

BSL NEW ENERGY TECHNOLOGY CO., LTD

User Manual

ESS-BATT 157C

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Identification Explanation

	Please read the endorsed documentation carefully
	Danger. Risk of electric shock!
	Transportation Safety Certification
	Flammability risk
	Keep the battery away from open flame or ignition sources.
	Recycling
	When the user maintains and repairs， disconnect the power and wait five minutes before working to prevent a stored charge
	This marking indicates that this product should not be disposed with other household wastes

Version History

Version	date	Version update history	Approval
V1.0	19/11/2026	First edition	

Catalogue

01 Safety Instruction 1

1.1 Safety Symbol Description 1
1.2 General Security 1
1.3 Electrical Safety 2
1.3.1 Wiring requirements 2
1.3.2 Grounding requirements 3
1.3.3 Maintenance requirements 3
1.4 Mechanical Safety 4
1.5 Battery Safety 4
1.6 Maintenance and Replacement 6

02 Product Introduction 7

2.1 Product Overview 7
2.2 Model Description 7
2.3 Product Functions 7
2.4 Product Appearance 9
2.5 Product Parameter 9
2.6.1 Battery Cabinet 10
2.6.2 Battery pack 11
2.6.3 High-voltage control box 12
2.6.4 Temperature control system 13
2.6.5 Thermal runaway suppression system 14
2.6.6 Pressure Relief System 16

03 Transportation and Storage 17

3.1 Packaging and Storage 17
3.1.1 Product packaging 17
3.1.2 Product storage 18
3.2 Transportation and Handling 18
3.2.1 Product Transportation 18
3.2.2 Product handling 19

04 Product Installation 20

4.1 Installation Environment 20
4.2 Space Requirements 21
4.3 Foundation Requirements 22
4.4 Preparation Before Installation 23
4.5 Mechanical Installation 25
4.6 Electrical Installation 26
4.6.1 External Connections of Battery Cabinet 27
4.7 Post - Installation Inspection 28

05 Startup and Debugging 29
5.1 Check Before Power On 29
5.2 Check Before Starting 29
5.3 Boot Steps 30
5.4 Communication Debugging 30
06 Product Maintenance 33
6.1 Battery System Maintenance 33
6.2 Cleaning 34
6.2.1 Preparation before cleaning 34
6.2.2 Cleaning and maintenance 35
6.3 Warranty Service 35
6.3.1 Warranty Period 35
6.3.2 Warranty Scope 35
6.3.3 Disclaimer 36
Appendix 37
Emergency handling measures for energy storage systems: 37
Emergency handling for air-conditioning refrigerant leakage 37

01 Safety Instruction

1.1 Safety Symbol Description

When installing, operating and maintaining the equipment, please read this manual first and follow all safety precautions marked 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 following symbols carefully.

 **DANGER:** Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.

 **WARNING:** Indicates a situation with a moderately hazardous situation which, if not avoided, could result in death or serious injury.

 **CAUTION:** Indicates a situation with a low risk of hazard which, if not avoided, may result in moderate or minor injury.

 **NOTICE:** Emphasis and supplementation of content may also provide tips for optimal use of the product.

1.2 General Security

 **Illustration:**

This equipment should be used in an environment that meets the design specifications. Otherwise, it may cause equipment failure. The resulting equipment malfunction or component damage, personal safety accidents, property losses, etc. are not within the scope of equipment quality assurance.Local laws, regulations and specifications should be followed when installing, operating and maintaining the equipment. The safety precautions in the manual are only used as a supplement to local laws, regulations and specifications. The company does not assume responsibility for any of the following situations.

1.The installation and use environment exceeds the requirements of relevant international, national and regional standards.

2.Operation not within the conditions of use described in this manual.

3.Unauthorized disassembly, modification of products or modification of software codes.

4.Failure to follow the operating instructions and safety warnings in the product and documentation.

5.Equipment damage caused by abnormal natural environment (Force majeure, such as earthquake, fire, storm, flood, mudslide, etc.).

6.Damage caused by the customer's failure to comply with transportation and installation requirements.

7.Damage caused by storage conditions not meeting the requirements of product documentation.
8.Damage to the hardware or data of the device due to customer negligence, improper operation or intentional damage .
9.System damage caused by a third party or customer , including relocation and installation of the system that does not comply with the requirements of this manual, and damage caused by adjustments, changes or removal of identification marks that do not comply with the requirements of this manual.
10.Defects, failures or damages caused by acts, events, omissions or accidents beyond the reasonable control of the Seller, including power outages or electrical failures, theft, war, riots, civil unrest, terrorism, intentional or malicious damage, etc.

Danger:

The equipment has high voltage. Improper operation may cause electric shock or fire, resulting in death, serious personal injury or serious property loss. Please follow the operation sequence and safety precautions given in this manual and other related documents and operate in accordance with the regulations:
1. Please check whether the pre-installed cables are connected and tightened. Check whether the device is damaged, such as holes, dents, or other signs of possible internal damage. Check that the internal components of the device are not displaced. It is forbidden to change the structure and installation sequence of the device without authorization.
2. It is forbidden to use water to clean the electrical parts inside the equipment. If liquid is found to have entered the equipment, please press the emergency stop switch immediately and notify the on-site management personnel.
3. It is forbidden to install, connect, maintain and replace with power on. Before touching any conductor surface or terminal, measure the voltage at the contact point and confirm that the protective ground wire of the equipment or the part to be repaired is reliably grounded and there is no risk of electric shock.
4. Except for the personnel who operate the equipment, other personnel are not allowed to approach the equipment. Do not power on the equipment before the equipment is installed or confirmed by professionals. When powering on for the first time or operating the main circuit with power on, at least two personnel must be present on site.

Illustration:

1. The user's operating behaviors and operating tools during transportation, handling, installation, wiring and maintenance must comply with the laws, regulations and relevant standards of the country and region where the user is located.
2. It is prohibited to reverse engineer, decompile, disassemble, adapt, implant or perform other derivative operations on the device software. It is not allowed to study the internal implementation of the device, obtain the source code of the device software, steal intellectual property rights, etc. in any way, and it is not allowed to disclose the results of any device software performance test.

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 bundled together, and cables of different types should be laid separately. They should not be entangled or crossed.
2.When the wiring is completed or you leave for a short time during the wiring process, you need to immediately seal the cable opening and close the cabinet door to prevent small animals from entering.
3.The cables used in the energy storage system must be firmly connected, well insulated, and meet the specifications. The cable conduit or wire hole must be protected to prevent the cables 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 to securely fix the cables. The cables in the backfill area must be ensured to fit tightly to the ground to prevent deformation or damage caused by the force applied when backfilling the soil.
5.Using cables in high temperature environments may cause aging and damage of the insulation layer. The distance between the cables and the heating device or the periphery of the heat source area should be at least 30mm.
6.To ensure construction safety, all cables should be laid and installed above 0℃. When moving cables, especially when working in low temperature environments, they should be handled with care.

