



BSL NEW ENERGY TECHNOLOGY CO., LTD

User Manual

M-Power Station S30/69

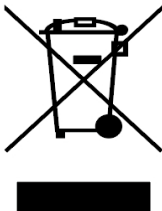
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Identification Instructions

	Please read the endorsed documentation carefully before using the product.
	When the user maintains and repairs, disconnect the power and wait five minutes before working to prevent a stored charge.
	Danger. Risk of electric shock!
RoHS COMPLIANT	Hazardous Substance Labeling
	Flammability risk
	Keep the battery away from open flame or ignition sources.
	Recycling
	The danger of high voltages. Danger to life due to high voltages in the energy storage system
	This marking indicates that this product should not be disposed of with other household wastes throughout the EU. To prevent possible environmental or human health harm from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmentally safe recycling.

Version History

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01 Safety Instructions

1.1 Safety symbol description

When installing, operating, and maintaining equipment, please read this manual first and follow all safety precautions indicated on the equipment and in the manual. **To ensure that users can better use this product and protect personal and property safety, please read the symbol prompts used below carefully.**



Danger: Indicates a highly potential danger that, if not avoided, could result in death or serious injury.



Warning: Indicates moderate potential danger if not avoided, which may result in death or serious injury to personnel.



Note: Indicates a low potential danger, and failure to avoid it may result in moderate or mild injury to personnel.



Illustration: Emphasizing and supplementing content may also provide tips for optimizing product usage.

1.2 General safety



Illustration:

This equipment should be used in an environment that meets the design specifications, otherwise it may cause equipment failure, resulting in abnormal equipment functions or component damage, personal safety accidents, property damage, etc., which are not within the scope of equipment quality assurance. Local laws, regulations, and standards should be followed when installing, operating, and maintaining equipment. The safety precautions in the manual are only supplementary to local laws, regulations, and norms. When any of the following situations occur, our company shall not be held responsible.

1. The installation and usage environment exceeds the provisions of relevant international, national, and regional standards.
2. Do not operate under the usage conditions described in this manual.
3. Unauthorized disassembly, alteration of products, or modification of software code.
4. Not following the operating instructions and safety warnings in the product and documentation.
5. Equipment damage caused by abnormal natural environments (force majeure such as earthquakes, fires, storms, floods, mudslides, etc.).
6. Damage caused by the customer's failure to comply with transportation and installation requirements.
7. Damage caused by storage conditions not meeting product documentation requirements.
8. Due to customer negligence, incorrect operation, or intentional damage, the hardware or data of the device is damaged.

9. System damage caused by third-party or customer reasons, including relocation and installation of systems that do not comply with the requirements of this manual, as well as damage caused by adjustments, changes, or removal of identification marks that do not comply with the requirements of this manual.

10. Defects, malfunctions or damages caused by actions, events, negligence or accidents beyond the reasonable control of the seller, including power outages or electrical failures, theft, war, riots, internal strife, terrorism, intentional or malicious damage, etc.



Danger:

The equipment has high voltage, and improper operation may result in electric shock or fire, leading to death, serious personal injury, or significant property damage. Please follow the operating sequence and safety precautions provided in this manual and other relevant documents, and operate in a standardized manner:

1. Please check if the pre-installed cables on the device are securely connected. Check if the equipment is damaged, such as holes, dents, or other signs of possible internal damage. Check that there is no displacement of the internal components of the equipment, and prohibit unauthorized changes to the structure, installation sequence, etc. of the equipment.
2. Do not use water to clean the electrical components inside the equipment. When liquid is found to have entered the interior of the equipment, please immediately press the emergency stop switch and notify the on-site management personnel.
3. Installation, wiring, maintenance, and replacement operations with electricity are prohibited. Before coming into contact with any conductor surface or terminal, the voltage at the contact point should be measured, and it should be confirmed that the protective grounding wire of the equipment or components that require maintenance is reliably grounded, and there is no risk of electric shock.
4. Do not approach the equipment except for personnel operating it. Do not power on the device until it has been installed or confirmed by a professional. At least two personnel must be present on site during the first power on or live operation of the main circuit.



Illustration:

1. The user's operational behavior and tools during transportation, handling, installation, wiring, and maintenance must comply with the laws, regulations, and relevant standards of the country or region where they are located.
2. During installation, operation, and maintenance, it is necessary to first clean the accumulated water, ice, snow, or other debris on the top of the cabinet before opening the cabinet door to prevent debris from falling into the cabinet.
3. Reverse engineering, decompilation, disassembly, adaptation, implantation, or other derivative operations of device software are prohibited. It is not allowed to study the internal implementation of the device, obtain the source code of the device software, steal intellectual property, or disclose the results of any device software performance testing in any way.

1.3 Electrical safety

1.3.1 Wiring requirements

1. Please select cables that comply with local laws and regulations. Cables of the same type should be tied together, and cables of different types should be laid separately. It is forbidden to wrap or cross lay them with each other.
2. If the wiring is completed or briefly left during the wiring process, the cable port should be immediately sealed, the cabinet door should be closed, and small animals should be avoided from entering.
3. The cables used in energy storage systems must be securely connected, well insulated, and meet the required specifications. The position of cable conduit or wire hole must be protected to prevent the cable from being damaged by sharp edges, burrs, etc.
4. After the cable wiring is completed, it is necessary to use cable brackets and cable clamps for reliable fixation. The cables in the backfilled soil area should be tightly attached to the ground to prevent deformation or damage caused by stress during backfilling.
5. The use of cables in high-temperature environments may cause aging and damage to the insulation layer. The distance between the cable and the periphery of the heating device or heat source area should be at least 30mm.
6. To ensure construction safety, all cables should be laid and installed at temperatures above 0 °C . When handling cables, especially in low-temperature environments, they should be handled with care.

1.3.2 Grounding requirements

1. Do not damage the grounding conductor. The grounding body of the equipment should be permanently connected to the protective grounding grid. Before operating the equipment, the electrical connections of the equipment should be checked to ensure that it is reliably grounded.
2. The grounding impedance of the equipment meets the requirements of the national standard GB 50054 and local electrical standards.
3. It is prohibited to operate the equipment without installing a grounding conductor. When installing equipment that requires grounding, protective grounding wires must be installed first; When dismantling equipment, the protective grounding wire must be removed last.

1.3.3 Maintenance requirements

1. Before connecting or removing cables, the protective switch of the corresponding circuit must be disconnected first.
2. Use a multimeter with the corresponding voltage level to check if the device is live and ensure that it has been completely powered off.
3. If there are live objects nearby, please use insulation boards or tapes to cover or wrap them.
4. After reliably connecting the circuit to be repaired to the grounding circuit using a grounding wire, carry out operation and maintenance.



Illustration:

1. Before connecting the cable, it is necessary to confirm that the cable label identification is correct before making the connection.
2. If the device has multiple inputs, all inputs should be disconnected and the device can only be operated after it is completely powered off.

3. After the maintenance is completed, dismantle the grounding wire between the maintenance circuit and the grounding circuit.

1.4 Mechanical safety



Note:

1. When transporting without wooden crates, the bottom fence must be removed. Take off and land with care to avoid impact or vibration.
2. During transportation, the center of gravity of the box should fall between the two forks on the forklift. Long distance handling, inversion, and tilting are prohibited.
3. When transporting equipment, it may be necessary to arrange auxiliary personnel to assist due to the large size of the equipment blocking the operator's line of sight.
4. To ensure the safety of drilling outside the equipment body, a suitable location should be selected before drilling to ensure that it will not cause short circuits or other impacts. During the drilling process, the equipment should be covered to prevent debris from falling into the interior of the equipment, and debris should be cleaned up promptly after drilling.
5. When handling equipment by hand, preparation should be made for bearing weight, and safety protective equipment such as protective gloves and anti smashing shoes should be worn.
6. Be careful when moving equipment during transportation to avoid impact or falling. Avoid scratching the surface of the equipment, damaging components or cables.

1.5 Battery safety



Illustration:

We are not responsible for any damage caused to the batteries provided by our company due to the following reasons:

1. Due to customer reasons, the battery was not charged and inspected in a timely manner, resulting in expired storage, capacity loss, or irreversible damage.
2. Mechanical damage, leakage, rupture, etc. caused by improper operation or failure to connect the battery as required.
3. Customers or third parties who are not aware of our company may change the battery usage scenario on their own. Including but not limited to: connecting additional loads to the battery by oneself, mixing with other brands of batteries, mixing with batteries of different rated capacities, etc.
4. Direct damage to the battery caused by the inability of on-site equipment operating environment or external power parameters to meet the environmental requirements for normal operation. Including the actual operating temperature of the battery being too high or too low, severe power grid conditions, frequent power outages, etc.
5. The customer has not set the battery operation management parameters correctly or maintained them improperly, resulting in frequent overdischarging of the battery, on-site expansion by the customer, or long-term inability to fully charge.
6. The customer did not perform proper maintenance on the battery according to the operating manual of the supporting equipment, including but not limited to: not regularly checking whether the battery terminal screws are tightened, etc.
7. The battery was stolen and lost.

8. Batteries that have exceeded their warranty period.



Danger:

1. Do not expose the battery to high temperature environments or heat generating devices such as sunlight, fire sources, transformers, heaters, etc. Overheating of batteries may cause fires and explosions.
2. Do not disassemble, modify or damage the battery (such as inserting foreign objects, immersing in water or other liquids, etc.) to avoid battery leakage, overheating, fire or explosion.
3. Thermal runaway of batteries can produce flammable gases, as well as harmful gases such as CO and HF. The accumulation of combustible gases generated after thermal runaway of batteries poses a risk of explosion and explosion, which may cause personal injury and property damage.
4. When installing and maintaining the battery, it is necessary to wrap the exposed cable terminals on the battery with insulating tape. At the same time, avoid foreign objects (such as conductive objects, screws, liquids, etc.) from entering the interior of the battery and causing a short circuit.



Warning:

1. Batteries must be stored in a separate warehouse and in their outer packaging, avoiding mixing with other materials, storing outdoors, and stacking batteries too high. The site must have fire-fighting facilities that meet the requirements, such as fire sand, fire extinguishers, etc.
2. Batteries should be avoided from impact. When handling batteries, they should be carried in the direction required by the battery, and inversion or tilting are prohibited.
3. Please use the battery within the temperature range specified in this manual. When the ambient temperature of the battery is below the lower limit of the operating temperature, charging is prohibited to avoid crystallization caused by low-temperature charging and internal short circuit of the battery.
4. Please dispose of used batteries in accordance with local laws and regulations, and do not dispose of batteries as household waste.
5. If the battery has been charged for more than 8 months, it needs to be recharged. If not recharged as required, it may affect the performance and service life of the battery.

Measures for handling battery abnormalities



Danger:

1. When electrolyte leakage or abnormal odor occurs, contact with the leaked liquid or gas should be avoided. Non professionals are not allowed to approach, please contact professionals immediately for assistance.
2. Electrolyte is corrosive and contact may cause skin irritation and chemical burns. If in contact with battery electrolyte, immediately clean the contact area with plenty of water and soap, and seek medical help immediately.
3. After the battery drops (with or without packaging), it is prohibited to continue using it. If there is no obvious deformation or damage to the appearance and there is no obvious

odor, smoke, or fire, transfer the battery to an open and safe place for 1 hour before processing, and contact our service engineer, while ensuring safety.

4. When there is a noticeable odor, damage, smoking, or fire after the battery drops, personnel should be evacuated immediately and the alarm should be reported in a timely manner. Professional personnel use fire-fighting equipment to extinguish fires while ensuring safety.

1.6 Maintenance and replacement



Warning:

1. If the device malfunctions, please contact your dealer promptly for assistance.
2. Before carrying out maintenance work, please power off the equipment first, and then follow the instructions on the delayed discharge label to wait for the corresponding time to ensure that the equipment has been powered off before operating it.
3. During the maintenance process, please try to avoid unrelated personnel entering the maintenance site, and temporary warning signs or fences must be erected for isolation.
4. Unauthorized personnel are not allowed to open the cabinet door, otherwise there is a risk of electric shock, and the resulting malfunction is not covered by the warranty.
5. It is prohibited to open the cabinet door in weather conditions such as rain, snow, lightning, dust, and heavy fog.
6. Before removing the components from the cabinet, please confirm that other components on the cabinet are not loose.
7. Operation and maintenance personnel as well as professional technicians should receive sufficient training on safe use and equipment maintenance, and should operate with sufficient preventive measures and personal protective equipment.
8. During equipment maintenance, insulation materials should be used to cover nearby live parts.
9. Before the fan is powered off or stopped rotating, it is forbidden for any object to come into contact with the running fan (such as fingers, components, bolts, etc.).
10. The equipment can only be powered on again after the fault has been resolved, otherwise it may cause the fault to expand or damage the equipment.
11. When conducting live inspection of the system, Note should be paid to the danger warning signs on the equipment to avoid standing at the cabinet door.
12. After the replacement of power components or wiring changes in the energy storage system, manual wiring inspection is required to avoid abnormal system operation.
13. When replacing the battery, please replace it with the same type of battery module.
14. After the maintenance operation is completed, it should be checked immediately to ensure that no tools or other components are missing in the equipment.
15. After completing maintenance and replacement operations, the cabinet door should be locked in a timely manner and the key should be properly kept.

02 Product Introduction

2.1 Overview of Energy Storage System

The M-Power Series S30/69 model typically consists of 6 battery packs, 1 high-voltage control box, 1 30kW hybrid inverter, and an optional 20kW forklift charger module. The unit is equipped with a small integrated display and control screen (local EMS) for unified management of the entire S30/69 mobile energy storage system. This series of products features scalability, programmability, and easy transport. It supports charging its own batteries via charging piles, grid connection, and PV input to ensure reliable power supply to loads. Additionally, with the optional 20kW forklift charger module, it provides the capability to charge forklift batteries.

2.2 Product Description

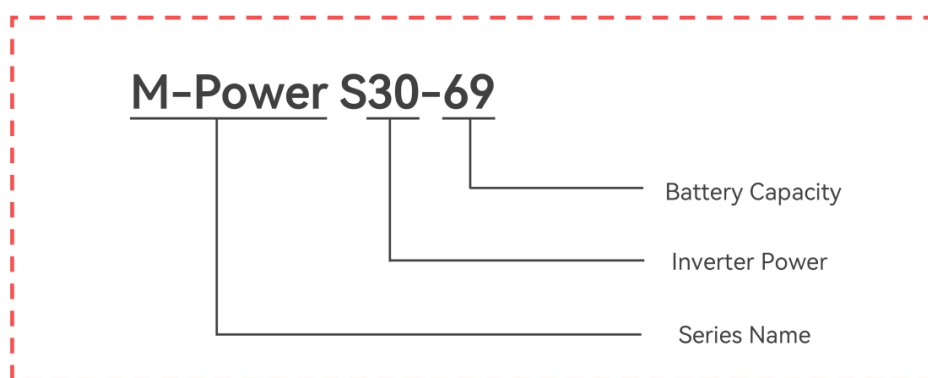


Figure 2.2

2.3 Product Application

The M-Power series produces zero emissions during operation and provides stable, reliable power supply for a wide range of application scenarios. This series is suitable for emergency backup, on-site operations, and mobile electric vehicle charging, delivering a clean, quiet, and intelligent energy supply to users.

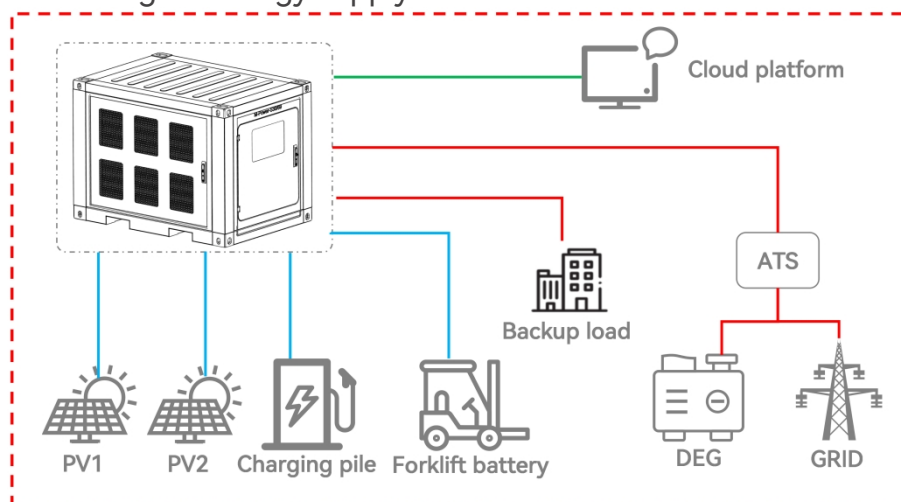


Figure 2.3-1

Solar-Storage Mode (No Charger Module):



Figure 2.3-3

Product convenience

After the product is unpacked and fully charged, it can be easily transported using a transportation tool for quick movement. In areas with limited power supply, it can be used for emergency power needs, and it can also be used for quick power supply through the charging gun.



Figure 2.3-4

2.4 Electrical Circuit Diagram

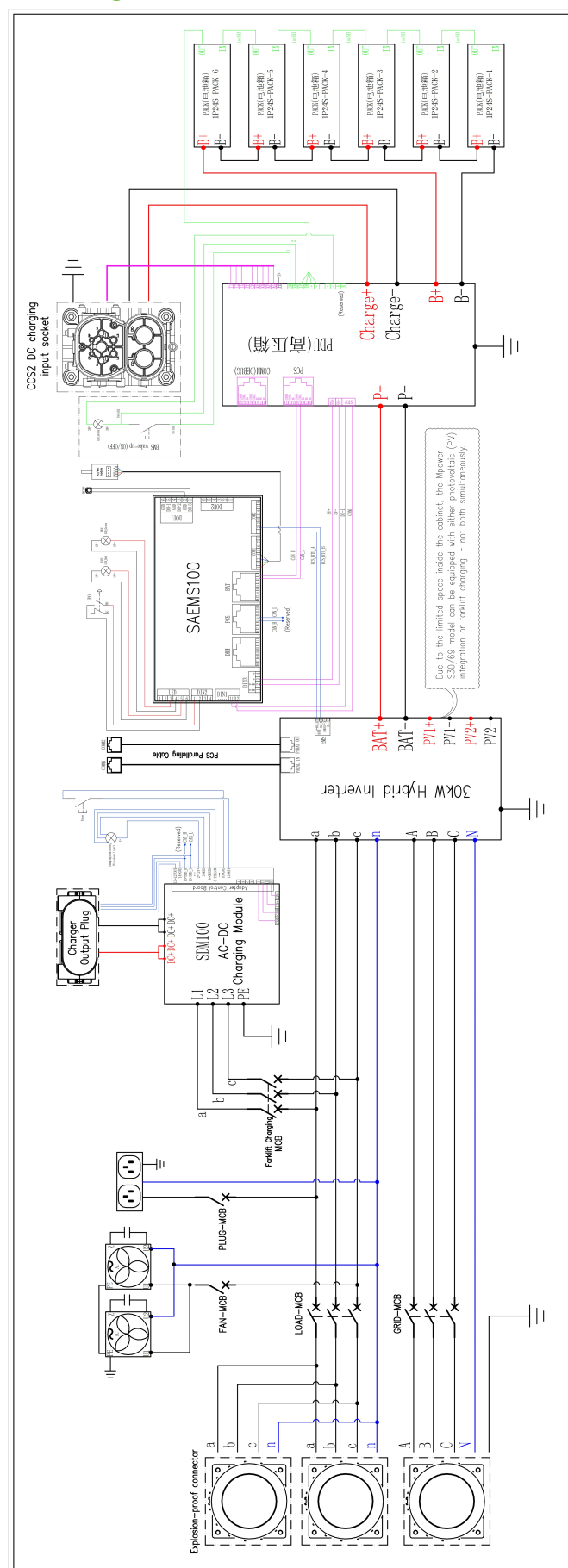


Figure 2.4

2.5 Product Appearance

S30-69

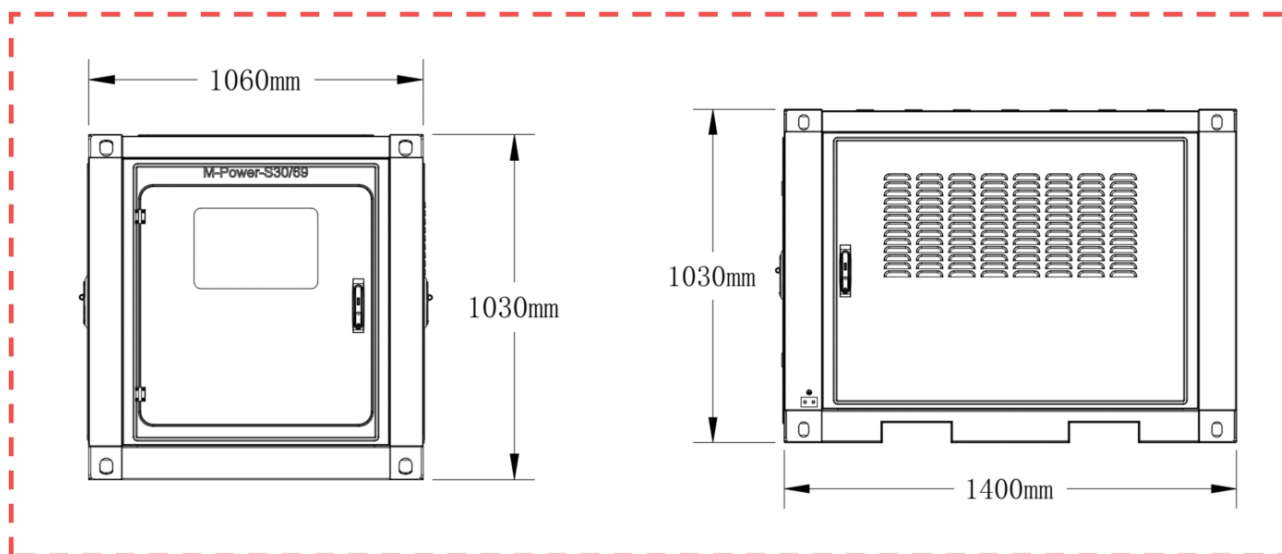


Figure 2.4

2.6 Product Specifications

M-Power series Parameter

Model	S30-69
Battery Parameters	
Cell Chemistry	Lithium Iron phosphate (LiFePO ₄)
Cell Capacity	3.2V/150Ah
Configuration	1P24S*6S(1P144S)
Rated Power	69.12kWh
Rated Charge/Discharge Power	0.5P(25±2°C)
Max. Charge/Discharge Current	150A(25±2°C)
Rated Voltage	460.8V
Operating Voltage Range	403.2V~518.4V
PV Parameters (Optional)	
Max.PV Power	19.2kW+19.2kW
Max.PV Voltage	850V
PV Start-Up Voltage	250V
MPPT Voltage Range	200-830V
Max. PV Current	32A+32A
MPPT Route	2
PCS Parameters	
Rated AC Power	30kW

Max. DC Current	100A
DC Voltage Range	320V~850V
Rated AC Voltage	AC400V/230V
Rated AC Current	43.5A
Rated AC Frequency	50Hz/60Hz(±2Hz)
Power Factor Adjustable Range	-0.8 Ahead ~ +0.8 Behind
Overload Capacity	110%,Normal Operation;120%,1 Min.
Exteranl Interface	
125A Three-Phase Quick Connector	3
16A Single-Phase Outlet	2
125A DC Charging Port	1
DC output (optional)	
20kW DC charger	1
General parameters	
Operating Humidity	10%-90% RH(Non-condensing)
Operating Temperature	-20°C to 55°C(Derating at >45°C)
Storage Temperature	0°C ~ 35°C
Altitude	3000m(>2000m Derating)
Cooling Method	Intelligent Air Cooling
Communication Protocol	RS485/CAN/RJ45/DRY/WiFi/4G
Isolation Method	Non-isolated
Protection Level	IP55
Dimension(W*D*H)	1060*1400*1030(±5mm)
Weight	1012Kg±3%

Table2.6



Note:

The actual parameters have been set according to the customer's requirements before the product was manufactured.

Due to the limited space inside the cabinet, the Mpower S30/69 model can be equipped with either photovoltaic (PV) integration or forklift charging – not both simultaneously.

