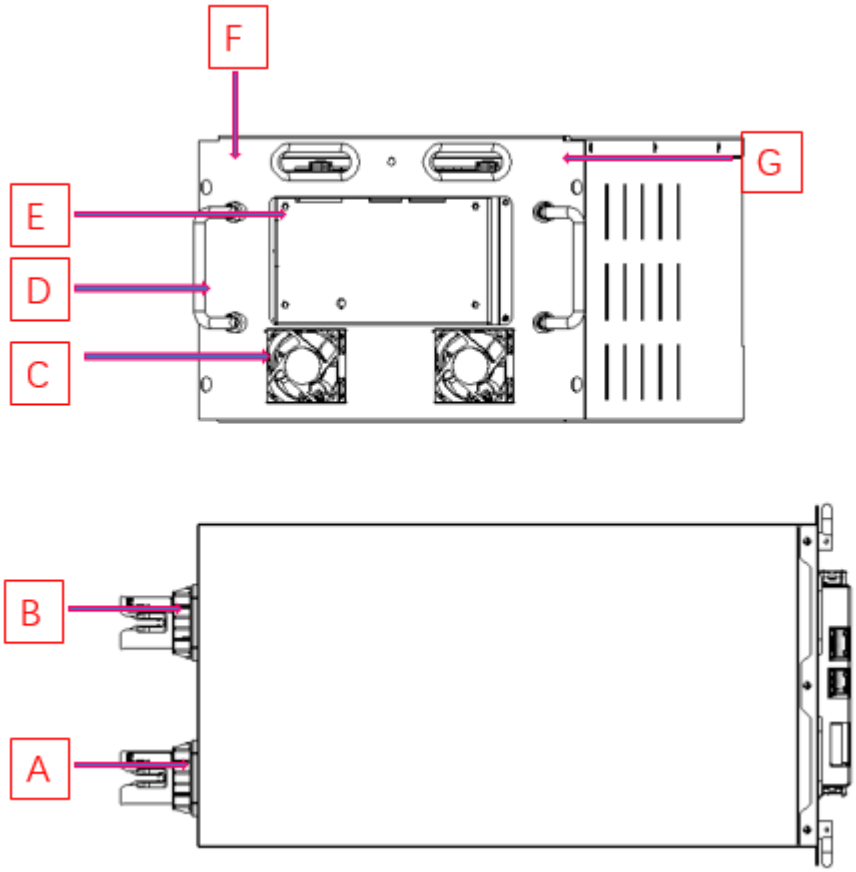


Figure 3-1 Battery Diagram

Table 3-1 Appearance

No.	Description	No.	Description
A	battery Negative terminal	E	BLMU
B	Battery Positive terminal	F	Boxes
C	Fans	G	Fixed lugs
D	Handle		

Table 3-2 Technical Specifications

No.	Description	Technical Specifications	Notes
1	Model	M38210-S	
2	Cell formation method	12S2P	
3	Rated voltage	38.4V	
4	Voltage range	36~43.2V	
5	Rated capacity	210Ah	Maximum charge/discharge current 0.5C
6	Rated energy	8.1kWh	
7	Operating power consumption	<2W	
8	Standby power consumption	<100mW	Battery sleep mode
9	Maximum charge/discharge current	105A	Constant current mode
10	DC internal resistance	<10mΩ	Factory default
11	Ambient temperature for transport/storage	-20°C~45°C	
12	Operating temperature range	-10°C~50°C	
13	Communication mode	CAN	
14	Weight	62kg	
15	Permissible working ambient humidity	15%~85%	

3.2 M7790-S Quick-Insert Back-Plug Battery

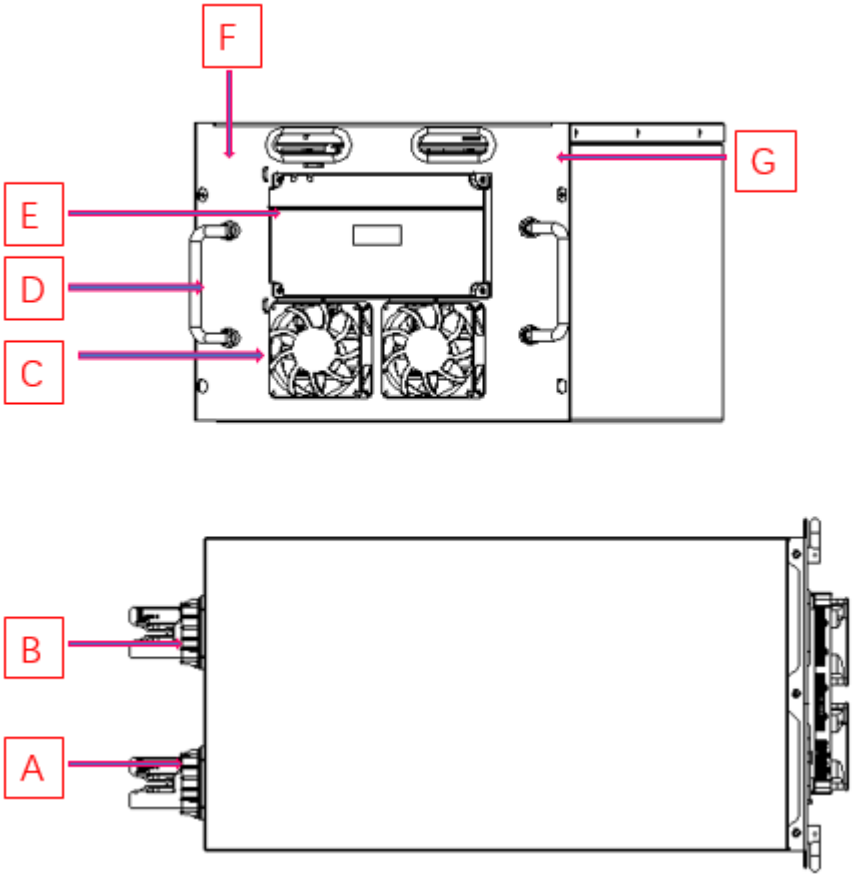


Figure 3-2 Battery Diagram

Table 3-3 Appearance

No.	Description	No.	Description
A	Battery Negative terminal	E	BLMU
B	Battery Positive terminal	F	Boxes
C	Fans	G	Fixed lugs
D	Handle		

Table 3-4 Technical Specifications

No.	Description	Technical Specifications	Notes
1	Model	M7790-S	
2	Cell formation method	24S1P	
3	Rated voltage	76.8V	
4	Voltage range	72 to 84.48V	
5	Rated capacity	90Ah	Max. charge/discharge current: 1C
6	Rated energy	6.9kWh	
7	Operating power consumption	<2W	
8	Standby power consumption	<100mW	Battery sleep mode
9	Maximum charge/discharge current	90	Constant current mode
10	DC internal resistance	<10mΩ	Factory default
11	Ambient temperature for transport/storage	-20°C~45°C	
12	Operating temperature range	-10°C~50°C	
13	Communication mode	CAN	
14	Weight	62kg	
15	Permissible working ambient humidity	15%~85%	

3.3 High Voltage Box

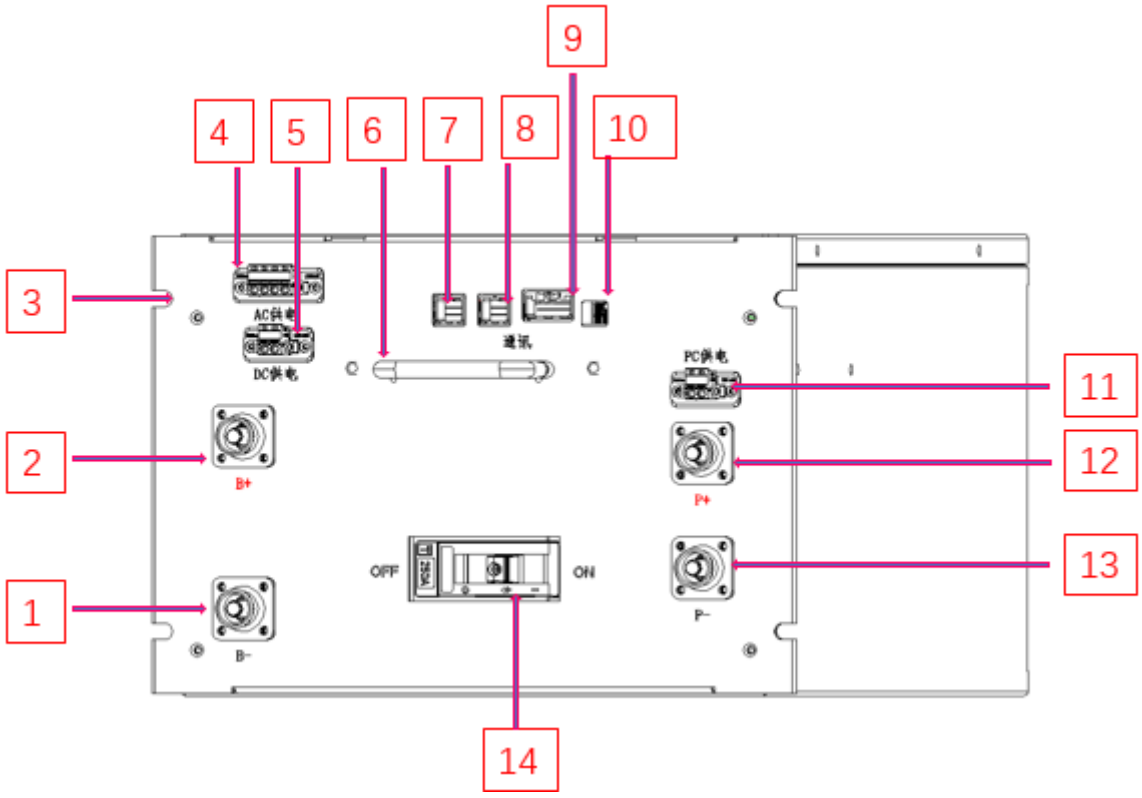


Figure 3-3 Diagram of the high voltage box

Table 3-5 Appearance

No.	Description	No.	Description
1	Negative input	9	BLMU to BMU communication port (CAN)
2	Positive input	10	Dipswitch
3	Mounting points × 4	11	SCADA screen power supply port
4	AC powered	12	Positive output
5	DC powered	13	Negative output
6	Handle	14	Plastic Case Switches
7	BMU communication port (CAN)	15	
8	BMU communication port (CAN)	16	

Table 3-6 Technical Specifications

No.	Description	Technical Specifications
1	Model	HV900105
2	Operating voltage range	200 ~ 900V
3	Module connection	M38210-S & M7790-S in series
4	Rated current	105A
5	Weight	20kg
6	Power consumption	<10W
7	Color	RAL7035

3.4 EMS4.0 Modules and Interface Definitions

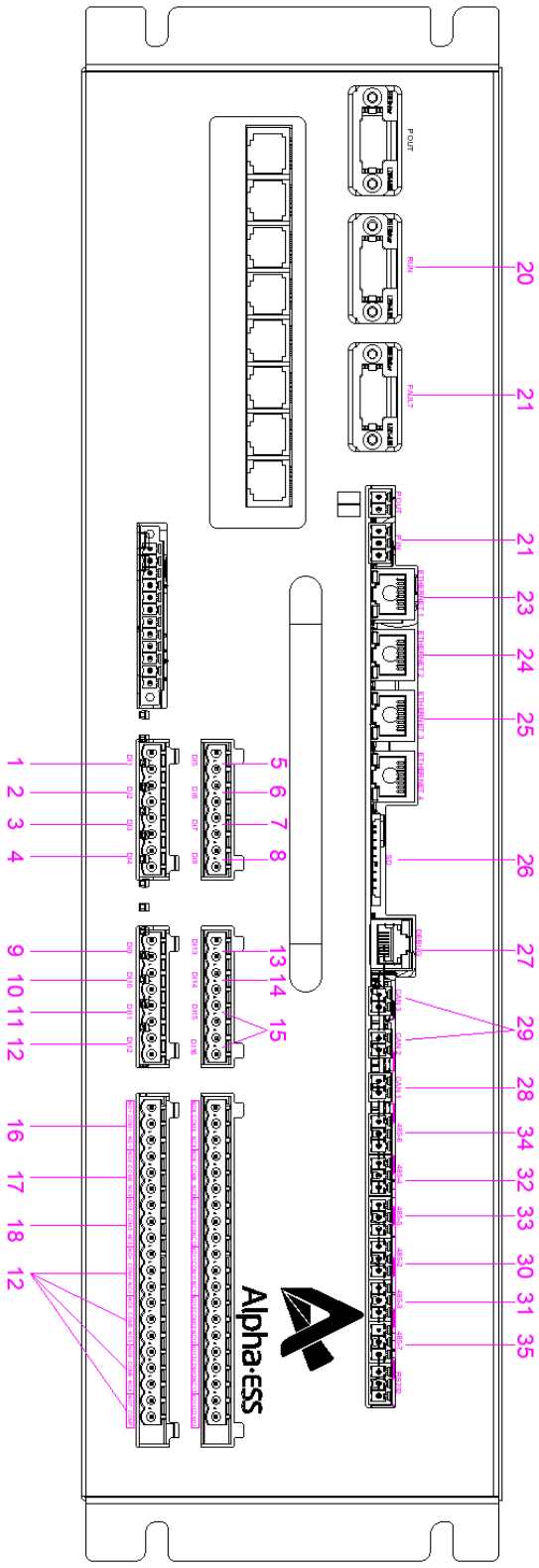


Figure 3-4 Schematic diagram of the EMS4.0 module

Table 3-7 Interface Definitions

No.	Interface Name	Interface Definition	Notes
1	DI1	Emergency stop signal	Telemeter (external normally closed)
2	DI2	Distribution main switch break feedback	Telemetry (external normally closed) (break - normally open close - normally closed)
3	DI3	Fire system failure	Telemetry (external normally closed)
4	DI4	Fire alarms (temperature/smoke/combustible gas alarms)	Telemetry (external normally closed)
5	DI5	Firefighting actions	Telemetry (external normally closed)
6	DI6	Dual power mains signal	Telemetry (external normally open)
7	DI7	Dual power supply backup signal	Telemetry (external normally open)
8	DI8	SPD signal (lightning strike)	Telemetry (external normally closed)
9	DI9	Flood signals	Telemetry (external normally closed)
10	DI10	Access control signals	Telemetry (external normally open)
11	DI11	RRCR_K1	External normally open
12	DI12	RRCR_K2	External normally open
13	DI13	RRCR_K3	External normally open
14	DI14	RRCR_K4	External normally open

15	DI15~16	Undefined	Wet node (active input)
16	DO1	Distribution main switch breakers	Remote control (normally open contact) As the coil is connected, an on/off signal with a closing time > 200 MS is required to achieve the breaking action
17	DO2	Oiler start/stop	Normally open nodes
18	DO3	BMS fault signal feedback	Normally closed nodes
19	DO4~8	Undefined	
20	SYS_RUN_LED	Running LEDs	Active switching signal with 24 V output
21	SYS_FAULT_LED	Faulty LED	Active switching signal with 24 V output
22	24V_IN	Input power	EMS power supply
23	LAN1	SCADA_FS	LAN1 via the switch to SCADA. Default ip of LAN1 of EMS: 192.168.200.101
24	LAN2	Energy storage converters	PCS via switch LAN2 default ip: 192.168.200.102
25	LAN3	Reserved	LAN3 default ip: 192.168.200.103
26	SD card	SD card	
27	DEBUG	Commissioning port	
28	CAN1	BMS	
29	CAN2~3	Reserved	
30	RS485-2	Photovoltaic inverters	

31	RS485-3	Oilers	
32	RS485-4	HMI/SCADA_FS	Connected to COM1 of SCADA_FS
33	RS485-5	Electricity meters	
34	RS485-6	Charging piles	
35	RS485-7	Air conditioning	

Table 3-8 Technical Parameters

No.	Description	Technical Specifications
1	Dimensions (L × W × H)	490.6 × 323 × 161 mm
2	Communication	RS-485 × 4, Ethernet 10/100/1000Mbps × 1
3	Internal storage	SD card, 16GB
4	Event Log	Keep a log of the system's work over the last five years
5	Operating voltage	24V
6	Power consumption	<10W

3.5 PWS2-30P-CN Inverter

30kW High Power Density Bi-directional Power Conversion System DC-Coupled Solution