1.3.2 Grounding requirements

1.It is forbidden to 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 connection of the equipment should be checked to ensure that the equipment is reliably grounded.
2.The grounding impedance of the equipment meets the national standard GB - 50054 and local electrical standards.
3.It is forbidden to operate the equipment without installing the grounding conductor. When installing equipment that needs to be grounded, the protective ground wire must be installed first; when dismantling the equipment, the protective ground wire must be removed last.

1.3.3 Maintenance requirements

1.Before connecting or removing cables, the protection switch of the corresponding circuit must be turned off.
2.Use a multimeter of the corresponding voltage level to check whether it is energized and ensure that the equipment is completely powered off.
3.If there is a charged object nearby, please use an insulating board or insulating tape to cover or wrap it.
4.Use the grounding wire to reliably connect the circuit to be inspected to the grounding circuit before performing operation and maintenance.

 **Illustration:**

1.Before connecting cables, make sure the cable labels are correct.

2.If the device has multiple inputs, all inputs of the device should be disconnected and the device can be operated only after it is completely powered off.
3.After the inspection is completed, remove the grounding wire between the inspection circuit and the grounding circuit.

1.4 Mechanical Safety

Notice:

1.When transporting without wooden boxes, the bottom panel must be removed. Handle with care during take-off and landing 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 transportation or inversion or tilting is prohibited.
3.When transporting equipment, the large size of the equipment may block the operator's view, so auxiliary personnel need to be arranged to assist.
4.To ensure the safety of drilling outside the equipment, a suitable location should be selected before drilling to ensure that there will be no short circuit or other effects. The equipment should be shielded during the drilling process to prevent debris from falling into the equipment, and the debris should be cleaned up in time after drilling.
5.When moving equipment by hand, you should be prepared to bear the weight and wear protective gloves, anti-smash shoes and other safety protection equipment.
6.Move the equipment carefully during transportation to avoid collision or drop. Avoid scratching the surface of the equipment and damaging parts or cables.

1.5 Battery Safety

Illustration:

The company is not responsible for damage to the batteries provided by the company caused by the following reasons:
1.The customer fails to charge or inspect the battery in time, resulting in overdue storage, capacity loss or irreversible damage.
2.Mechanical damage, leakage, rupture, etc. caused by falling due to improper operation or failure to connect the battery as required.
3.The customer or third party changes the battery usage scenario without informing the company, including but not limited to: connecting additional loads to the battery, mixing with other brands of batteries, mixing with batteries of different rated capacities, etc.
4.Direct damage to the battery caused by the on-site equipment operating environment or external power parameters not meeting the environmental requirements for normal operation, including the actual operating temperature of the battery being too high or too low, the grid being in bad condition and frequent power outages, etc.
5.The customer fails to correctly set the battery operation management parameters or improperly maintains the battery, resulting in frequent over-discharge of the battery, on-site capacity expansion by the customer, or the battery cannot be fully charged for a long time.
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: failing to regularly check whether the battery terminal screws are tightened.

7.The battery is stolen or lost.
8.Batteries that have exceeded the warranty period.

Danger :

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

Warning:

1.Batteries must be stored in a separate warehouse and in outer packaging. Avoid mixing with other materials, avoid open-air storage, and avoid stacking batteries too high. Firefighting facilities that meet the requirements must be available on site, such as fire sand, fire extinguishers, etc.
2.Avoid impact on the battery. When transporting the battery, it should be carried in the direction required by the battery. It is forbidden to invert or tilt it.
3.Please use the battery within the temperature range specified in this manual. When the battery ambient temperature is lower than the lower limit of the operating temperature, charging is prohibited to avoid crystallization due to low temperature charging and causing internal short circuit of the battery.
4.Please dispose of used batteries in accordance with local laws and regulations. Do not treat batteries as household waste.
5.If the battery is not recharged for more than 8 months, it is necessary to recharge the battery. Failure to do so may affect the performance and service life of the battery.

Battery Abnormality Handling Measures

Danger:

1.When electrolyte leakage or abnormal odor occurs, avoid contact with leaking liquid or gas. Non-professionals should not approach, please contact professionals immediately.
2.The electrolyte is corrosive and contact may cause skin irritation and chemical burns. If you come into contact with battery electrolyte, you need to immediately wash the contact area with plenty of water and soap and seek medical help immediately.
3.After the battery has fallen (regardless of whether it is packed with materials or not), it is prohibited to continue to use it. If there is no obvious deformation or damage on the

appearance and no obvious odor, smoke or fire, transport the battery to an open and safe place and let it stand for 1 hour before processing, and contact our service engineer.
4.If the battery drops and there is an obvious odor, damage, smoke, or fire, people should be evacuated immediately and the police should be called in time. Professionals should use fire-fighting facilities to extinguish the fire while ensuring safety.

1.6 Maintenance and Replacement

Warning:

1.Contact your dealer immediately if the device fails.
2.Do not power on the device before troubleshooting.
3.Keep unauthorized personnel away during maintenance. Erect temporary warning signs or fencing to secure the area.
4.Unauthorized personnel must not open the cabinet door. Risk of electric shock. Faults caused by unauthorized access will void the warranty.
5.It is forbidden to open the cabinet door in rain, snow, thunder and lightning, dust, fog and other weather conditions.
6.Before removing the components from the cabinet, please make sure that other components on the cabinet are not loose.
7.All operators, maintenance staff and qualified technicians must be properly trained in safe usage and equipment maintenance. Operations should only be conducted with sufficient safety precautions and while wearing appropriate PPE.
8.During equipment maintenance, nearby live parts should be covered with insulating materials.
9.Before the fan is powered off and stops rotating, do not allow any objects to touch the running fan(such as fingers, parts, bolts, etc.).
10.The equipment must not be re-energized until all faults have been completely resolved. Premature power restoration may lead to fault escalation or equipment damage.
11.When inspecting the system with power on, pay attention to the danger signs on the equipment and avoid standing at the cabinet door.
12.After the power components of the energy storage system are replaced or the wiring is changed, manual wiring detection is required to avoid abnormal system operation.
13.When replacing batteries, you must install the exact same type of battery module. Mixing different module types is prohibited.
14.Upon completion of maintenance operations, immediate inspection shall be conducted to verify no tools or components remain inside the equipment.
15.After completing maintenance and replacement operations, the cabinet door should be locked in time and the key should be properly kept.

02 Product Introduction

2.1 Product Overview

The Cubicon Lite series consists of one high-voltage box and 205Ah battery packs. Each battery group contains 16 battery cells connected in series, and the rated capacity of these battery cells is 205Ah. The high-voltage box is equipped with a battery cluster management unit and a series of protection and control electrical components, whose main function is to manage and protect the operating status of the entire battery cluster.
The DC battery cabinet adopts a modular battery compartment design, making the installation and maintenance process more convenient. In addition, the DC battery cabinet can be combined with an adapted inverter to form a complete energy storage system. This design not only improves the flexibility of the system, but also facilitates expansion and application.