2.7 Component Introduction

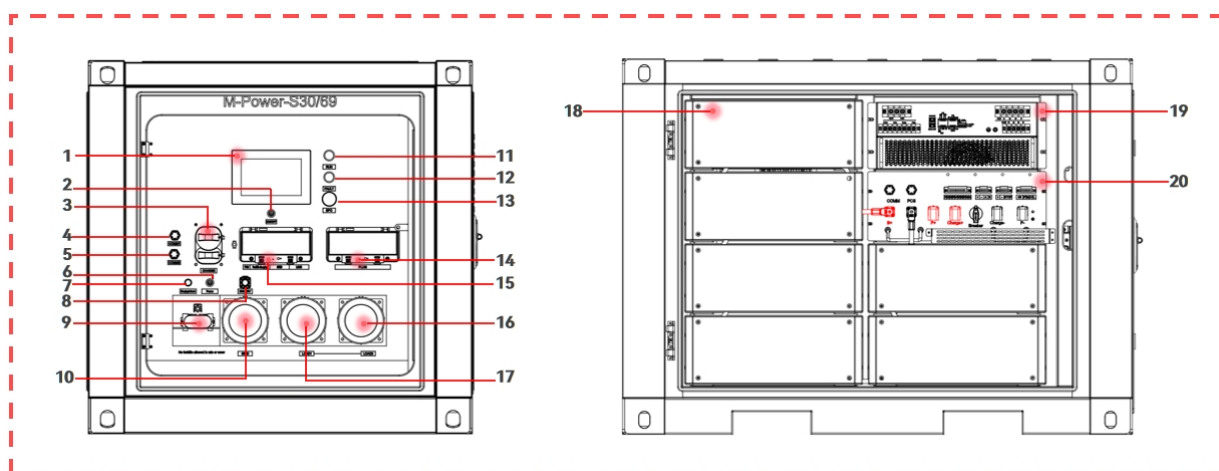


Figure 2.7-1

NO.	Model name	Descriptions
1	HMI	Used for displaying battery parameters and related parameters of forklift charging
2	HMI Switch	HMI power switch
3	DC Charging Station	Battery charging interface, which can be charged using a charging gun.
4	Commucation interface-1	Parallel port Input
5	Commucation interface-2	Parallel port Output
6	Forklift Charging pause	Used for pausing the charging of the forklift
7	Forklift Charging Light	Forklift charging indicator light
8	DEG-DRY	Diesel generator dry contact
9	Forklift Charging Plug	Used for connecting the charging cables of forklifts
10	GRID interface	Used for connecting the equipment to the grid side
11	Run	Running indicator light
12	Fault	Fault indicating lamp
13	EPO Button	Emergency brake button
14	220V socket & switch	For 220V equipment power supply
15	Pilot switch	Include: FAN、Forklift Charging、GRID、LOAD

16	LOAD-2	Load input/output port2
17	LOAD-1	Load input/output port 1
18	Battery Pack	150Ah 1P24S
19	Inverter	30kW Hybrid Energy Storage Inverter
20	High Voltage Box	-

Table2.7

2.7.1 Battery Pack

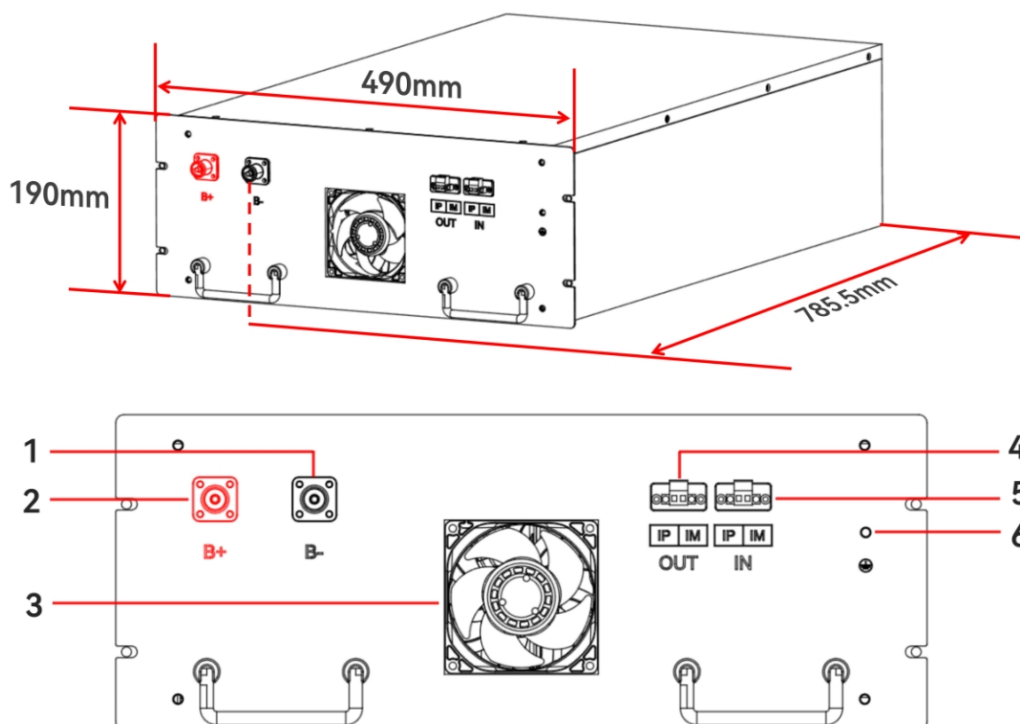


Figure 2.7.1

NO.	Model name	Descriptions
1	Battery negative interface	Connect the negative terminal.
2	Battery Positive interface	Connect the positive terminal.
3	Battery Pack cooling fan	Cool the battery to reduce the chance of thermal runaway.
4	Communication Input Interface	Used for BMU communication information collection.
5	Communication Output Interface	Used for BMU communication information collection.
6	Grounding interface	Used as external grounding for the battery pack.

Table 2.9.1

2.7.2 High Voltage Control Box

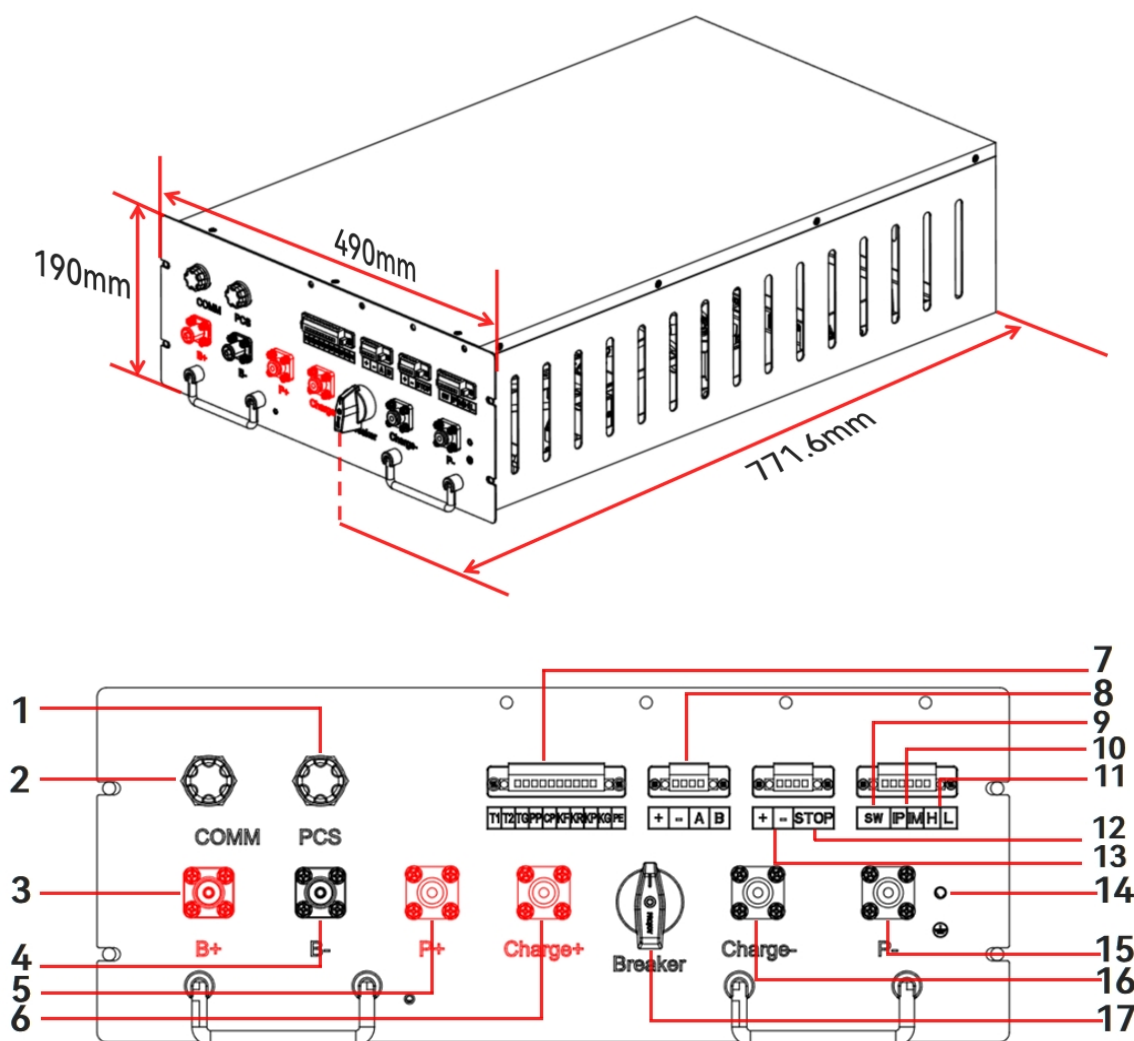


Figure 2.7.2

NO.	Model name	Descriptions
1	PCS	Inverter communication connection
2	COMM	BMS host software debug port
3	Battery positive connection port	Connect the positive terminal
4	Battery negative connection port	Connect the negative terminal
5	System positive output port	Connect the external positive DC cable, which can be connected to the positive terminal of the inverter.
6	Forklift Charging input	If you choose the option with the forklift charging module, the high-voltage box will include the positive input port of the power line for this charging module.
7	Charging station communication interface	Used for obtaining communication information of the charging station.
8	485 communication interface (reserved)	Used for internal module connection communication
9	Switch power supply port	Used for power supply of HMI switch
10	BMS communication interface	Used for receiving BMS information

11	Inverter communication interface	Used for receiving Inverter information
12	STOP	During charger-to-S30/69 charging, this node provides BMS-to-EMS feedback of charging status to suppress invalid fault indications.
13	HMI power supply interface	Used for HMI power supply
14	Grounding interface	Used for external grounding of the equipment
15	System negative output port	Connect the external negative DC cable, which can be connected to the negative terminal of the inverter.
16	Forklift Charging Output	If you choose the option with the forklift charging module, the high-voltage box will include the negative output terminal of the power line for this charging module.
17	Isolating circuit breaker	Control the on and off of the high-voltage circuit of the battery.

Table 2.7.2

2.7.3 Energy Storage Inverter

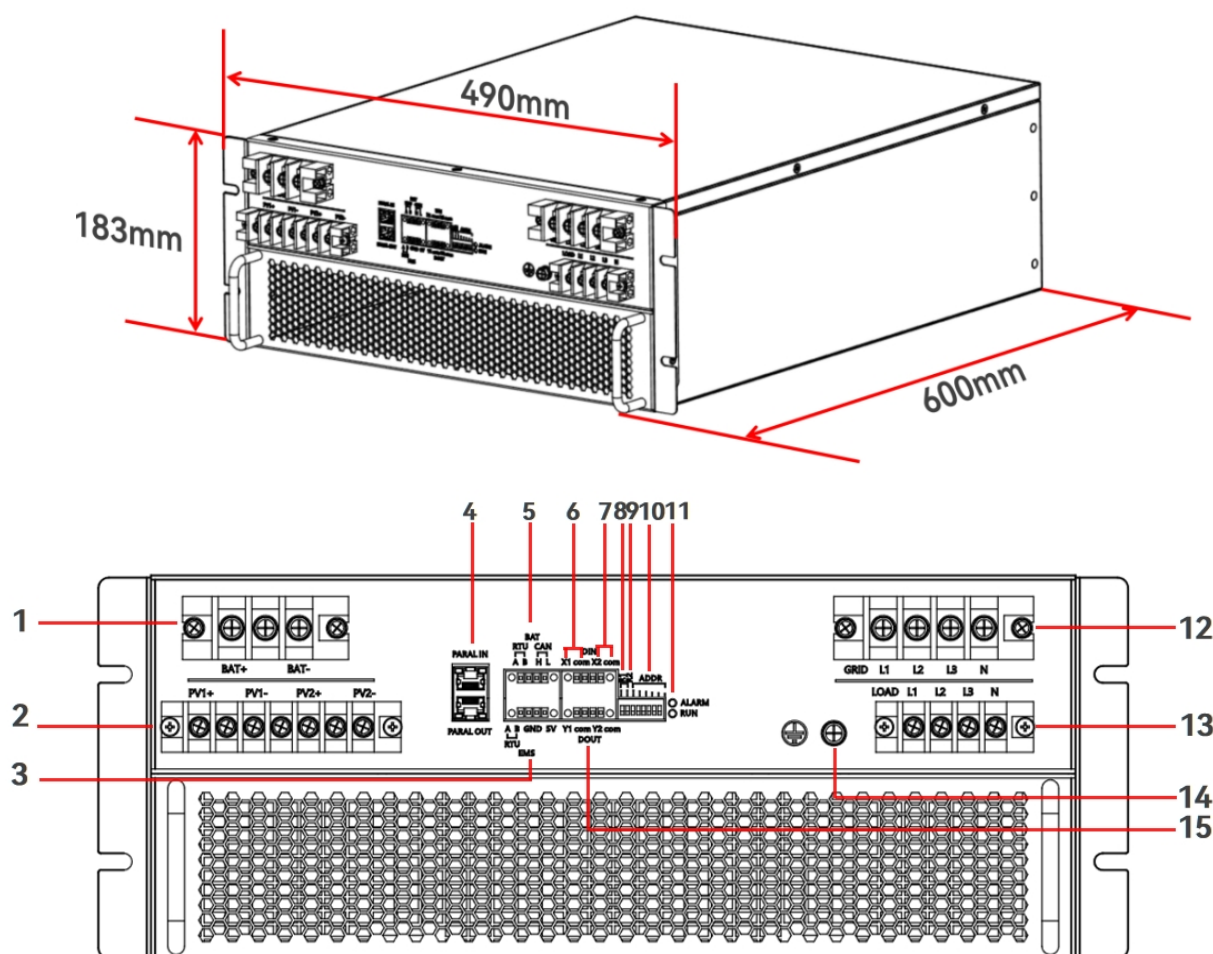


Figure 2.7.3

NO.	Model name	Descriptions
1	BAT side connection interface	Used for connecting the battery side to the inverter
2	PV side connection interface	If you choose to install photovoltaic modules, they can be connected to the photovoltaic system.
3	EMS communication interface	RS485 interface
4	Parallel communication interface	The products are connected for communication when they are put together.
5	BAT communication interface	Includes BAT RS485 interface and BAT CAN interface
6	EPO Interconnection Interface	The communication information through this interface.
7	X2 reserved interface	Dry contact input (reserved)
8	Parallel communication matching resistor	The above is ON. Switch ON the first module and the last module.
9	EMS RTU communication matching resistor	The above is ON. Switch ON the first module and the last module.
10	Module address jumper	Above is ON Module address 000001 has an address of 1 Module address 000100 has an address of 4
11	Inverter indicator light	Including fault and status indicator lights
12	Grid connection terminal	Used for connecting to the inverter on the grid side
13	Load side connection interface	Used for connecting to the inverter on the load side
14	External grounding terminal	For external grounding of the inverter
15	Output dry contact point	DOUT

Table 2.7.3 Parallel Connection Port Table

2.7.4 Integrated charging module

M-Power is equipped with an integrated charging module specifically designed for forklifts. It is an efficient and high-power-density AC-DC charging module that supports a three-phase four-wire input ranging from 285VAC to 485VAC (line voltage), with an output voltage range of 30VDC to 120VDC, and a rated output power of 20kW.

The charging module features a separated design CAN communication interface. Communication between the charging module and the monitoring module is conducted using the CAN communication protocol. Through system monitoring, the output voltage mode of the charging module can be set, and functions such as voltage regulation, current limiting, and module power-on/off can be realized.

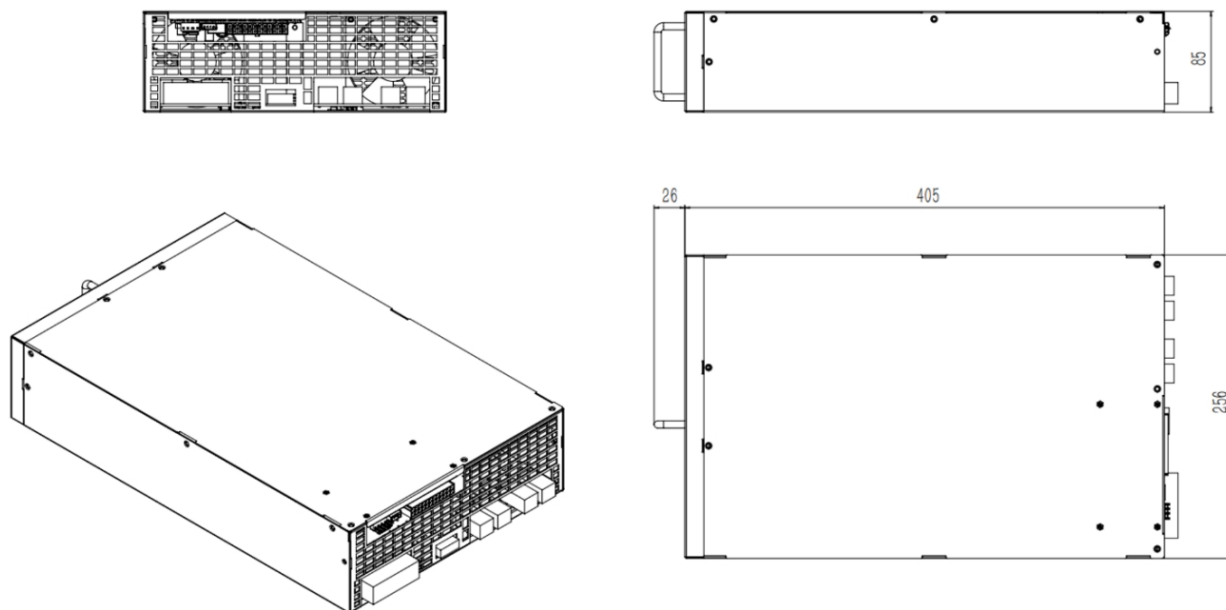


Table 2.7.4-1

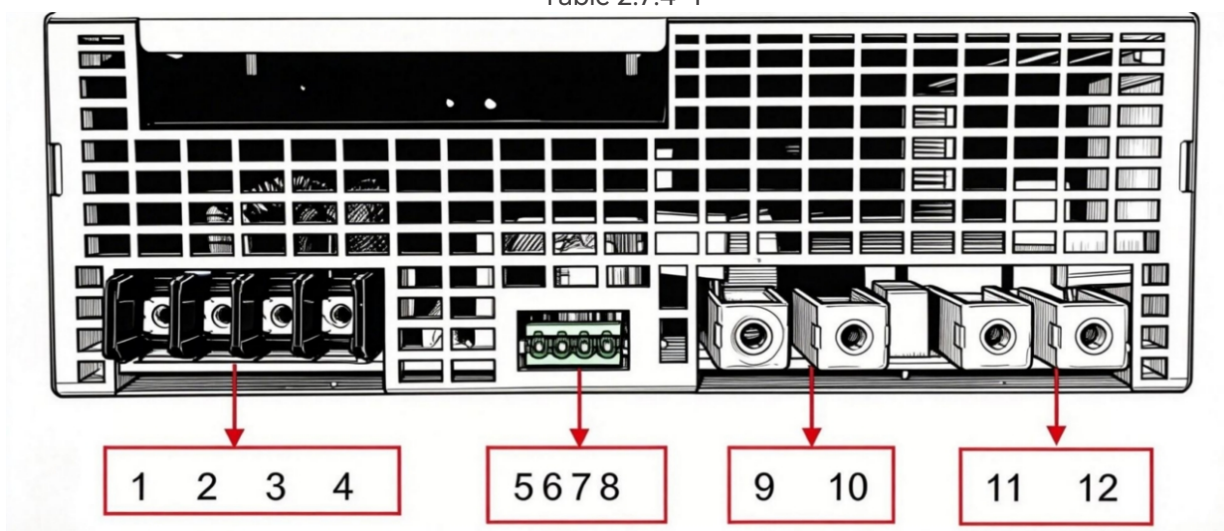


Table 2.7.4-2

NO	Interface definition
1	PE
2	L1
3	L2
4	L3
5	12V+
6	12V-
7	CANL
8	CANH
9	DC-
10	DC-
11	DC+
12	DC+

Table 2.7.4-1 Integrated Charging Module Interface Definition Table

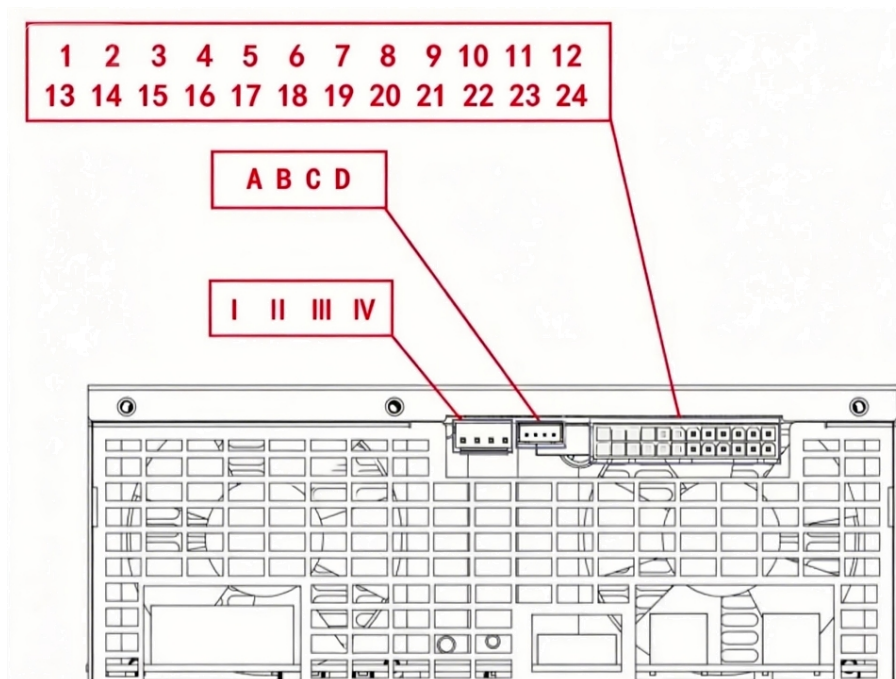


Table 2.7.4-3 Communication Interface Definition of Charging Integration Module

NO	Interface definition
1	12VOUT
2	12V power supply +
3	Red LED control
4	Green LED control
5	Yellow LED control
6	5V+
7	USART_RX
8	USART_TX
9	GND
10	GND
11	Button control settings
12	Machine temperature detection
13	12VOUT
14	GND
15	BMS_H
16	BMS_L
17	CC1 Test
18	Electronic lock control +
19	Electronic Lock Control -
20	Electronic lock feedback +
21	Electronic lock feedback -
22	Gun temperature detection 1
23	Gun temperature detection 2
24	Gun temperature detection -

Table 2.7.4-2

Serial number	Interface definition
A	3.3V+
B	SWDIO
C	SWCLK
D	GND

Table 2.7.4-3

Serial number	Interface definition
I	CAN_L
II	CAN_H
III	12V power input +
IV	12V power input -

Table 2.7.4-4

Forklift Charging Light Explanation

Indicator light	Normal state	Abnormal state	Anomalous cause
Green	ON	OFF	No power input
Yellow	OFF	Constantly ON	Input overvoltage, module non-uniform current, abnormal relay switching during discharge failure, abnormal PFC bus (overvoltage, imbalance)
Yellow	OFF	0.5sFlash	CAN failure
Yellow	OFF	2sFlash	Overheating fault
Yellow	OFF	5sFlash	Bus-bar fault
Red	OFF	Constantly ON	Short circuit
Red	OFF	0.5sFlash	Output overvoltage or undervoltage
Red	OFF	3sFlash	Fan error
Red	OFF	5sFlash	Power imbalance

Table 2.7.4-5

2.8 Configuration List

M-Power Series Configuration List

Name	Model	Unit	Qty.	Remarks
Battery system	150Ah, 69.9kWh	Set	1	With control-box
Hybrid energy storage inverter	30kW 400V/230V	Set	1	Modularization
Auxiliary system	Access control, power distribution, smoke and heat detectors, cables, etc.	Set	1	Matching
AC-DC charging	SDM100	Set	1	(optional)
Management system	SAEMS100	Set	1	Matching

Table 2.8



Note:

The actual configuration will be based on the supply arrangement.

03 Transportation and storage

3.1 Packaging and Storage

3.1.1 Product Packaging

To ensure that the product is well protected during transportation, a specific wooden box is used for packaging. The equipment packaging includes the following basic parameters (and may include others), which need to be carefully verified according to the project requirements:

Parameter	Illustration
Model	Product model
Size	Size after product packaging
Weight	Total weight after product packaging
Identification	Face up, handle with care, center of gravity position, etc.

Table 3.1.1

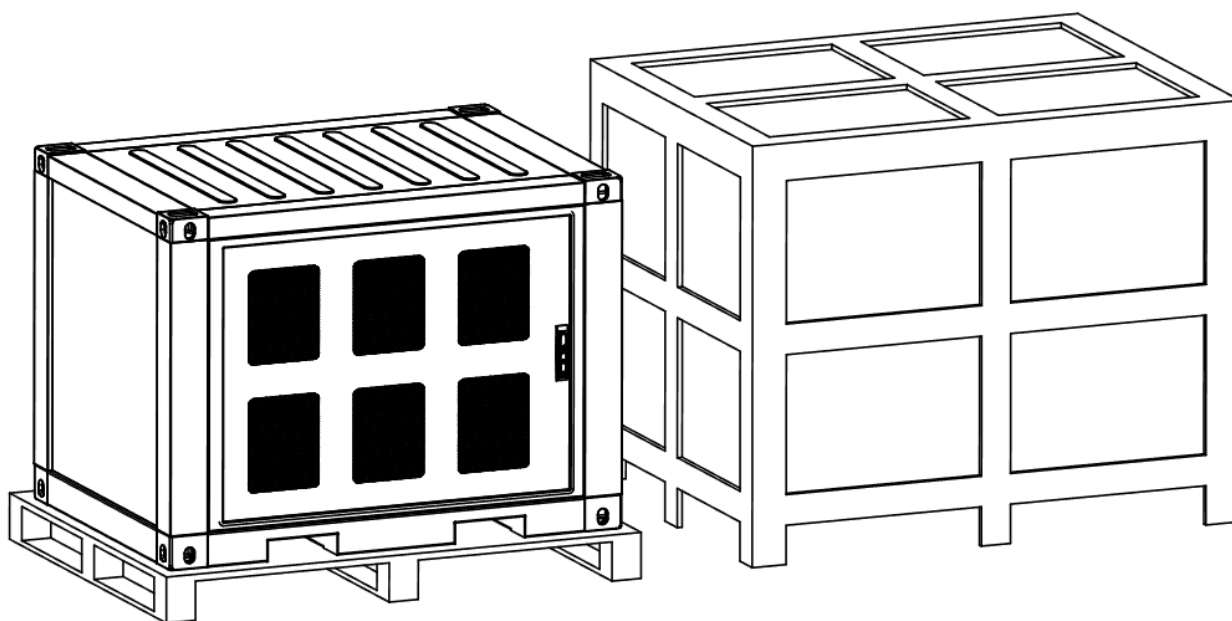


Figure 3.1.1-Packaging illustration



Note:

The actual configuration will be based on the supply arrangement.