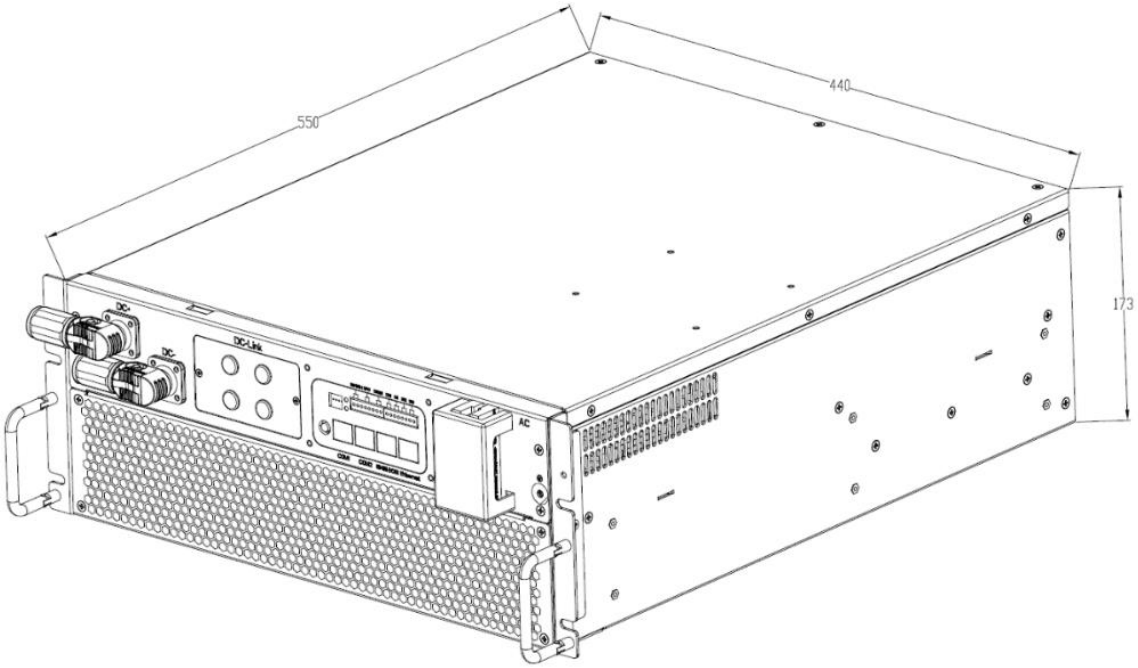


Figure 3-5 Dimensions of PWS2-30P-EX modular machine model (unit: mm)

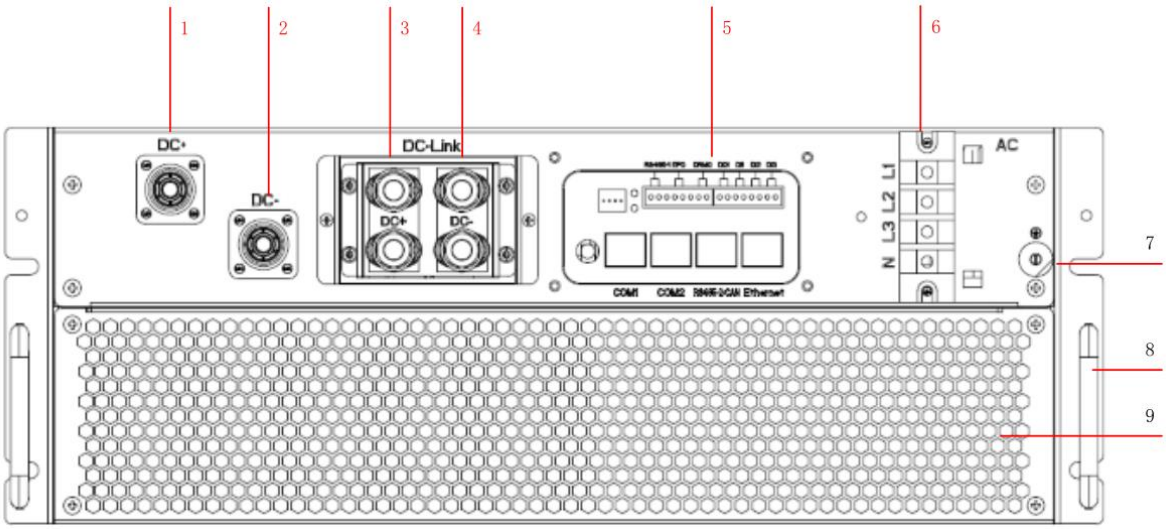


Figure 3-6 Appearance of front side of PWS2-30P-EX / PWS2-29P-EX

No.	Name	Description
1	Positive DC port	To connect positive power cables with the battery cabinet
2	Negative DC port	To connect negative power cables with the battery cabinet
3	DC bus positive	MC4 terminal*2
4	DC bus negative	MC4 terminal*2
5	Signal interface area	External communication interface
6	AC terminal	AC wiring
7	Ground terminal	Grounding protection wire fixed point
8	handle	Extraction module, not for load-bearing
9	Vent	Fan cover and air duct vents

3.6 PDS1-45K/PDS1-60K DC/DC Converter

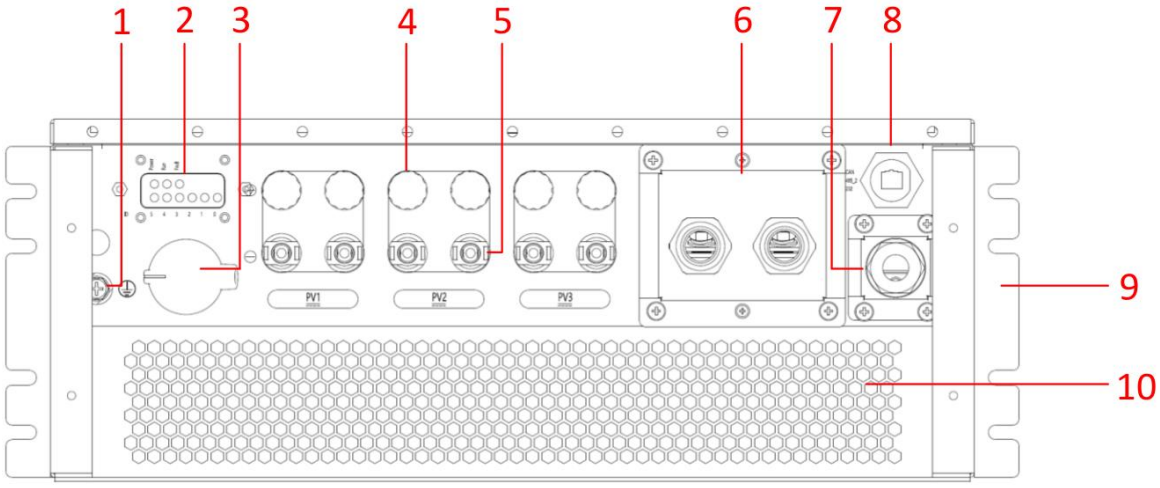


Figure 3-7 PDS1-45K/PDS1-60K module model panel appearance diagram

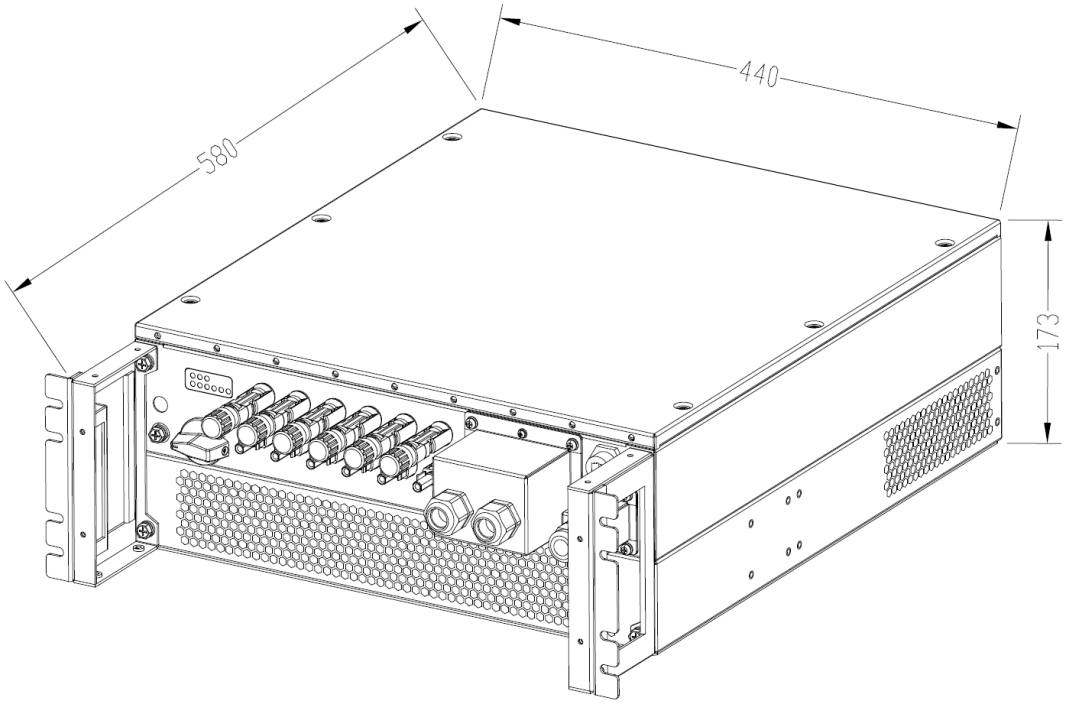


Figure 3-8 PDS1-45K/PDS1-60K module external dimension diagram (unit: mm)

No.	Name	Description
1	Ground terminal	Grounding protection wire fixed point
2	Indicator light	To indicate the working status and ID of the module
3	PV input switch	To turn on/off the photovoltaic input. (To avoid power device life attenuation because of the impact current, do not turn on the switch when the photovoltaic voltage is higher than 100V.)
4	PV positive input port	MC4 terminal*6 To connect positive power cables to the photovoltaic module
5	PV negative input port	MC4 terminal*6 To connect negative power cables to the photovoltaic module
6	DC output port	To connect power cables to the PCS system

7	Signal interface	External communication interface
8	Reserve signal interface	Not supported at present
9	Handle	Extraction and install module, not for load-bearing
10	Vent	Fan cover and air duct vents

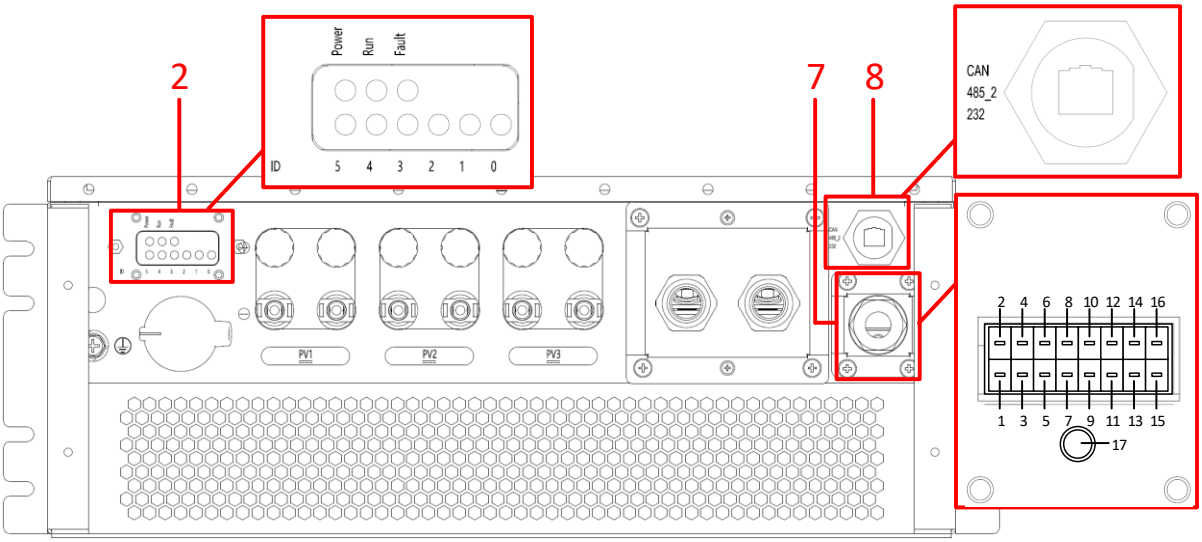


Figure 3-9 Communication panel and display panel

Table 3-2 Technical parameters table

SN	Pin Definition	Description
2	Indicator light	Power: Module power indicator Run: Module run indicator Fault: Module fault indicator ID0-ID5: Module six-digit ID code, used to indicate the module serial number
7	Signal interface. 1/3: 485B_1(PCS) 2/4: 485A_1PCS) 5/6: R_485_1(PCS)	1/2/3/4: RS485_1 differential signal,Connect to PCS or EMS. 5/6: 120 ohms matching resistor access signal for 485_1(PCS); Short the Pin5 and Pin6 to enable it.

	7/8: R_485_2(Reserve) 9/10: R_CAN(Reserve) 11/13: GND 12/14: Dry in 15: GND_ios 16: Dry out_ios	7/8: 120 ohms matching resistor access signal for 485_2(Reserve); Short the Pin7 and Pin8 to enable it. 9/10: 120 ohms matching resistor access signal for CAN(Reserve); Short the Pin9 and Pin10 to enable it. 11/13: GND of Dry in signal. 12/14: EPO dry contact input signal; Connect to EMS or PCS or others. 15/16:DO OC output (Reserve). 17: Grounding screw holes of RS485 communication cable shielding layer.
8	Reserve signal interface 1: CAN_H(Reserve) 2: CAN_L(Reserve) 3: 485A_2(Reserve) 4: 485B_2(Reserve) 5: RS232_T(Reserve) 7: RS232_R(Reserve) 6/8: GND	1/2: CAN differential signal (Reserve, not supported at present). 3/4: RS485_2 differential signal (Reserve, not supported at present). 5/7: RS232 differential signal (Reserve, not supported at present). 6/8: GND of RS232_T and RS232_R.

3.7 ATS PWD-100M

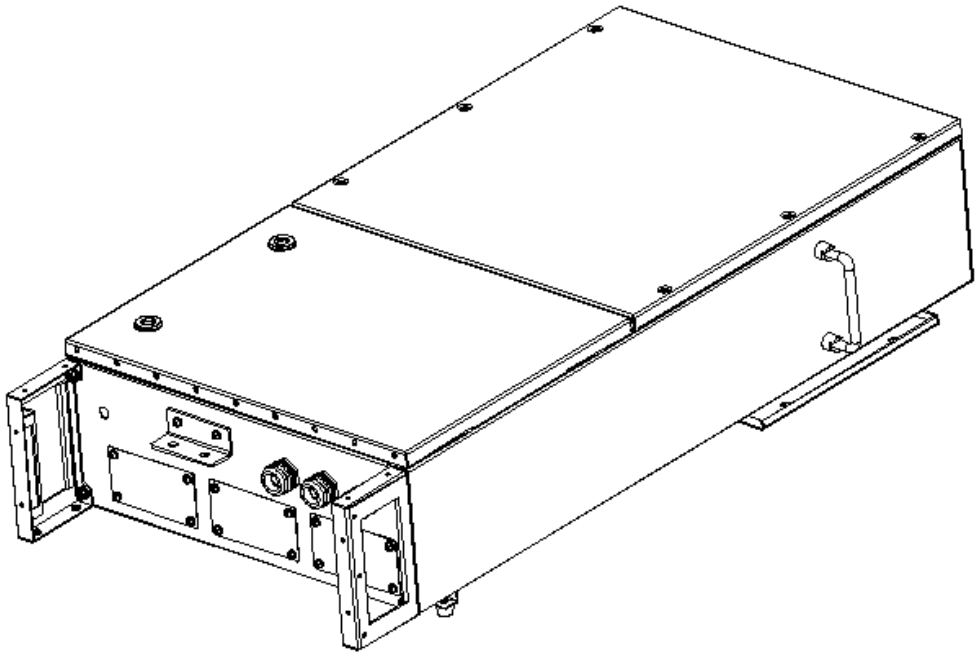


Figure 3-10 PWD-100M-O Intelligent Switching Box External Dimensions

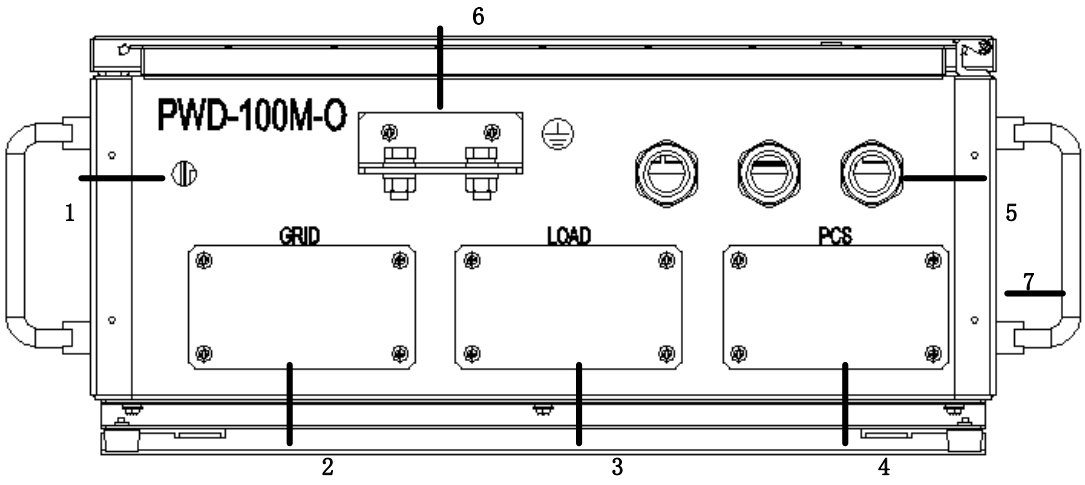


Figure 3-11 PWD-100M-O front panel

No.	Name	Description
1	Pneumatic pressure reducing valve	Prevents expansion when the internal temperature of the module is high
2	Grid terminal	Grid side inlet baffle (remove this baffle during installation)
3	Load side terminals	Load side inlet baffle (remove this baffle during installation)
4	PCS side terminal block	PCS side inlet baffle (remove this baffle during installation)
5	Signal line waterproof terminal	External communication port
6	Grounding terminal	Grounding protection wire fixed point
7	Handle	For chassis support

4. Installation

4.1 Product Installation

Before unpacking, please check the packaging for obvious signs of damage. If there are signs of damage, do not unpack, check the system model and contact your dealer as soon as possible.