2.2 Model Description

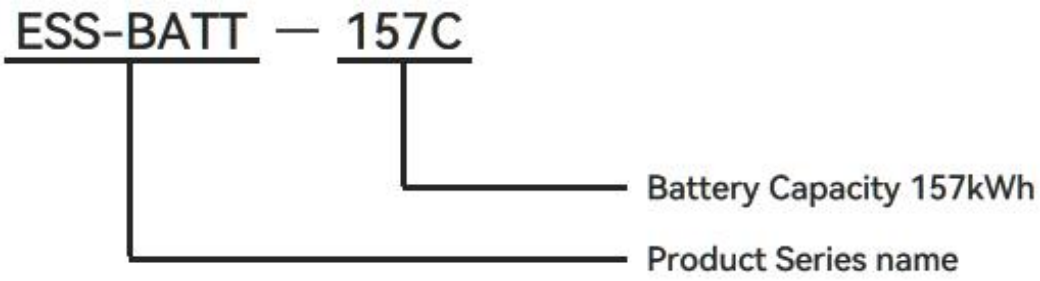


Figure 2.2

Notice:

The adapter inverter, DC photovoltaic cabinet, energy storage converter cabinet, etc. are optional components. The rated output power and battery capacity can be flexibly configured according to project requirements.

2.3 Product Functions

The DC battery cabinet integrates battery pack, high-voltage box, battery management system (BMS), power distribution system, environmental control system, fire control system and other electrical protection components. The design of the battery cabinet adopts a modular concept, which allows it to be flexibly matched with other components and facilitates future expansion. In addition, the DC battery cabinet adopts front maintenance, which can reduce the floor space and maintenance channels. It has the characteristics of safety, reliability, rapid deployment, low cost, high energy efficiency and intelligent management.
In common application scenarios, the battery system matching strategy is as follows:
1.External inverter : When the charging demand of the DC battery cabinet is detected , the inverter starts to convert the DC voltage suitable for battery charging and charges the

battery ; when the load power is supplied , the inverter transmits the converted AC power to the grid or directly supplies AC loads such as households and businesses.

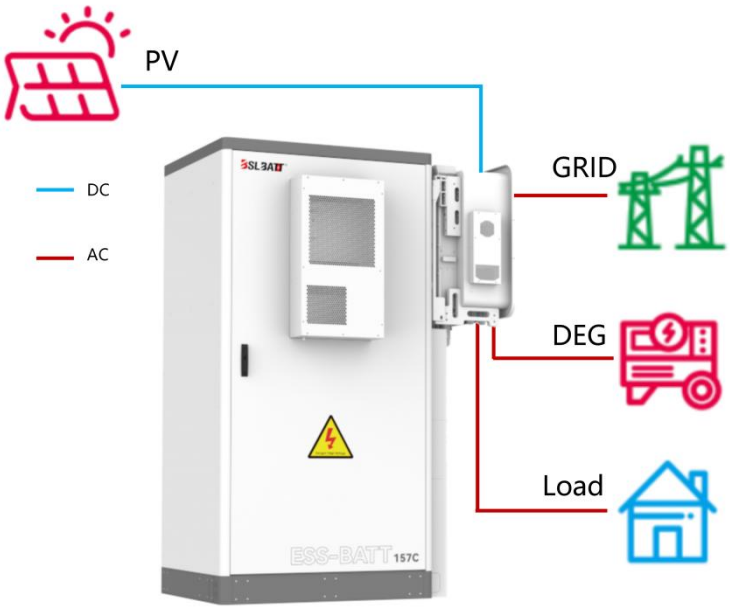


Figure 2.3-1

Notice:

1.The actual parameters are set according to customer requirements before leaving the factory.

2.External energy storage converter cabinet + Photovoltaic DC cabinet : The photovoltaic DC cabinet collects and optimizes photovoltaic power, the DC battery cabinet stores power, and the energy storage converter cabinet is responsible for the conversion and regulation of power, realizing the intelligent flow and optimized management of power between the power grid, load and energy storage equipment. The combination of the three together constitutes an efficient photovoltaic energy storage system.

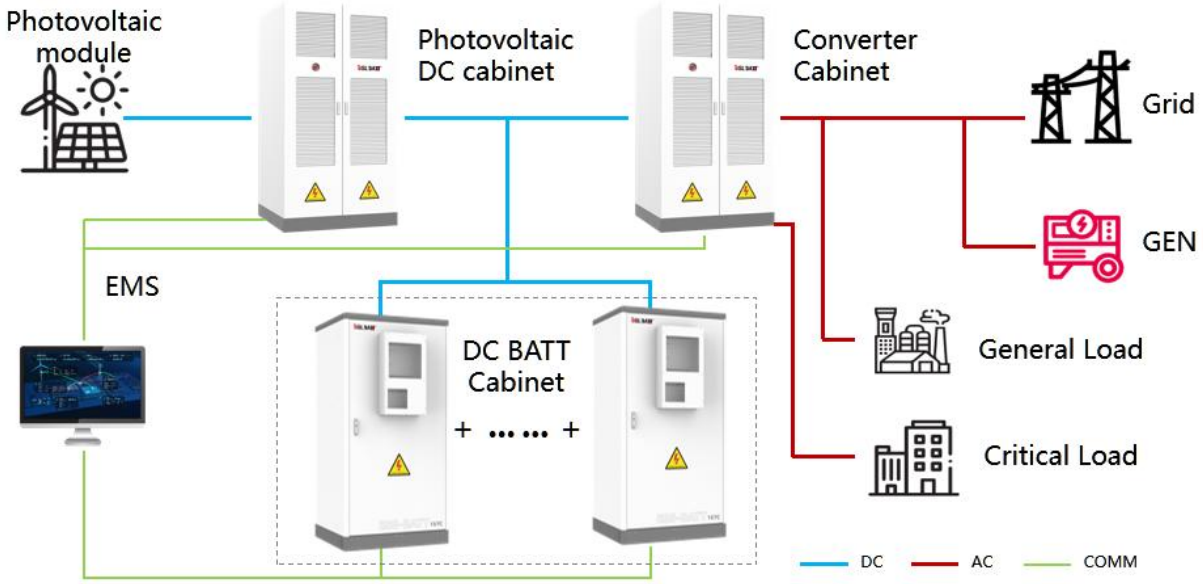


Figure 2.3-2

Notice: The actual parameters are set according to customer requirements before leaving the factory.