3.1.2 Product Storage

If the product is not to be transported or installed immediately, it must be stored indoors. The storage location must meet the following conditions:

Parameter	Requirement
Storage temperature (excluding the battery)	-25°C~+60°C
Battery Storage temperature	20°C ~ 30°C
Storage relative humidity	< 90% (Non-condensation)
Altitude	< 3000m

Table 3.1.2

When the battery is in low power storage mode, it is necessary to recharge according to the maximum time interval allowed by the battery's SOC at complete discharge. If no recharge is performed beyond this maximum time interval, the battery may be damaged due to over-discharge.

The SOC value before power-off for storage operation	The longest interval for recharging power
SOC=50%	8 months
30%≤SOC<50%	4 months
5%≤SOC<30%	20 days
SOC<5%	48h

Table 3.1.3



Note: The operation of replenishing electricity must be carried out by professionals who have received skill training, and insulated gloves and specialized insulated tools must be worn during the operation.

During the process of replenishing electricity, someone must be present on site to observe and promptly handle any abnormalities.

During the process of recharging, if the battery experiences abnormalities such as swelling or smoking, it should be immediately stopped from charging and scrapped.

3.2 Transportation and Handling

3.2.1 Product Transportation

1. To maintain optimal protection for the equipment, it is recommended to transport it in its original packaging.
2. The equipment must be transported in accordance with the instructions and markings on the packaging to prevent personal injury and equipment damage.
3. Rail transport and air transport are not recommended for energy storage batteries. For road transport, the speed should be limited to 80 km/h on flat roads and 60 km/h on rough roads. In case of any discrepancy, local traffic regulations shall prevail.

3.2.2 Product Handling

1. When using a forklift for handling, ensure that the forklift has sufficient load capacity and that the equipment's center of gravity remains positioned between the forks to prevent

personal injury and equipment damage.

2. For transportation with batteries installed, the forklift must have a load capacity of ≥ 3.5 tons; for transportation without batteries, the load capacity must be ≥ 1.5 tons.
3. Recommended fork dimensions: length ≥ 1.5 m, width 80–160 mm, thickness 25–70 mm.

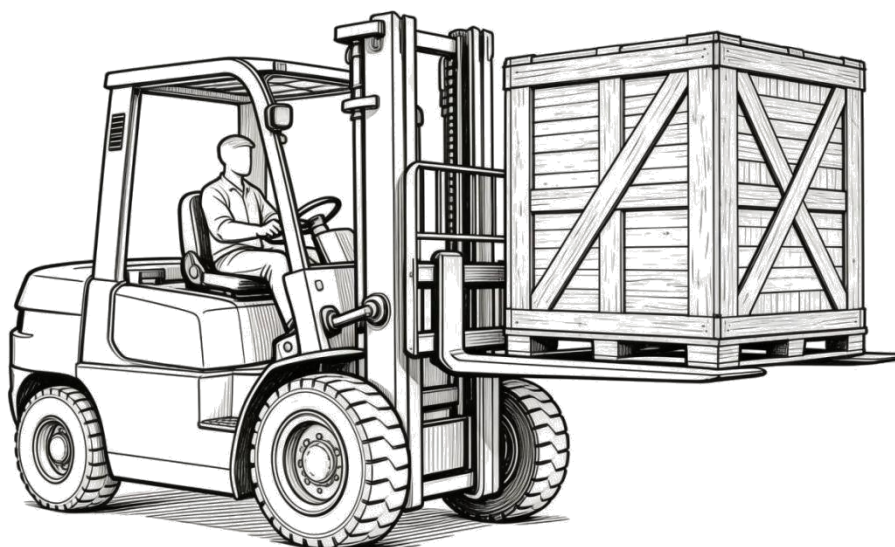


Figure 3.2.2 - Handling Diagram



Notice: Avoid rough handling during transportation or installation, as it may cause battery short-circuit, damage (e.g., leakage, rupture), fire, or even explosion, and always prioritize personal safety.

3.3 Product Stacking

If you purchase two or more products, you can stack them after opening the package for use. When stacking, use the specific locking mechanism for fixation. Please refer to the picture below:

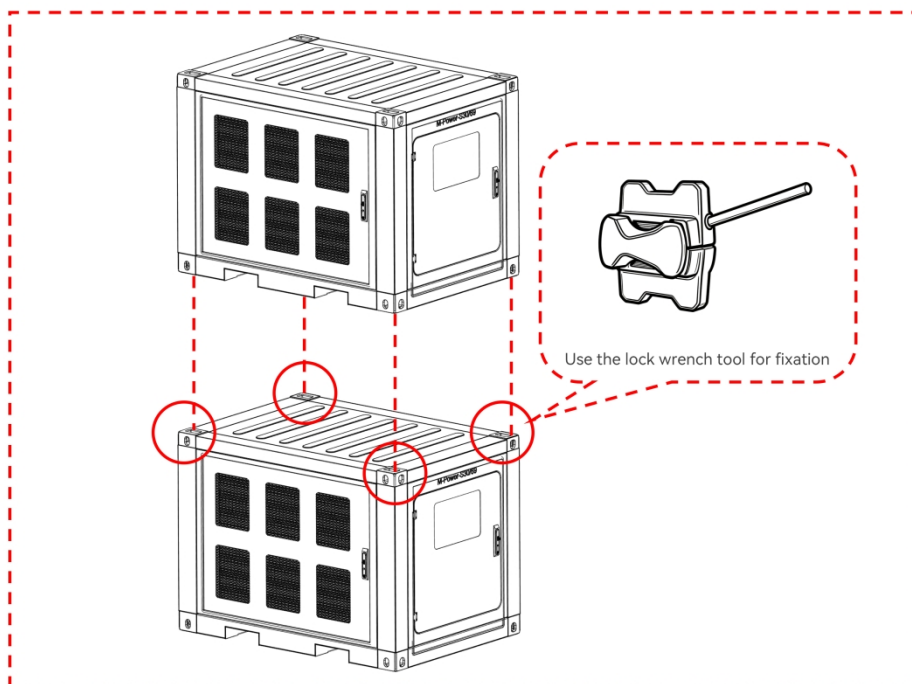


Figure 3.3

04 Product installation

4.1 Installation Environment

The installation layout of energy storage systems must meet the fire distance or firewall requirements specified by local standards, including but not limited to the "GB 51048-2014 Design Code for Electrochemical Energy Storage Power Stations", NFPA 855 Standard for the Installation of Stationary Energy Storage Systems. The energy storage system is only suitable for outdoor scenarios and requires outdoor layout. It does not support indoor layout. The general requirements for site selection are as follows:

1. The installation location should be above the historical highest water level in the area. The distance from the airport, landfill, riverbank or dam should be $\geq 2\text{km}$.
2. Choose a place with good ventilation. When the device is running, do not cover the ventilation openings and cooling system to prevent high temperature fires. Adequate installation space to ensure that surrounding equipment is not affected by the heat generated by the product; Ensure sufficient external wiring space in the installation location. Having convenient transportation conditions and reliable fire suppression system equipment.
3. The installation location should be away from fire sources, and flammable and explosive materials should not be placed around the equipment. If the equipment is installed in a place with lush vegetation, in addition to routine weeding, the ground below the equipment needs to be hardened to prevent overgrown weeds.
4. Do not install energy storage systems outdoors in salt affected areas to prevent equipment from corroding and causing fires. Salt damaged areas refer to areas within 2km of the coast or affected by sea winds.
5. The energy storage system must be equipped with protective measures such as fences and walls, and safety warning signs must be erected for isolation to prevent unauthorized personnel from entering during equipment operation, which may cause personal injury or property damage.
6. The equipment should be installed in an area far away from liquids and should not be installed below water pipes, air outlets, or other locations that are prone to condensation; It should not be installed below air conditioning vents, ventilation openings, computer room outlet windows, and other locations that are prone to water leakage, to prevent liquids from entering the interior and causing equipment short circuits.



Illustration

When the safety distance of the site selection cannot meet the requirements of relevant national standards, it is recommended to reselect the site. Site selection should avoid scenarios that are not recommended by industry standards and regulations, including but not limited to the following locations, regions, and places:

1. Strong vibration, strong noise sources, and strong electromagnetic field interference areas.
2. Places that generate or have dust, oil fumes, harmful gases, corrosive gases, etc.

3. Places where corrosive, flammable, and explosive materials are produced or stored. Within the hazardous range of blasting.
4. Places with existing underground facilities. Densely populated areas, high-rise buildings, and underground structures.
5. There are unfavorable geological conditions such as rubber soil and weak soil layers, which are prone to water accumulation and sinking on the ground.
6. Within the boundary of the mining subsidence (displacement) zone. The area that may be submerged after a dam or embankment collapses.
7. Earthquake faults and seismic areas with a fortification intensity higher than nine degrees. Areas with direct hazards such as mudslides, landslides, quicksand, and caves.
8. Important water source hygiene protection zone.
9. Historical relics and historic sites protection area.

If there is no more suitable location, it is recommended to install a firewall with a fire resistance of no less than 3 hours for security protection, while considering the requirements for equipment transportation, installation, maintenance, and other space. Suggest referring to *T/CEC 373-2020*. The length and height of the firewall should exceed the outer contour of the energy storage cabinet by 1m each.

4.2 Space Preparation

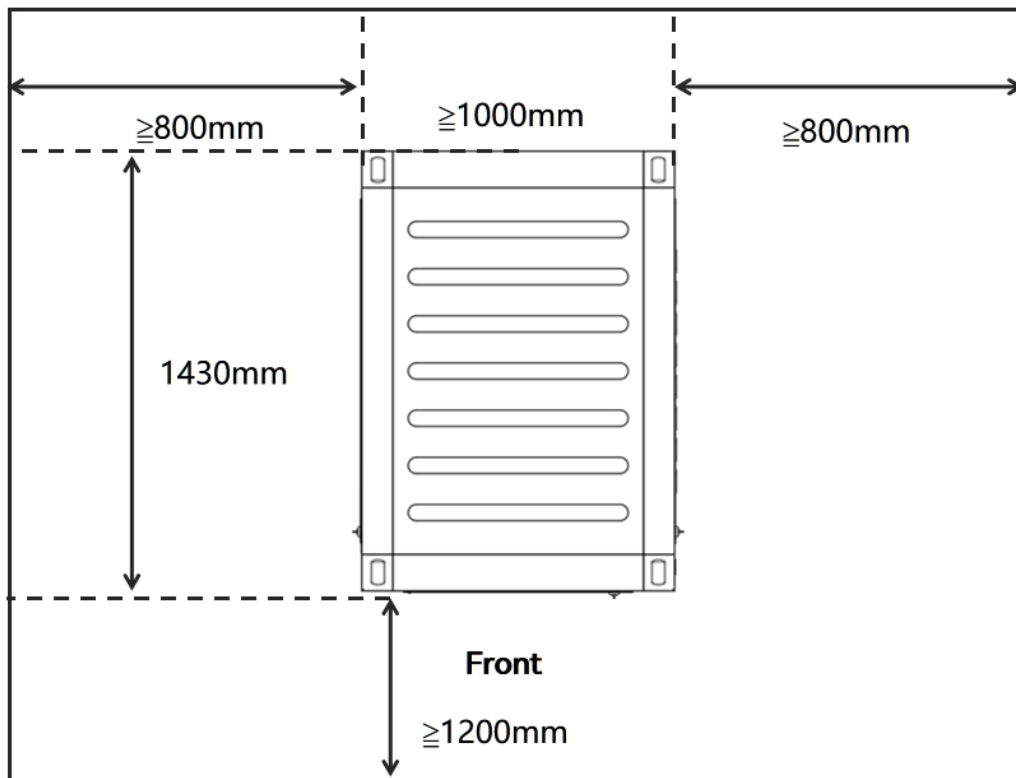


Figure 4.2-1



Illustration: The recommended "Spatial Layout Diagram" in the above figure refers to the "*GB 51048-2014 Design Code for Electrochemical Energy Storage Power Stations*", and the safety distance setting should be based on the actual local implementation standards.

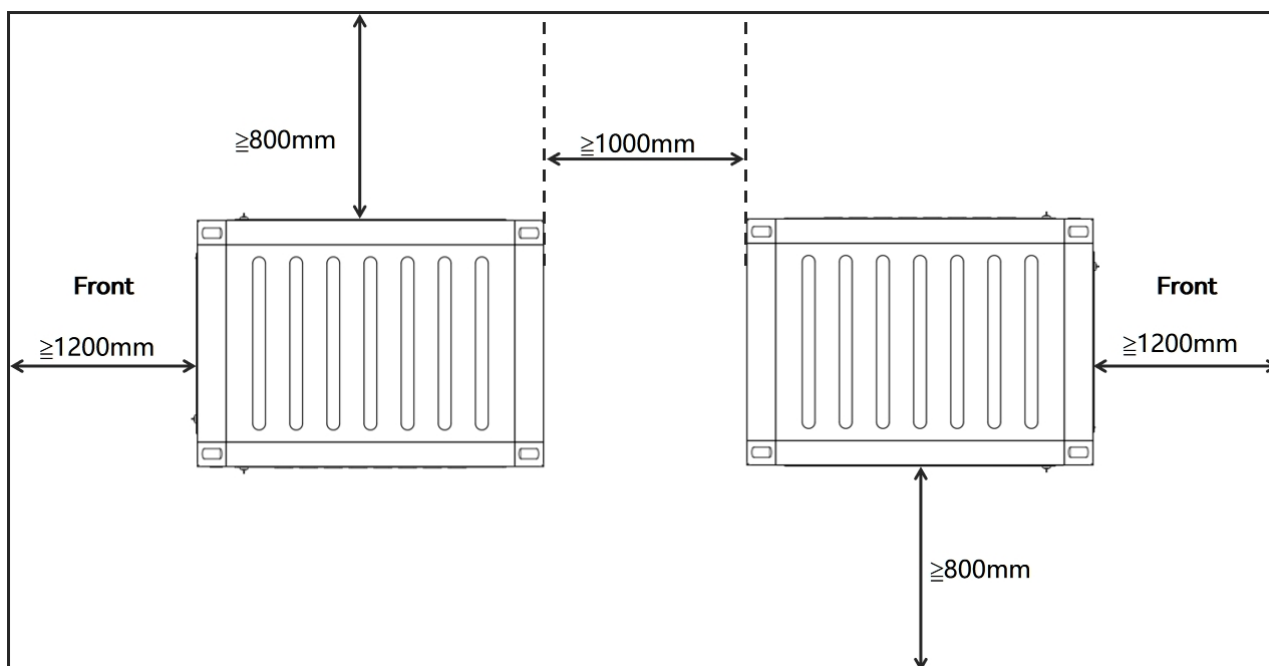


Figure4.2-2



Illustration: The above figure shows the minimum space requirement.

4.3 Foundation Preparation

Foundation reference diagram

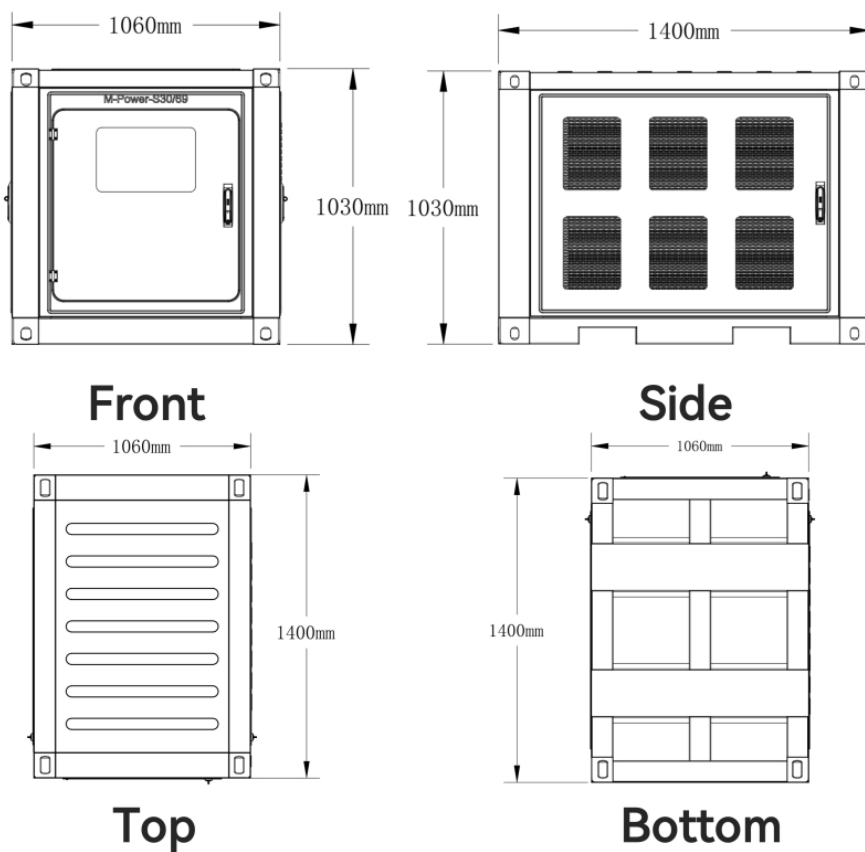


Figure4.3



Illustration: The above diagram cannot be used as the final construction drawing and is for reference only.

Foundation design requirements:

1. The foundation must be higher than the local historical highest water level and at least 300mm above the horizontal ground level;
2. Construct drainage facilities in accordance with local geological and municipal drainage requirements to ensure that there is no accumulation of water at the equipment foundation; The foundation construction should meet the local historical maximum rainfall drainage requirements, and the discharged water needs to be treated in accordance with local laws and regulations;
3. The energy storage system must be installed on concrete or other non combustible surfaces; The installation plane must be horizontal, firm, and flat, with sufficient load-bearing capacity, and no dents or tilts are allowed;
4. The foundation is configured based on the total weight of the equipment. When the bearing capacity of the foundation is not met, it needs to be reviewed; The bottom of the foundation pit must be compacted and filled; It is strictly prohibited to disturb the foundation by soaking in water after excavation. If it is disturbed by soaking in water, excavation should continue and replacement should be carried out;
5. When constructing the foundation, it is necessary to consider the issue of cable outgoing lines for the energy storage system and reserve trenches or entry holes; The reserved holes in the foundation and the bottom inlet holes should be sealed;



Illustration : The survey, design, and construction plan for the on-site foundation must be led by a qualified design institute or professional technical personnel, and strictly follow local regulations, industry standards, and the actual situation of the project for review and confirmation.

4.4 Preparations Before Installation

1. Before installing the product, it is necessary to check whether the product is intact and undamaged. If any signs of damage are found, please keep evidence and contact the equipment manufacturer.
2. If the product is confirmed to be normal, please check according to the delivery list to see if the accessories are complete.
3. Users need to prepare relevant installation tools before installation.

NO.	Inspection Item	Handling Measure
1	Whether the fasteners are tightened	If loose, retighten the screws
2	Whether the space environment meets the installation dimension requirements	If the space is insufficient, it is recommended to redesign before installation
3	Whether the air duct is unobstructed and free of foreign objects	If there are foreign objects, please clean them; if it is not unobstructed, eliminate the cause

Table 4.4-1 Pre-installation checklist

NO.	Name	QTY	Remarks
1	Industrial, commercial and Portable energy storage battery	1SET	Including Productdoor key
2	User Manual	1BOOK	
3	Certificate of Conformity	1PCS	
4	Delivery Inspection Report	1PCS	
5	Packing List	1PCS	

Table 4.4-2 Delivery List

Assistance Tool Table

NO.	Tool Name	Legend
1	Insulating gloves	
2	Safety goggles	
3	Insulating shoes	
4	Work clothes	
5	Safety helmet	
6	Screwdriver	
7	Wire stripper	
8	Hydraulic clamp	
9	Heat gun	
10	Multimeter	
11	Torque wrench	
12	Marker pen	

Table 4.4-3

4.5 Mechanical Installation

Step 1: ensuring that the product is free from any abnormalities and all accessories are complete. Then, you can refer to the following suggestions for mechanical installation:

1. Select the installation position of the equipment in advance according to the product size, and ensure proper positioning and fixation; it is recommended that the foundation be as shown in Figure 4.2-1
2. Based on the weight of the product, the selected installation location must have sufficient load-bearing capacity.
3. The grounding point is reliable and ensures that the grounding resistance is less than 4Ω

Step 2: After completing the wiring, it is necessary to check whether the communication between the battery management system, energy storage converter and monitoring system is normal. Finally, remove all packaging waste, flammable debris and construction tools around the product, keep the installation site clean, and verify whether the main technical parameters on the product nameplate are clear and complete, including information such as the type of energy storage device, rated power, rated energy, rated voltage, fire type, etc., to prepare for subsequent debugging and power-on.



Note:

Under normal circumstances, this product comes with a pre-installed battery pack when it leaves the factory. If you have the option to install the battery pack yourself, please read the following precautions:

When conducting the installation of the battery pack, it is recommended to use forklifts or other auxiliary installation tools. Four or more people are required to operate collaboratively during the transportation of the battery pack. During the process, handle with care and avoid any bumps. Pay attention to personal safety and do not remove the protective components on the battery terminals during the transportation.

The installation of the battery pack should follow the bottom-up sequence for fixation. The forklift should also be coordinated with the installation sequence of the battery pack to prevent the risk of tipping over due to an excessively high center of gravity. The battery pack installation operation can only be carried out after the forklift has completely stopped running, and no one is allowed to stand or extend any part of their body below the installation area.

4.6 Electrical Connections

Before making electrical connections, ensure that the battery shows no external damage, and use professional tools to open the protective cover of the battery pack to prepare for subsequent wiring. After completing the connections, replace the protective cover and secure it with M5 screws.

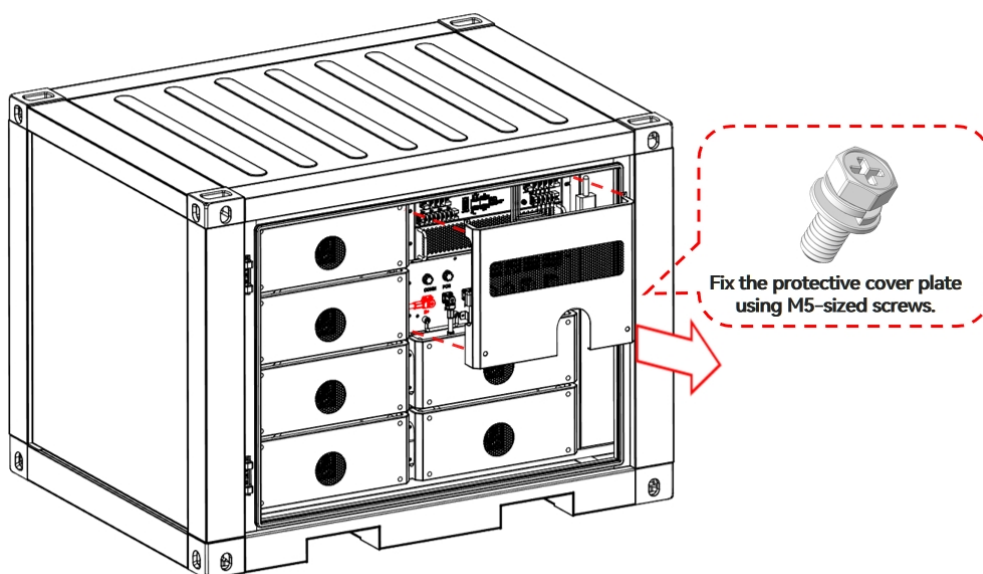


Figure 4.6-1

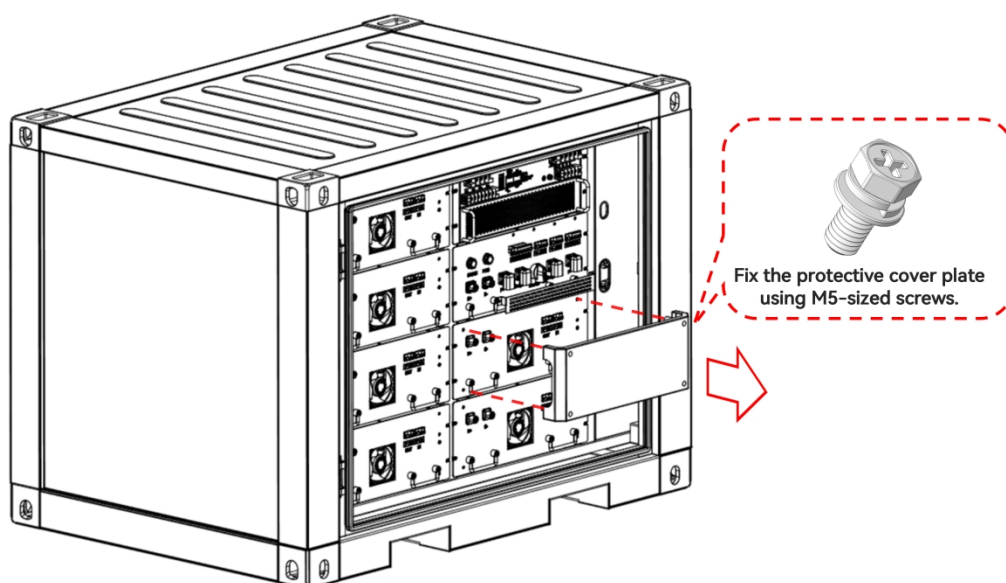


Figure 4.6-2

4.6.1 Grounding Connection

After the product is in place, the internal transportation fixing brackets should be removed, and an insulation check must be conducted before the electrical wiring. All external connections should be disconnected, the product should be grounded for discharge, and then an insulation resistance tester should be used to measure the insulation resistance between each independent circuit and the exposed conductive parts, as well as between each independent circuit. For systems with a voltage level of 1kV or below, the insulation resistance should be no less than $1\text{M}\Omega$. At the same time, all circuit breakers and disconnectors should be checked to ensure they are in the open position.



Note:

1. Protective ground wire, recommended specification: Type: outdoor single core copper wire, conductor cross section: 6mm^2 ;
2. Please ensure that the cable is not loose after being pressed in place;

3. Before making the electrical connection, please perform the grounding connection as the first step, and the protective ground line should be removed as the last step when the battery system is removed.