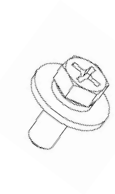
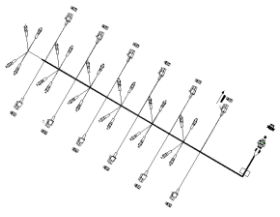
After unpacking, please check that each product is in good condition and contact your dealer as soon as possible if there is any obvious damage to the exterior.

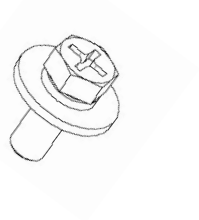
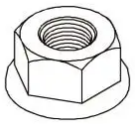
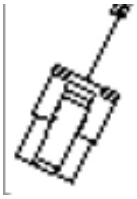
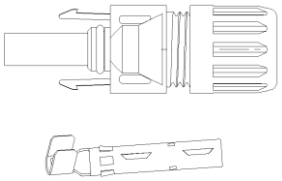
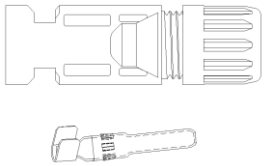
4.1.1 Parts List

Please check the parts list before installing the product. Please do not connect power cables or communication cables indiscriminately and check the material number before wiring.

Table 4-1 Parts List

M7790-S Battery (Optional)			
			
33500399 (*BT-BT*) Quantity 1: Inter-cell communication lines	40100088 Quantity: 4 Battery fixing screw, 4 X M6*14		

Communication cable 390mm Batteries - Batteries			
M38210-S Battery (Optional)			
			
33500600 (*BT-BT*) Quantity: 1 Inter-battery communication lines Communication cable 385mm Batteries - Batteries	40100088 Quantity: 4 Battery fixing screw 4 X M6*14		
System Accessories			
			
33201648 Quantity: 1 Battery - High voltage box (positive) 1900mm (to be	33201647 Quantity: 1 Battery - High voltage box (negative)	36000086 Ties, quantity: 20	Fan power supply harness, quantity: 1 33500463 (to be pre-installed in the system)

pre-installed in the system)	2100mm (to be pre-installed in the system)		
			
33500627 (BT - HV) Quantity 1 BT-HV (communication) 1800mm (to be pre-installed in the system)	41500004 Quantity: 20 Tie 4*200mm nylon.	40100134 Quantity: 2 Screws GB/T9074.13 Stainless steel M8*25 Phillips socket combination screws	40200021 Quantity: 2 Nut GB/T 6177.1-2000 Stainless steel body M8 Hexagonal flange face
			
33500216 Quantity: 1 Other Wires UL1332 22AWG 39000038 Other Colors 50mm Communication Harnesses Termination Resistors - Harnesses	M4 Cross countersunk head screws Quantity: 2	PV terminal Male connector Quantity: 6 sets	PV terminal Female connector Quantity: 6 sets

4.1.2 H30 Outdoor Unit Installation

4.1.2.1 Transport Conditions

The various devices in the H30 outdoor unit, except for the battery section, are factory-installed and fixed to the inside of the outdoor unit.

The following conditions need to be met to transport a mobile H30 outdoor unit:

- The doors of each cabinet of the H30 outdoor unit are locked tightly.
- Choose the right forklift truck for the site conditions. The selected tool must have sufficient load-bearing capacity.
- Additional traction devices may be required if movement on slopes etc. is required.
- Remove all obstacles that are or may be present during the movement, such as trees, cables, etc.
- The H30 outdoor unit should be selected for transport movement in good weather conditions whenever possible.
- Always install warning signs or warning strips to prevent non-workers from entering the lifting and transport area to avoid accidents.

4.1.2.2 Forklift Transport

If the installation site is flat, the H30 outdoor unit can be transported by forklift truck. the H30 outdoor unit is equipped with fork holes at the bottom specifically for forklift transport. The battery H30 outdoor unit is moved through the front fork holes.

If using forklift transport methods, the following requirements shall be met:

- The forklift truck should be equipped with an adequate load capacity (minimum 5 tonnes).
- The length of the pins should be at least 1100mm.
- The pins should be inserted into the forked jacks on the bottom of the workstation (see the diagram below for the location of the forked jacks). Insert the pins of the stake
- The foot depth should be the depth of the pile, i.e. 1100mm.

- The H30 outdoor unit should be transported, moved and set down slowly and steadily. Transportation is recommended.
- Only place the H30 outdoor unit in a smooth place. The area should be free of any obstacles or bulges.

4.1.2.3 Pre-Transport Preparation for Forklifts

The outer wooden box needs to be removed before transporting the H30 outdoor unit using a forklift truck.

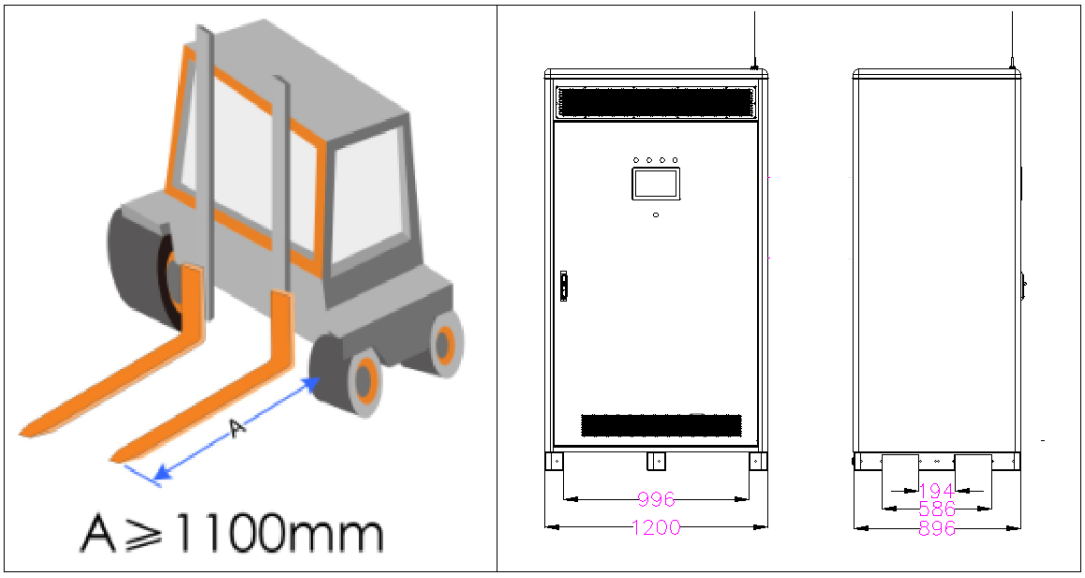


Figure 4-1 Schematic diagram of forklift transport in two directions

4.1.2.4 H30 System Installation

After moving the H30 outdoor unit to the mounting position with a forklift or other tool, secure its base with M12 screws, refer to Figure 4-2.

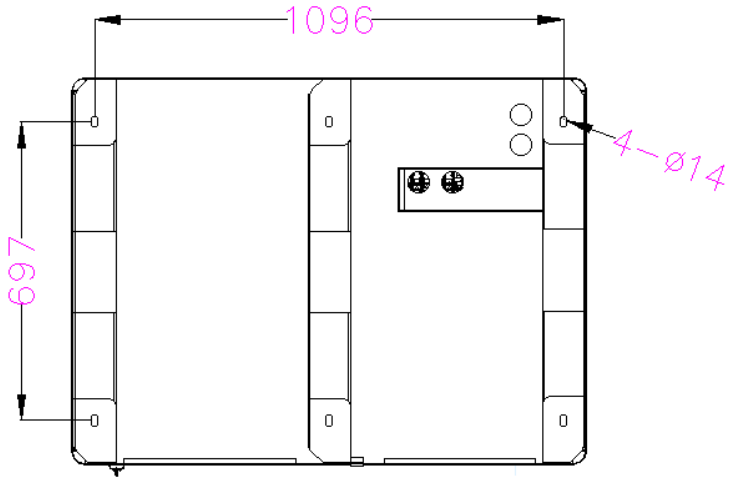


Figure 4- 2 Base diagram

The wiring holes are located on the bottom of the H30 outdoor unit and the cable is threaded into the cable slot through the wiring holes in the base.

When the H30 outdoor unit needs to be fixed to the channel steel, Φ14 holes should be punched in the channel steel and screws should be used to fix the H30 outdoor unit to the channel steel, Please refer to Figure 4-3.

When the H30 outdoor unit needs to be fixed to the concrete floor, holes need to be drilled in the floor and screws need to be used to fix the H30 outdoor unit to the concrete floor, please refer toFigure 4-4 Connect the grounding point on the lower rear door of the H30 outdoor unit to the site grounding point using an earth wire and tighten with a bolt after connection.

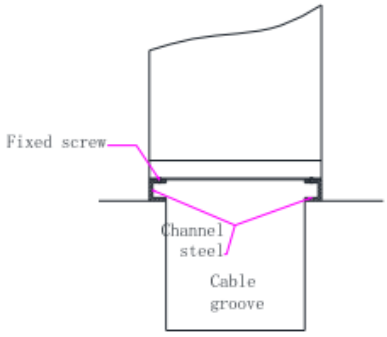


Figure 4-3 Fixed on the channel

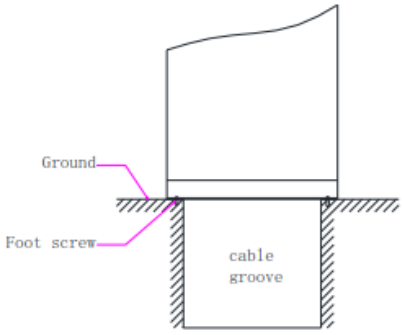


Figure 4-4 Fixed to the concrete floor

Make sure that the H30 outdoor unit is reliably grounded. If it is not connected or is loose, it may cause electric shock. It is recommended that the earth wire is protected by painting the outside of the earth terminal after installation.

4.1.2.5 Exterior Cabinet Decorative Cover Installation

At the end of the H30 outdoor unit installation, the external cables of the H30 unit will need to be routed through the cable trunking and then the decorative cover of the outdoor cabinet will be installed in place. Please refer to Figure 4-5.

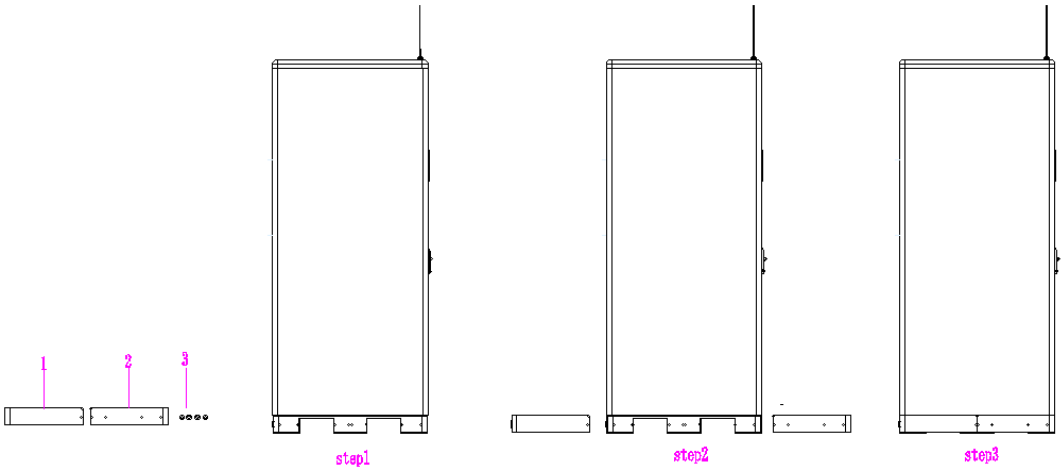


Figure 4-5 Assembly diagram of the decorative cover

Table 4-2 List of parts for the assembly of the decorative cover

No.	Description
1	Front cover plate
2	Back cover plate
3	M4*8 stainless steel screws

Table 4-3 Installation steps for decorative covers

Step	Description
Step 1	Remove the front cover plate, the rear cover plate and the M4*8 stainless steel screws from the cabinet
Step 2	Assemble the front and rear cover panels to the outdoor cabinet in the pattern shown
Step 3	Final state of the front and rear cover plates fixed to the outdoor cabinet with M4*8 stainless steel screws

4.1.3 Wall Mounting of ATS Equipment

ATS wall mounting on the right side of the outdoor unit

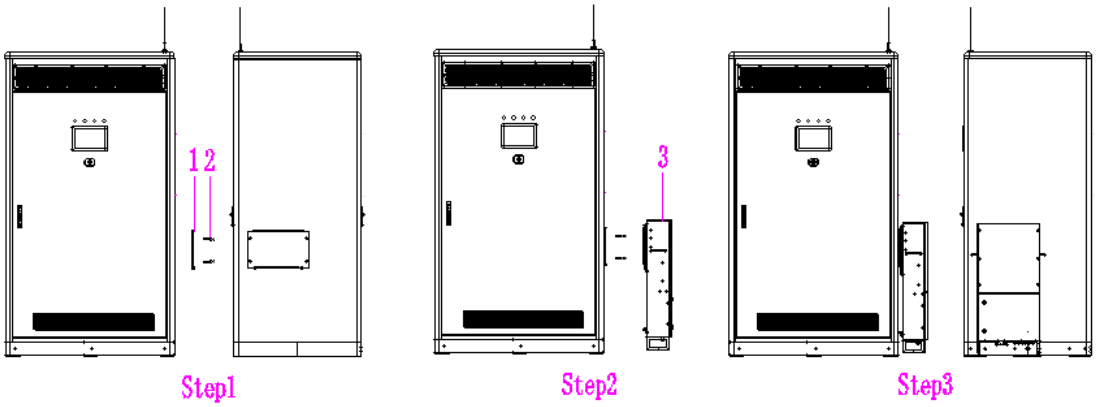


Figure 4-6 Illustration of ATS wall-mounted equipment installation

Table 4-4 List of parts for ATS wall mounting

No.	Description
1	ATS wall mounting plate (accessory in ATS box)
2	ATS wall mounting plate mounting screws
3	ATS equipment body

Table 4-5 ATS wall mounting procedure

Step	Description
Step 1	using four ATS wall mounting plate mounting screws to install ATS wall mounting plate to the right side of the H30 outdoor unit
Step 2	ATS equipment wall-mounted directly on the ATS wall-mounting plate
Step 3	Final installation status of ATS equipment

4.2 Electrical Safety Class Installation

4.2.1 Grounding Requirements

1. When the product is installed, the protective earth wire must be installed first. When dismantling, the protective earth wire must be removed last.
2. The system should be permanently earthed. Before operating the system, the electrical connections to the system should be checked to ensure that the system is reliably earthed.
3. Damage to the earth conductor is prohibited.

It is strictly forbidden to install the system before grounding, the first step is to ground the system externally, followed by the connection of the power cable of the back-plug system, after which the rest of the system is installed.

4.2.2 External Earthing of the System

The H30 outdoor system includes internal earthing and external earthing, and the earthing of the system's internal equipment is completed prior to delivery.

The diagram below shows the location of the external grounding point. The earth resistance must be measured after the earth connection has been made. The earth resistance value must also be determined in accordance with the relevant standards of the country/region where the project is located.

In addition, the recommended size of the earthing wire used for the external earthing of the system is greater than or equal to 16mm^2.