2.4 Product Appearance

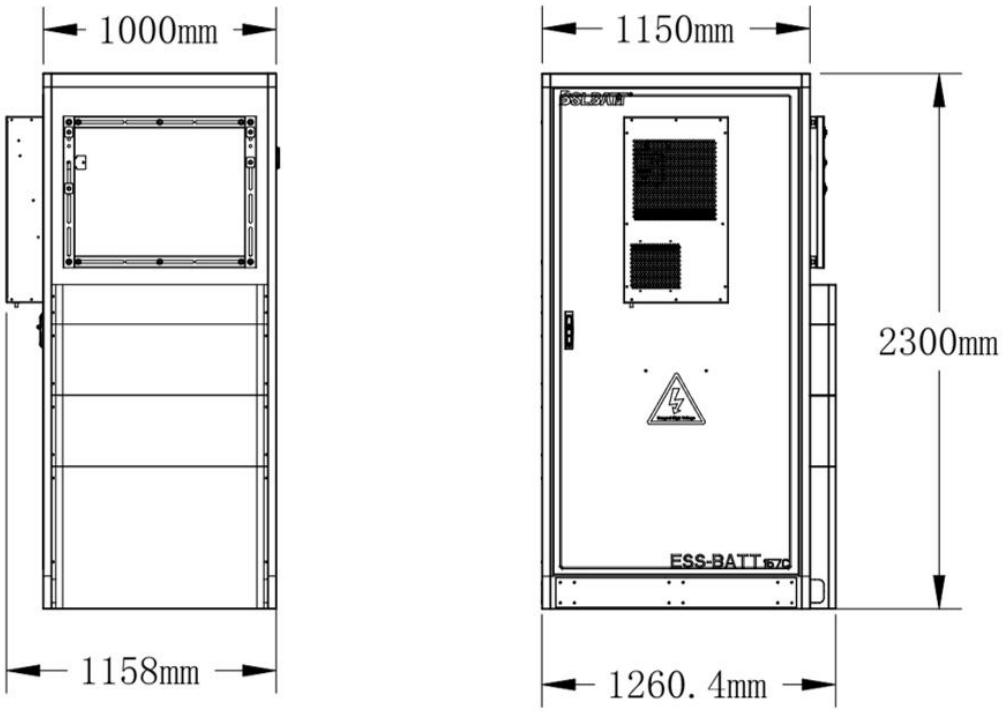


Figure 2.4

2.5 Product Parameter

Model	ESS-BATT Cubicon Lite	
Battery Pack		
Cell Type	Lithium Iron Phosphate (LFP)	
Cell capacity	205Ah	
Combination Method	1P16S	
Rated Voltage	51.2V	
Rated Capacity	205A	
Rated Energy	10.49kWh	
Max. Charge/Discharge Rate	≤1C	
Dimensions(W*H*D,mm)	470*674*227(±5)	
Weight	85kg±1%	
Battery Cluster		
Battery Model	ESS-BATT 146C Lite	ESS-BATT 157C Lite
Number of Battery Packs	14	15
System Rated Capacity	205Ah	
System Rated Voltage	716.8V	768.0V
Operating Voltage Range	627.2V ~ 795.2V	672.2V ~ 852.0V
System Rated Power	146.9kWh	157.4kWh
Rated Charge/Discharge Current	105.5A (25±2°C)	
Rated Charge/Discharge Power	73.5kW (0.5P. 25±2°C)	78.7kW (0.5P. 25±2°C)
Max. Charge/Discharge Current	200A (25±2°C)	

Environmental & Operational		
Operating Temperature	-20℃~55℃	
Humidity Range	10% ~ 90% RH (No Condensation)	
Storage Temperature	0℃~35℃	
Altitude Limit	≤3000m	
Installation Environment	Outdoor	
Cooling Mode	Industrial-grade air conditioning	
Firefighting	Hot-air aerosol	
Communication Protocol	CAN/ModBus	
Protection Level	IP55	
Dimensions (W*D*H,mm)	1150*1172*2300 mm (±5)	
Weight	1765kg±3%	1850kg±3%

Table 2.5-1

Notice: The actual parameters are set according to customer requirements before leaving the factory.

2.6 Component Introduction

2.6.1 Battery Cabinet

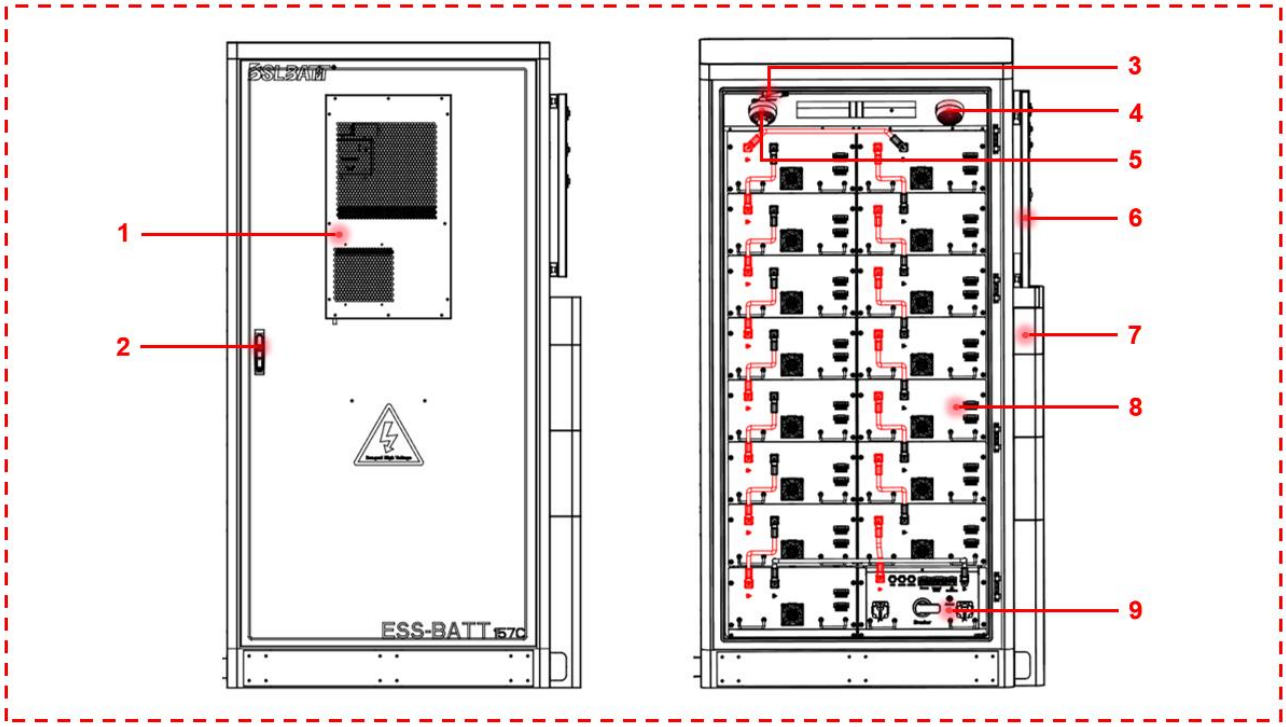


Figure 2.6.1

Notice:

The DC battery cabinet supports external inverters and capacity expansion. The external inverter is required to be of an appropriate model. If the battery capacity is to be expanded, the number of battery cabinets needs to be increased.