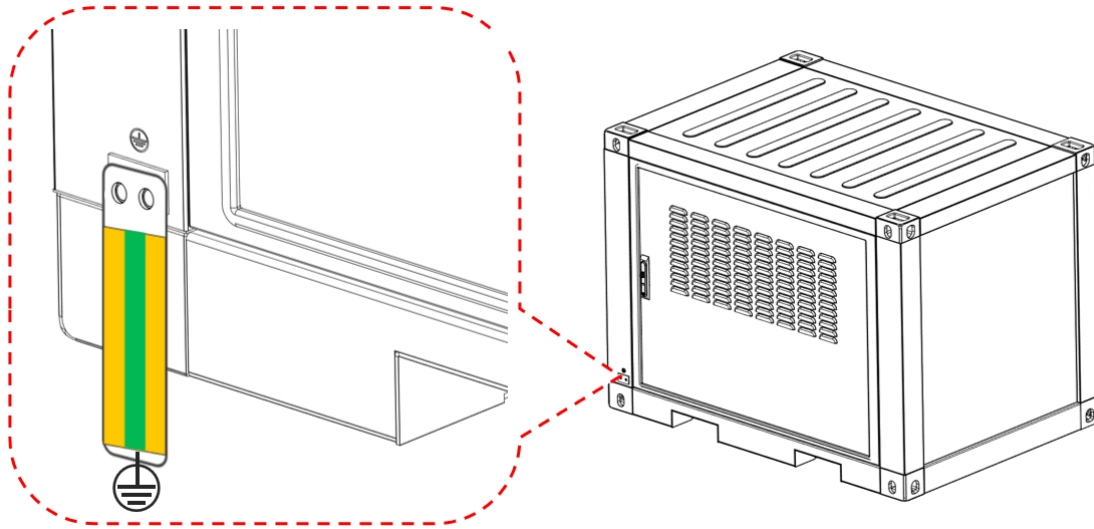


Figure 4.6.1

4.6.2 Power line connection



Danger:

1. During the connection process, pay attention to the positive and negative terminals. It is strictly prohibited to short-circuit the positive and negative terminals of the battery pack.
2. Smoking or using open flames near the battery is strictly prohibited.
3. On-site, there must be fire-fighting facilities that meet the requirements, such as fire sand and fire extinguishers.
4. Please use special protective equipment and special insulating tools to avoid electric shock injuries or short-circuit faults.



Note:

When connecting and securing the battery pack, make sure that the cables are undamaged.

Step 1: Connect the positive and negative terminals of the battery pack using the included quick-connect cable provided with the product.

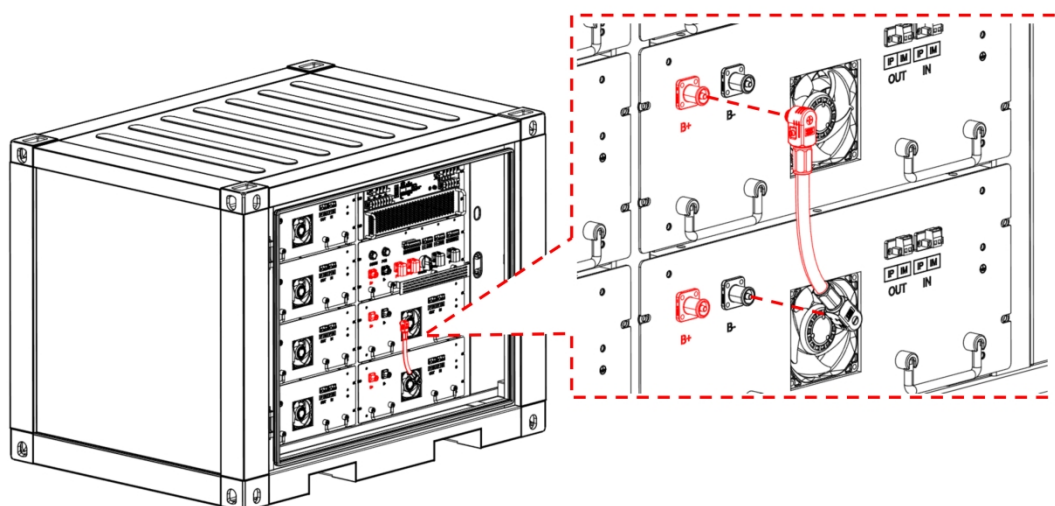


Figure 4.6.2-2

Step 2: After all the power cables between the battery packs have been connected, the positive and negative terminals of the battery packs ("B+" and "B-") will be connected to the positive and negative terminals of the high-voltage box ("B+" and "B-").

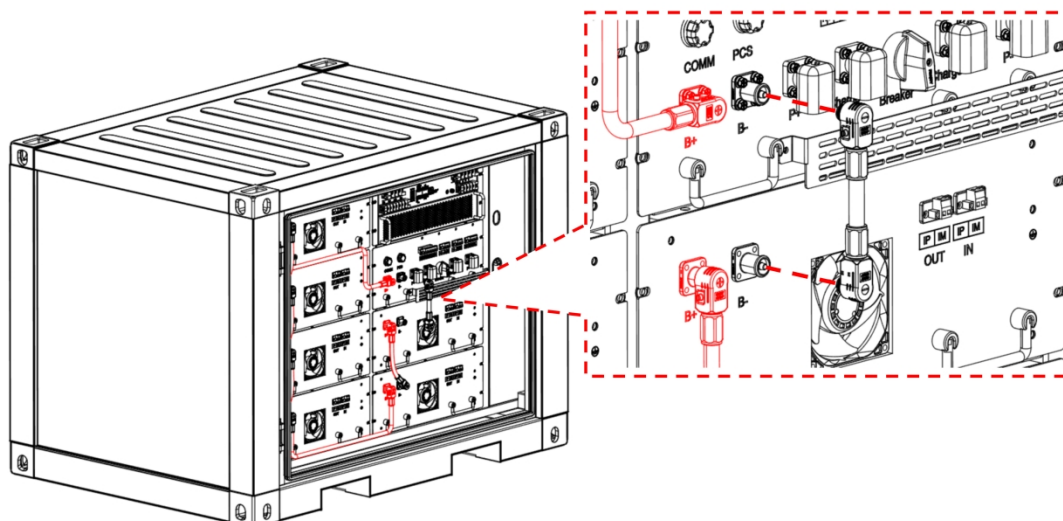


Figure 4.7.2-3



Illustration:

Unless the project has special requirements, the connections between the battery packs inside the cabinet will have been completed before shipment. The internal wiring reference is as follows.

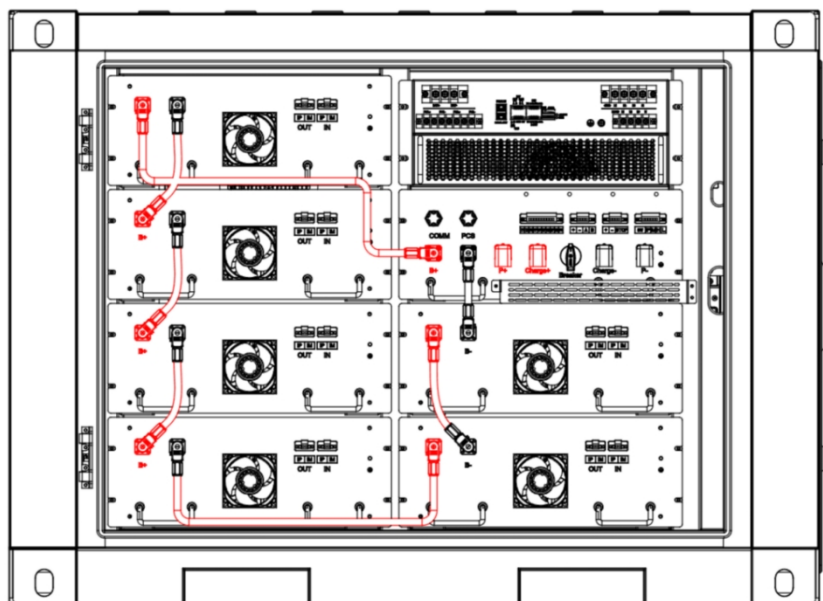


Figure 4.6.2-2

Step 3: Connect the PCS to the high-voltage control box



Note:

The PCS module has been pre-installed in the electrical compartment of the cabinet, and the DC side cables of the PCS have been connected before leaving the factory. The other end of these cables is connected to the high-voltage control box inside the battery compartment.

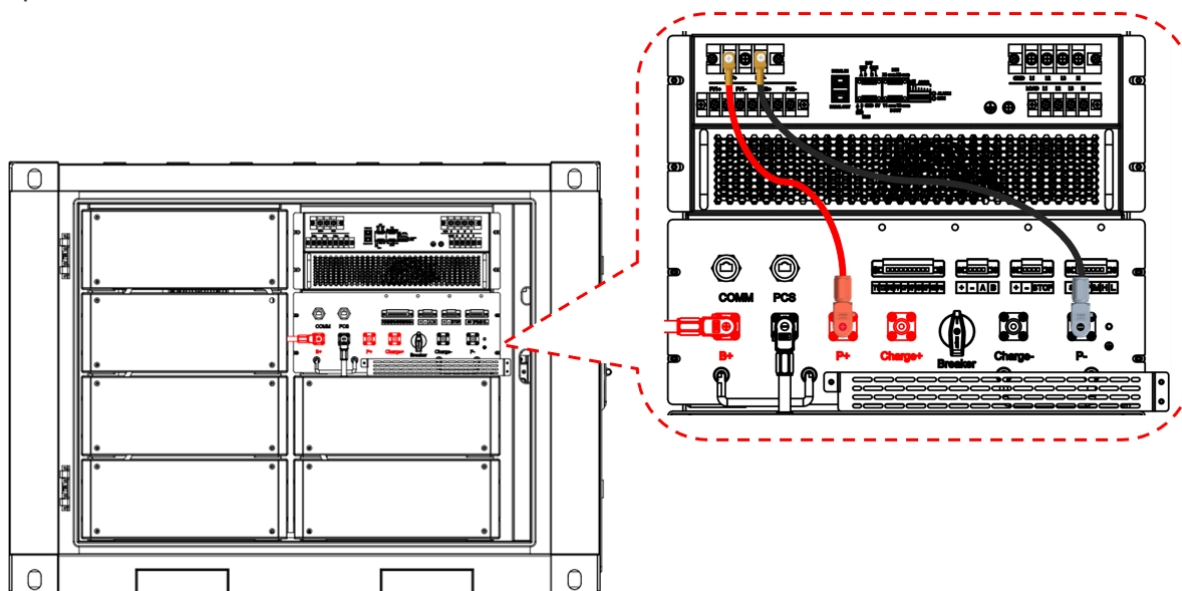


Figure 4.7.2-4



Note:

In the event of power failure, remove the protective covers on the "P+" and "P-" ports on the control box, connect the cables, and secure them with M8 bolts.



Illustration:

Unless there are special requirements for the project, the connections on the control box inside the cabinet have already been completed before the product was manufactured.

4.7 Check after Equipment Wiring

After the installation is completed, in order to prevent damage to the equipment and property loss, it is necessary to conduct another inspection and measurement of the following items.

NO.	Inspection item
1	Before measurement, disconnect the battery side and electrical side switches to ensure that the energy storage device is not electrified.
2	The positive and negative connections between the battery and the energy storage device are correct, the AC phase sequence is accurate and has been tightened. Measure the resistance between the three phases. It should be in the mega-ohm range. If it is in the kilo-ohm range or smaller, the wiring needs to be checked.
3	The external control cables, grounding wires and communication lines have been securely fastened.
4	The resistance of the grounding wire is less than 4Ω , and the cable is in good condition with no damage or cracks.
5	Clean up the installation area. Ensure that no tools or foreign objects are left behind within the installation area.
6	Fireproof mud is used to seal the gaps in the cables to prevent small animals from entering.

Table 4.7

05 Startup and Debugging

5.1 Pre-check before Power On

1. Check whether the circuit breakers inside the energy storage converter cabinet are in the disconnected state.
2. Verify that all communication and power cable terminals are securely connected.
3. Inspect whether the communication and power wiring harnesses as well as the power cables in the energy storage converter cabinet are correctly connected.
4. Check all communication connections on the modules and the integrated display-control unit inside the energy storage converter cabinet for any issues.

5.2 Pre-check before Startup

Before starting the product, please ensure that the installation has been completed according to specifications and a comprehensive inspection has been carried out. Only when all requirements are met should the product be powered on and put into operation.

1) Appearance Inspection

- a. The equipment exterior shall be intact, free from structural damage, corrosion, or paint peeling. If paint damage is found, promptly perform touch-up painting.
- b. All equipment labels and markings shall be clear and complete. Any that are damaged or illegible must be replaced immediately.

2) Grounding Inspection

A dedicated grounding point shall be present on the cabinet, and the grounding connection must be secure and reliable. All internal grounding conductors must be reliably connected to the grounding copper busbar.

3) Cable Inspection

- a. Cable protective sleeves/jackets shall be intact with no visible damage.
- b. Terminal crimping must comply with standards, and all connections shall be firm without looseness.
- c. Labels on both ends of each cable shall be clear and correct. Cable routing shall follow the principle of separating power and signal cables. Adequate slack must be left at bends; cables must not be pulled taut.
- d. Cable mounting bolts shall be tightened, and cables must not move when gently pulled. All cable entry holes must be properly sealed.

4) Busbar Inspection

Busbars shall show no cracks or significant deformation. Bolts at connection points must be tightened. Phase sequence markings shall be clear and correctly aligned. No foreign objects or debris shall be present on the busbars.



Note:

1. Insulated gloves are required for operation.
2. For transportation safety, we disconnect one section of the battery module's DC cable, leaving the entire cluster of batteries in an open circuit state. Before powering on, we need

to connect the DC cable and insert it into the connector. If you hear a "card" sound, it means it has been inserted into place.

5.3 Startup Procedure

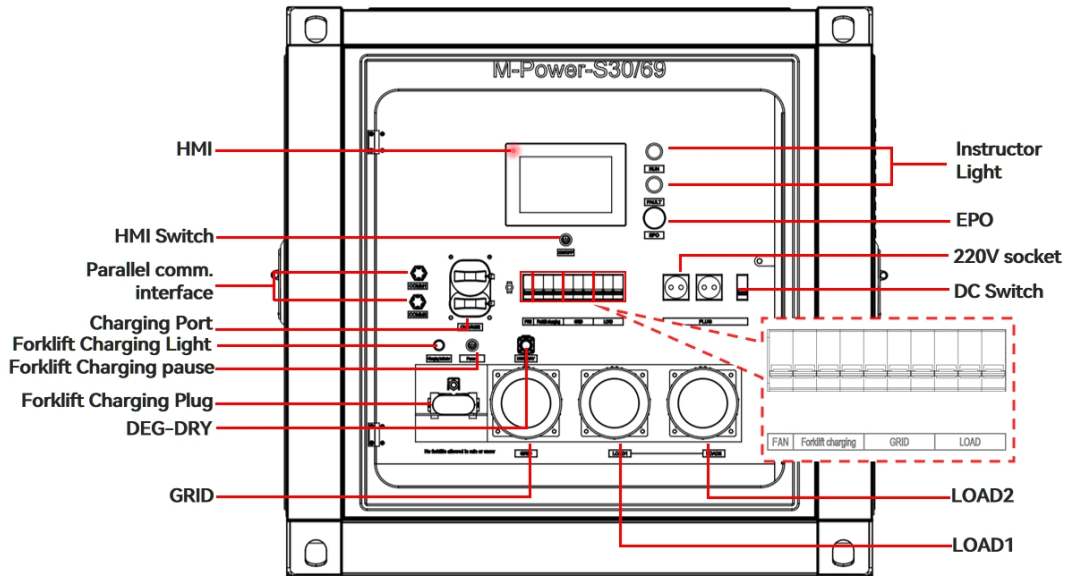


Figure 5.3-1 Switch Position Diagram

After completing the pre-startup inspection, unlock the front-side equipment door and the battery-side equipment door, connect the circuit cables, and then the system can be started. The switches and their designations are shown in Figure 5.3. The operation procedure is as follows:

Step 1: Close the circuit breaker (Breaker) in the battery-side high-voltage box.

Step 2: Press the HMI Switch and wait for approximately 2 minutes to allow the system to start.

Step 3: Close the auxiliary switches according to the required energy storage application mode.

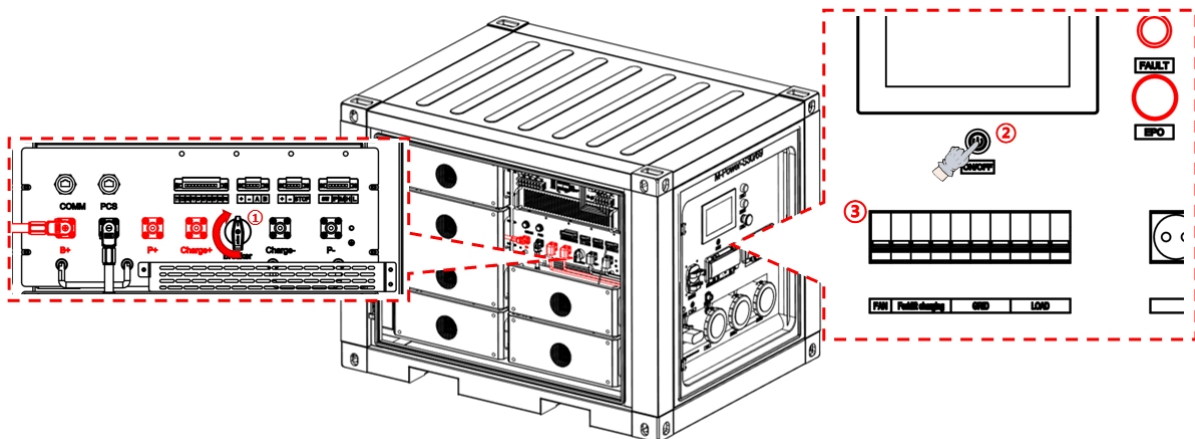


Figure 5.3-2 StartProcedure

5.4 Shutdown Procedure:

Step 1: Turn off the auxiliary switch

Step 2: Turn off the HMI Switch

Step 3: Turn off the Circuit Breaker to complete the system power-off

After shutting down the entire system, wait for 5 minutes and use professional tools to measure the equipment voltage to ensure a complete power-off of the system.

06 Operation and Handling

6.1 Home page interface description

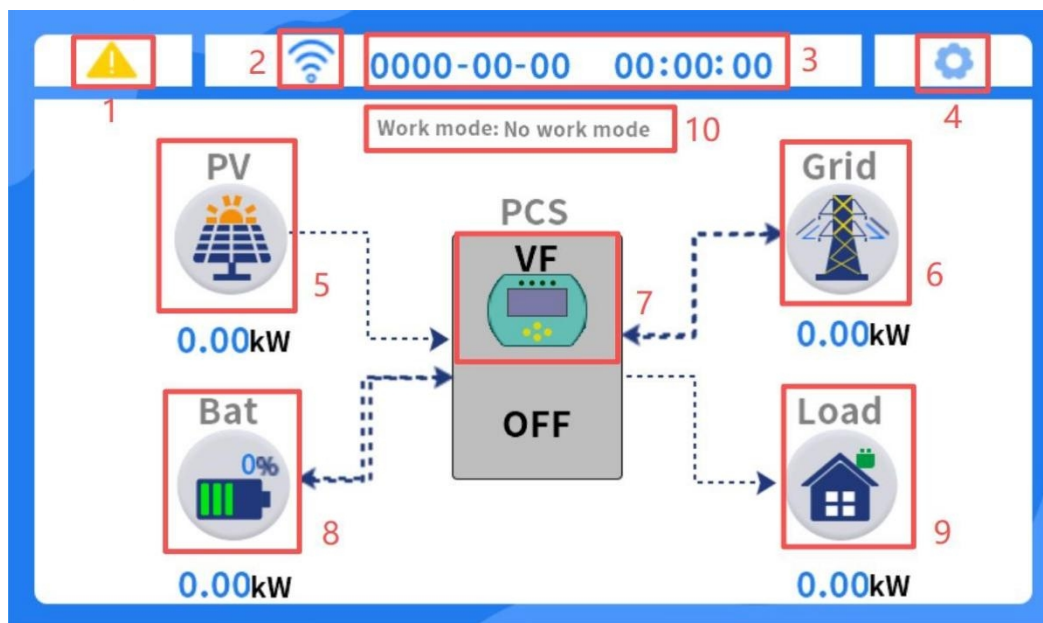


Figure 6.1

HMI display and control integrated screen menu Table

Serial number	Menu name	Parameter Function
1	Fault/warning:	When the icon is gray, there is no warning or fault. When the icon is yellow, there is a warning. When the icon is red, there is a fault.
2	WIFI icon:	Shows whether the communication bar is online. If the communication bar is online, the WIFI icon is blue; if the communication bar is offline, the WIFI icon is gray.
3	Time display:	Display the real-time time of the equipment.
4	Set the button:	Click this button to enter the Settings interface.
5	Photovoltaic part:	Including photovoltaic power, photovoltaic icon and energy flow. Click the photovoltaic icon to enter the photovoltaic detailed information interface.
6	Power grid:	Includes power grid power (positive value is the power supply of converter, negative value is the discharge of converter), energy flow and power grid icon. Click the power grid icon to enter the detailed information interface of the power grid.
7	Converter section:	Click the converter icon to enter the converter detailed information interface when the converter is turned on (the converter icon is green) and when the converter is turned off (the converter icon is gray).

8	Battery section:	Includes battery power (positive value is discharge, negative value is discharge), energy flow, battery SOC and battery icon. Click the battery icon to enter the battery details interface.
9	Load section:	Includes load power, energy flow and load icon. Click the load icon to enter the load details interface.
10	Working mode section:	Real-time display of EMS current working mode

Table 6.1

6.2 Local EMS Settings

Click the settings button in the upper right corner to enter the settings interface.

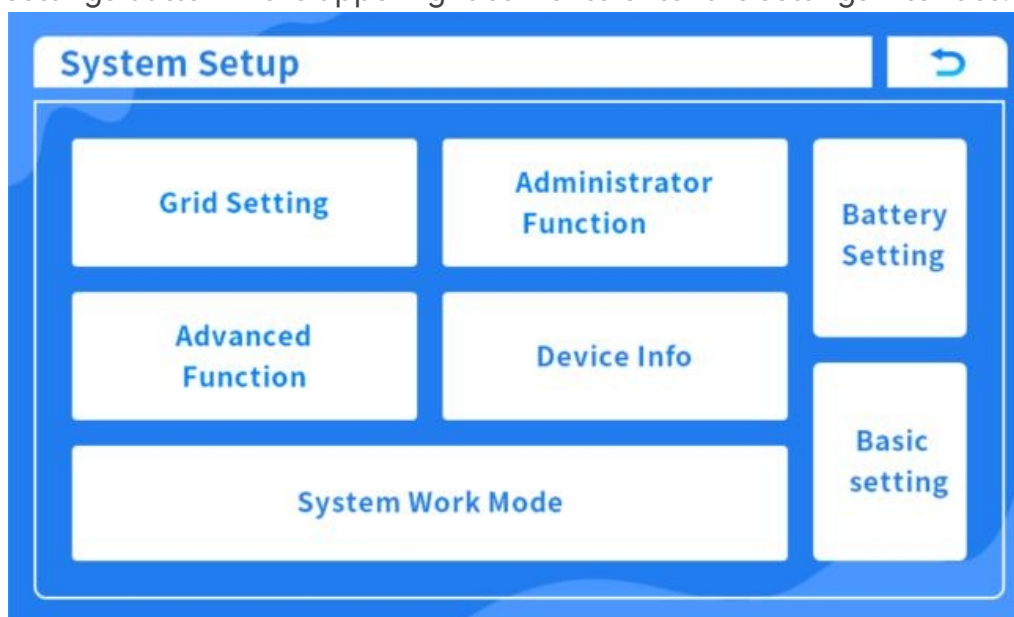


Figure 6.2 sets the page

6.2.1 BasicSettingsNotes

To enter the basic Settings interface:

Home Page → Click the settings button → Setting page → Basic setting





Figure 6.2.1 Basic Settings Page

Power on: Click to Power On.

Shutdown: Click OFF to shut down.

Automatic power on/off: Check auto matic power on/off,the inverter will automatically start up after the battery is powered on; if not checked, the device needs to be manually started after power off.

Beeper: When checked, clicking the button will make a sound; when unchecked, clicking the button will be silent.

Sleep time: Set the screen to turn off when no operation is performed.

Previous/Next: Click or scroll up/down.

Save Settings: Click to save parameters, click to check whether the saved values are effective.

6.2.2 Select inverter model

After clicking "Settings" on the main interface to enter the settings screen, click "Advanced Function"→ "PCS/System Config"

Select the number of converters, which is default to 1.

When an EMS connects multiple inverters:

Select the corresponding number → Select the model SP30HBG2, and click  to save parameters.

Model Comparison Table:

Screen display model	Plate number
SP30HBG2	SP30HBG2/SP25HBG2/SP15HBG2/SP30HBPS/SP25HBPS//SP15HBPS
SP60HCG2	SP60HCG2/SP60HCPS
SP50HCG2	SP50HCG2/SP50HCPS
SP100H+STS+MPPT/DCDC	SP100HC/SP125HCPS+STS200/PCM170/PCM330+SP120HCPV
SP100+STS	SP100HC/SP125HCPS+STS200/PCM170/PCM330
SP100H+MPPT/DCDC	SP100HC/SP125HCP+SP120HCPV

Table 6.2.2

6.3 Battery configuration

To enter the battery SOC setting interface:

Main interface → Settings icon in the upper right corner → Battery Settings

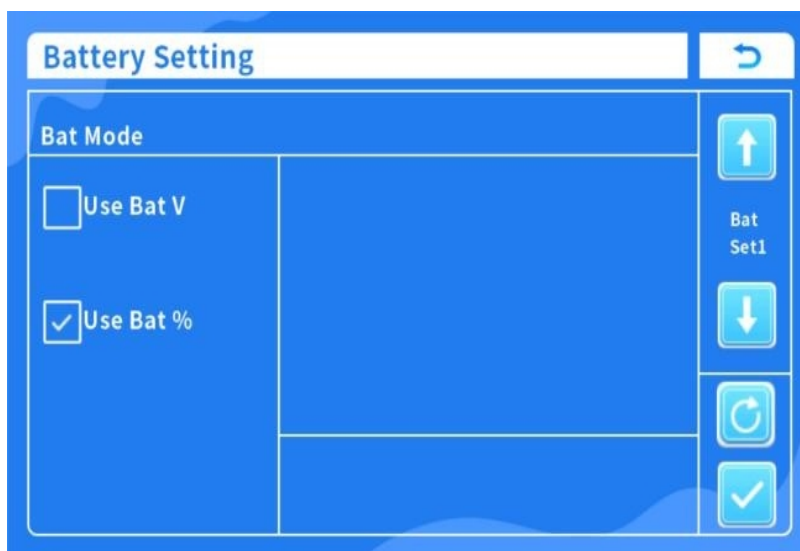


Figure 6.3 (FIG.) Basic Settings Page



Illustration:

Select battery mode, use battery voltage and use battery SOC. Usually lead-acid batteries choose battery voltage mode, lithium batteries choose battery SOC mode.