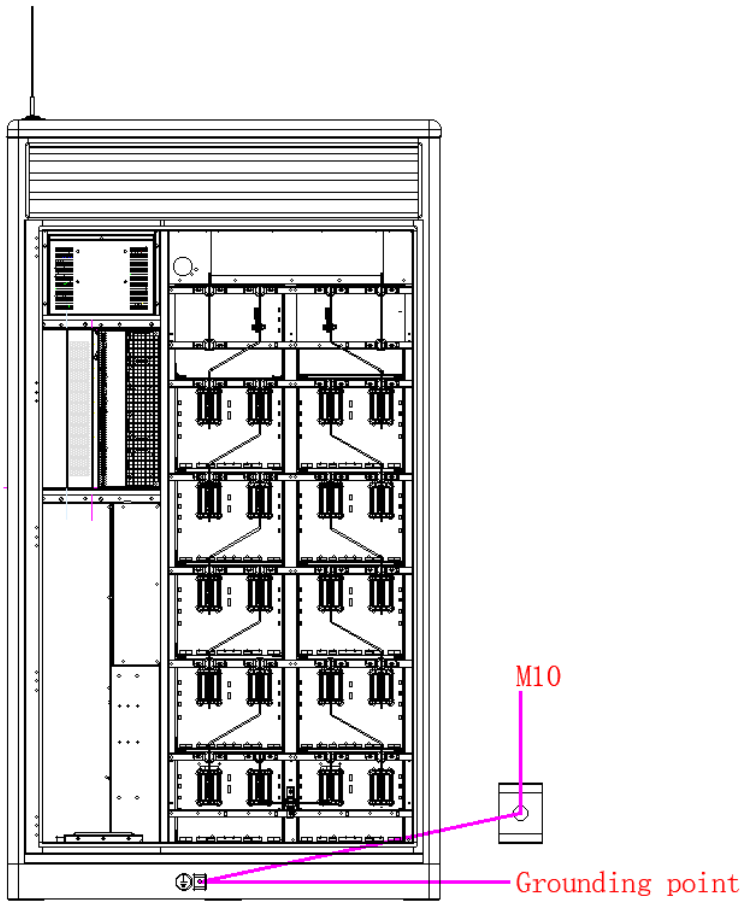


Figure 4-7 Diagram of the external earthing of the H30 outdoor system

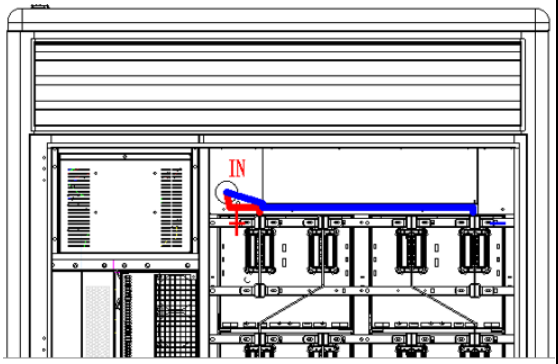
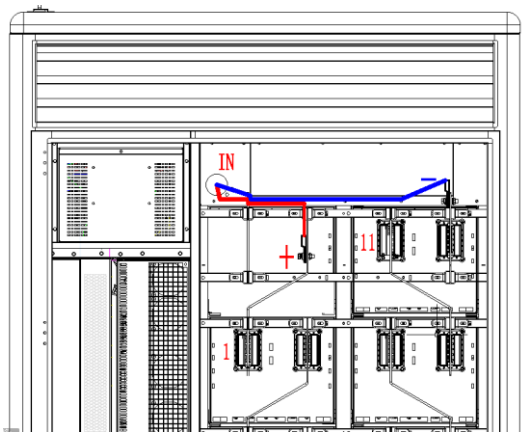
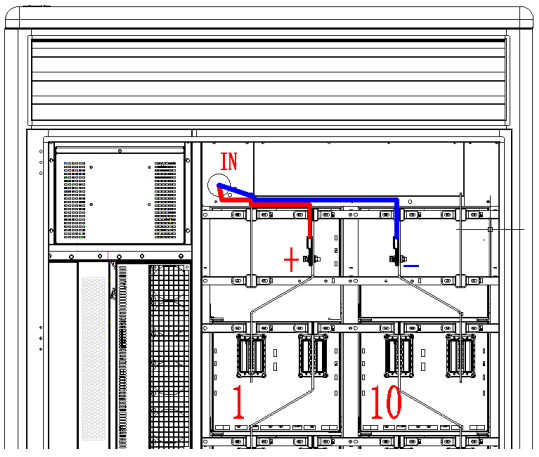
After the system is externally earthed, when opening the cabinet door to install the system the power cable connection for the back plug system must be connected first, it is strictly forbidden to connect the power cable after installing the battery pack.

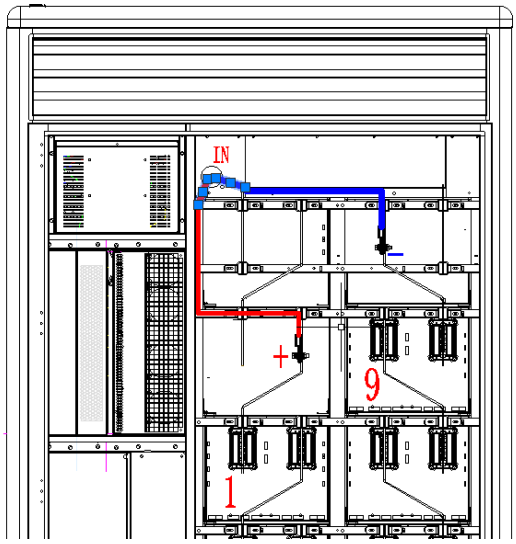
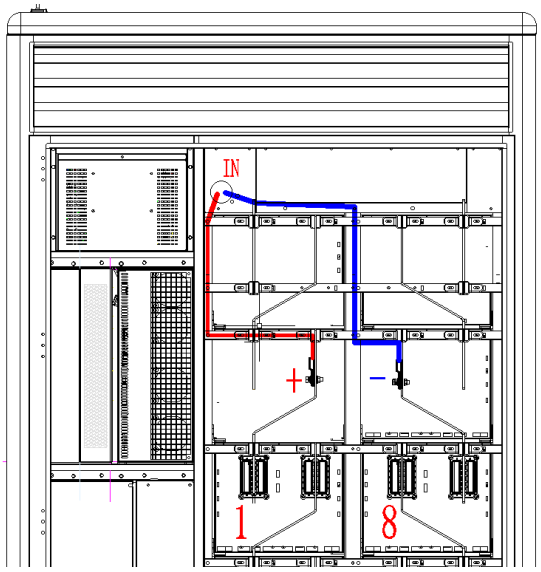
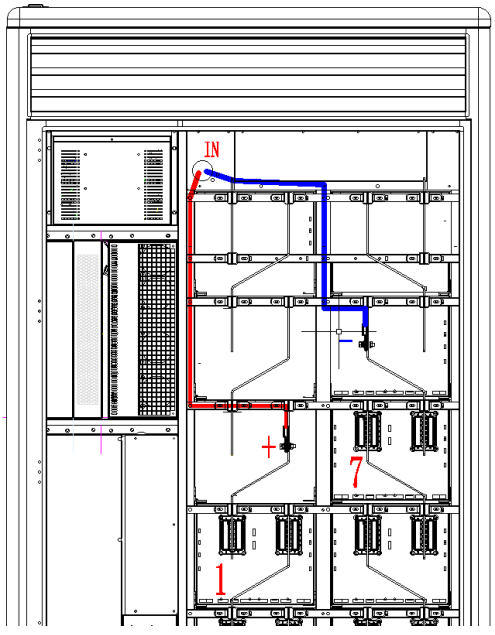
4.2.3 Back-Plug System Power Cable Connection

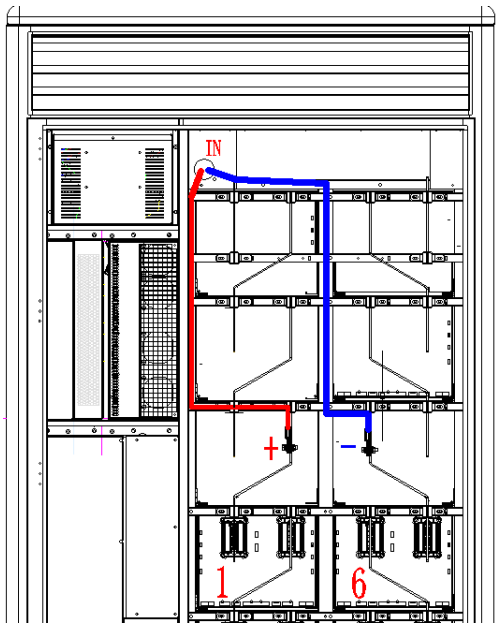
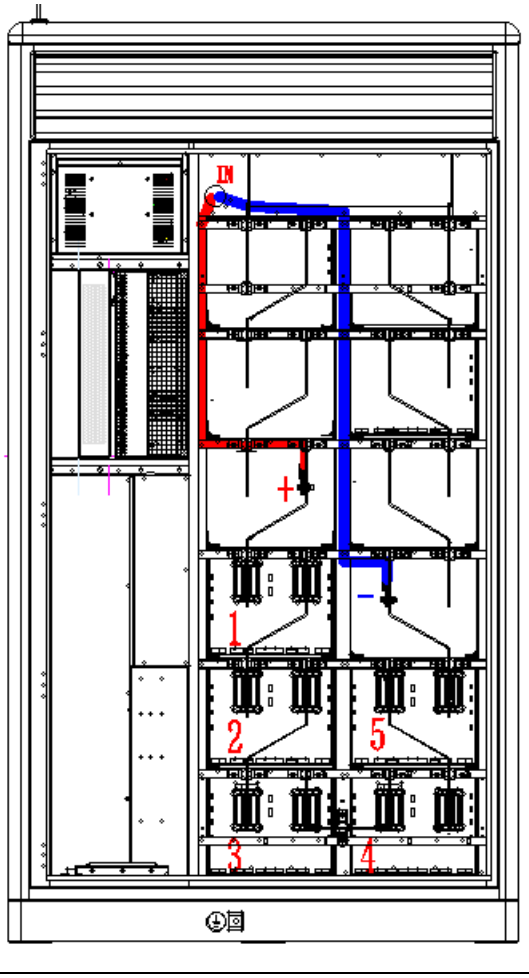
4.2.3.1 Battery Power Cable Side Connection

Please use the mounting screws and nuts in the system accessories list to connect the positive and negative terminals shown in the illustration in each battery cluster to the positive and negative power cables leading from the high voltage box.

Table 4-6 Battery to high-voltage box power line battery end access points

Number of Batteries	Positive Battery Access Point	Negative Battery Access Point	Wiring Diagram
12	BT1 B+	BT12 B-	
11	BT1 B+	BT11 B-	
10	BT7 B+	BT10 B-AA	

9	BT1 B+	BT8 B-	
8	BT1 B+	BT8 B-	
7	BT1 B+	BT7 B-	

6	BT1 B+	BT6 B-	
5	BT1 B+	BT5 B-	

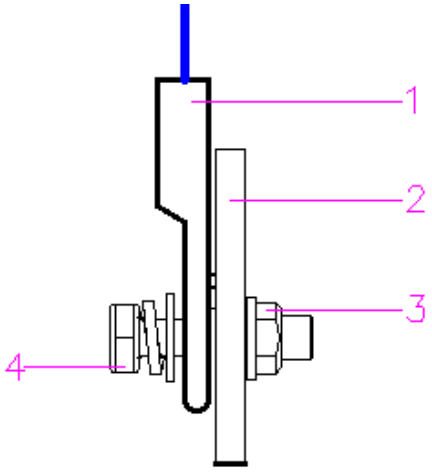


Figure 4-8 Diagram of wire harness and copper connection

Table 4-7 Configuration of wire harness and copper connections

No.	Description
1	Power cables (copper nose)
2	Copper busbar
3	M8 flange nut
4	Triple combination screw M8

4.2.4 Battery Installation

Figure 4-8 Battery pack unpacking diagram

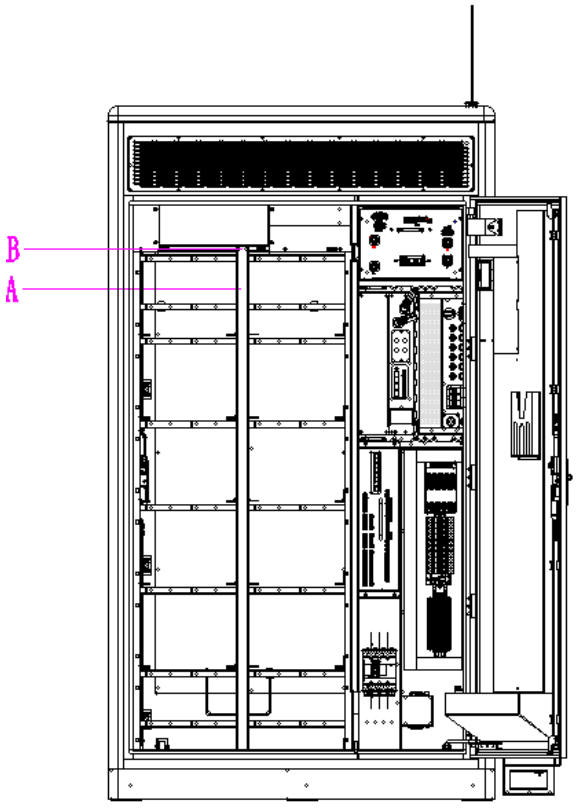


Figure 4-10 Schematic diagram of the wire harness cover

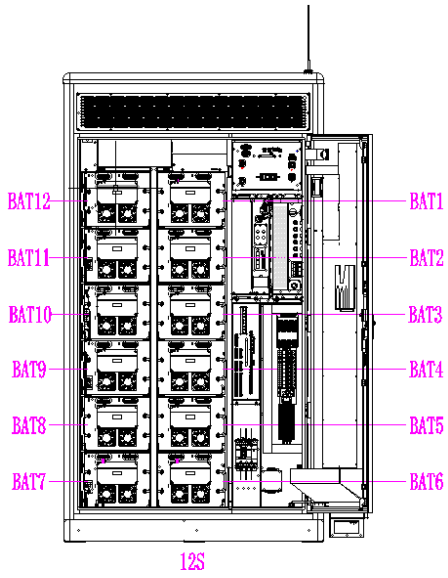
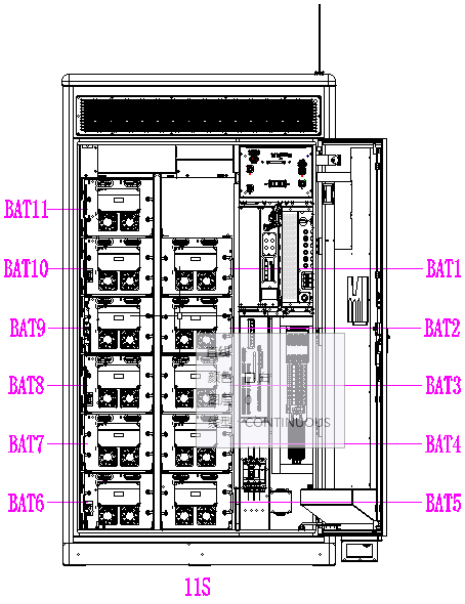
Table 4-8 Battery pack unpacking and installation procedure

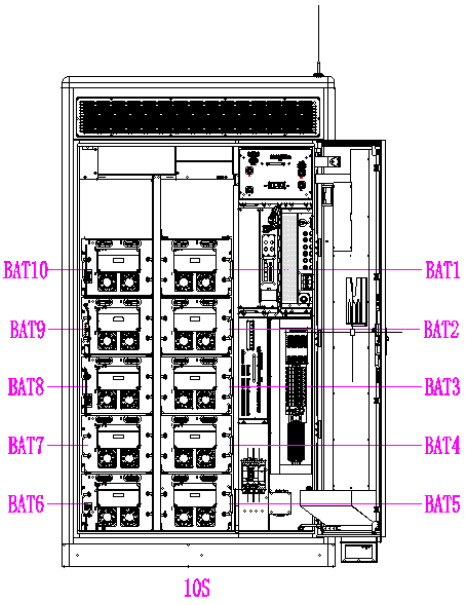
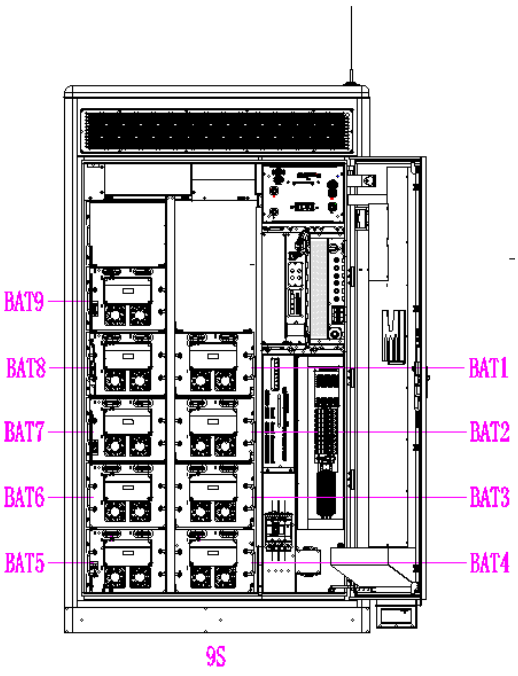
Step	Description
Step 1	Unpack all batteries and not lose the internal parts
Step 2	Check the battery type on the battery label.
Step 3	Remove the harness cover mounting screw (M4*8 Phillips triple combination screw) B with a Phillips screwdriver, then remove the harness cover A. As shown in Figure 4-9
Step 4	Place the same cluster of batteries in the same battery holder with serial numbers 01 to 12 in order (if less than 12 batteries are installed in order as shown in the diagram) and secure the batteries to the holder using the matching screws as shown in **错误!未找到引用源。**.