NO.	Model name	Descriptions
1	Air conditioner	Supporting cooling, heating and dehumidification functions
2	Door handle	Switch cabinet door
3	Limit switch	Detect the status of the door
4	Smoke detector	Detect the smoke concentration inside the cabinet
5	Temperature detector	Detect the ambient temperature inside the cabinet
6	Inverter bracket	Used for the external suspension inverter
7	Door panel guard plate	-
8	Battery pack	1P16S-51.2V battery pack
9	High-voltage control box	Control the operation of the battery system and ensure safety isolation

Table 2.6.1

2.6.2 Battery pack

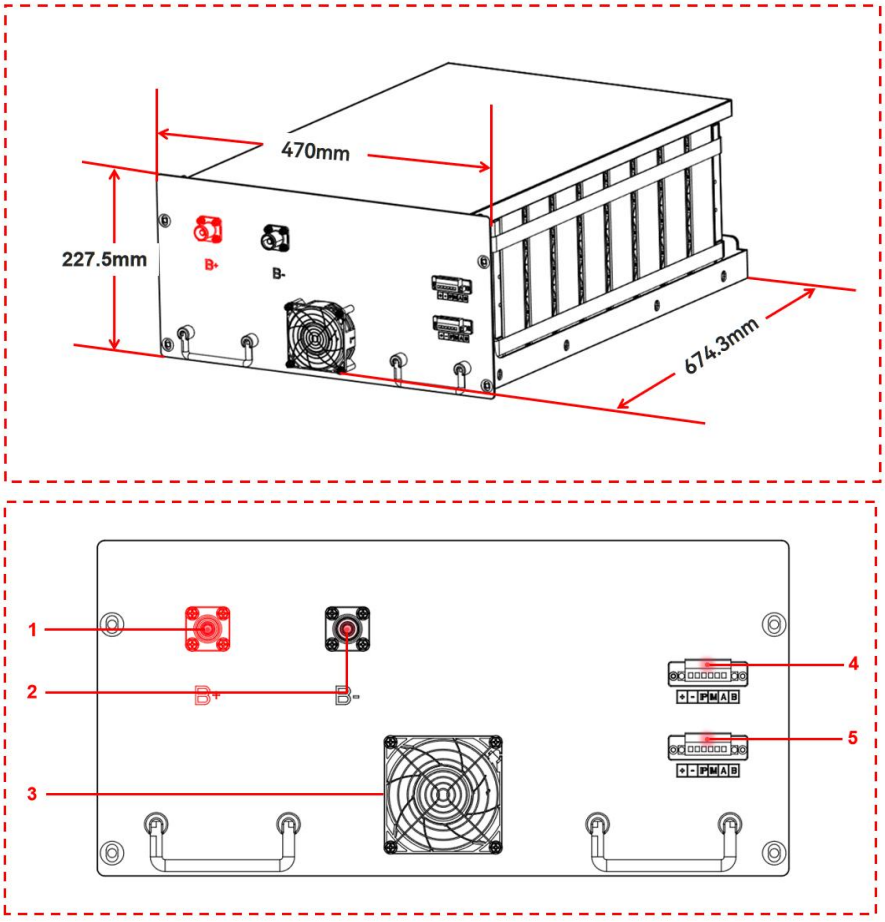


Figure 2.6.2

NO.	Model name	Descriptions
1	B+	Battery positive interface
2	B-	Battery negative interface
3	FAN	Cooling fan
4	Parallel input	Used for BMU communication information collection
5	Parallel output	Used for BMU communication information collection

Table 2.6.2

2.6.3 High-voltage control box

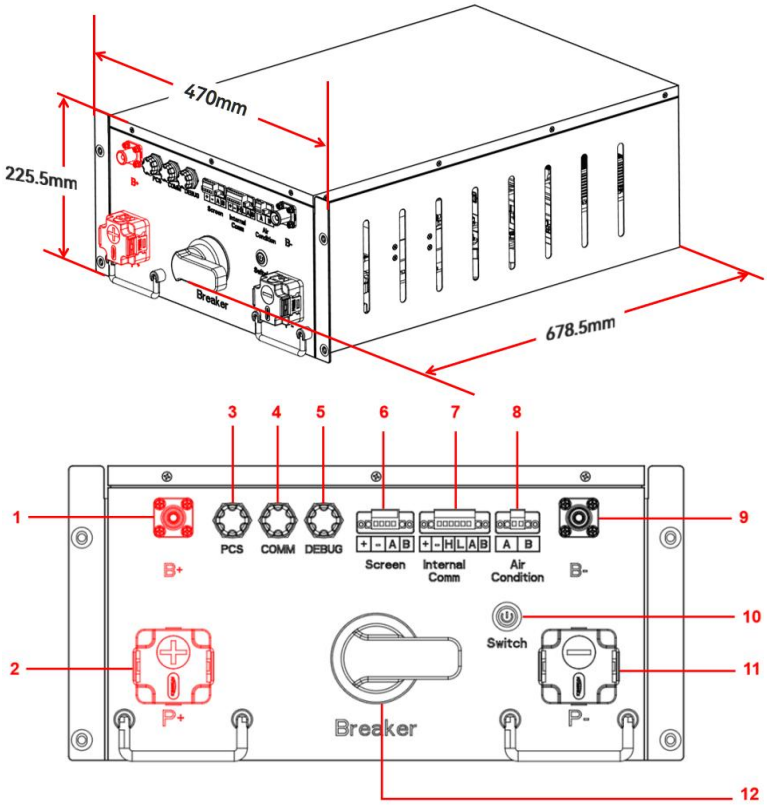


Figure 2.6.3

NO.	Model name	Descriptions
1	Battery positive connection port	Connect the positive terminal
2	System positive output port	Connect the external positive DC cable, which can be connected to the positive terminal of the inverter.
3	PCS communication port	PCS communication connection
4	Upper system communication port	Address confirmation for parallel connection with another battery system
5	Debugging communication port	communicating with the computer,

		monitoring and upgrading the battery.
6	24V power output	External power supply or communication interface for the display screen
7	Battery contact	Battery pack communication master control,connecting to each battery pack to check status.
8	Air conditioning communication port	RS485 communication
9	Battery negative connection port	Connect the negative terminal
10	Switch	Control the "on/off" of the low-voltage circuit in the battery system
11	System negative output port	Connect the external negative DC cable, which can be connected to the negative terminal of the inverter.
12	Isolating circuit breaker	Control the on and off of the high-voltage circuit of the battery.