6.3.1 Lithium battery configuration

Battery SOC mode setting:

check the use of battery SOC ☒ Use Bat % → click the previous page to three pages to select the battery protocol, after selecting the battery protocol click save the setting;

After click ☒ to enter the second page battery SOC setting interface.



Figure 6.3.1

interface description:

Stop chg: The battery is charged to the cutoff SOC (the actual SOC of the battery is $\geq$ the set value). When the SOC reaches this threshold, the charging will stop regardless of photovoltaic or grid.

Differential Return: Restore the charging stop backoff value. Charging resumes when the actual battery SOC falls below the set charging stop SOC-backoff value. For example, if the charging stop threshold is set to 95% and the charging stop backoff is set to 1%, charging resumes when the battery SOC drops below $95\% - 1\% = 94\%$.

Stop(Discharge) : Discharge in the grid-connected state up to the SOC. In the grid-connected state, when the battery is lower than or equal to this value, the battery stops discharging. It is usually used as the standby power SOC.

Stop discharge return difference: Restore the discharge return difference value. When the actual battery SOC+ stop discharge return difference value is higher than the set SOC value, restore the battery discharge. For example, if the stop discharge threshold is set to 50% and the stop discharge return difference is set to 1%, then when the actual battery SOC is higher than $50\% + 1\% = 51\%$, the discharge will be restored.

DG Power Off: used when communicating with the diesel generator through dry contact signal. When SOC is greater than or equal to this setting value, EMS controls the shutdown of the diesel generator.

DG Power On: used when communicating with the diesel generator through dry contact signal. When the SOC is less than or equal to this setting value, EMS controls the startup of the diesel generator.

Off Grid PCS Power off: In off-grid state, when the battery SOC is lower than this value, the inverter will shut down and stop working.

Shut-off point return difference: When the inverter is off, after shutdown, when the PV is up, the battery will be charged. When the battery charge reaches the off-grid shutdown setting SOC+ shutdown point return difference SOC, the inverter will restart.

After setting the parameters, click Save parameters

6.4 Work mode configuration



Note: The battery SOC must be set before the mode can be set.

Home screen → Settings icon in the upper right corner → Click “System working mode” to enter the mode setting page.

Pattern	Application scenarios
Self-consumption	Photovoltaic power generation for self-use, not selling electricity to the grid.
Grid-connected surplus electricity	The photovoltaic power is used for self-use and the surplus is sold to the grid.
Time function	Periodic charging and discharging, backup power, peak-valley arbitrage, oil engine charging.
Self-use + backup power	For self-use of photovoltaic power generation, the battery needs to be off-grid (power failure).
Meter anti-backflow	The photovoltaic and battery outputs need to be output to the grid port, but not in reverse current to the grid.

Table 6.4

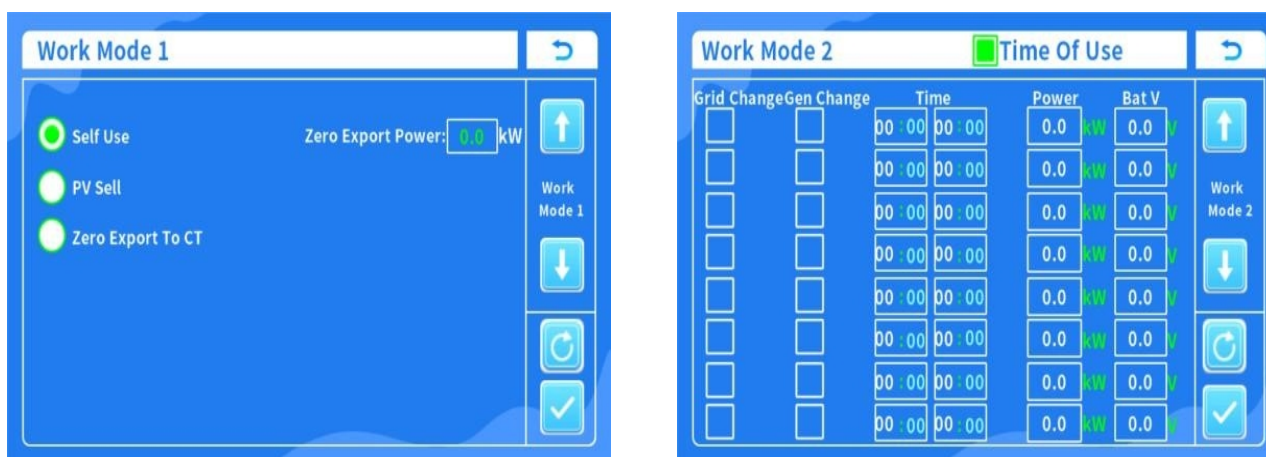


Figure 6.4

6.4.1. Set up self-use mode

Mode description:

In the self-use mode, the power supply order of the load is: PV > battery > grid. The PV gives priority to the power supply to the load. When the PV is insufficient, the battery supplements. When the PV and battery are insufficient, the grid participates in the power supply.

Setting method:

Home screen → Settings icon in the upper right corner → "System working mode"

Enter the mode setting page select self-use , and set the anti-flow power to 0kW or -0.1kW (it will continue to draw 0.1kW from the grid, and the anti-flow effect will be better), then click  save Settings.

6.4.2. Set the surplus power on the Internet mode**Mode description:**

In the mode of surplus power on the grid, the priority order of photovoltaic output is: load> battery> grid. When the photovoltaic output is greater than the load and the battery is full, the excess photovoltaic output will be output to the grid.

Setting method:

Home screen → Settings icon in the upper right corner → "System working mode"

Enter the mode setting page and select "Save power to the Internet".

6.4.3 Set the time function**Mode description:**

The time function setting interface can set the charging and discharging of multiple charging and discharging periods (power discharged to the grid), which can be used for grid charging, peak shaving and valley filling, diesel power charging, etc.



Figure 6.4.3 Time function configuration

Setting method:

Home screen → Settings icon in the upper right corner → "System working mode", enter the mode setting page.

Click  to go to the next page.

Setting of charging time : Set the charging and discharging time periods. Multiple charging and discharging time periods can be set. The time periods cannot be repeated or cross days.

Charge/discharged power setting : set the charge/discharged power in the corresponding time period, negative for charging, positive for discharging.



As of Bat SOC setting : the corresponding charge or discharge SOC, which has a lower priority than the battery setting interface. If the actual battery SOC reaches the value set in the battery setting interface, it will be prioritized.

After the setting is completed according to the **Time Of Use** requirements, check the use of the time function and click save the setting.

6.4.4. Set the self-use + backup power mode

Mode description:

Spontaneous use + backup power mode,

When the battery SOC is greater than the standby power SOC, the load power supply order is: PV> battery> grid. The PV gives priority to the load power supply.

When the PV is greater than the load, the excess part is used for battery charging;

When the PV is insufficient, the battery supplements;

When the PV and battery give power to the load at the same time, the grid participates in the power supply;

When the battery SOC is less than the standby power SOC, the power supply order is: photovoltaic> power grid, photovoltaic gives priority to the load power supply, and the excess photovoltaic charges the battery.

When the photovoltaic is insufficient, the power grid participates in the power supply, and the battery does not output.

Setting method:

Step 1: Enter the battery SOC setting interface (see 1.2 Battery Settings for details), and set the value of the SOC at which discharge ends (for backup power SOC).

Step 2: Home screen → Settings icon in the upper right corner → "System working mode", enter the mode setting page and select self-use .

Step 3 (for grid charging applications): In the time function configuration interface, set the charging duration, power output, and end-of-charge (SOC) threshold for the grid (diesel generator).

Typically, the grid's SOC threshold is higher than the battery's.

The photovoltaic system will utilize the excess capacity to charge the battery beyond this threshold.

All the setting values can be flexibly set and adjusted according to the actual field requirements.

6.4.5. Set the meter to anti-flow mode

Mode description:

It is usually used when part of the load needs to be connected to the power grid port.

When using the inverter anti-flow, the default self-use mode is activated. In this case, the anti-flow inverter inside the inverter does not take effect. The PV and battery outputs to the LOAD port (off-grid port) and GRID port (power grid port) will not flow back to the power grid.

Setting method:

Connect the anti-flow meter to the meter  → Enter the meter and configure the anti-flow meter (see 6.5 Meter configuration) → Return to the working mode Settings  check the anti-flow meter → Click save Settings .

6.5 Meter configuration

The EMS can be configured with up to two meters of two types: anti-flow meters and metering meters.

Before configuring the meter, confirm the meter wiring. The 485 communication line of the meter should be connected to the RS485 interface of EMS. See the interface description for details. Connected meter models: Ankerui ADL400, Ankerui DTSD1352.

Setting method:

Home screen → Settings con in the upper right corner → Advanced functions → Meter configuration.



Figure 6.5 Meter configuration

Select the number of meters  →  Select the meter protocol → Check the meter enable (depending on where the meter is connected, either at the grid end or at the load end, with anti-reverse current meters usually connected at the grid end) → Click save Settings .

**Illustration:**

- 1) When the meter is connected to the grid side, the 485 communication address of the meter should be set as 150, when the meter is connected to the load side, the 485 communication address of the meter should be set as 151.
- 2) The communication baud rate of the electricity meter should be set to 9600.

6.6. Automatic activation of diesel generator configuration

To automatically start the diesel generator, two 485 communication lines need to be drawn from DO port pin of EMS and connected to the NO relay of the diesel generator.



Illustration : DO1–DO6 are all configurable as dry contact signal inputs for diesel generator start; currently the S30/69 uses DO3.

The diagram is as follows:

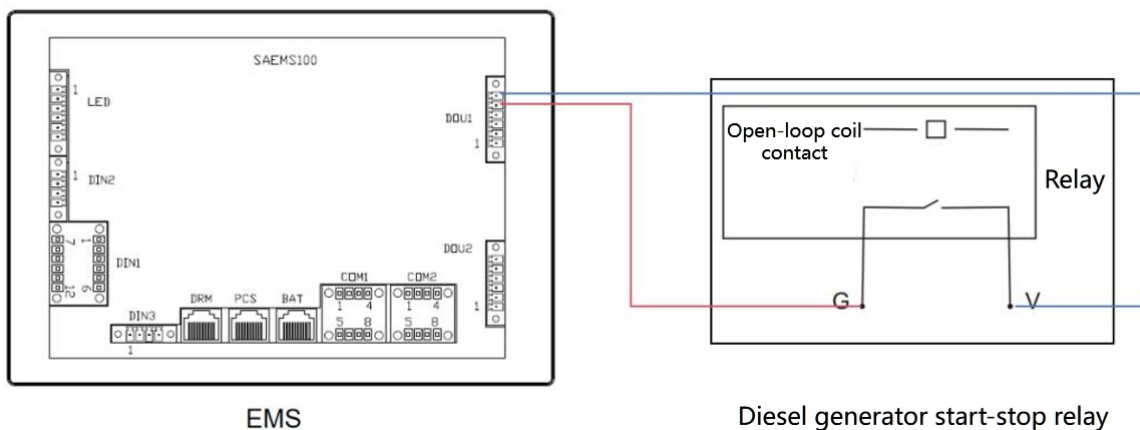


Figure 6.6-1 Diesel generator wiring

After connecting the communication line, configure it on the local MES.

Step 1:

Home screen → Settings con in the upper right corner → Advanced functions → I/O config → Click Next page  to output configuration page.

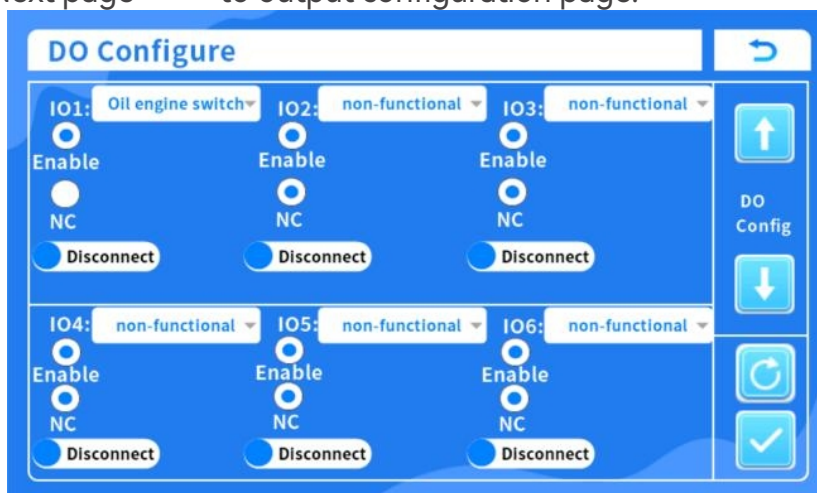


Figure 6.6-2 Generator start/stop dry contact configuration

Select the dry contact configuration option corresponding to the wiring, select the oil engine switch **IO1: Oil engine switch** and click enable, If the wiring is normally closed, check NC; . If it is normally open, please uncheck it.

Step 2:

Home screen → Settings icon in the upper right corner → "Battery Settings" → Next page → Enter the battery SOC setting interface → Set the "DG Use" switch on/off based on SOC.



Note: "Power On SOC" is the threshold for starting the engine, and "Power Off SOC" is the threshold for shutting down the engine.



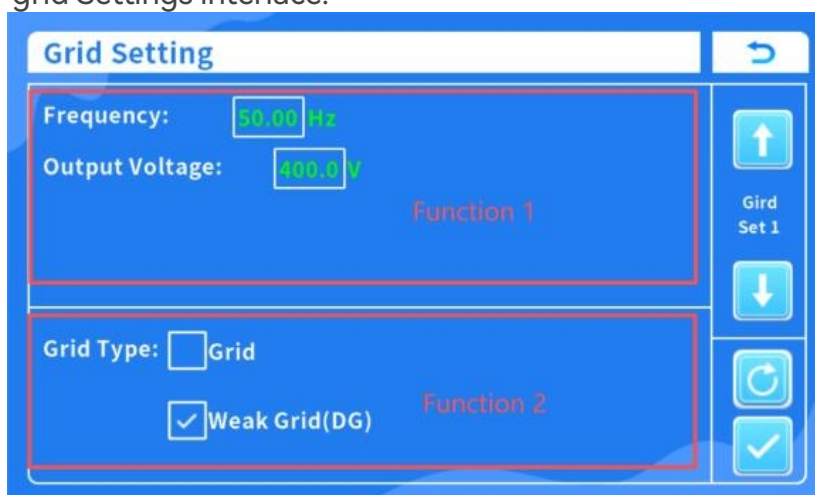
Figure 6.6-3 Generator SOC start/stop configuration

6.7. Weak grid configuration

Grid configurations are typically deployed in low-voltage grid areas and diesel generator systems where grid frequency and voltage conditions are suboptimal.

These solutions can be customized by adjusting the inverter's parameters—including under-voltage detection thresholds, over-voltage thresholds, under-frequency thresholds, over-frequency thresholds, and response time intervals to effectively adapt to challenging grid environments.

Home screen → Settings icon in the upper right corner → “Power Grid Settings” → Enter the power grid Settings interlace.



Grid Setting 2

OVP: V Time: s

UVP: V Time: s

Function 3

OFP: Hz Time: s

UFP: Hz Time: s

Grid Setting 3

Q Mode:

Q Set: kVar

PR: % (Pnom/s)

Function 4

HVRT/LVRT: ☐ Enable

Island Protection: ☐ Enable

Function 5

PF:

Figure 6.7–Power Grid Settings

Function 1: Set the power grid frequency and output voltage

Function 2: Select the power grid type. Check the ordinary power grid, and check the "Weak Grid (DG)" ☒ Weak Grid (DG) when the frequency or voltage of the power grid (oil engine) is poor, which will expand the range of voltage and frequency judgment to be compatible with the weak power grid scenario.

Function 3: manually adjust voltage, frequency range and time judgment.

Function 4: reactive power regulation.

Function 5: voltage traversal, island detection setting, power factor adjustment.

6.8 Multi-machine parallel configuration

Multi-machine parallel operation is divided into three cases

1. A single EMS connects to multiple inverters, as shown in the following schematic diagram:

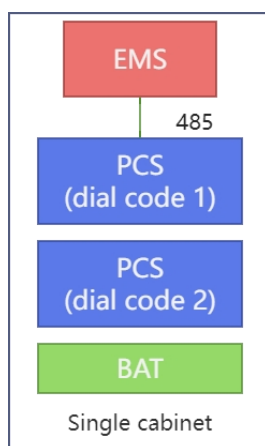


Figure 6.8-1

Local EMS screen setting method:

Main interface → Settings icon in the upper right corner to enter the Settings interface →

Administrator functions  → Converter/system configuration 

→ Set the number of converters **PCS Quantity:** → Click  to save parameters.

2. A single system is an EMS connected to a single PCS, and multiple systems are connected in parallel, as shown in the following schematic diagram:

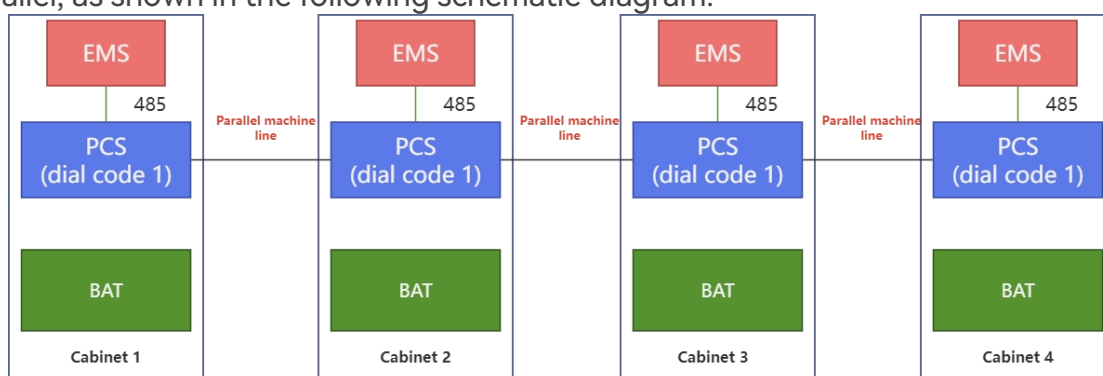


Figure 6.8-2

Local EMS screen setting method:

Main interface → Settings icon in the upper right corner to enter the Settings interface →

Administrator functions  → Next page  → Enter the cabinet Settings page.

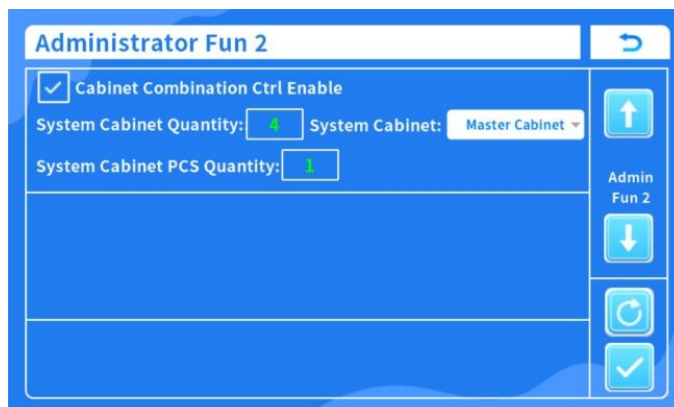


Figure 6.8-3

Check the cabinet Combination Ctrl Enable ☒ Cabinet Combination Ctrl Enable, Set the System Cabinet Quantity: according to the actual number of parallel units. Each EMS selects the number of system cabinets according to the master-slave relationship of the system cabinet. System Cabinet: Master Cabinet

3. A single system is an EMS connected to multiple inverters, and multiple systems are connected in parallel, as shown in the following schematic diagram:

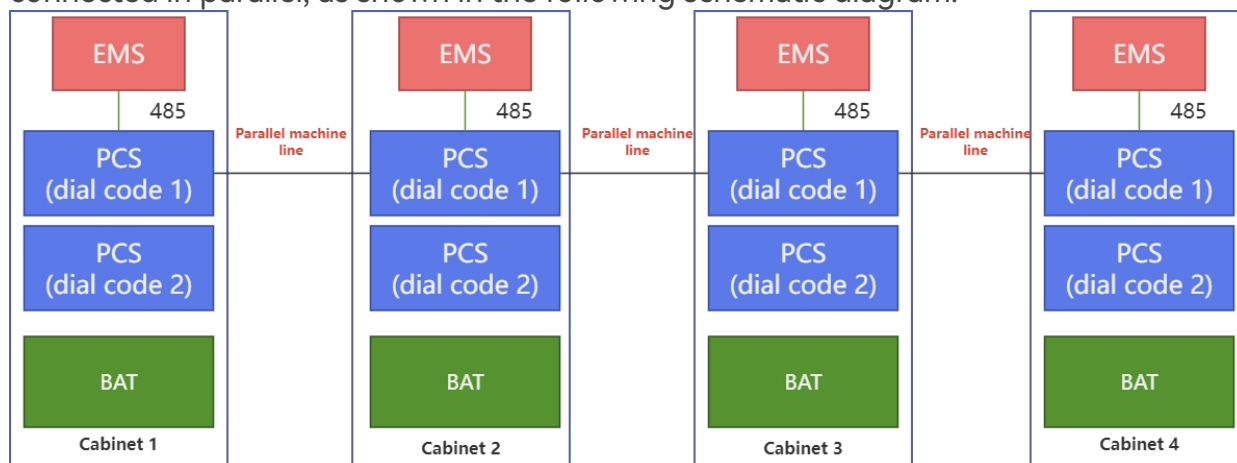


Figure 6.8-4

Main interface → Settings icon in the upper right corner to enter the Settings interface →

Administrator functions → Enter the cabinet Settings page.

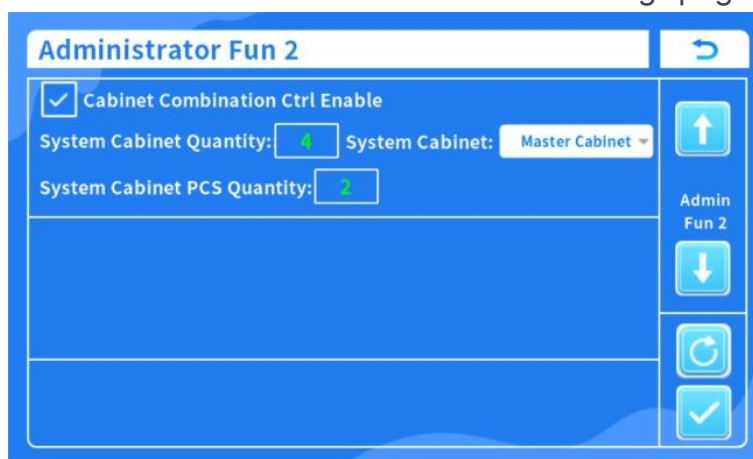


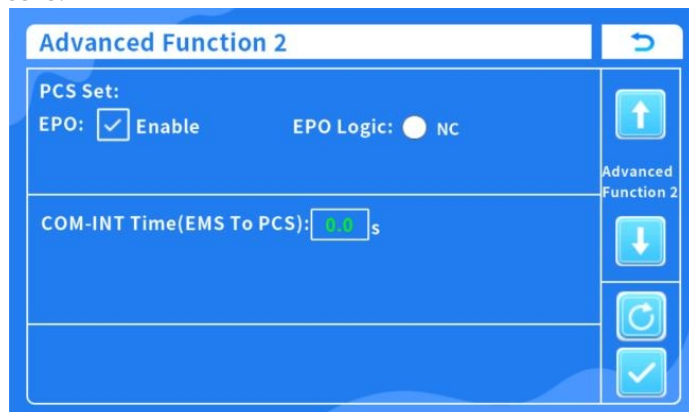
Figure 6.8-5

Check the parallel cabinet enablement ☒ Cabinet Combination Ctrl Enable, set the number of parallel cabinets System Cabinet Quantity: , set the number of converters in a single system cabinet System Cabinet PCS Quantity: , and select the number of system cabinet numbers according to the master-slave relationship of the system cabinet for each EMS Master Cabinet.

6.9 PCS emergency stop configuration

PCS DIN: X1 access to the emergency stop button is used. The emergency stop is normally closed by default, If you need to open it, you need to set it:

Main interface → Settings icon in the upper right corner to enter the Settings interface → Advanced Function2 **Advanced Function 2** → “Epo Logic:NC” **EPO Logic: NC** → Click to save parameters.