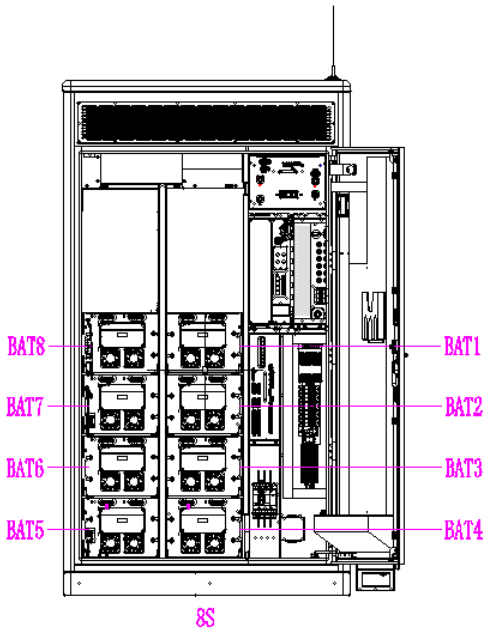
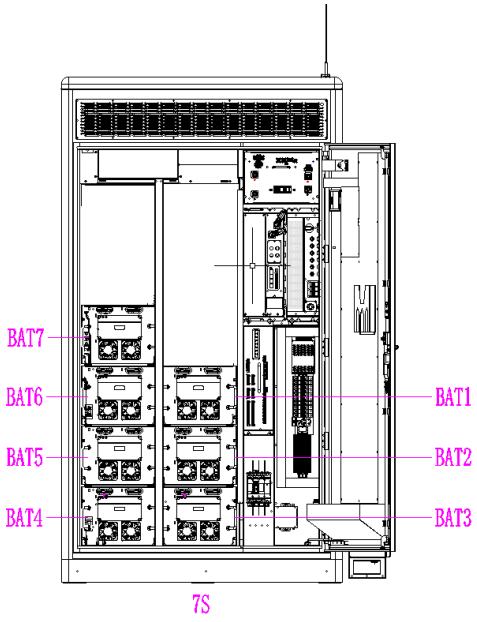
Table 4-9 Illustrative table of materials related to harness covers

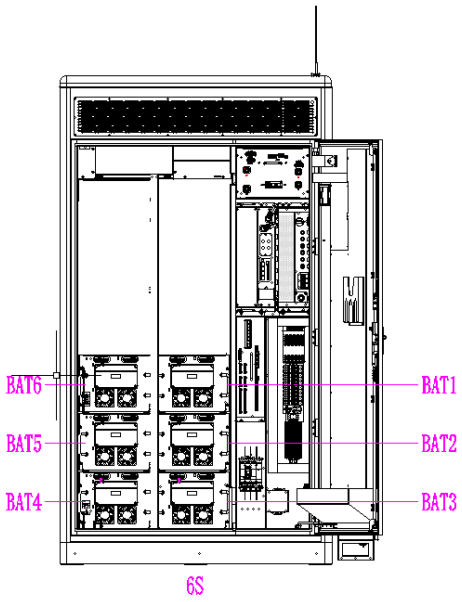
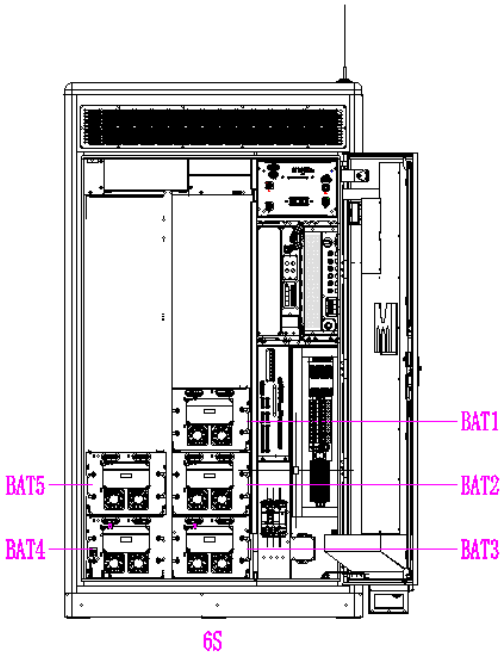
No.	Description
A	Wire harness cover
B	Wire harness cover mounting screws (M4*8 Phillips triple combination screws)

Table 4-10 Battery assembly location diagram for various configurations

Number of Batteries Configured	Batteries' Installation Positions and Sequence
12	
11	

10	 BAT10 BAT9 BAT8 BAT7 BAT6 BAT1 BAT2 BAT3 BAT4 BAT5 10S
9	 BAT9 BAT8 BAT7 BAT6 BAT5 BAT1 BAT2 BAT3 BAT4 9S

8	 BAT8 BAT7 BAT6 BAT5 BAT1 BAT2 BAT3 BAT4 8S
7	 BAT7 BAT6 BAT5 BAT4 BAT1 BAT2 BAT3 7S

6	 BAT6 BAT5 BAT4 BAT1 BAT2 BAT3 6S
5	 BAT5 BAT4 BAT1 BAT2 BAT3 6S

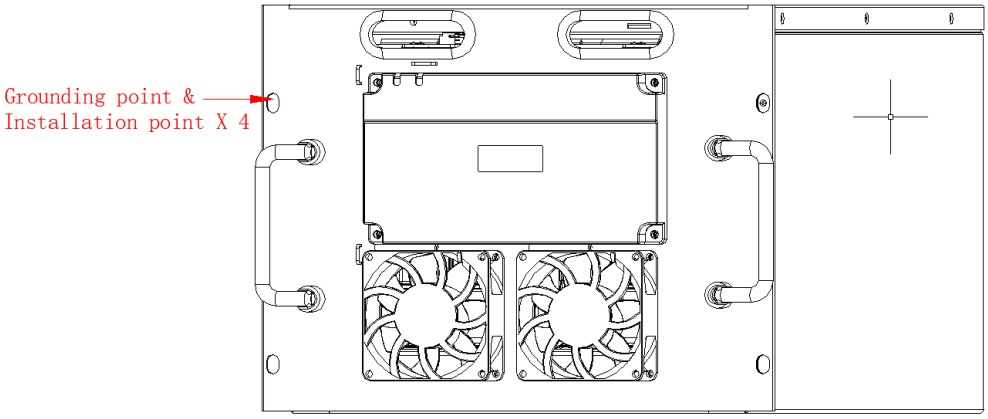


Figure 4-11 Battery grounding diagram

Before wiring, secure the battery to the battery holder with the three combination screws.

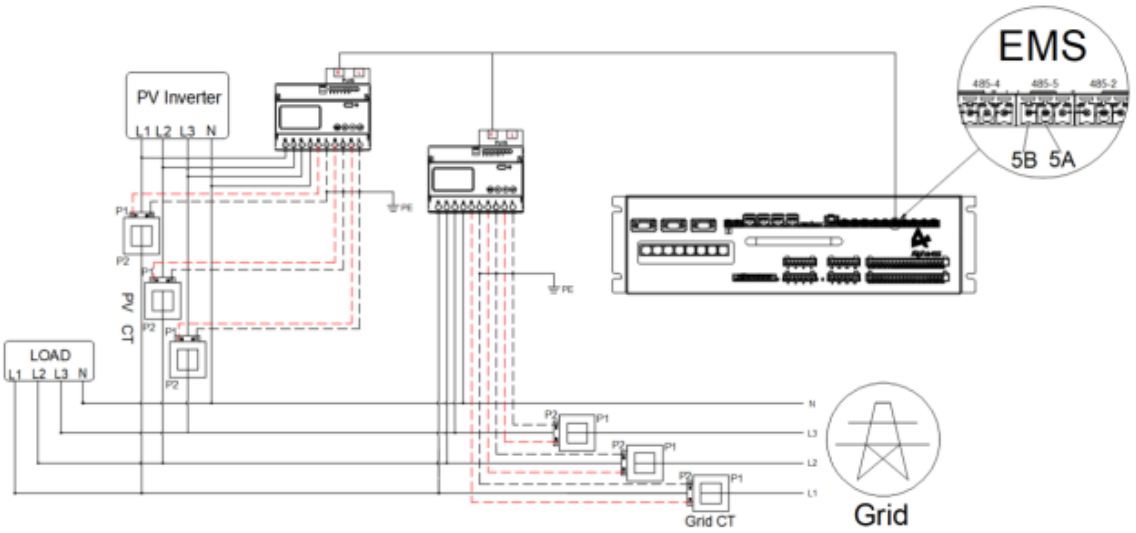
The earth resistance should be less than 4Ω.

4.2.5 Meter

4.2.5.1 Meter Installation Wiring

Meter connection in different modes

Grid Meter	PV Meter	Mode
√ √ √	××	DC
√ √ √	√ √ √	AC/Hybrid



Acrel ADL3000 Wiring Diagram

For H30 installation, please wire as shown in the diagram (three phase four wire). Pay attention to the positive direction of the transformer and the position of the two lines of the transformer into the meter (e.g. Ia* to S1, Ia to S2).

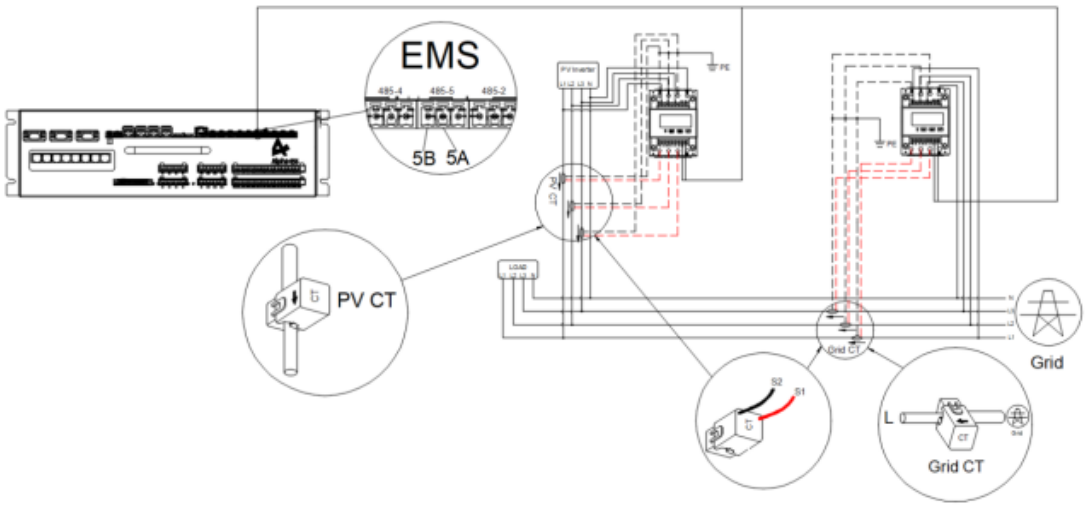
Wiring location description of Acrel three phase meter (with CT)

Grid CT	PV CT	GRID
Ia*--------S1	Ia*--------S1	Ua----------L1
Ia--------S2	Ia--------S2	Ub----------L2
Ib*--------S1	Ib*--------S1	Uc----------L3
Ib--------S2	Ib--------S2	N-------- N
Ic*--------S1	Ic*--------S1	
Ic--------S2	Ic--------S2	

Wiring of communication connected Meter (Acrel) and EMS

Grid Meter	PV Meter	EMS	Signal
21(Meter) - 5A(EMS)	21(Meter) - 5A(EMS)	5A (EMS)	RS485_A
22(Meter) - 5B(EMS)	22(Meter) - 5B(EMS)	5B (EMS)	RS485_B

Internet cable_3(GreenWhite)-----5A(EMS)	Internet cable_3(GreenWhite)--5A(EMS)	5A (EMS)	RS485_A
Internet cable_6(Green)--5B(EMS)	Internet cable_6(Green)--5B(EMS)	5B (EMS)	RS485_B



Chint Meter Wiring Schematic Diagram

For H30 installation, please wire as shown in the diagram (three phase four wire). Pay attention to the direction of the transformer and the position of the two wires of the transformer into the meter (e.g. 1 to S1, 3 to S2).

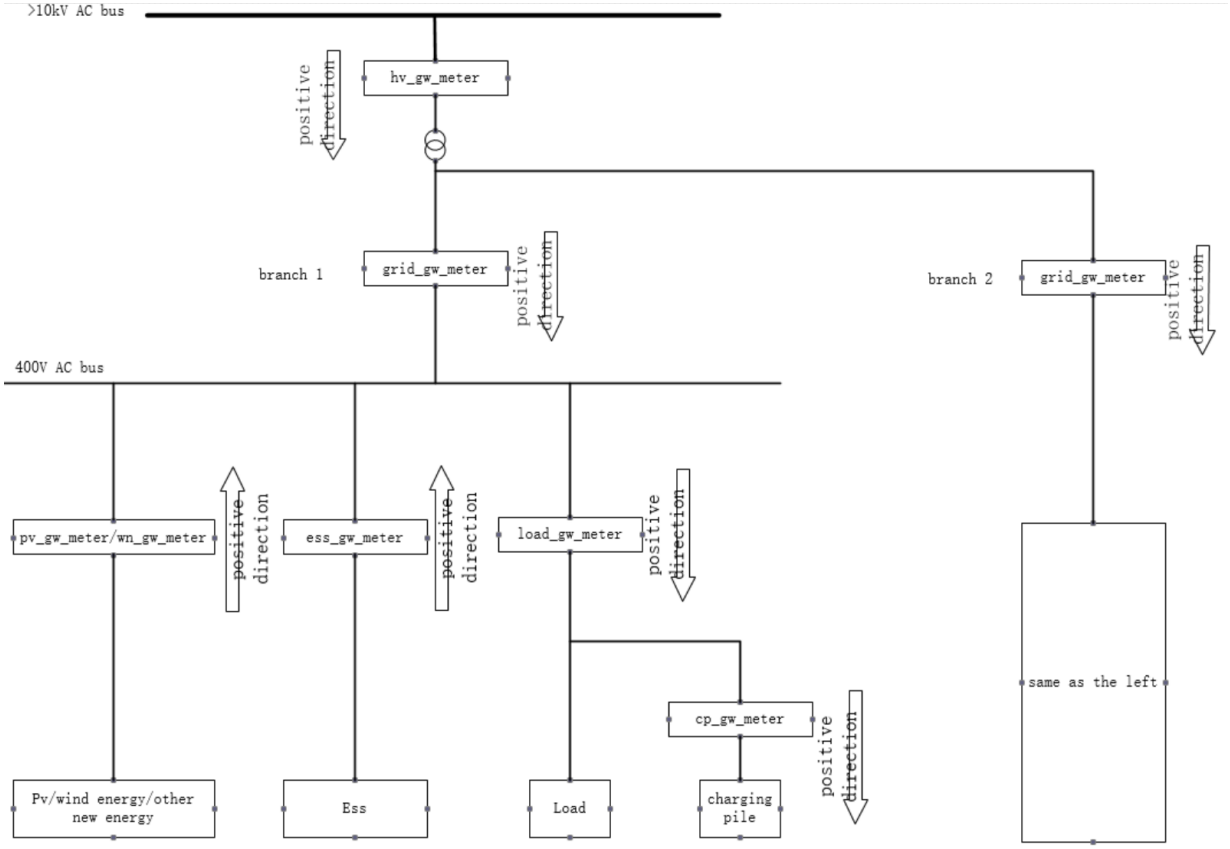
Wiring location description of Chint three phase meter (with CT)

Grid CT	PV CT	GRID
1--------S1 (Red)	1--------S1 (Red)	2----------L1
3--------S2 (Black)	3--------S2 (Black)	5----------L2
4--------S1 (Red)	4--------S1 (Red)	8----------L3
6--------S2 (Black)	6--------S2 (Black)	10-------- N
7--------S1 (Red)	7--------S1 (Red)	
9--------S2 (Black)	9--------S2 (Black)	

Wiring of communication connected Meter (Chint) and EMS

Grid Meter	PV Meter	EMS	Signal
24(Meter) - 5A(EMS)	24(Meter) - 5A(EMS)	5A (EMS)	RS485_A
25(Meter) - 5B(EMS)	25(Meter) - 5B(EMS)	5B (EMS)	RS485_B

4.2.5.2 Diagram of the Positive Direction of the Meter Wiring



The positive direction corresponding to the positive value of the energy storage meter data is defaulted as shown above, with the H30 installed with a grid shut-off meter and a PV grid-connected meter.

4.2.5.3 Division of Communication Addresses for Meter Devices

Type of electricity meter	Lower limit of equipment communication address	Upper limit of equipment communication address	Description	
Grid gateway meter	101	109	grid_gw_meter	The communication address of the metered device is set from the lower address limit
Energy storage and grid-connected electricity meter	111	119	ess_gw_meter	Ibid
Photovoltaic grid-connected electricity meter	121	129	pv_gw_meter	Ibid
Charging station gateway meter	131	139	cp_gw_meter	Ibid
Wind energy grid connection point gateway meter	141	149	wn_gw_meter	Ibid
Load shut-off meter	151	159	load_gw_meter	Ibid
Energy storage internal self-consumption meter	161	169	ess_in_gw_meter	Ibid
High voltage side shut-off meter	171	179	hv_gw_meter	Ibid

H30 has grid gate meters and PV grid-connected meters, please set the address as shown above; the device communication address is set from the low address; for example: 101 for grid gate meters and 121 for PV grid-connected meters.