Table 2.6.3

2.6.4 Temperature control system

Industrial air conditioners

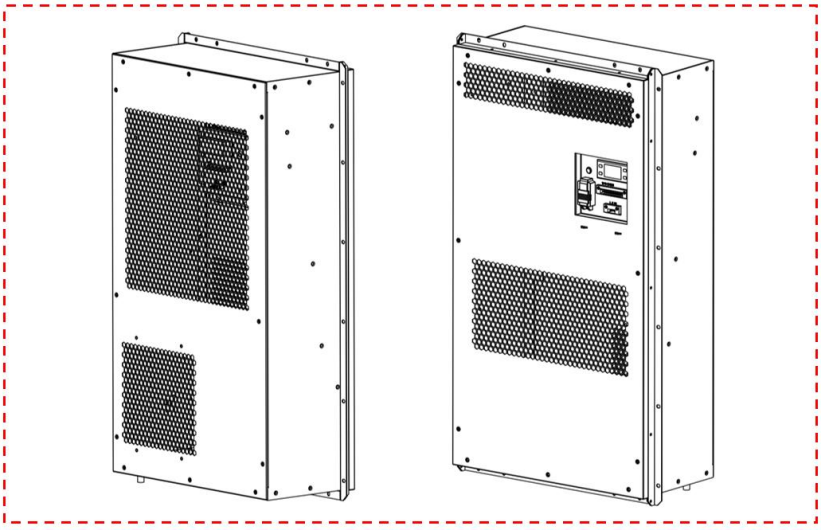


Figure 2.6.4

Product Name	Industrial air conditioners
Mounting Method	Semi-embedded Mounting
Power Supply	220VAC±15% 50Hz/60Hz

Cooling Capacity	2000W@L35/L35
Power Consumption	870W@L35/L35
Working Temperature Range	-40℃ ~ +55℃
IP Grade	IP55
Net Weight	38kg
Refrigerant	R134a
Heater	standard(1000W)

Table 2.6.4

2.6.5 Thermal runaway suppression system

Smoke sensor & temperature sensor



Figure 2.6.5-1

Technical Specifications of Temperature&Smoke Detector	
Operation voltage	9~28V DC
Operation current	Static current<60uA
Alarm current	10mA≤I≤50mA
indicator	Flashes during monitoring and stays on constantly when alarming.
Operating temperature	-10℃~+55℃
Relative humidity	<95%RH(Without condensation)
Smoke sensitivity	0.4dB/m
Alarm temperature level	A2R

Table 2.6.5-1

Fire protection system

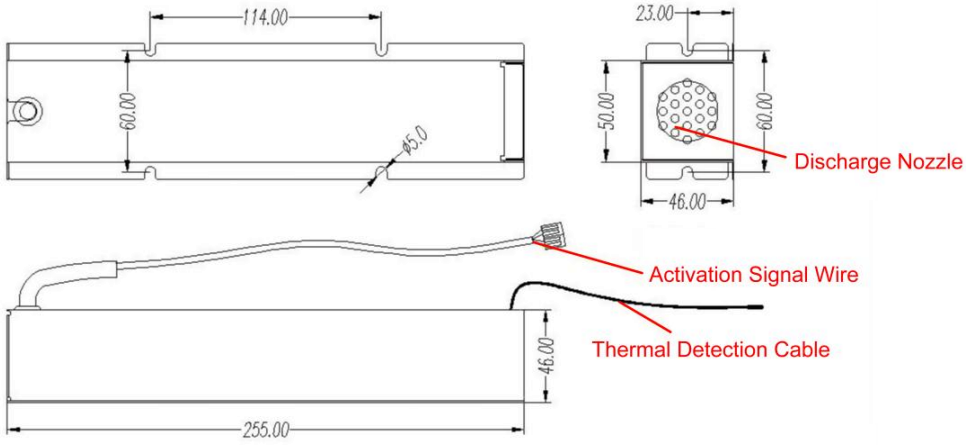


Figure2.6.5-2

Fire equipment parameter table	
Service life	10 years
Startup method	hot start and electric start
Cold Cranking Temperature	160℃→180℃
Ambient Operating Temperature	-50℃→+90℃
Mandatory Safety Clearance	≤ 3 m^3
Total Aerosol Emission Mass	300g ± 2%
Spray delay time	≤5s
Nozzle temperature	5mm away from the nozzle≤200℃
Passive switch feedback signal	normally open in standby mode, normally closed after startup (starts after exceeding 80℃)
Equipment weight	860g

Table 2.6.5-2

2.6.6 Pressure Relief System

Pressure Relief Valve

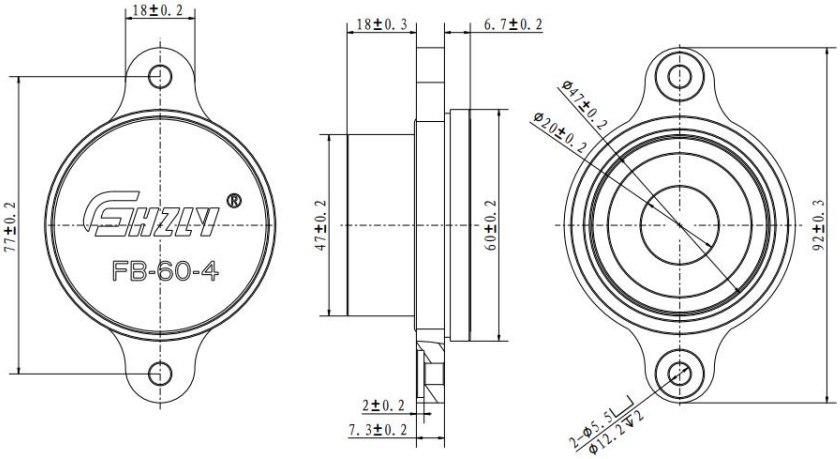


Figure 2.6.6

Pressure Relief System Technical Parameter	
IP Protection Rating	IP68
Air Permeability Rate	>900ml/min(air pressure 1.5kPa)
Burst Pressure	4 ± 1kPa
Environmental Compliance	Rohs2.0
Flame Retardant Class	UL94-VO
Temperature Resistance	300g ± 2%
Discharge Lag Time	-40℃~125℃

Table 2.6.6

Notice:

1.The system maintains equilibrium between internal and external pressure differentials under standard operating conditions. This pressure-balancing architecture prevents hermetic seal integrity failure caused by environmental variations.

2.During battery module abnormal states , the integrated venting mechanism achieves rapid depressurization.

03 Transportation and Storage

3.1 Packaging and Storage

3.1.1 Product packaging

In order to keep the product in a better protective state during transportation, it is packed in a specific wooden box. The equipment packaging has the following basic parameters (including but not limited to), which need to be carefully checked according to project requirements:

Parameter	Illustration
model	Product Model
size	Product packaging size
weight	Total weight of product after packaging
Logo	Face up, place with care, center of gravity, etc.