Figur 6.9-1 PCS emergency stop configuration

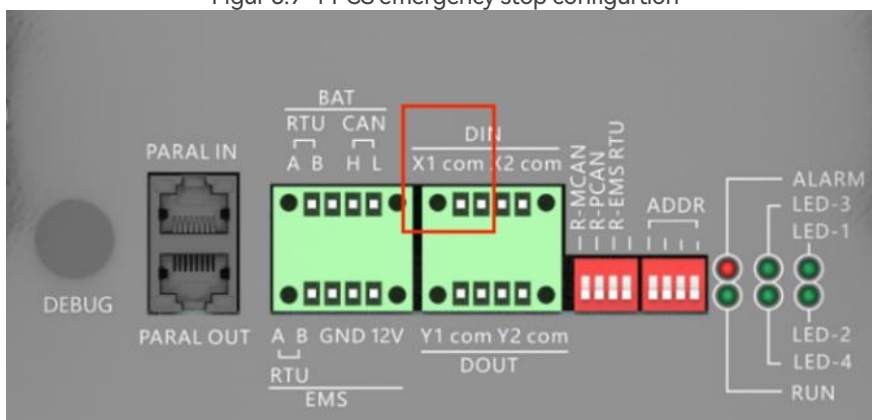
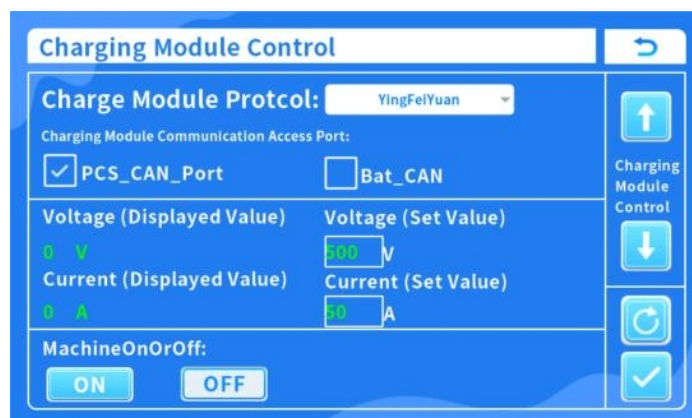


Figure 6.9-2 PCS emergency stop terminal

6.10 Charging module configuration

When connected to the charging module, the maximum charging current and voltage can be set.

Main interface → Settings icon in the upper right corner to enter the Settings interface → Advanced Function → Page turn → Find charging module Settings interface.



Figur 6.10 PCS emergency stop configuration

Select communication protocol → select the access communication port → set the voltage regulator → set the maximum current → switch on/off. The automatic switch on/off of the charging module is determined and adjusted according to the SOC of the starting and stopping of the diesel generator.

6.11 Single-phase charging function configuration

The single-phase charging function is only available when charging is connected to the grid, and only supports A-phase access and A-phase load.

Main interface → Settings icon in the upper right corner to enter the Settings interlace →

Advanced Function  → Page turn  → Find the single-phase charging

Settings interface → Check the single-phase charging mode → Set the charging power.

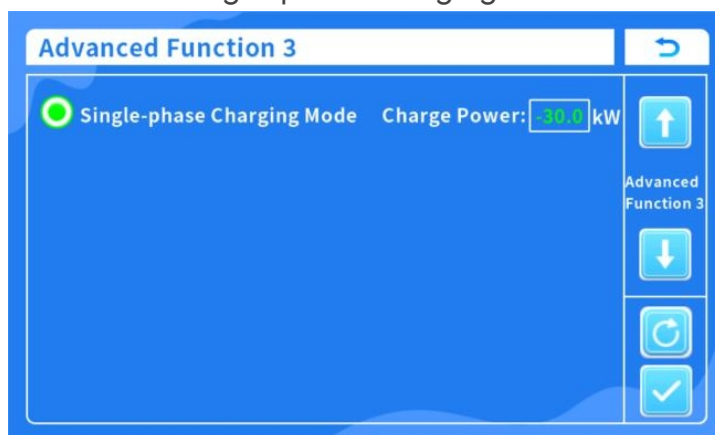


Figure 6.11 Single-phase charging configuration

6.12 Dry contact configuration

6.12.1 Indicator light configuration

Characteristic	Function	Optional items	Remarks
LED	J1	The default alarm indicator cannot be configured	PCS alarm, BMS alarm, and low SOC (SOC below PCS shutdown threshold).
	J2		
	J3	The operation indicator cannot be configured	Chang Liang
	J4		And offline, PCS is on and running
	J5	Default fault indicator, not configurable	PCS await the opportune moment
	J6		1S flashing
			3S always on, 100MS flashing
			Off the grid, PCS is up and running
			PCS faults, emergency stops, faults caused by input dry contacts, BMS protection and faults

Table 6.12.1

6.12.2 EMS emergency stop, switch on/off configuration

Characteristic	Function	Optional items	Remarks
DIN2	J1	The default emergency stop function cannot be configured	1. By default, it is a normally open dry contact. If the dry contact is connected to a normally closed dry contact, the logic of the emergency stop function should be reversed.
	J2		2. When the normally closed signal is input, the EPO function is triggered the EMS generates corresponding alarms, and the PCS is forced to shut down.
	J3	The default PCS power on/off function cannot be configured	1. By default, it is a normally open dry contact. If the dry contact is connected to a normally closed dry contact, the logic of the emergency stop function should be reversed.
	J4		2. Input a normally closed signal to force the PCS to start up, and input a normally open signal to force the PCS to shut down.

Table 6.12.2

6.12.3 Enter DI custom configuration

Operation instructions: Main interface → Settings icon in the upper right corner to enter the Settings interface → Advanced functions → Input and output configuration.



Figure 6.12.3 Input dry contact configuration page

Table 6.12.3

Pulse output					
Port identifier		EMS interface	Optional items	Function	Remarks
DIN1	J1	Input 6 (DI6)	Default is not finetional, can be configured.	1.It is assumed to be a normally open dry contact.	Default enabled
	J2			If the dry contact is connected as a normally closed dry contact,the normally closed button should be enabled.	
	J3	Input 5 (DI5)	Default is not finetional, can be configured.	2.Customizable configuration options	Default enabled
	J4				

J5	Input 4	Default is not finetional,	include:alarm systems,fault	Default
J6	(DI4)	can be configured.	detection,cabinet door alerts,ATS	enabled
J7	Input 3	Default is not finetional,	feedback,contactor feedback,generator	Default
J8	(DI3)	can be configured.	feedback,fire alarms,fire emergency	enabled
J9	Input 2	Default is not finetional,	alerts,smoke detectors,water intrusion	Default
J10	(DI2)	can be configured.	sensors,shutdown (input), startup	enabled
J11	Input 1	Default is not finetional,	(input), emergency stop (input),	Default
J12	(DI1)	can be configured.	lightning protection alarms, off-grid	enabled
			operation control, molded case circuit	
			breakers (input), and molded case circuit	
			breakers (output).	
			3. If you need other functions, please	Default
			contact the manufacturer for	enabled
			customization;	

Table 6.12.3



Illustration:

- 1.After setting the parameters, you need to click "Issue Settings" and click "Yes" to confirm the successful delivery of parameters .
- 2.Do not set the same function for different IO ports.

6.12.4 Custom output DO configuration

Operation instrinctions:Main interface → Settings icon in the upper right comer to enter the Settings interface → Advanced functions → Input and output configuration.

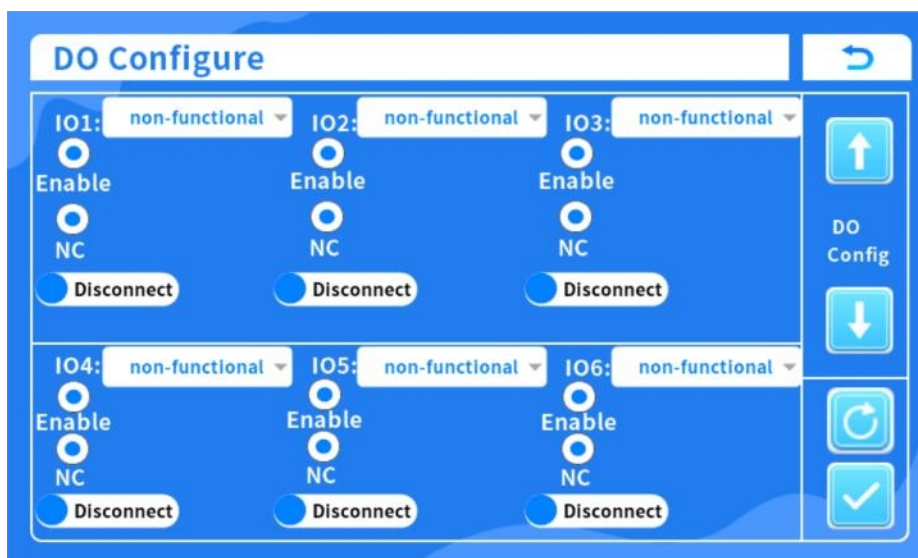


Figure 6.12.3 Input dry contact configuration page

Port identifier	EMS interface	Optional items	Function	Remarks
DO U1	J1	Default is not functional,can be configured	1.It is assumed to be a normally open dry contact.	Disabled by default,
	J2		If the dry contact is connected as a normally	if you want to enable it, please check enabled;

DO U2	J3	output2 (DO2)	Default is not functional and can be configured	closed dry contact, the normally closed button should be enabled.	Disabled by default. If enabled, please check enabled.
	J4				
	J5	output1 (DO1)	Default oil engine startstop control can be configured	2. Customizable configuration options include: generator switch, grid-connected/off-grid switching, fan control relay control, contactor AC control, tripe control, cell-specific fan control, single-load start-stop control heater control (cell temperature monitoring), electrica control (opening/closing), operation liquid cooling fluid replenishment control, DC trip control (cell voltage monitoring), and DC trip control (fault detection).	Disabled by default. If enabled, check it.
	J6				
	J7	output6 (DO6)	Default is not functional, can be configured.	generator switch, grid-connected/off-grid switching, fan control relay control, contactor AC control, tripe control, cell-specific fan control, single-load start-stop control heater control (cell temperature monitoring), electrica control (opening/closing), operation liquid cooling fluid replenishment control, DC trip control (cell voltage monitoring), and DC trip control (fault detection).	Disabled by default. If enabled, please check enabled.
	J8				
	J9	output5 (DO5)	Default is not functional, can be configured.	generator switch, grid-connected/off-grid switching, fan control relay control, contactor AC control, tripe control, cell-specific fan control, single-load start-stop control heater control (cell temperature monitoring), electrica control (opening/closing), operation liquid cooling fluid replenishment control, DC trip control (cell voltage monitoring), and DC trip control (fault detection).	Disabled by default. If enabled, please check enabled.
	J10				
	J11			3. If other functions are needed, please contact the manufacturer for customization.	
	J12	output4 (DO4)	Default is not functional, can be configured.		

Table 6.12.4



Illustration:

1. After setting the parameters, you need to click "Issue Settings" and click "Yes" to confirm that the parameters have been issued successfully.
2. Do not set the same function for different IO ports.

6.13 Other display interface description

Click the grid, load, PCS, PV and battery icons on the home page to enter the detailed information view interface.



Figure 6.13-1 Grid details page



Figure 6.13-2 PV details page



Figure 6.13-3 Load details page



Figure 6.13-4 Battery cluster details page



Figure 6.13-5 Battery cluster details page2



Figure 6.13-6 Battery cluster details page3

07 Platform Configuration and Wiring Guide

To connect to the cloud platform, you first need to establish a communication connection. The platform is available on both PC (web) and mobile devices. The web version can be accessed at: <https://www.valueclouds.com/#/system/upgradeManagement>, while the mobile app requires downloading.



IOSAPP



AndroidAPP

7.1 WiFi/4Gcommunication stick

7.1.1 Product interface



Figure7.1-1 Product interface

WiFi/4G module aviation plug interface definition

Order number	Pin definitions	Description
1	GND	Powering up
2	VCC	Input DC voltage DC5V-DC12V
3	RS485-A	RS485 interface A/+
4	RS485-B	RS485 interface B/-

Table 7.1-1



Figure7.1-2 Indicator lights

WiFi/4G module indicator light

Order number	Silk screen name	Description
1	PWR/source	Light the lamp:
2	COM/equipment	Light up the lights:The subordinate
3	NET/networking	Light the lamp:Connect to the base
4	SRV/Cloud Connection	Light the lamp:Connect to the specified

7.2 Mobile (APP) cloud platform

Step1:Register and log in to the APP

Please use your mobile phone to scan the Android QR code.



IOSAPP



AndroidAPP

Open the mobile APP, log in your account, if you don't have an account, please register an account first.

Note that the PC and mobile account and password are common.

Register a cloud platform account → Log in the account → Log in to the cloud platform.

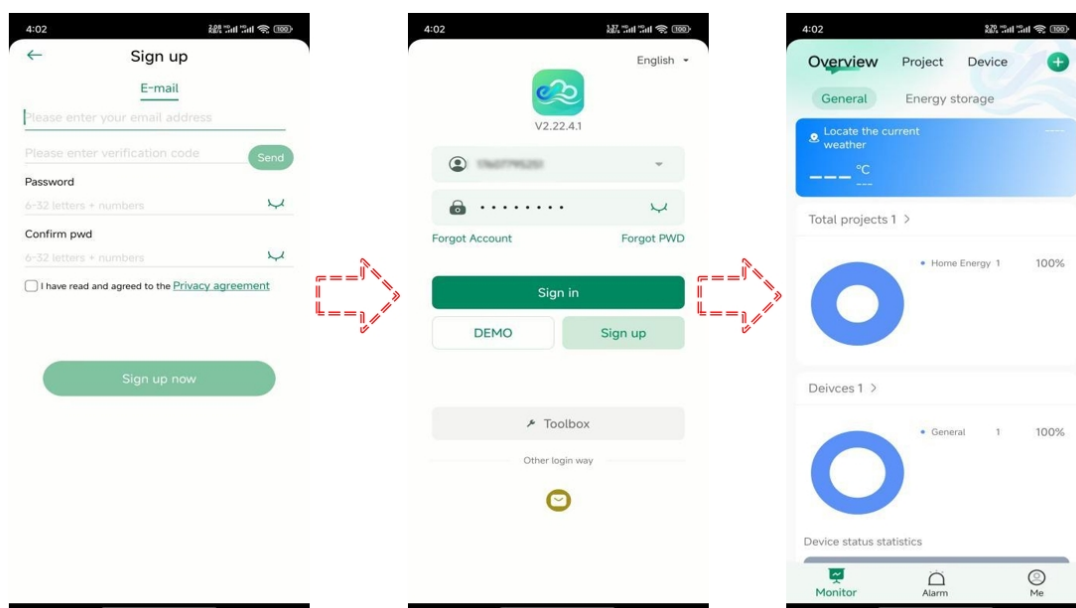


Figure 7.2-1

Step2: Connect the Wifi stick to the network

The 4G version of the communication stick is plug and play, while the Wifi version of the communication stick requires Bluetooth networking. The following are the steps of the Wifi version of the communication stick to Bluetooth networking.

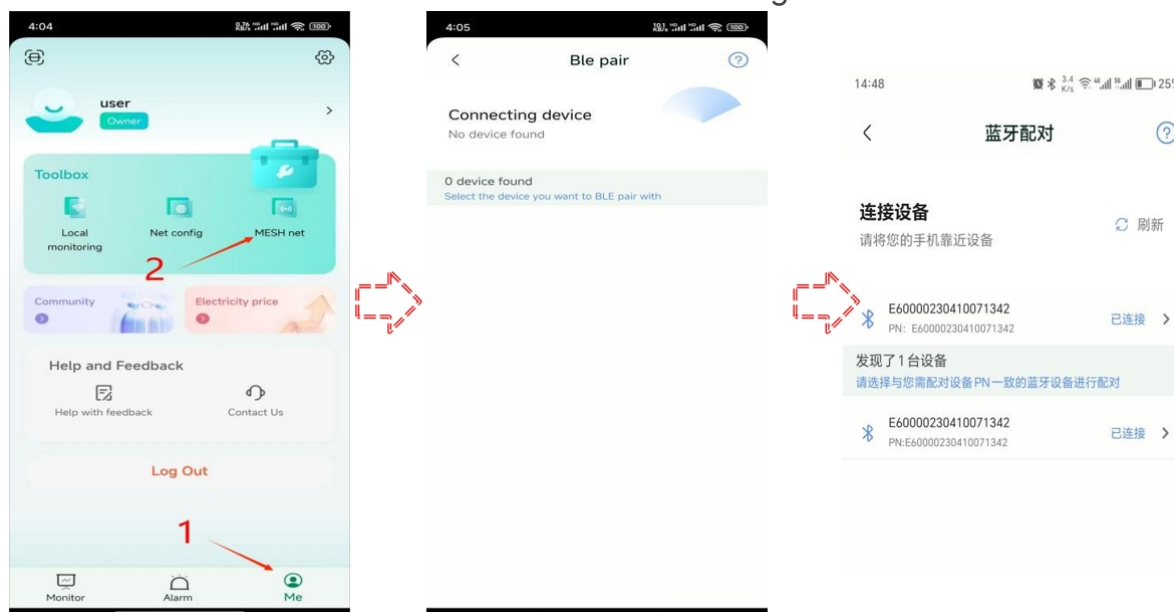


Figure 7.2-2

APP My → Click network configuration → Select Bluetooth network → Select the corresponding WiFi communication bar → Connect.



Illustration:

The Wi-Fi version of the communication stick cannot connect to 5G Wi-Fi. If you are using a Wi-Fi communication stick without 4G Wi-Fi, you can turn on the 4G hotspot on your phone and connect the Wi-Fi module to the phone's hotspot.

7.3 Add 4G/WiFi comm card devices to mobile app.

7.3.1 Add a WiFi version of the communication stick

Steps to add a Wi-Fi communication device: If adding for the first time, configure its network. After configuration, the device will be automatically added to the currently logged-in account.

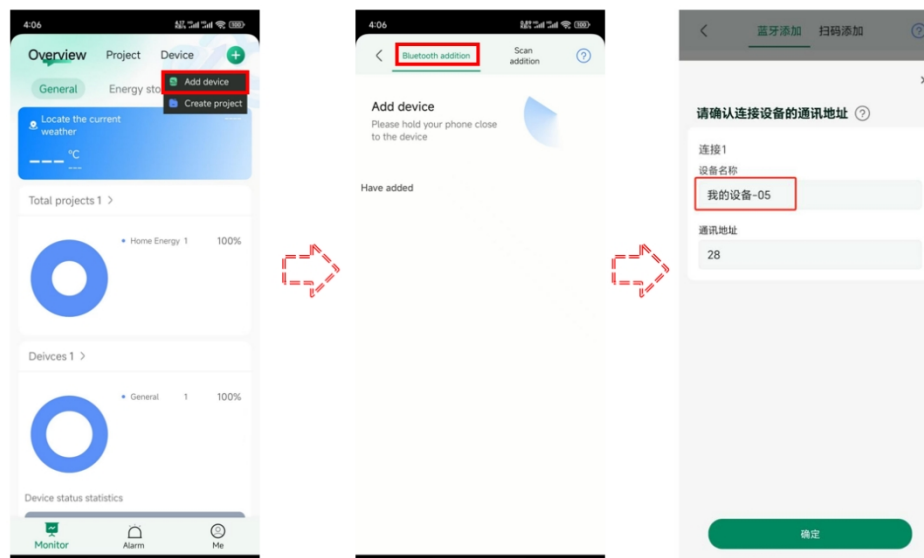


Figure 7.3.1

Click the left top corner to add the device → Bluetooth scan the device (or scan the QR code of the data collector to add) → click the device to add → change the device name.



Illustration:

The device name is recommended to be changed to project address or project name.

7.3.2 Add 4G version communication stick

Add 4G version communication equipment, the steps are as follows:

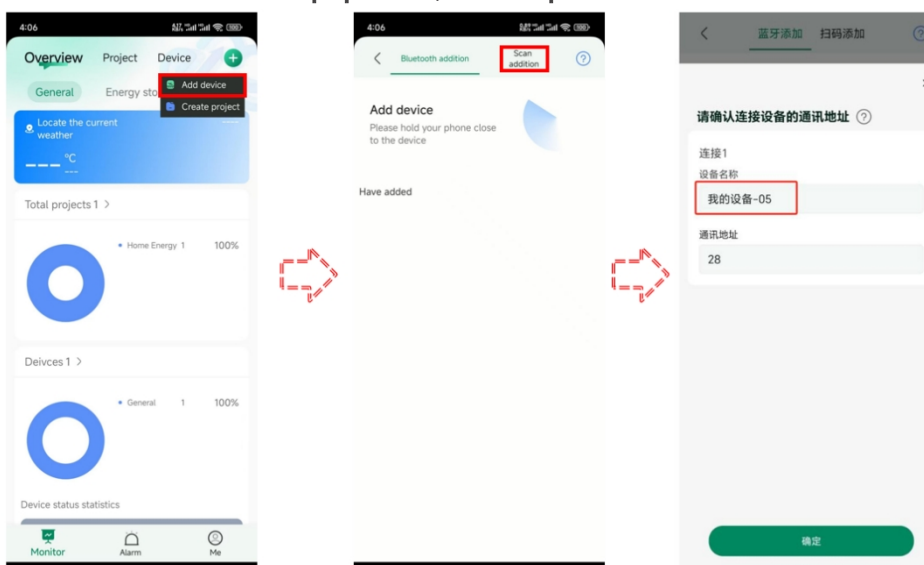


Figure 7.3.2

Click the add device in the top left corner → click scan the QR code to add the scanning stick → click add device → change the device name.



Illustration:

The device name is recommended to be changed to project address or project name.

7.3.3 Mobile phone APP remote control device

When the device is connected to the network, the device can be controlled through the cloud platform.

Operation method: Enter the device page → click the control icon in the upper left corner to enter the control page → select function → send.

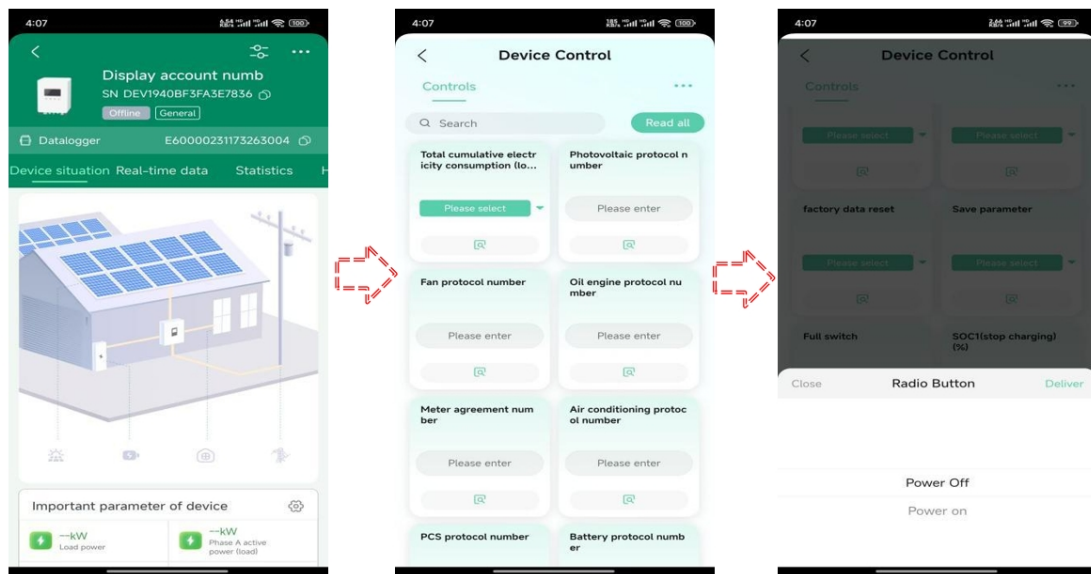


Figure 7.3.3

One-click read: Read the current EMS setting value.

EMS mode: Select EMS working mode, you can choose: self-use, photovoltaic Internet access, time function.

PCS protocol number: Select the PCS model.

Battery protocol number: Select the battery protocol number.

Restore factory Settings: Parameters are restored to factory default values (do not set them easily unless necessary)

Save parameters: Save the setting parameters.

All power on/off: Power on or off the device.

SOC (Stop charging): The battery is charged until the SOC (the actual SOC of the battery is greater than or equal to the set value), and the charging will stop when the SOC reaches this value, whether photovoltaic or grid.

SOC2 (off-grid, PV limit point):

SOC3 (off-grid, diesel shutdown): When SOC is greater than or equal to this setting value, EMS controls the diesel generator to shut down.

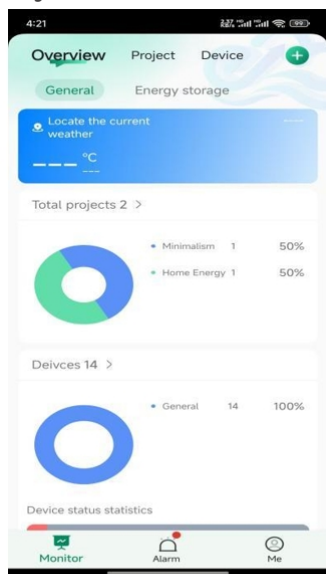
SOC4 (off-grid, diesel engine starts): When SOC is less than or equal to this setting value, EMS controls the diesel engine starts.

SOC5 (stop charging and shut down the gateway off the grid): not available

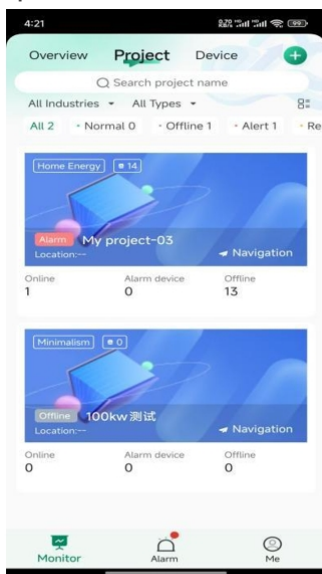
SOC6 (machine shutdown): not available

7.3.4 Mobile APP page description

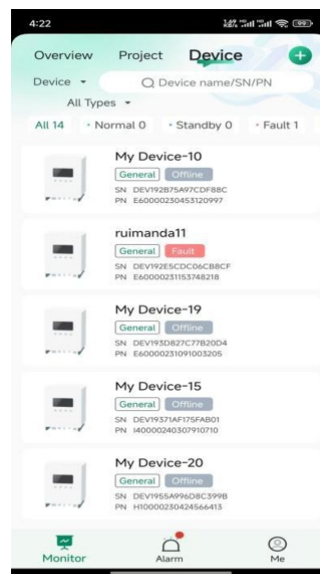
To view system data, you need to log in to the account first, then click on the device, find the device you want to view, and open the device list.



(FIG.) Main interface



(FIG.) Project list interface



(FIG.) Device parameter interface

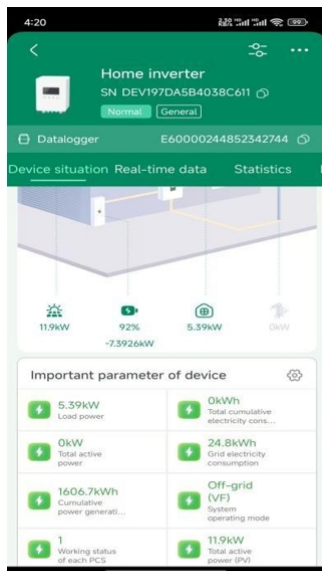
Figure 7.3.4-1

Home page: view the account profile, including the number of projects, total number of devices, etc.