4.2.5.4 Example of Setting the Communication Address of the Astronergy Meter DTSU666

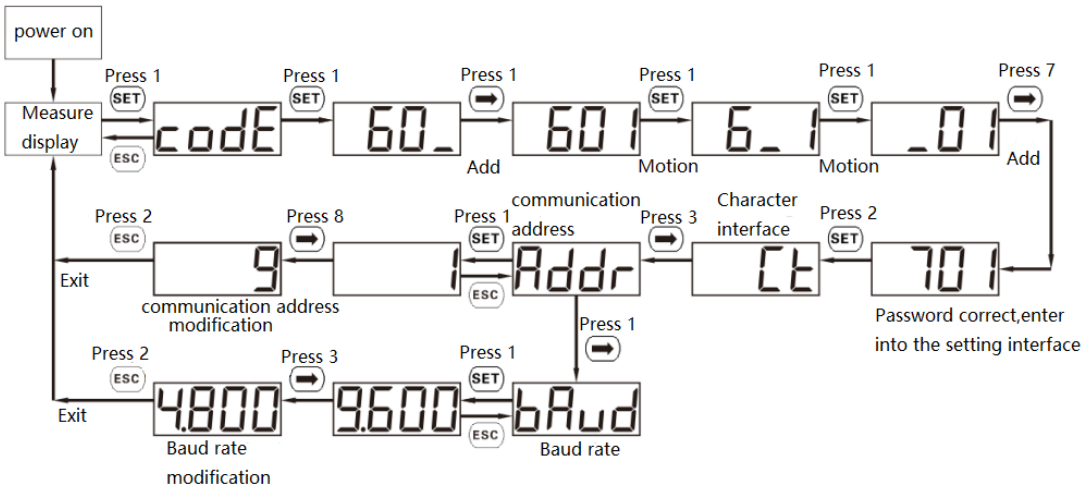


Diagram 5 Setting examples for communication address and baud rate

4.2.5.5 Example of Setting the Communication Address of the Ankerys meter ADL3000

Under any display item in the display menu, press SET to enter the "PASS" interface, then press ↵ to display "0000", press ↵ after prompting to enter the password, if the password is incorrectly entered, then return to "0000". "If the password is entered correctly, then you can set the parameters, select BUS, find ADDR and press SET to enter the "SAVE" interface after setting according to the "meter address division rules". Press ↵ under "YES" to save and exit, or press ↵ under "NO" to exit directly without saving.

Table 7 Description of the setup menu

No.	First-level Menu		Second-level Menu		
	Symbols	Meaning	Symbols	Meaning	Scope
1	BUS	Communication settings	ADDR	Correspondence address setting	1-247
			Baud	Baud rate selection	19200, 9600, 4800, 2400, 1200
			Parity	Calibration options	None, Even
			HI	645 high 6-digit table number	000000-999999
			LO	645 lower 6 digit table number	000000-999999
2	SyS	System settings	PL	Network selection	3P4L:Three phase four wire 3P3L: three-phase, three-wire
			EF.	Compound rate options	EF:compound rate E: Non-repetitive rates
			CoDE	Password setting	1-9999
			LED	Backlight time setting	1-9999
3	In.	Variable ratio setting	Pt	Voltage ratio	1-9999
			Ct	Current ratio	1-9999

4.2.6 Antenna Installation

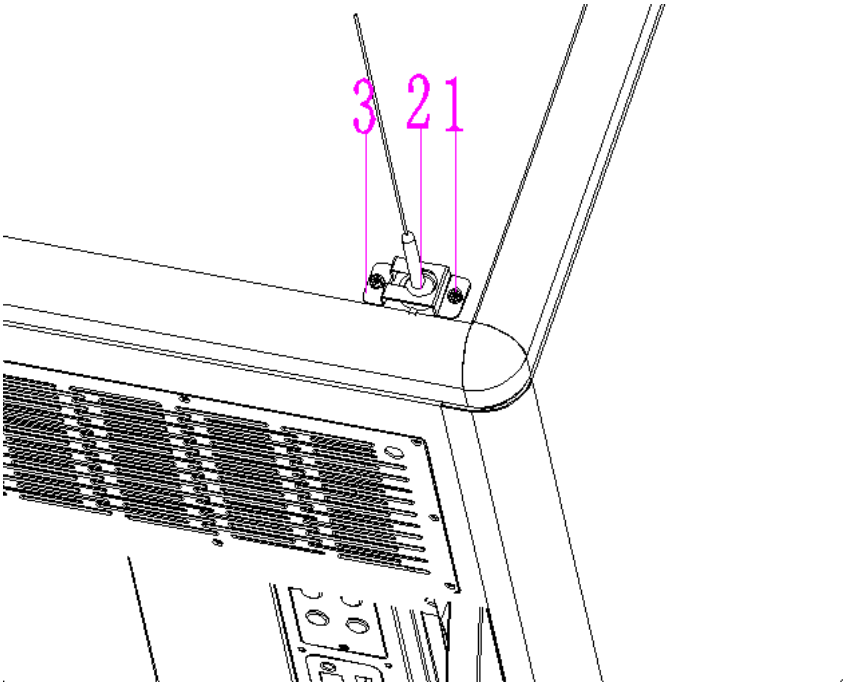


Figure 4-12 Diagram of antenna installation

Table 4-11 List of antenna installation parts

No.	Description
1	Antenna installation screws (reserved for the case)
2	Antenna
3	Antenna installation sheet metal

4.2.7 4G Modular Phone Card Installation

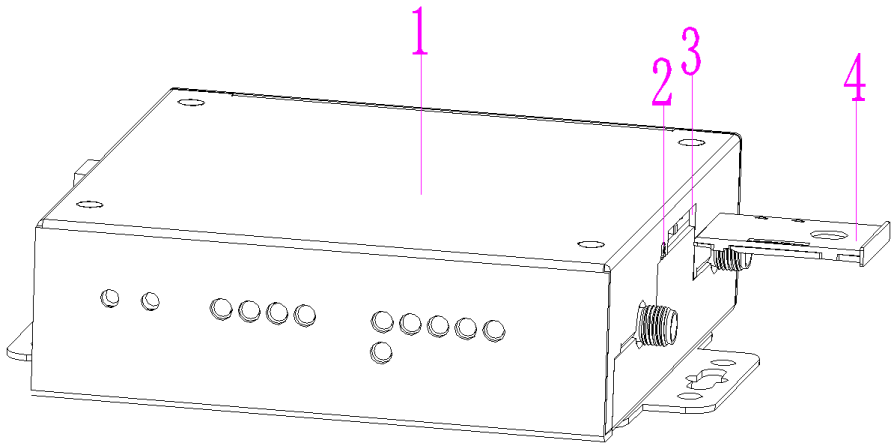


Figure 4-13 SIM card installation diagram

Table 4-12 SIM card installation parts list

No.	Description
1	4G module body
2	Thimble opening
3	SIM card slot
4	SIM card slot

For SIM card installation, you need to press the thimble opening to pop out the card slot, then place the phone card into the slot and push the slot into the slot opening to complete the phone card installation.

4.3 Electrical Connections

4.3.1 Safety Precautions

The following safety precautions should be observed throughout the electrical connection process and all other operations on equipment such as energy storage systems.

- Disconnect all external connections of the energy storage integrated system and to the internal power supply of the device.
- Ensure that the disconnections are not accidentally re-energised.
- Use a multimeter to ensure that the inside of the appliance is completely uncharged.

- Apply the necessary earthing.
- Insulate and cover the adjacent energized parts of the operating election, insulated fabric made of insulting material is used.

4.3.2 Open the Cabinet Door

Open the door before the cable is connected

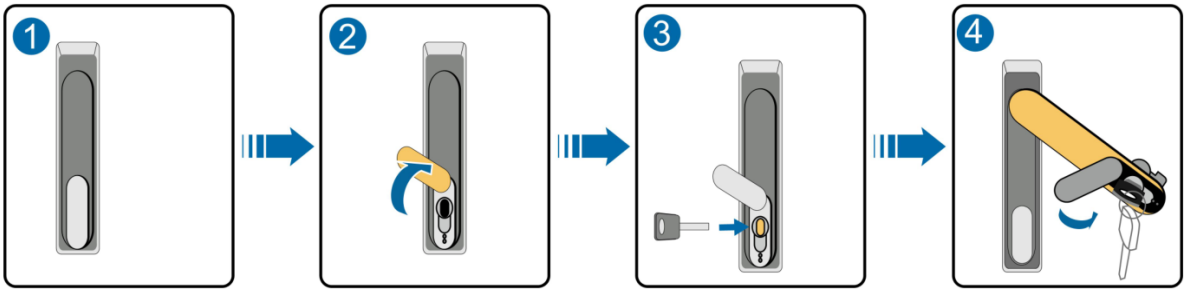


Figure 4-14 Schematic diagram of the door opening procedure

Table 4-13 Illustrative table of door opening steps

Step	Description
1	Locked status
2	Move the cover upwards over the locking hole
3	Insert the door key and turn clockwise
4	Turn the handle clockwise to the position shown in the diagram to open the front door.

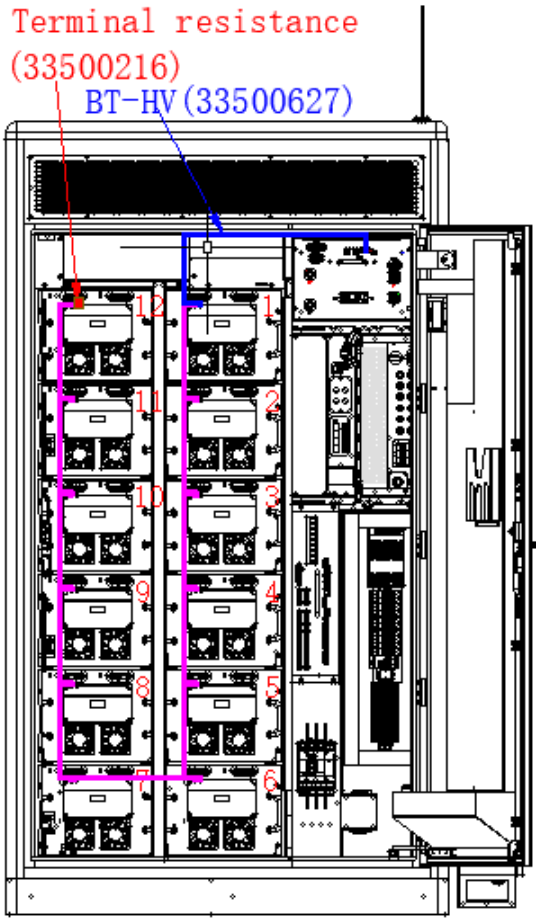
4.3.3 Communication Cable Connection

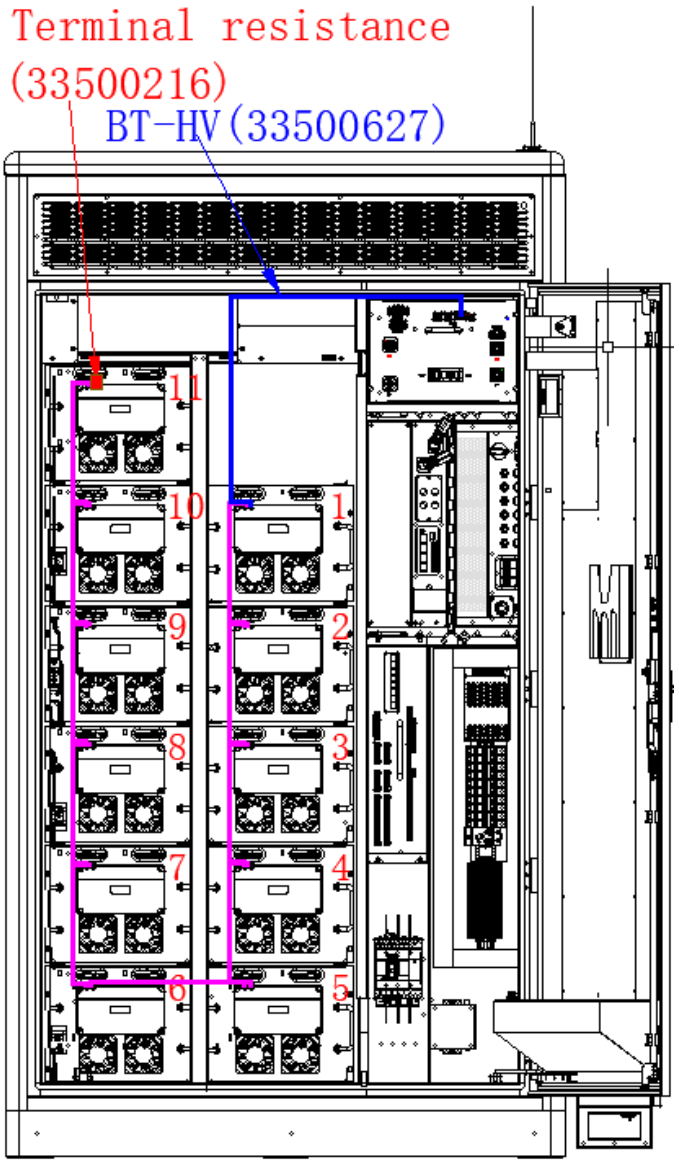
4.3.3.1 Battery Side Connection

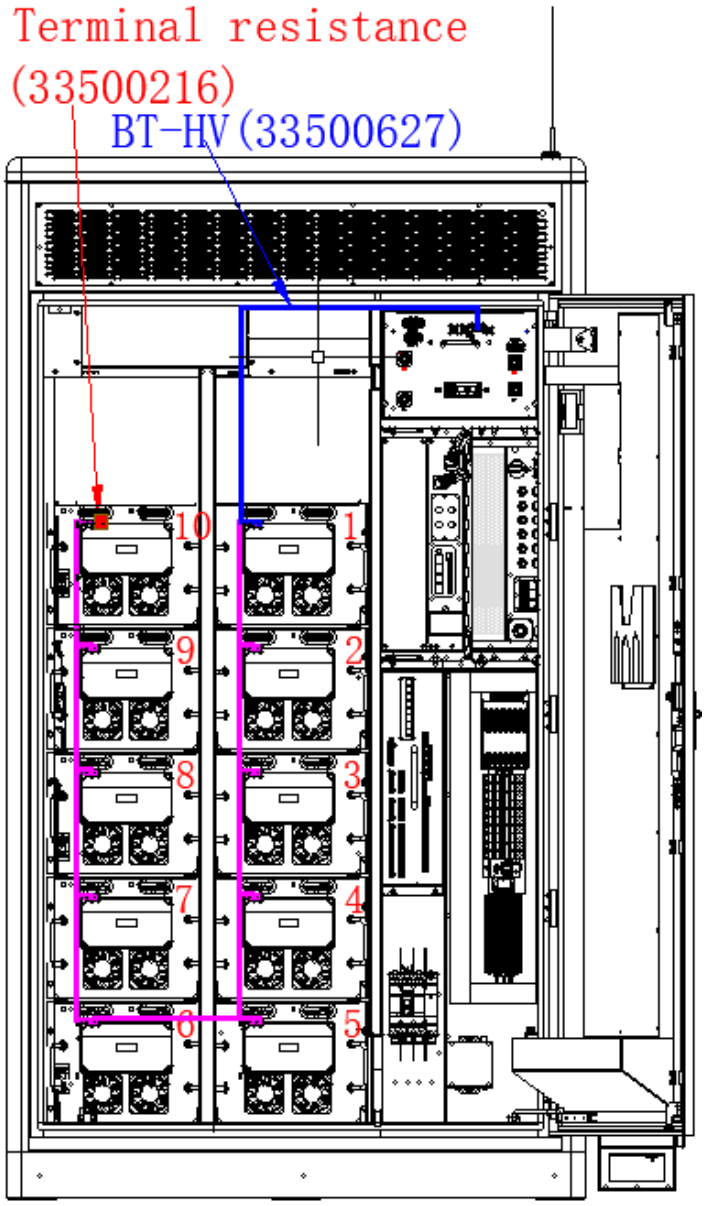
Depending on the configuration differences between items, configure the communication wires among batteries (see Table 4-1 Parts List for specific part numbers), and the sequence of connection and the location of the termination resistors are shown in Table 4-14: Schematic diagram of connection sequence of communication cable and the location of the termination resistors. Please use the communication wires from the battery parts list to connect the batteries with each other.

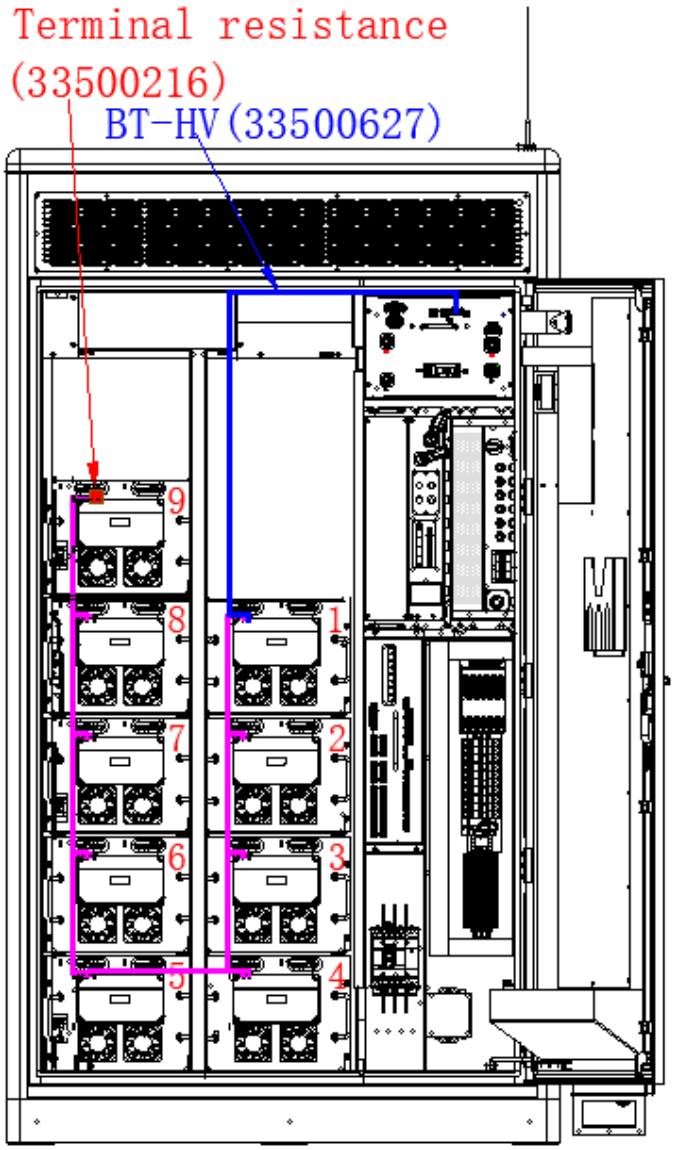
The part numbers for the inter-battery communication cable and termination resistor are indicated in the illustration under the M7790-S part number. If the configuration is M38210-SC battery, please refer to the part list for the corresponding inter-cell communication cable and termination resistor.