Table 3.1.1

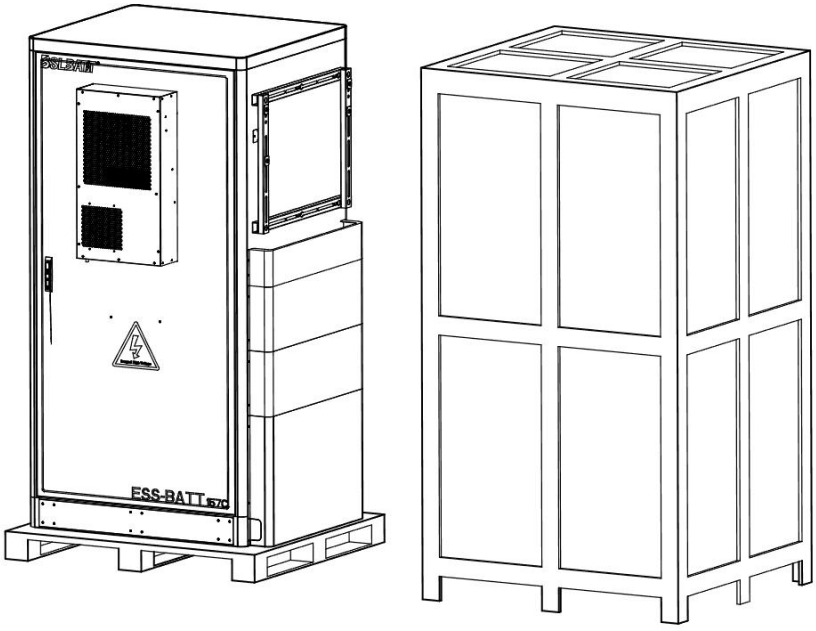


Figure 3.1.1

Notice:

The actual parameters are set according to customer requirements before leaving the factory.

3.1.2 Product storage

If the product is not transported or installed for use immediately, it must be stored indoors in a location that meets the following conditions:

Parameter	Require
Storage temperature (without battery)	-25℃~+60℃
Battery	20℃ ~ 30℃
Storage relative humidity	≤90%(no condensation)
altitude	≤2000m

Table 3.1.2-1

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%	6 months
30%≦SOC<50%	4 months
5%≦SOC<30%	20 days
SOC<5%	48h

Table 3.1.2-2

Notice:

1.Batteries must be stored in a dry, well-ventilated, and clean indoor environment, away from direct sunlight, moisture, radiation, corrosive substances, metal dust, heat sources, or open flames.

2.If any battery exhibits abnormalities (e.g. carbonization, electrolyte leakage, swelling, or water ingress), immediately isolate it in a designated hazardous storage area with a minimum 3-meter clearance from combustibles and dispose of it promptly.

3.During storage, batteries should be segregated from other equipment, and the area must be equipped with certified firefighting tools (e.g. fire extinguishers and sand buckets).

4.For optimal performance, batteries should be used without prolonged storage; otherwise, periodic replenishment charging is required to prevent irreversible damage.

3.2 Transportation and Handling

3.2.1 Product Transportation

1.In order to keep the equip ment in a better protective state, it is recommended to transport it with packaging;

2.Equipment transportation must be carried out according to the requirements marked on

the packaging to prevent personal injury and equipment damage;

3.Railway and air transportation are not recommended for energy storage batteries. Speed limit requirements for land transportation: 80km/h on flat roads and 60km/h on rugged roads. If there is a conflict, please follow local traffic regulations.

3.2.2 Product handling

1.When using a forklift to move the equipment, make sure the forklift has sufficient load capacity and make sure the center of gravity of the equipment falls between the forklift's feet to prevent personal injury and equipment damage;

2.For transportation with batteries, the forklift load-bearing capacity needs to be ≥ 3t; for transportation without batteries, the forklift load-bearing capacity needs to be ≥1.5t;

3.The recommended fork and knife length is ≥ 1.5m, width 80cm~160cm, and thickness is 25mm~70mm.

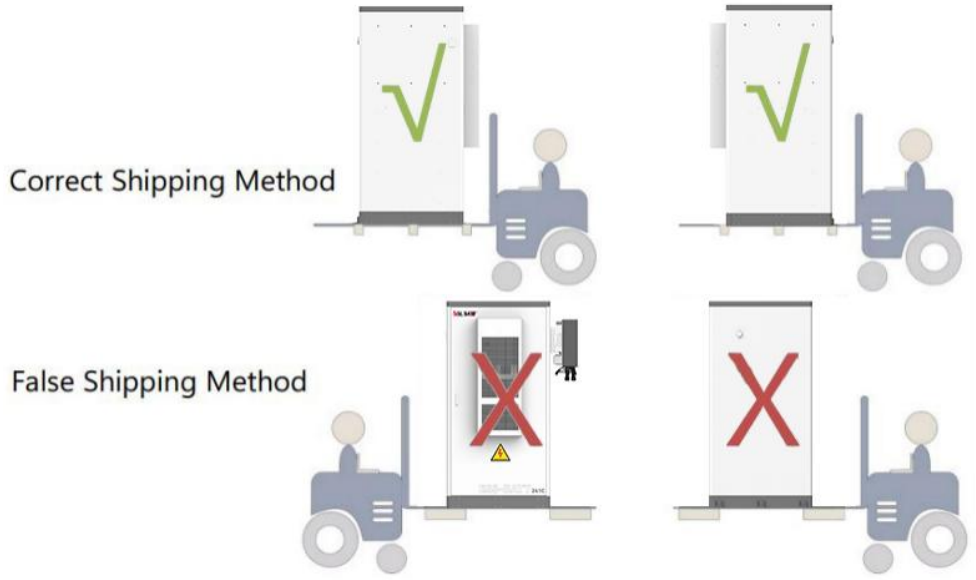


Figure 3.2.2

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.

04 Product Installation

4.1 Installation Environment

The installation layout of the energy storage system must meet the fire protection distance or firewall requirements specified by local standards, including but not limited to " *GB 51048-2014 Design Specifications for Electrochemical Energy Storage Stations* " and "*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, not indoor layout. The general requirements for site selection are as follows:

1.The installation location should be higher than the highest historical water level in the area. The distance to the airport, landfill, river bank or dam should be ≥2km.

2.Choose a well-ventilated place. When the equipment is running, do not block the vents and cooling system to prevent high temperature fire. There should be enough installation space to ensure that surrounding equipment will not be affected by the heat generated by the product; the installation location should ensure that there is enough space for external wiring. It should have convenient transportation conditions and reliable fire suppression system equipment.

3.The installation location should be far away from fire sources, and flammable and explosive items 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 under the equipment needs to be hardened to prevent weeds from growing.

4.Do not install the energy storage system outdoors in salt-damaged areas to prevent equipment corrosion and fire. Salt-damaged areas refer to areas within 2 km from the coast or affected by sea breeze.

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 loss.