Project list interface: Projects are classified according to the project, and a project can be bound to multiple devices.

Device list interface: According to device number, view all accounts bound to the account.

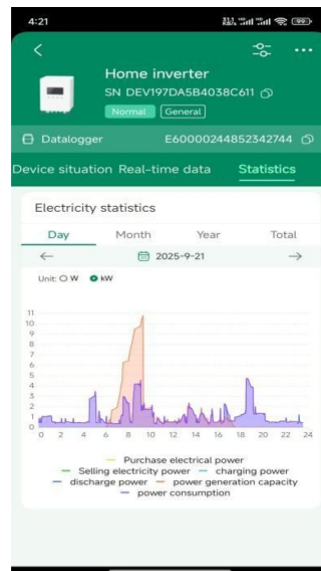
Device interface:



(FIG.) Equipment overview



(FIG.) Real-time parameters



(FIG.) Data statistics

Figure 7.3.4-2

Device overview: View the overview of the device in operation

Real-time parameters: you can view the real-time operating status of the system, PCS information, BMS information, load and power grid information, system information, diesel generator and wind turbine information.

Data statistics: View power generation and electricity consumption data.

7.4 PC (web) cloud platform

If the communication stick is of the WiFi version, please first configure the Bluetooth network of the communication stick. The web address is:

<https://smartems.valueclouds.com>. If you do not have an account, please register an account first.

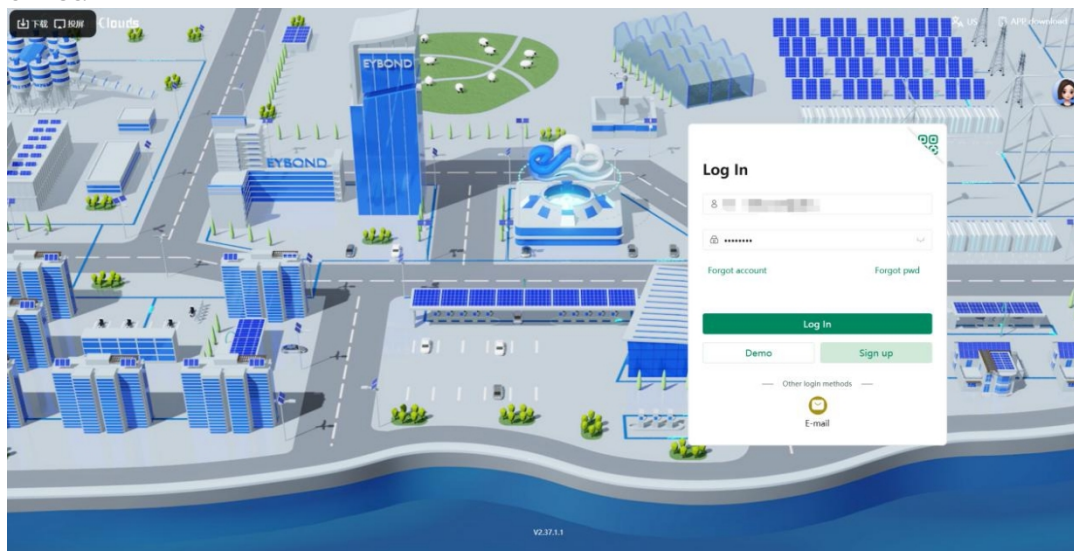
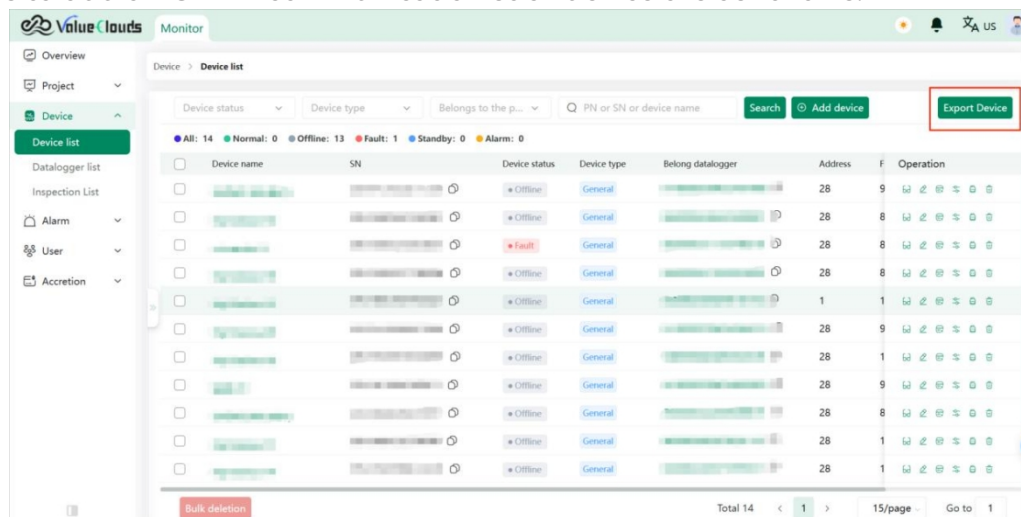


Figure 7.4 PC login interface (web)

7.4.1 Add 4G/WiFi communication stick devices to PC (web)

Add 4G/Wifi communication stick device. First, log in to the PC web page. If you have added this device, ignore this chapter.

The steps to add a 4G/Wifi communication stick device are as follows:



In the device list, find the add device button in the upper right corner and click the add device button.

ValueClouds Monitor

Device > Device list > Add device

Add device

PN *

E60000230453114359

Please confirm the communication address of the connected device *

Connect1

Device name

My Device-14

Confirm

Fill in the PN number. The PN number is under the QR code of 4G/Wifi communication stick. It is recommended to fill in the device name as the project address, and the device address should not be changed.

ValueClouds Monitor

Device > Device list > Add device

Add device

Add Success

Continue adding Viewing device

7.4.2 View system data on the PC (web)

The device that can be clicked to view

设备列表

设备状态 设备类型 所属项目 Q PN, SN或设备名称 搜索

总: 5 正常: 1 离线: 4 故障: 0 待机: 0 警告: 0

设备名称	设备状态	所属项目	通讯地址	固件版本号	所属项目	操作
	离线	我的项目-03	28	V1.0	我的项目-03	
	离线	我的项目-03	28	D08	我的项目-03	
	正常	我的项目-03	28	D09	我的项目-03	
	离线	我的项目-03	62	--	我的项目-03	
	离线	我的项目-03	28	--	我的项目-03	

The system information contains the following information

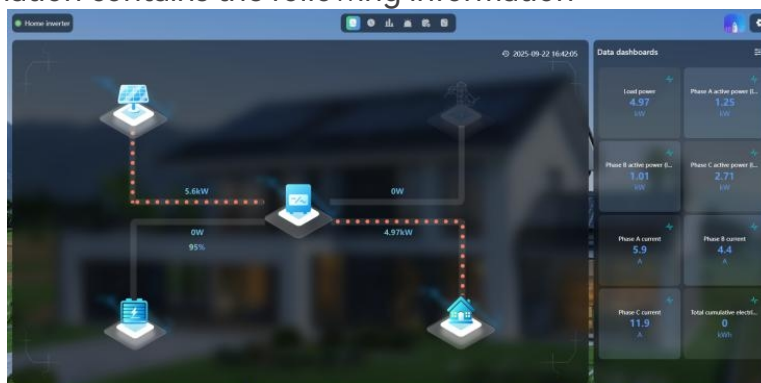


Figure 7.4.2-1 Energy flow chart



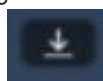
Figure 7.4.2-2 System, operating status, load and other information

State	Level	Description	Occurrence time	Disappeared time	Code	Handling suggestion
Recovered	High	The 14 battery BMS is seriously faulty	2025-08-22 14:58:52	2025-08-22 15:10:58	bat15	---
Recovered	High	The 14PCS DC voltage is abnormal	2025-08-22 14:58:52	2025-08-22 15:07:13	bat4	---
Recovered	High	The 14PCS DC voltage is abnormal	2025-08-22 14:30:34	2025-08-22 14:41:05	bat15	---
Recovered	High	The 14PCS DC voltage is abnormal	2025-08-22 14:30:34	2025-08-22 14:41:05	bat4	---
Recovered	High	The 14 battery BMS alarm is generated	2025-08-22 13:29:50	2025-08-22 14:10:22	bat13	---
Recovered	High	The 14 battery BMS alarm is generated	2025-08-22 12:27:41	2025-08-22 13:15:20	bat13	---
Recovered	High	The 14 battery BMS alarm is generated	2025-08-18 08:31:05	2025-08-18 09:31:53	bat13	---
Recovered	High	The 14 battery BMS is faulty	2025-08-18 08:31:05	2025-08-18 09:31:53	bat14	---
Recovered	High	The 14 battery BMS alarm is generated	2025-08-14 08:07:18	2025-08-14 08:50:28	bat13	---
Recovered	High	The 14 battery BMS is faulty	2025-08-14 08:07:18	2025-08-14 08:50:28	bat14	---
Recovered	High	The 14 battery BMS alarm is generated	2025-07-20 01:17:28	2025-07-20 09:45:17	bat13	---
Recovered	High	The 14 battery BMS is faulty	2025-07-20 01:17:28	2025-07-20 09:45:17	bat14	---
Recovered	High	The 14 battery BMS alarm is generated	2025-07-19 13:12:39	2025-07-19 18:39:32	bat13	---

Figure 7.4.2-3 Equipment alarm

Timestamp	Load power(W)	Phase A active power...	Phase B active power...	Phase C active power...	Phase A current(A)	Phase B current(A)	Phase C current(A)	Total active power(W)
2025-09-22 10:41:43	11.49	3.57	4.83	2.68	0.0	0.0	0.0	0.00
2025-09-22 10:36:52	11.24	3.89	4.75	2.59	0.0	0.0	0.0	0.00
2025-09-22 10:31:59	12.06	3.93	4.77	3.35	0.0	0.0	0.0	0.00
2025-09-22 10:27:07	12.61	3.90	4.74	3.37	0.0	0.0	0.0	0.00
2025-09-22 10:22:15	12.16	3.97	4.80	3.37	0.0	0.0	0.0	0.00
2025-09-22 10:17:22	12.13	3.95	4.80	3.36	0.0	0.0	0.0	0.00
2025-09-22 10:11:58	12.04	3.91	4.79	3.34	0.0	0.0	0.0	0.00
2025-09-22 10:06:52	11.93	3.91	4.77	3.30	0.0	0.0	0.0	0.00
2025-09-22 10:02:09	11.93	3.84	4.75	3.34	0.0	0.0	0.0	0.00
2025-09-22 10:01:08	11.74	3.78	4.63	3.29	0.0	0.0	0.0	0.00
2025-09-22 10:01:09	11.79	3.81	4.66	3.31	0.0	0.0	0.0	0.00
2025-09-22 10:00:05	11.77	3.79	4.67	3.33	0.0	0.0	0.0	0.00
2025-09-22 09:55:22	11.85	3.83	4.70	3.30	0.0	0.0	0.0	0.00
2025-09-22 09:50:26	11.85	3.86	4.68	3.31	0.0	0.0	0.0	0.00
2025-09-22 09:45:30	11.71	3.81	4.61	3.27	0.0	0.0	0.0	0.00

Figure 7.4.2-4 Historical data



Click the download icon in the upper right corner of the historical data interface to download the historical data.

7.5 Wiring instructions

7.5.1 EMS interface diagram and definition

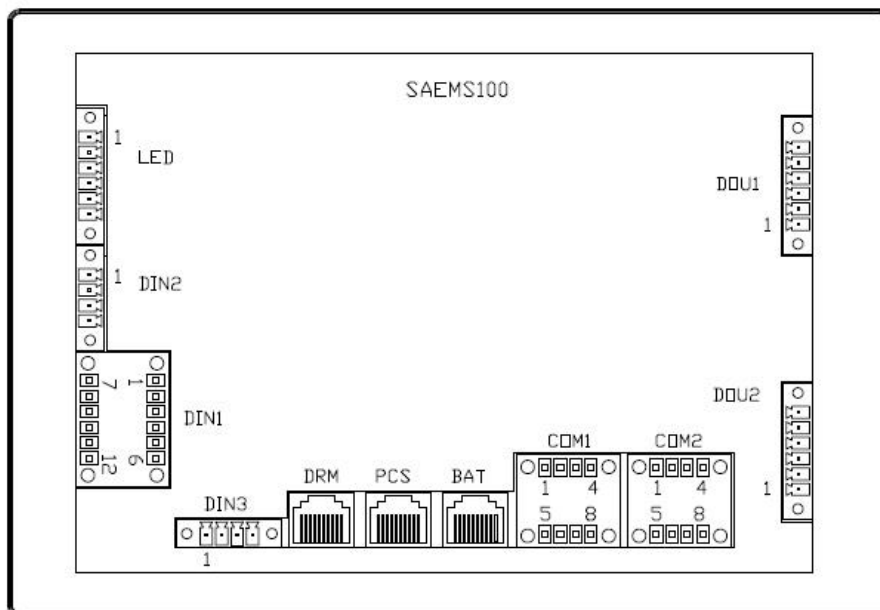


Figure 7.5.1 EMS terminal port

Characteristic		Definition	Remarks
LED	1	LED_12V	12V indicator light power supply
	2	LED_YELLOW_GND	System alarm indicator
	3	LED_12V	12V indicator light power supply
	4	LED_GREEN_GND	System operating indicator light
	5	LED_12V	12V indicator light power supply
	6	LED_RED_GND	System fault indicator
0	1	Vcc supply electricity GND	Important: Please match the appropriate machine 1.AEMS100: Vcc is powered by 5V adaptation : SP30HBG2 2.AEMS200: Vcc is powered by 5V adaptation : SP100HC+MPPT 3.AEMS300: Vcc---12V power supply adaptation : SP60HCG2/SP50HCG2/SP40HCG2/SP30HCG2 4.AEMS400: Vcc--12V power supply adaptation : SP125HCPS/SP100HCPS
	2	Vcc supply electricity GND	
	3	Vcc supply electricity	
	4	Vcc supply electricity	
DRM	RJ45	DRM joggle	See the DRM standard for details.
PCS	RJ45	And power-off or PCS connection cable	Connect to the PCS parallel network port using a Category 5 industrial network cable.

BAT	1		Pin1---BAT_CAN_H	The RJ45 interface mode can also be defined using the 5-8 interfaces in COM1.
	2		Pin2---BAT_CAN_L	
	7		Pin7---BAT_RTU_A	
	8		Pin8---BAT_RTU_B	
COM1	upper strata	1	DTU/Cloud platform communications	DTU/Cloud platform communications
		2	Wifi/4G_Rtu_485A	
		3	Wifi/4G_Rtu_485B	
		4	Wifi/4G_GND	
	lower levels	5	BAT_CAN_H	The same interface as BAT, connected to BMS, CAN or RTU mode can be selected.
		6	BAT_CAN_L	
		7	BAT_RTU_A	
		8	BAT_RTU_B	
COM2	upper strata	1	PCS_RTU_A	Communication RTU mode with PCS
		2	PCS_RTU_B	
		3	/	
		4	/	
	lower levels	5	Meter_RTU_A	Meter communication
		6	Meter_RTU_B	
		7	Air_RTU_A	Air-conditioning communication
		8	Air_RTU_B	
DIN 1	upper strata	1	DI6	Custom input
		2	COM6	
		3	DI4	Custom input
		4	COM4	
		5	DI2	Custom input
		6	COM2	
	lower levels	7	DI5	Custom input
		8	COM5	
		9	DI3	Custom input
		10	COM3	
		11	DI1	Custom input

		12	COM1	
DIN2	1		EPO	jerk
	2		EPO-GND	
	3		Power ON/OFF	Power button
	4		GND	
	5		/	
	6		/	
DOU1	1		DO3	Custom input
	2		COM3	
	3		DO2	Custom input
	4		COM2	
	5		DO1	Motor start/stop
	6		COM1	
DOU2	1		DO6	Custom input
	2		COM6	
	3		DO5	Custom input
	4		COM5	
	5		DO4	Custom input
	6		COM4	

Table 7.5.1-Overall interface diagram

7.6 Screen update

For upgrades, refer to the following steps.

1. Preparations for the burn

Confirm that the TF card is in FAT32 format (if the TF card is not in FAT32 format, please first format the SD card to FAT32). If the TF card is not in FAT32 format, right-click to initialize.

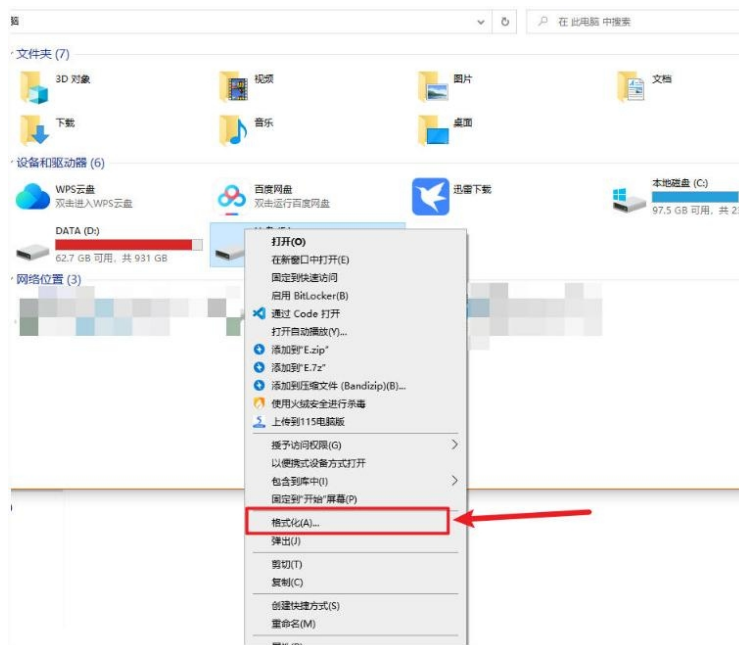


Figure 7.6-1

Make sure that the size of the SD card is not more than 32G. Before use, make sure that the SD card has no hidden partition (no boot disk), the capacity of the SD card is not more than 32G (for example, 512M, 1GB, 2GB, 4GB, 8GB, 16GB, 32GB are available), and the SD card is formatted as fat32 format.

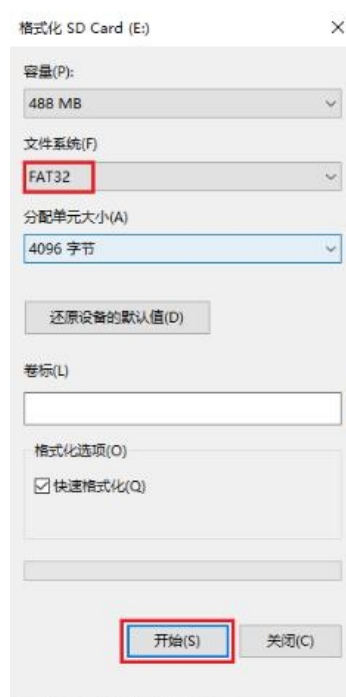


Figure 7.6-2

Download the project (screen program) to the serial port screen using an SD card. Ensure that the SD card does not exceed 32GB, and copy the TFT file to the root directory of the SD card.

There is and can only be one TFT file in the root directory of the SD card, otherwise an error will occur. The following figure shows an example of the file burning.



Figure 7.6-3

Make sure the read-only attribute in the TFT file properties is unselected



Figure 7.6-4

2. Burn screen files

Power off the serial port screen. Insert the TF card into the TF card slot of the serial port screen. The TF card is inserted in the direction where the face with the letter is facing the back of the screen.



Figure 7.6-5



Note: Do not plug or unplug the TF card during power on/off of the HMI screen. After inserting the TF card properly, the diagram is as follows.



Figure 7.6-6

Power on the serial port screen and wait for the program to be burned. The following figure shows the HMI screen burning the program and the program burning accomplish.

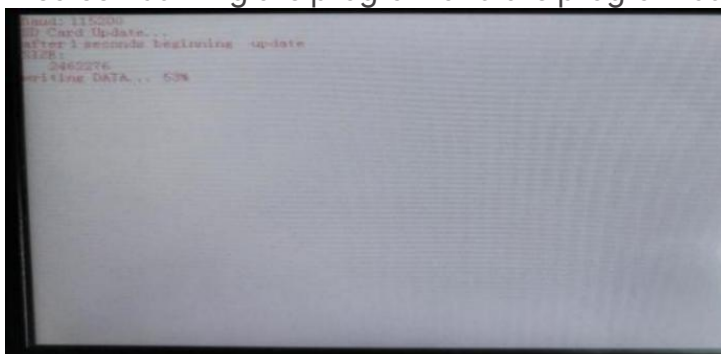


Figure 7.6-7 File is being burned.

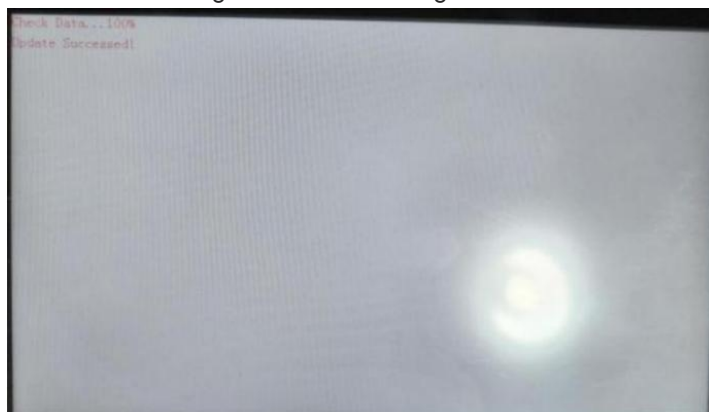


Figure 7.6-7 Burn successful

The serial port screen is powered off and the TF card is removed. The serial port screen is re-powered on and the program is burned in. The picture after burning in is as shown below:

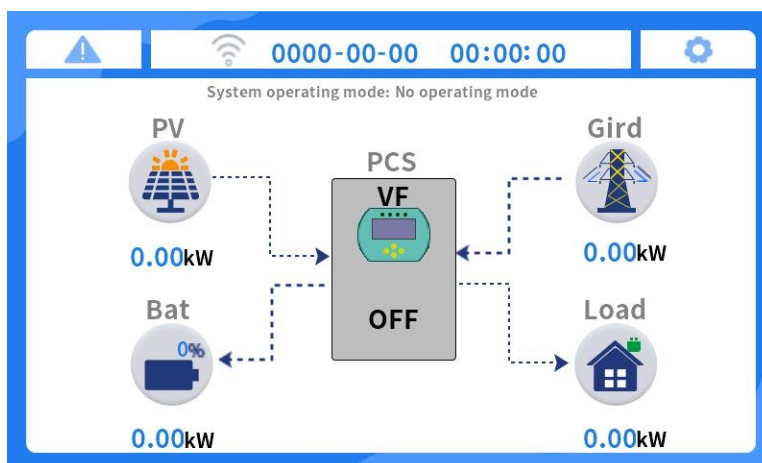


Figure 7.6-8

08 Alarm and Maintenance

Related explanation:

Serial Number	Term	Explanation
1	Failure	When a device malfunctions, the system stops operating.
2	Alarm	When a device's output power decreases or some functions fail due to external factors, but the system's charging and discharging functions are not affected.
3	Normal operation	Refers to a system that is working every day.
4	Interval operation	Refers to a system with an irregular monthly operation frequency and cannot guarantee daily operation.
5	Lost in use	Refers to a battery system that has not been started for more than 3 consecutive months.

Table 8

8.1 Alarm Handling

Alarm fault codes and fault handling measures

Alarm or Fault Name	Fault code	Power off or not	Fault recovery method	Fault resolution measures
Soft start failed	1	Power off	Self-recovery	1. Power off the module, wait for 1 to 2 minutes, then the module will restart. 2. After the above operations, if the fault still persists, please contact the relevant staff for handling.
Address duplication /Invalid address	3	Power off	Pre-start detection, power-off recovery	1. Power off the module, and reselect a module address that is inconsistent with the one on the system. The address range is #1 to #10. 2. With the address range being #1 to #10, the jumpers switch from left to right. The left side represents the high address bit, and the right side represents the low address bit. When set to "NO" position, it is effective and calculated in binary system. 3. After resetting the address, the system needs to be powered off and restarted for the changes to take effect.

ECAP malfunction	4	Power off	Self-recovery	1. Check if the network cables between the servers are properly connected. Reconnect the network cables of the servers. 2. Replace the network cables of the servers.
AC relay short circuit	5	Power off	Power-off recovery	Power off the module and check if the intermediate relay for the inverter is damaged.
CPLD step-by-step current limiting fault	6	Power off	Self-recovery	The machine has experienced an overcurrent situation. Check the load conditions or the wiring.
Short circuit between the output lines of the INV device	8	Power off	Self-recovery	Power off the module and check if there is any short circuit between each phase and each wire.
Overload protection shutdown	9	Power off	Self-recovery	Have been operating under overload for a long time. Please check the load.
Battery failure				
Bus imbalance	17	Power off	Self-recovery	1. Power off the module, wait for 1 to 2 minutes, then the module will restart. 2. Contact the relevant staff for resolution.
Bus overvoltage	18	Power off	Self-recovery	Check if the P and N voltages of the busbar are overvoltage. Wait for 1 minute after power-off and then re-power on.
Low Bus voltage	19	Power off	Self-recovery	1. Check whether the P and N of the busbar are under-voltage and whether the input voltage is too low. 2. Contact the relevant staff to resolve the issue.
Bus sampling error	20	Power off	Self-recovery	The voltage of the bus is not equal to P + N, and there is an error in the sampling.
DC soft start failed	21	Power off	Self-recovery	Wait until the bus voltage rises and then restart the machine.
Reverse connection of the battery	22	Power off	Self-recovery	Check whether the positive and negative poles of the battery are connected in the wrong way.