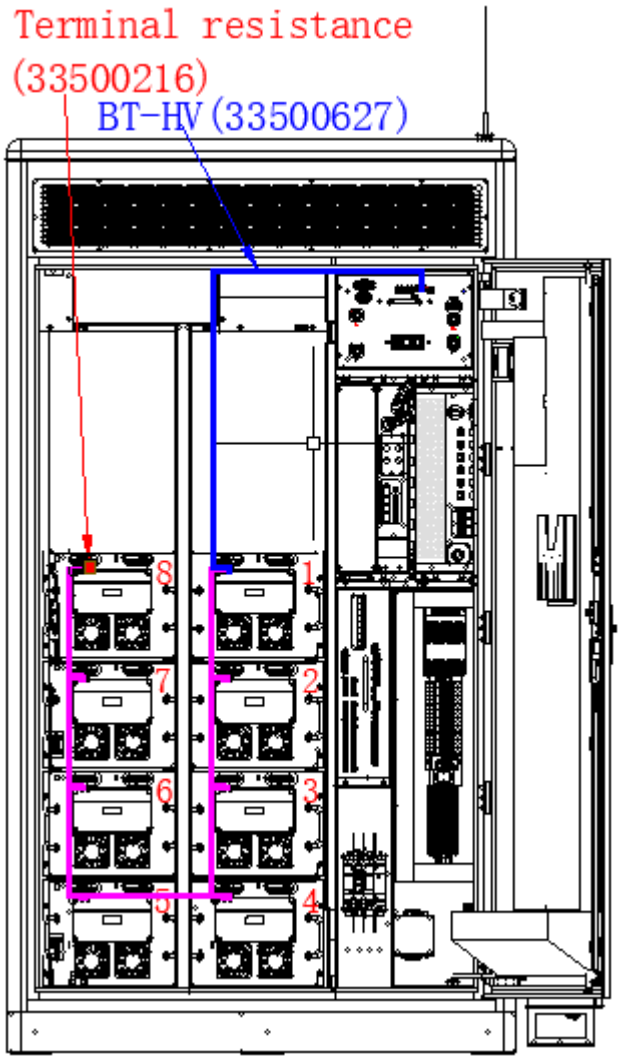
Table 4-14 Diagram showing the sequence of communication cable connections and the location of the termination resistors

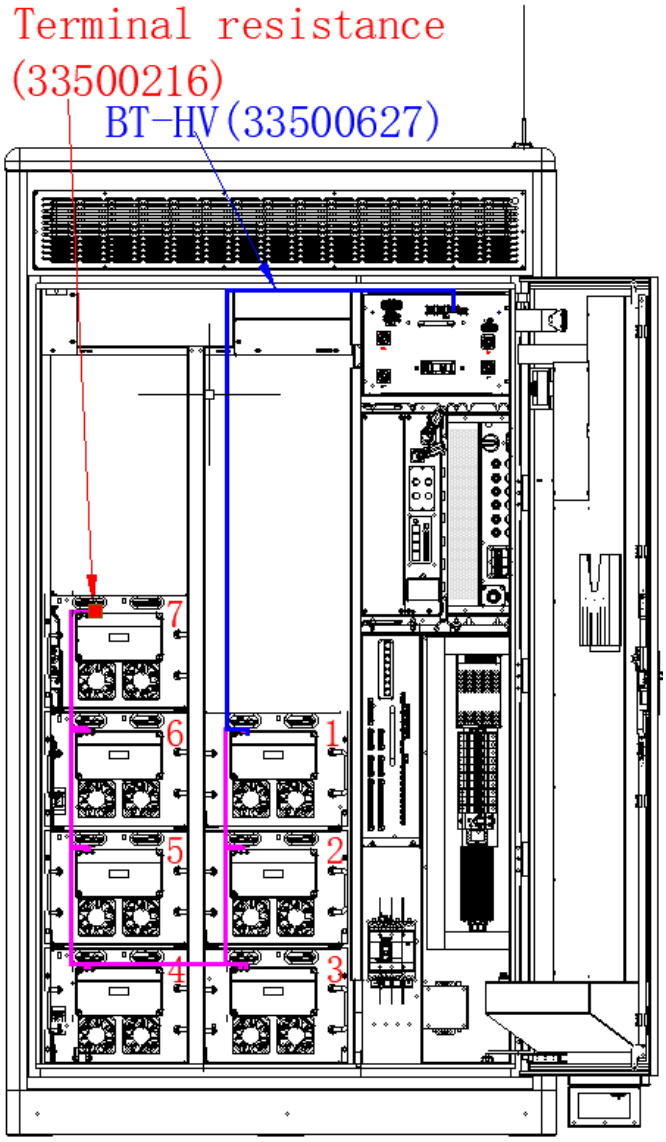
Number of batteries	Diagram showing the sequence of communication cable connections and the location of the termination resistors
12	

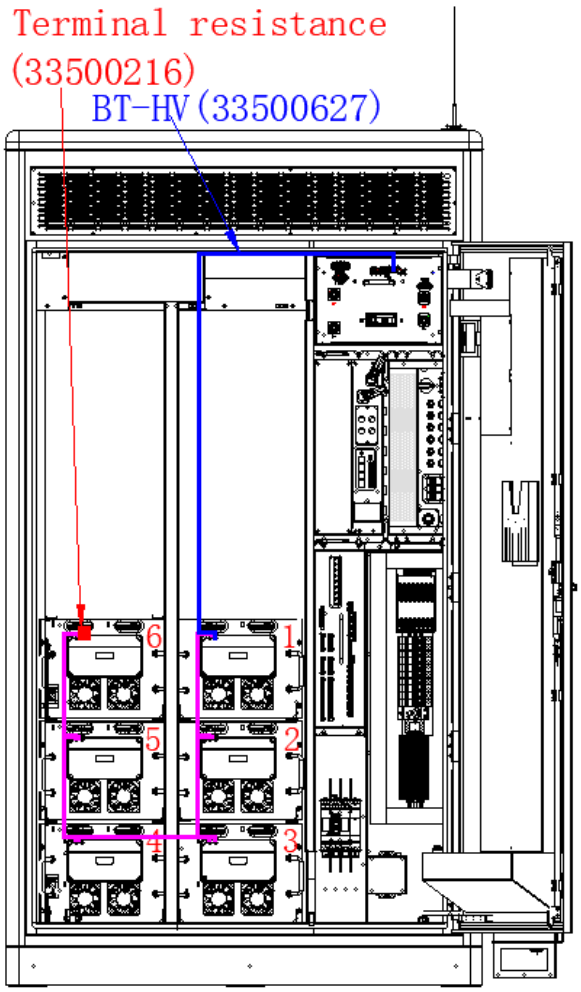
11	 Terminal resistance (33500216) BT-HV(33500627) 11 10 1 9 2 8 3 7 4 6 5

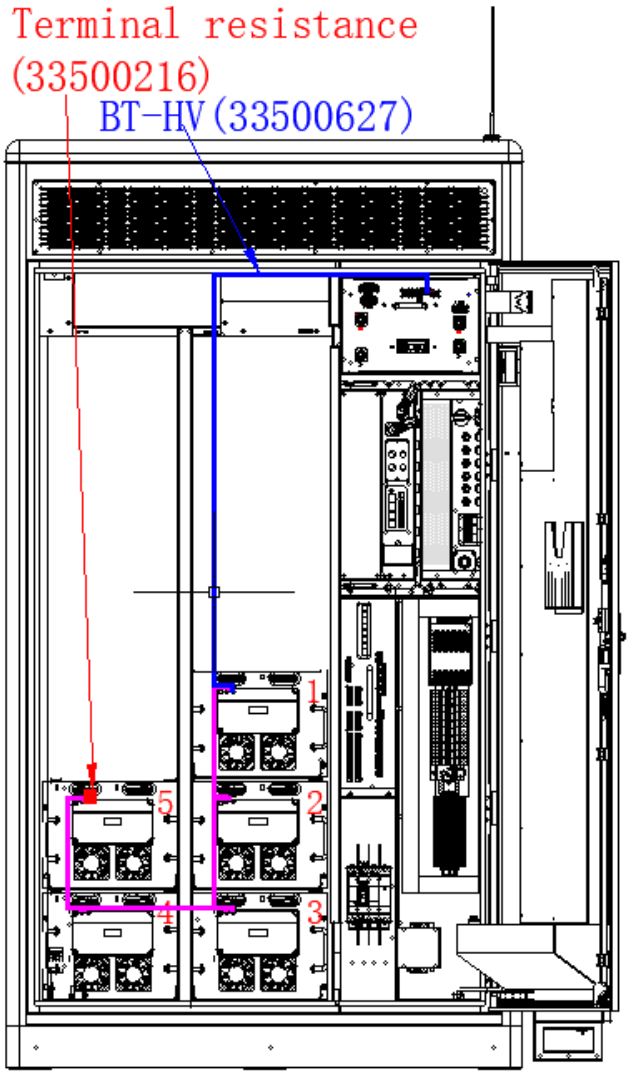
10	 Terminal resistance (33500216) BT-HV(33500627) 10 1 9 2 8 3 7 4 6 5

9	 Terminal resistance (33500216) BT-HV(33500627) 9 8 7 6 5 1 2 3 4

8	 Terminal resistance (33500216) BT-HV(33500627) 8 1 7 2 6 3 5 4

7	 Terminal resistance (33500216) BT-HV(33500627) 7 6 5 4 1 2 3

6	 Terminal resistance (33500216) BT-HV(33500627) 6 1 5 2 4 3

5	

1. Please use the termination resistor from the system accessory parts list and plug it into the last battery CAN port of each battery cluster, refer to Table 4-3 & Figure 4-3.
2. Connect the (CAN port) above the high voltage box to the high voltage box (LMU port) using the communication cable from the system accessories parts list, refer to Figure 4-3.
3. Please use the fan power supply harness from the System Accessories parts list to connect the (DC port) above the high voltage box to the battery (LMU supply port), refer to Figure 4-4.

4.3.3.2 Communication Connection between ATS and PCS

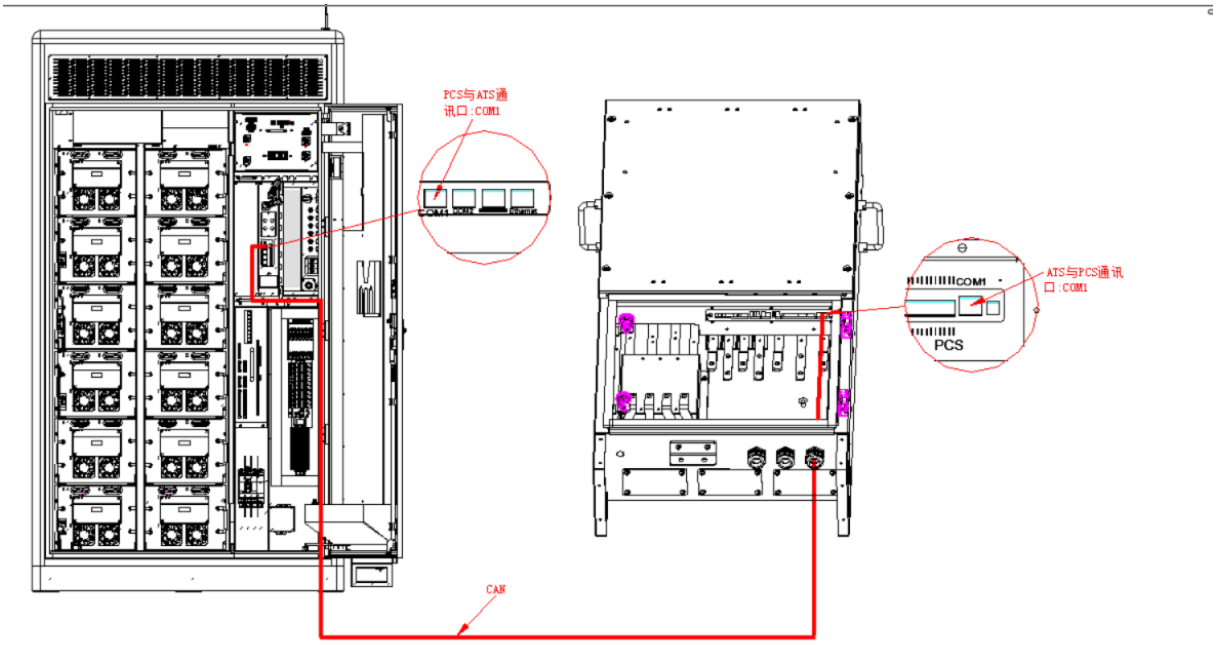


Figure 4-15 Communication connection between the ATS and a single PCS

The communication between the ATS and the PCS uses CAN, and the communication cable of CAN uses super category 6 network cable, and the interface at both ends is RJ45 network port. When there is only one ATS and one PCS in the system for networking, the dip switches 1 and 2 of the ATS should be dialed down and 3 and 4 dialed up, while the dip switch 4 of the PCS should be dialed up and all other dip switches of the PC S should be dialed down.

4.3.3.3 RRCR Connection

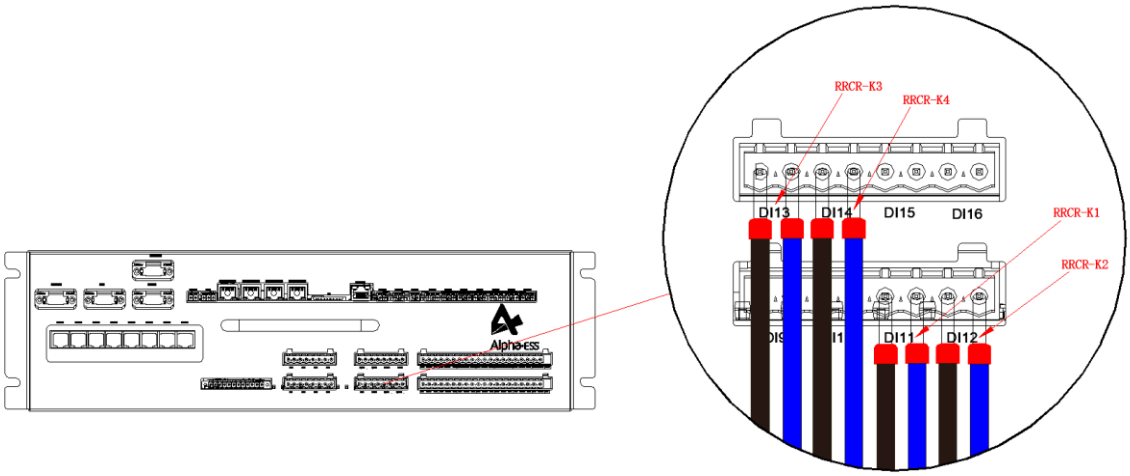


Figure 4-15 Communication connection between EMS and RRCR

The EMS is adapted to the German external device RRCR, which performs the action of adjusting the maximum feeder power with an external normally open signal, where DI11 is connected to RRCR_K1, DI12 to RRCR_K2, DI13 to RRCR_K3 and DI14 to RRCR_K4.

4.3.4 Fan Power Supply Harness Connection

1. Please use the fan power supply harness in the system parts list, and connect them to the designated locations in the diagram following the numbering on the harness. BL power supply ports J1-J12, fan power supply ports J101-J1201 & J102-J1202 should be connected to the corresponding positions shown in the diagram. If the battery cabinet is not fully installed, please still connect the wires as illustrated in the diagram.