Battery overvoltage	23	Power off	Self-recovery	Check if the battery input is overvoltage. Power down for 1 minute and then power on again.
Low battery voltage	24	Power off	Self-recovery	Check if the input voltage of the battery is insufficient.
Overcurrent discharge	25	Power off	Self-recovery	Check if there is an overcurrent during the discharge process.
Overcurrent charging	26	Power off	Self-recovery	Check if there is an overcurrent during charging.
DC contactor failure	32	Power off	Self-recovery	PTC malfunction or DC contactor malfunction
Grid failure				
Low grid frequency	33	Power off	Self-recovery	1. Check if the low-frequency protection point of the power grid is set too high. 2. Check if the time setting of the low-frequency protection point of the power grid is too short.
High grid frequency	34	Power off	Self-recovery	1. Check if the high-frequency protection point of the power grid is set too low. 2. Check if the time of the high-frequency protection point of the power grid is too short.
Low grid voltage	35	Power off	Self-recovery	1. Check if the setting of the grid under-voltage protection point is too high. 2. Check if the duration of the grid under-voltage protection point is too short.
High grid voltage	36	Power off	Self-recovery	1. Check if the overvoltage protection point of the power grid is set too low. 2. Check if the time of the overvoltage protection point of the power grid is too short.
Reverse phase sequence	37	Power off	Self-recovery	Check if the phase sequence is reversed
Island failure	40	Power off	Self-recovery	
Abnormal output current	41	Power off	Self-recovery	1. Check if the current output is exceeding the limit. 2. Check for a short circuit.

Abnormal inverter overcurrent	43	Do not turn off the device	Alarm, self-recovery	The machine's inductor current does not match the output current.
Abnormal leakage current	47	Do not turn off the device	Alarm, self-recovery	1. Check if the leakage current protection point is set too low. 2. Check if the time of the leakage current protection point is too short.
System failure category				
Fan error	50	Do not turn off the device	Alarm, self-recovery	Check if the fan is damaged
Incorrect mode	52	Power off	Self-recovery	Phase locking failure occurs in the VF mode.
Abnormal auxiliary source	53	Power off	Self-recovery	Check if the auxiliary power supply voltage is too low.
SysFault	54	Power off	Self-recovery	Reporting other faults that caused the system to shut down. To eliminate this fault, one needs to first eliminate the other faults.
Arm failure	55	Power off	Self-recovery	Check whether the address setting is incorrect, or if there is a communication interruption, emergency stop malfunction, etc.
Excessive temperature fault	57	Power off	Self-recovery	Check if the machine environment is too hot and enhance ventilation.
IGBT temperature anomaly	58	Power off	Self-recovery	Check whether there is a significant temperature difference among the three IGBTs.
Flash initialization error	59	Power off	Self-recovery	EEPROM chip initialization failed
Internal communication failure	61	Power off	Self-recovery	1. Check if the connection between the DSP and the ARM is unstable or disconnected. 2. Check if there is no program in the DSP or the ARM.
CPLD Exception	64	Power off	Self-recovery	Abnormal hardware version number of CPLD

Table 8.1

8.2 Charging Module System Maintenance

To ensure that the charging module can operate stably for a long time, it is recommended to perform regular maintenance as described in this chapter.

The dust filter of the cabinet should be cleaned regularly to prevent dust from accumulating at the air intake, which could cause the internal temperature of the charging module to rise excessively. To perform maintenance on the energy storage system once every three months.

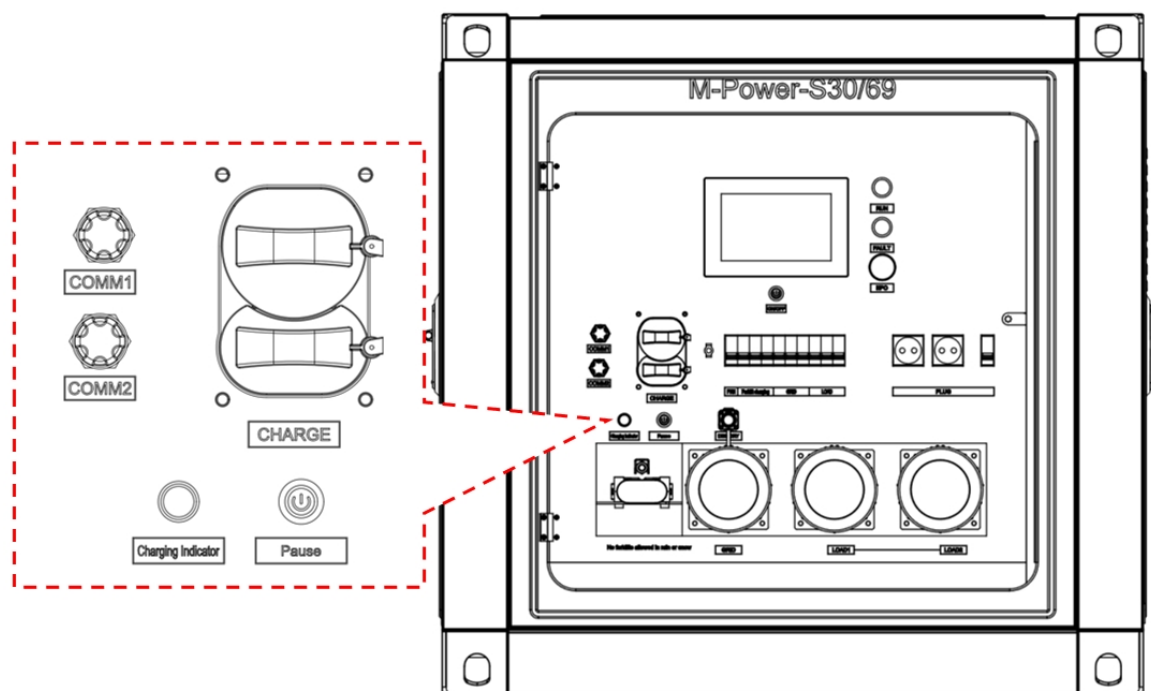


Figure 8.2

Related alerts	Reason analysis	Suggested solutions
The green indicator light goes out.	No input or output voltage.	Make sure the input voltage is normal.
Module over-temperature protection.	The fan is blocked.	Remove the objects that are hindering the operation of the fan
	Poor ventilation.	Remove the obstacles at the air duct opening
	Excessive environmental temperature.	Reduce the environmental temperature
Module bus voltage anomaly	The fan blades are damaged.	Replace the fan.
	PFC output overvoltage and undervoltage protection	Exchange the positions of the abnormal charging module and the normal charging module. If the abnormal charging module still fails to function properly, replace it with a new one.

Module input overvoltage	The input voltage for communication exceeds the normal range.	Ensure that the input voltage for communication is within the normal range.
Module communication interrupted	Module communication interrupted	Check the connection of the communication line
Module short-circuit fault	Short circuit Output	After removing the charging module, restart the device. If the malfunction continues to occur, replace the charging module.
Fan error	Fan failed	Replace the fan.

Table 8.2



Illustration: If the problem persists even after trouble shooting the charging module failure, please contact the relevant staff for technical support.

8.3 Check for EMS faults and troubleshoot

8.3.1 Check for system failures

Home screen → Exclamation  mark in the upper left corner → Enter the fault. information view screen. Click to clear the historical fault and only display the current fault information.

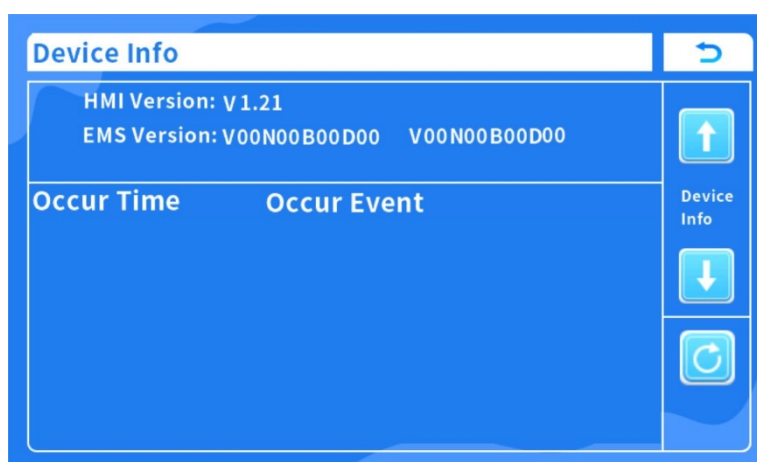


Figure 8.3.1 Equipment information

8.3.2 Refer to the table for fault information

Alarm or fault name	Fault code	Whether to turn off	Method of fault recovery	Measures to eliminate the fault
jerk	F115	shut down	Restore manually after manual site inspection	1.Check whether the emergency stop function is triggered; 2.Check whether the EMS dry contact is set in reverse; 3.After the above operation,if the fault still exists,contact the manufacturer for treatment.
Fire alarm	F104	shut down	Restore manually after manual site inspection	1.Check whether there is a fire on the site; 2.Whether the dry contact of EMS is reversed; 3.After the above operation,if the fault still exists,contact the manufacturer for treatment.
Fire alarm	F103	shut down	Restore manually after manual site inspection	1.Check whether there is a fire on the site; 2.Whether the dry contact of EMS is reversed; 3.After the above operation,if the fault still exists,contact the manufacturer for treatment;
Lightning protection alerts	F107	shut down	Restore manually after manual site inspection	1.Check whether the field equipment is struck by lightning; 2.Whether the dry contact of EMS is reversed; 3.After the above operation,if the fault still exists,contact the manufacturer for treatment;
Smoke alarms	F105	shut down	Restore manually after manual site inspection	1.Check whether there is a fire on the site; 2.Whether the dry contact of EMS is reversed; 3.After the above operation,if the fault still exists,contact the manufacturer for treatment;
Cabinet door alarm	F99	Don't turn off the computer	Self-recovery	1.Check whether the door is open; 2.Whether the dry contact of EMS is reversed; 3.After the above operation,if the fault still exists,contact the manufacturer for treatment;

Inverter faults	F1	shut down	Self-recovery	1.The module is powered down and waits for 1~2minutes before the module restarts; 2.After the above operation,if the fault still exists,contact the manufacturer for treatment.
N line abnormality	F2	shut down	Self-recovery	1.The module is powered down and waits for 1~2minutes before the module restarts; 2.After the above operation,if the fault still exists,contact the manufacturer for treatment.
Synchronous signal fault	F4	shut down	Self-recovery	1.Check whether the network cable between the two machines is connected properly; 2.Replace the network cable;
Relay failure	F5	shut down	Restore power	1.Power off the module,check whether the AC side relay is damaged or adhered; 2.After the above operation,if the fault still exists,contact the manufacturer for treatment.
Circuit breaker current limiting	F6	shut down	Self-recovery	1.The module is powered down and waits for 1-2 minutes before restarting; 2.After the above operation,if the fault still exists,contact the manufacturer for treatment.
The reverse transformer softens and fails	F7	shut down	Self-recovery	1.The module is powered down and waits for 1~2minutes before the module restarts; 2.After the above operation,if the fault still exists,contact the manufacturer for treatment.
AC short trouble	F8	shut down	Self-recovery	1.Check whether there is a short circuit between phases.
AC side overload protection	F9	shut down	Self-recovery	1.If the load is overloaded for a long time,check the load.
AC three-phase unbalanced overload protection	F10	shut down	Self-recovery	1.Check whether the load of each phase is too unbalanced.
Low off-grid output voltage	F11	shut down	Self-recovery	1.Check the load type; 2.Contact the manufacturer for treatment.
High off-grid frequency	F12	shut down	Self-recovery	1.Check the load type; 2.Contact the manufacturer for treatment.
Low off-grid frequency	F13	shut down	Self-recovery	1.Check the load type; 2.Contact the manufacturer for treatment.

Overload alarm is in progress	F14	Only alarm, not shutdown	Self-recovery	1.Check whether the load is too large.
Trip current limit alarm	F15	Only alarm, not shutdown	Self-recovery	1.Check whether the load is too large.
Machine quota limit sign	F16	Only alarm, not shutdown	Self-recovery	1.Check the PCS temperature; 2.Check whether the load is too large.
Bus imbalance	F17	shut down	Self-recovery	1.Power down the module,wait 1-2 minutes,and restart the module; 2.After the above operation,if the fault still exists,contact the manufacturer for treatment.
Bus overvoltage	F18	shut down	Self-recovery	1.Power down the module,wait 1-2 minutes,and restart the module; 2.After the above operation,if the fault still exists,contact the manufacturer for treatment.
Under-voltage at the bus	F19	shut down	Self-recovery	1.Power down the module,wait 1-2 minutes,and restart the module; 2.After the above operation,if the fault still exists,contact the manufacturer for treatment.
Motherboard hardware exception	F20	shut down	Self-recovery	1.Power down the module,wait 1-2 minutes,and restart the module; 2.After the above operation,if the fault still exists,contact the manufacturer for treatment.
Bus capacitor soft start process	F21	shut down	Self-recovery	1.Power down the module,wait 1-2 minutes,and restart the module; 2.After the above operation,if the fault still exists,contact the manufacturer for treatment.
DC input reversed	F22	shut down	Self-recovery	1.Check whether the positive and negative of DC input are reversed.
DC input overvoltage	F23	shut down	Self-recovery	1.Check whether the DC input voltage is overvoltage; 2.Power off and wait for 1 minute,then power on again.
DC input under-voltage	F24	shut down	Self-recovery	1.Check whether the DC input voltage is under voltage.
DC1 overcurrent	F25	shut down	Self-recovery	1.Check whether the discharge is excessive.

DC2 overcurrent	F26	shut down	Self-recovery	1.Check whether the current is too high during charging.
DC hardware overcurrent	F27	shut down	Self-recovery	1.Check whether the load is too large.
PV hardware overcurrent	F28	Only PV is closed	Self-recovery	1.The module is powered downand waits for 1~2minutes before the module restarts; 2.After the above operation,if the fault still exists,contact the manufacturer for treatment.
Unbalanced overcurrent	F29	shut down	Self-recovery	1.The module is powered downand waits for 1~2minutes before the module restarts; 2.After the above operation,if the fault still exists,contact the manufacturer for treatment.
IGBT overheating	F30	shut down	Self-recovery	1.The module is powered down and waits for 1~2minutes before the module restarts; 2.After the above operation,if the fault still exists,contact the manufacturer for treatment.
DC current imbalance	F31	shut down	Self-recovery	1.The module is powered down and waits for 1~2minutes before the module restarts; 2.After the above operation,if the fault still exists,contact the manufacturer for treatment.
DC contactor fault	F32	shut down	Restore power	1.The module is powered down and waits for 1~2minutes before the module restarts; 2.After the above operation,if the fault still exists,contact the manufacturer for treatment.
Low power grid frequency	F33	shut down	Self-recovery	1.Check whether the low frequency protection point of the power grid is set too high; 2.Check whether the time of low frequency protection point of the power grid is too short.
High power grid frequency	F34	shut down	Self-recovery	1. Check whether the high frequency protection point of the power grid is set too low; 2. Check whether the time of high frequency protection point of the power grid is too short;

Low grid voltage	F35	shut down	Self-recovery	1. Check whether the low voltage protection point is set too low; 2. Check whether the time of low-voltage protection point of the power grid is too short.
High grid voltage	F36	shut down	Self-recovery	1. Check whether the high voltage protection point of the power grid is set too low; 2. Check whether the time of high voltage protection point on the power grid is too short.
Grid reversal	F37	shut down	Self-recovery	1. Check whether the PCS AC input wiring is reversed;
Island malfunction	F40	shut down	Self-recovery	1. The module is powered down and waits for 1-2 minutes before the module restarts; 2. After the above operation, if the fault still exists, please contact the manufacturer for treatment.
Current overcurrent	F41	shut down	Self-recovery	1. The module is powered down and waits for 1-2 minutes before the module restarts; 2. After the above operation, if the fault still exists, please contact the manufacturer for treatment.
N line current overcurrent	F42	shut down	Self-recovery	1. The module is powered down and waits for 1-2 minutes before the module restarts; 2. After the above operation, if the fault still exists, please contact the manufacturer for treatment.
Inductive current overcurrent	F43	shut down	Self-recovery	1. The module is powered down and waits for 1-2 minutes before the module restarts; 2. After the above operation, if the fault still exists, please contact the manufacturer for treatment.
Low voltage traversal fault	F44	shut down	Self-recovery	1. The module is powered down and waits for 1-2 minutes before the module restarts; 2. After the above operation, if the fault still exists, please contact the manufacturer for treatment.
High voltage traversal fault	F45	shut down	Self-recovery	1. The module is powered down and waits for 1-2 minutes before the module restarts; 2. After the above operation, if the fault still exists, please contact the manufacturer for treatment.

Leakage current alarm	F47	Only alarm, not shutdown	Self-recovery	1. Check whether the leakage current protection point is set too low; 2. Check whether the time of leakage current protection point is too short;
Lightning protection faults	F49	shut down	Self-recovery	1. Check whether it is struck by lightning.
Fan alarms	F50	shut down	Self-recovery	1. Check whether the fan is damaged.
insulation fault	F51	Only alarm, not shutdown	Self-recovery	1. The module is powered down and waits for 1~2 minutes before the module restarts; 2. After the above operation, if the fault still exists, please contact the manufacturer for treatment.
Model error	F52	shut down	Self-recovery	1. In PCSVF mode, check whether there is voltage on the AC test.
Auxiliary power supply failure	F53	shut down	Self-recovery	1. Check whether the auxiliary power supply voltage is too low; 2. After the above operation, if the fault still exists, please contact the manufacturer for treatment.
COM communication board failure	F55	shut down	Self-recovery	1. The module is powered down and waits for 1~2 minutes before the module restarts; 2. After the above operation, if the fault still exists, please contact the manufacturer for treatment.
BMS out-of-order	F56	shut down	Self-recovery	1. Check for faults on the battery side.
Module overheating	F57	shut down	Self-recovery	1. The module is powered down and waits for 1~2 minutes before the module restarts; 2. After the above operation, if the fault still exists, please contact the manufacturer.
IGBT temperature anomaly	F58	shut down	Self-recovery	1. The module is powered down and waits for 1~2 minutes before the module restarts; 2. After the above operation, if the fault still exists, please contact the manufacturer for treatment.
External FLASH exception	F59	shut down	Self-recovery	1. The module is powered down and waits for 1~2 minutes before the module restarts; 2. After the above operation, if the fault still exists, please contact the manufacturer for treatment.

BMS communication alarms	F60	shut down	Self-recovery	1. Check the communication line between PCS and BMS; 2. Check whether the protocol selection of PCS is consistent with BMS.
Internal communication failure	F61	shut down	Self-recovery	1. Check whether the DSP and ARM are wired; 2. Whether DSP or ARM has no program.
MCAN unusual	F62	shut down	Self-recovery	1. Contact the manufacturer for treatment.
PCAN unusual	F63	shut down	Self-recovery	1. Contact the manufacturer for treatment.
PV 1 low voltage	F65	Only PV is closed	Self-recovery	1. Check whether the input voltage of PV 1 is below the input voltage range.
Low voltage photovoltaic 2	F66	Only PV is closed	Self-recovery	1. Check whether the pv2 input voltage is below the input voltage range.
PV 1 high voltage	F67	Only PV is closed	Self-recovery	1. Check whether the input voltage of PV 1 is higher than the input voltage range.
PV 2 high voltage	F68	Only PV is closed	Self-recovery	1. Check whether the pv2 input voltage is higher than the input voltage range.
Photovoltaic 1 input reverse	F69	Only PV is closed	Self-recovery	1. Check whether the positive and negative of photovoltaic input 1 are connected in reverse.
Photovoltaic 2 input reverse	F70	Only PV is closed	Self-recovery	1. Check whether the positive and negative of photovoltaic input 2 are connected in reverse;
PV1 overcurrent	F71	Only PV is closed	Self-recovery	1. Check whether PV current is overcurrent.
PV2 overcurrent	F72	Only PV is closed	Self-recovery	1. Check whether PV current is overcurrent.
Low frequency fault on the grid (or oil engine) side	F81	shut down	Self-recovery	1. Check whether the low frequency protection point is set too high; 2. Check whether the time of bypassing low frequency protection point is too short.
High frequency on the grid (or oil engine) side	F82	shut down	Self-recovery	1. Check whether the high frequency protection point is set too low; 2. Check whether the bypass high frequency protection point time is too short.
Low voltage on the grid (or oil engine) side	F83	shut down	Self-recovery	1. Check whether the bypass low voltage protection point is set too low; 2. Check whether the bypass low-voltage protection point time is too short.

High voltage on the grid (or oil engine) side	F84	shut down	Self-recovery	1. Check whether the bypass high voltage protection point is set too low; 2. Check whether the bypass high voltage protection point time is too short.
Grid (or oil engine) out of order	F87	shut down	Self-recovery	1. Check whether the phase sequence of the bypass is reversed.
Quick test fault of power grid (or oil engine)	F95	shut down	Self-recovery	1. Check the grid side wiring; 2. Contact the manufacturer for treatment.

Table 8.3.2 Fault Codes and Handling Measures

8.3.3 Operating Steps

Step 1: Power off and shut down the system

Step 2: Use the special tools and keys to open the system cabinet door.

Step 3: Before operation, ensure that the MPower S30/69 is completely de-energized and hang a "Do Not Close" warning tag.



Note : Use a multimeter to check if the equipment is still energized inside. Only proceed with the next step when the equipment is no longer powered.



Figure 8.3.3-2

Step 4: Open the cabinet door, release the snap fastener of the dust-proof cotton frame, remove the dust-proof cotton, and place the aluminum frame and the dust-proof cotton flat in the safe storage area.



Figure 8.3.3-3

Step 5: Use a high-pressure water gun to rinse the dust-proof cotton. If it gets too dirty, you can clean it with a cleaning agent.



Figure 8.3.3-4

Step 6: After the dust-proof cotton has been cleaned, place it in the aluminum dust-proof cotton frame, let it dry, and then fix it with the clips.

Step 7: Restart the machine

8.4 Warranty Services

8.4.1 Warranty Period

Provided that the product is used correctly, the warranty period shall be in accordance with the agreement stipulated in the business contract.

8.4.2 Warranty Scope

During the warranty period, the company will provide free repair or replacement for any malfunction caused by defects in the product itself. The customer shall allow a reasonable response time for the company to carry out repairs. Replaced products shall be disposed of by the company. The customer must present valid proof of purchase and ensure that the product trademark is clearly visible; otherwise, the company reserves the right to decline warranty coverage.

8.4.3 Disclaimer Statement

Under the following circumstances, the company shall have the right to decline warranty coverage but may still provide paid repair services.

1. The product has exceeded the warranty period.
2. Valid proof of purchase cannot be provided.
3. Damage caused during transportation or handling.
4. Damage resulting from improper installation, modification, or repairs performed by unauthorized personnel.
5. Damage caused by operation under abnormal conditions or in unsuitable environments.
6. Malfunction or damage resulting from the use of non-Naton components or software.
7. Failures caused by force majeure, such as fire, earthquake, or flood.

Appendix

Emergency Response Procedures for Energy Storage Systems

Battery Drop or Severe Impact

If obvious odor, damage, smoking, or fire is observed:

Immediately evacuate all personnel, call emergency services, and contact professional emergency responders.

Only trained personnel should attempt to extinguish the fire using appropriate firefighting equipment, while ensuring their own safety.

If no obvious deformation, damage, odor, smoking, or fire is observed:

Warehouse Scenario: Evacuate personnel. Using specialized mechanical tools, trained personnel must move the battery to an open, safe outdoor area. Contact a service engineer immediately. Monitor the battery for at least one hour, ensuring its temperature stabilizes within a range of $\pm 10^{\circ}\text{C}$ of ambient temperature, before proceeding with further handling.

Energy Storage System Site: Evacuate personnel and close the cabinet doors. Trained personnel must move the battery to a safe area. Contact a service engineer. The battery must be left untouched for at least one hour before any further assessment or handling is performed.

Flood Occurrence

Immediately power down the energy storage system, but **only** if it is absolutely safe to do so.

If any part of the battery has been submerged, **DO NOT TOUCH** the battery to avoid the risk of electric shock.

DO NOT continue to use batteries that have been submerged in water. Contact the designated recycling company for professional disposal in accordance with hazardous waste treatment procedures.

In Case of Fire



Warning:

Power down the system if it is safe to do so.

Use a carbon dioxide (CO_2), FM-200, or ABC dry chemical fire extinguisher to fight the fire. Firefighters must avoid contact with high-voltage components to prevent the risk of electric shock.

High battery temperatures may cause deformation, electrolyte leakage, and the release of toxic gases. Wear appropriate respiratory protection, keep a safe distance from the scene, and avoid skin exposure to prevent irritation and chemical burns.

When the audible and visual alarm is activated

DO NOT approach or open the equipment doors. Immediately evacuate the area.

If it is safe to do so, cut off the system power remotely.

In case of vent activation

On-site personnel protection: It is strictly forbidden to operate directly facing or in close proximity to the vent outlet to avoid injury from expelled high-temperature gases or materials.

Post-incident maintenance: A service engineer must be contacted to conduct a comprehensive inspection and professional assessment of the system.

In the Event of Fire Suppressant Discharge or Fire

Instructions for Operations and Maintenance Personnel:

Evacuate Immediately and Alert: Evacuate the area immediately and call the emergency services. Provide information such as the battery type, system capacity, and location layout.

Do Not Re-enter and Isolate the Area: Do not re-enter the fire zone or open the energy storage system cabinet doors. Isolate the scene and maintain a watch.

Remotely Power Down Safely: Power down the system remotely, but **only** if you can do so safely.

Provide Product Information: Provide the firefighters with detailed product information and the user manual.

Leave Handling to Professionals After the Fire: After the fire is extinguished, only trained professionals may handle the system. **DO NOT OPEN** the cabinet doors under any circumstances.

Contact Service Engineer: Contact a service engineer for a comprehensive system assessment and subsequent maintenance.

Instructions for Firefighters:

Refer to Provided Information: Refer to the product information provided by the operations personnel for context.

Do Not Open Doors Until Safe: Do not open the energy storage system cabinet doors before ensuring it is safe to do so.

Control and Contain the Fire: Employ control measures to extinguish the fire and prevent it from spreading to adjacent energy storage cabinets.



User Manual

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