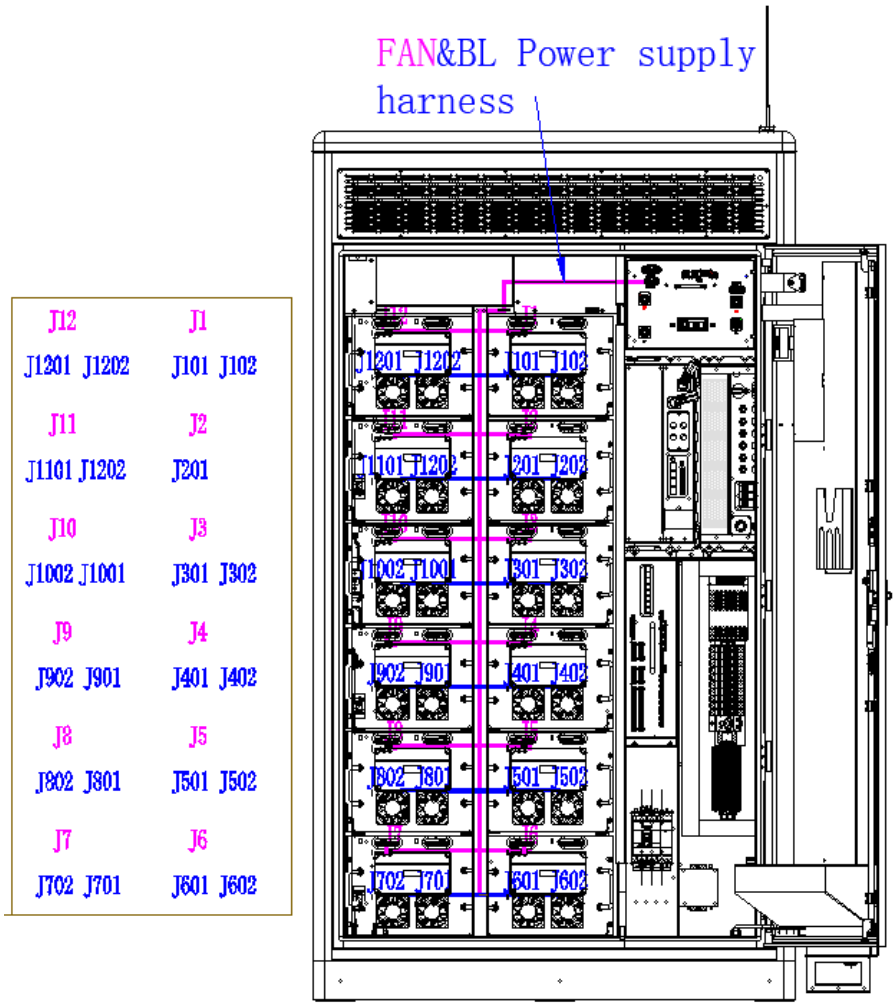


Figure 4-16 Fan power supply harness

4.3.5 PV Side Connection

1. Measure the PV voltage with a multimeter to ensure that the PV voltage is within the PV input voltage range of the DCDC module, which is 200-830V. .
2. Disconnect the PV circuit breaker from the DCDC module and make sure that there is no voltage between the positive and negative PV inputs before wiring.
3. Connect the positive PV terminal to the "PV+" of the PV side DC switch on the DCDC module.
4. Connect the negative PV terminal to the "PV -" of the PV side DC switch on the DCDC module.
5. Make sure the wiring is secure.

Table 4-15 Description of PV cables

Rated Power	Recommended Size for Copper-core DC Cables
45 kW	10 mm^2

For PV connections, please refer toFigure 4- and 错误!未找到引用源。

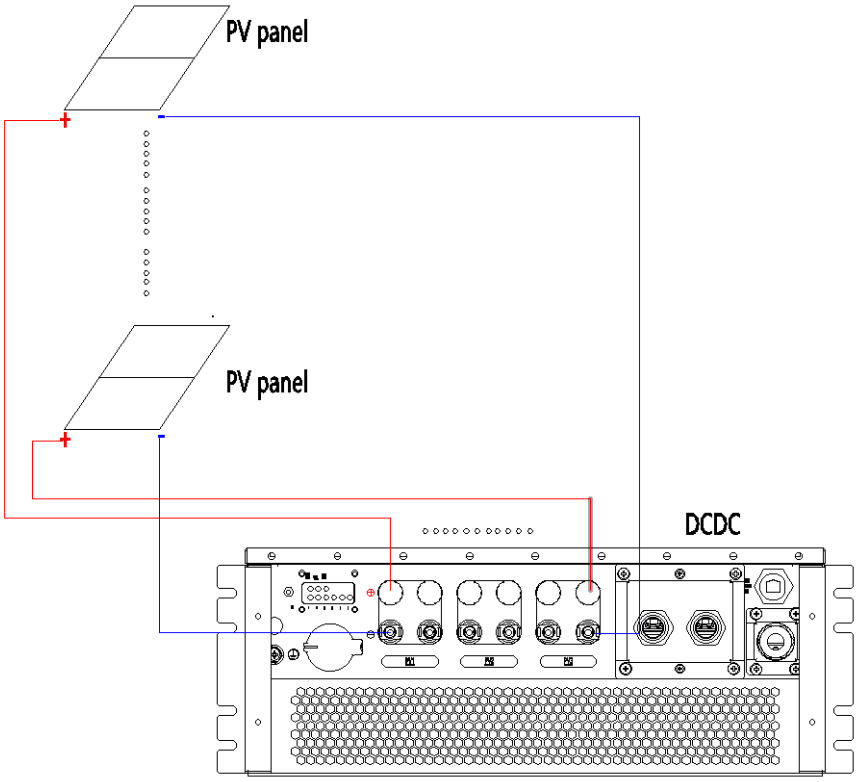


Figure 4-17 PV side wiring

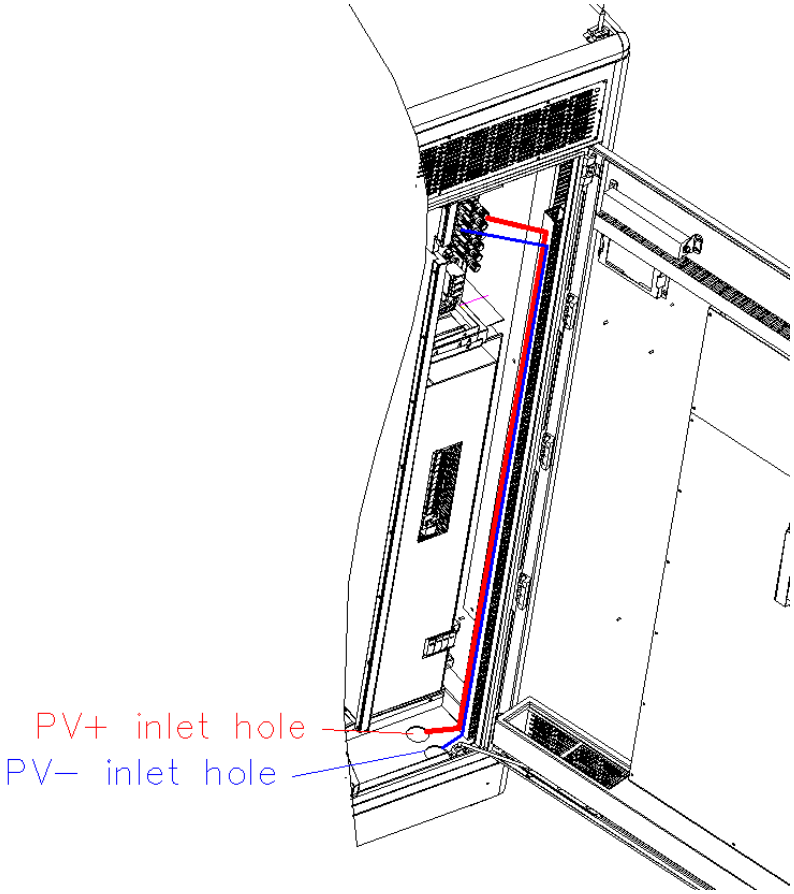


Figure 4-18 PV inlet and routing path

1. Connect the positive PV harness of the PV string through the PV+ inlet hole and connected to the positive terminal of the DCDC module Refer to Figure 4-24.
2. Connect the negative PV harness of the PV string to the negative terminal of the DCDC module by passing it through the PV-inlet hole.Refer to Figure 4-24.
3. If there are 2 or more PV strings then repeat steps 1, 2 and 3 to connect to the DCDC module.

The DC/DC connections are labeled and should be connected in groups.

For instance, PV1+ and PV1- should be grouped together, as PV2+ and PV2-, and PV3+ and PV3-.

4.3.6 AC Side Connection

1. Ensure that the AC side is wired in the correct phase sequence.
2. Disconnect the AC circuit breaker in the H30 outdoor unit.

3. Use a multimeter to measure and ensure that there is no voltage on the cable connected to the copper strip.
4. Phases L1 / L2 / L3 and N of the AC circuit breaker on the PCS side of the H30 outdoor unit, is connected to the PCS side of the ATS, phases L1 / L2 / L3 and N respectively
5. Make sure the wiring is secure.

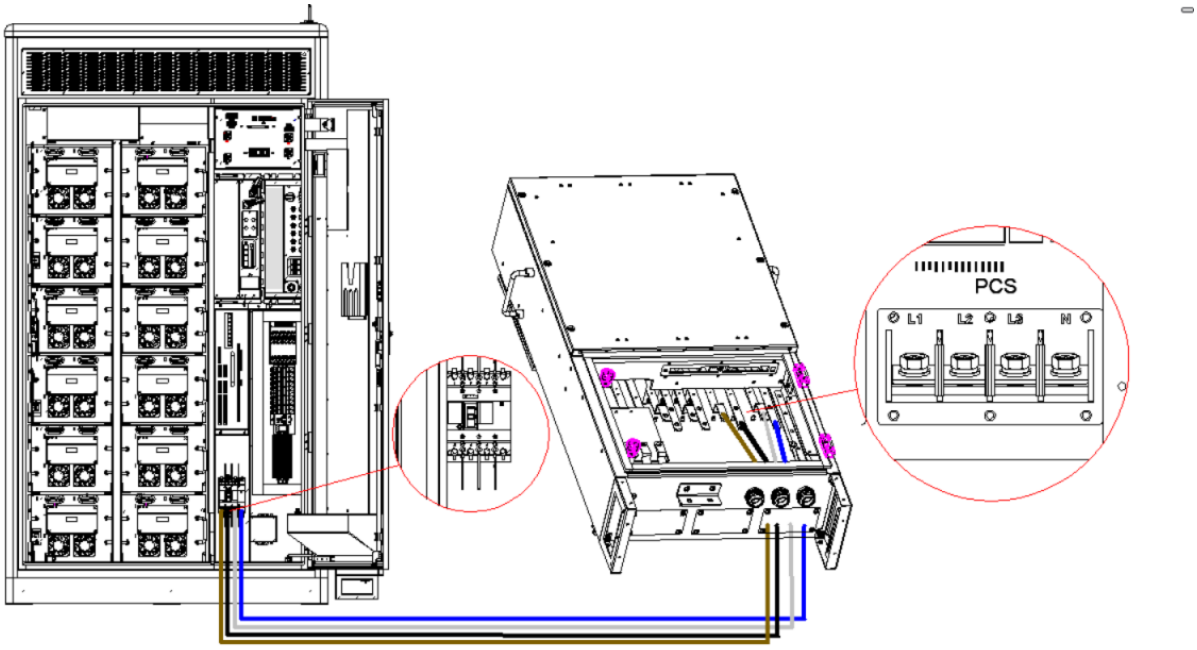


Figure 4-19 Illustration of three-phase, four-wire AC wiring

Table 4-16 AC Cable Description

Rated power	Recommended size of copper core cable
30 kW	≥16 mm²

Before wiring, use a multimeter to measure the voltage on the AC side to ensure that there is no voltage at the connection point.

All cables should be connected externally through the inlet hole at the bottom of the H30 outdoor unit.

4.3.7 Sealed Inlet and Outlet Holes

Once the wiring is complete, the inlet and outlet holes of the equipment are sealed with fireproof mortar.

4.3.8 ATS External Wiring Instructions

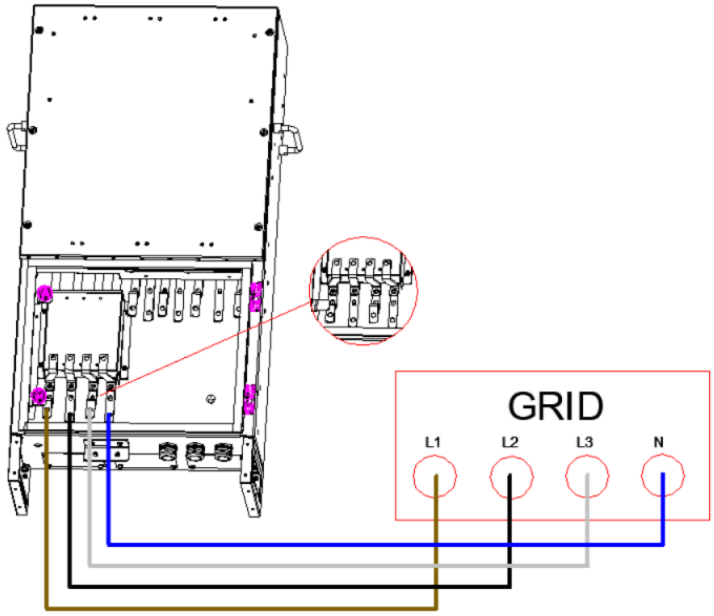


Figure 4-20 Illustration of ATS and GRID wiring

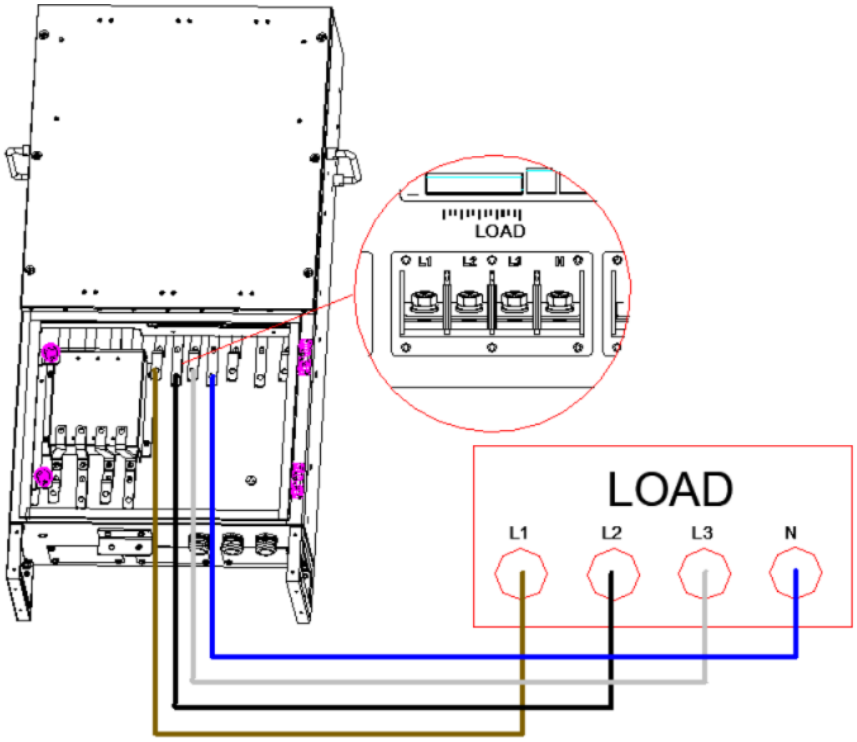


Figure 4-21 Illustration of ATS and LOAD wiring

1. Measuring the GRID and LOAD wiring positions of the ATS with a multimeter;
2. Ensure that there is no voltage at the GRID and LOAD wiring positions of the ATS;
3. Connect phases L1 / L2 / L3 / N of the GRID side of the ATS to phases L1 / L2 / L3 / N of the GRID respectively (see Figure 26), ensuring that the wiring is in the correct phase sequence and tightened;
4. Connect phases L1 / L2 / L3 / N of the LOAD side of the ATS to phases L1 / L2 / L3 / N of the LOAD respectively (see Figure 27), ensuring that the wiring is in the correct phase sequence and tightened;
5. The external wiring of the ATS (ATS to GRID and LOAD) cable must not be less than 70mm^2.

Once the wiring is complete, plug the inlet holes with fireproof clay or other fire retardant, well-sealed material.

5. Checks before System Start-up

The following steps are required after the system has been wired and before it can be started up for operation:

1. Measure the input voltage of the high voltage box with a multimeter. The normal voltage range should be 700~830V;
2. Measure the input insulation resistance (B+ to ground / B- to ground) of the high-voltage box, insulation resistance value ≥ 1MΩ;
3. For further details, please refer to the Operation & Maintenance Manual.

6. Technical Service Contact

If you have technical questions about our products, please contact our service hotline. The contact information is provided at the end of this manual. Please provide the following information for our technical service team to help you with the necessary assistance:

A. System configuration
B. Product serial number (SN)
C. Software version number
D. Fault information
E. PV module information

7. System Installation Torque Force Table

No.	Location	Specifications and Materials	Quantity	Torque (Nm)
1	Single battery fixing	Screw, triple hexagon cross, M6*14, stainless steel	4pcs	5±10%
2	AC Plastic Case	Stainless steel screw M8, grade 4.8 bolt, white zinc plated	4pcs	10±10%
3	ATS wall panels	Stainless steel screw M8	4pcs	10±10%
4	Back-plug copper bar DC positive and negative	Stainless steel screw M8 Nut, flange, M8.	2pcs	10±10%
5	External earth fixing	M10*35 Carbon steel, grade 4.8 bolts, white zinc plated	1pcs	15±10%

Please follow the recommended torque values in the table and provide feedback to the AlphaESS engineers if there are any special or unusual circumstances.

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