6.The equipment should be installed in an area away from liquids. It should not be installed below water pipes, air outlets, or other locations where condensation water is likely to form. It should not be installed below air conditioning outlets, vents, computer room outlet windows, or other locations that are prone to water leakage to prevent liquid from entering the interior and causing a short circuit in the equipment.

Illustration:

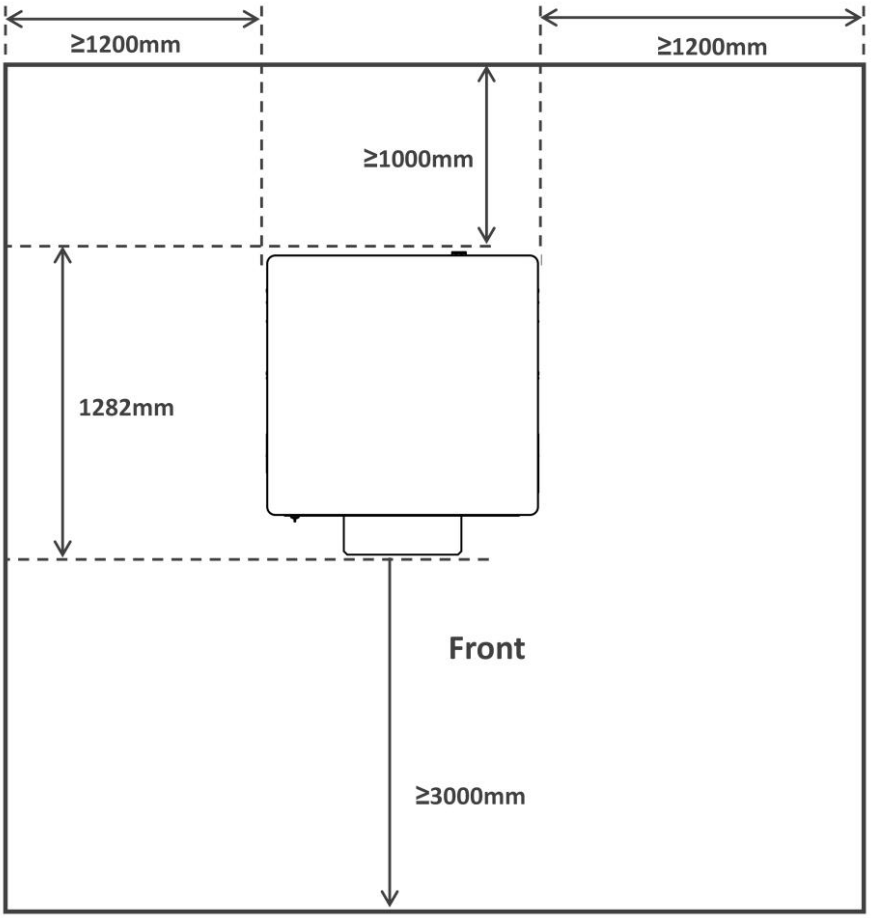
When the safety distance of the selected site cannot meet the requirements of relevant national standards, it is recommended to re-select the site. The site selection should avoid scenarios that are not recommended by industry standards and regulations, including but not limited to the following areas,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

1. Areas with strong vibration, strong noise sources and strong electromagnetic field interference.

2. Places that generate or have dust, oil smoke, harmful gases, corrosive gases, etc.
3. Places where corrosive, flammable, or explosive items are produced or stored. Areas subject to explosion hazard.
4. Places with existing underground facilities: crowded places, high-rise buildings, underground buildings.
5. Unfavorable geological conditions such as rubber soil, soft soil layers, and ground that is prone to water accumulation and sinking.
6. Within the boundaries of mining subsidence (dislocation) areas. Areas that may be flooded after the dam or embankment fails.
7. Earthquake faults and earthquake zones with a fortification intensity higher than 9 degrees. Areas with direct hazards such as debris flows, landslides, quicksand, and karst caves.
8. Important water supply source sanitary protection areas.
9. Historical relics and historic sites protection areas.

If there is no more suitable site, it is recommended to install a fire wall with a fire resistance of not less than 3h for safety protection, while considering the space requirements for equipment transportation, installation, maintenance, etc. It is recommended to refer to T/*CEC 373-2020*. The length and height of the fire wall should exceed the outer contour of the energy storage cabinet by 1m each.

4.2 Space Requirements



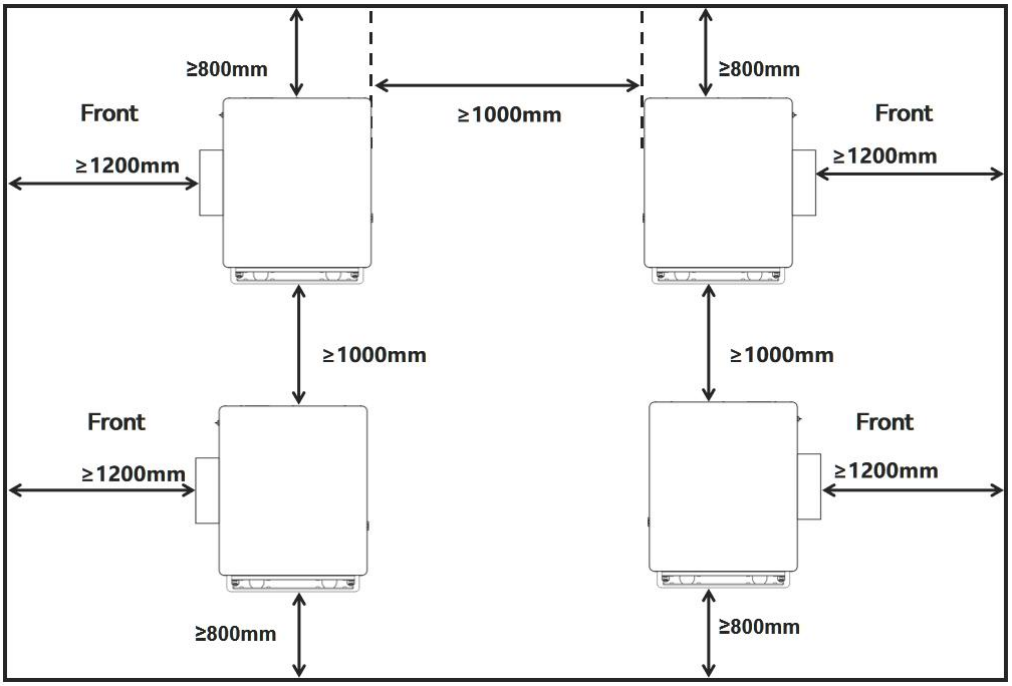


Figure 4.2

Illustration:

The layout design refers to the requirements of *GB 51048-2014* Code for Design of Electrochemical Energy Storage Power Station. Safety clearance settings shall comply with local implementation standards.

4.3 Foundation Requirements

Foundation Reference Diagram

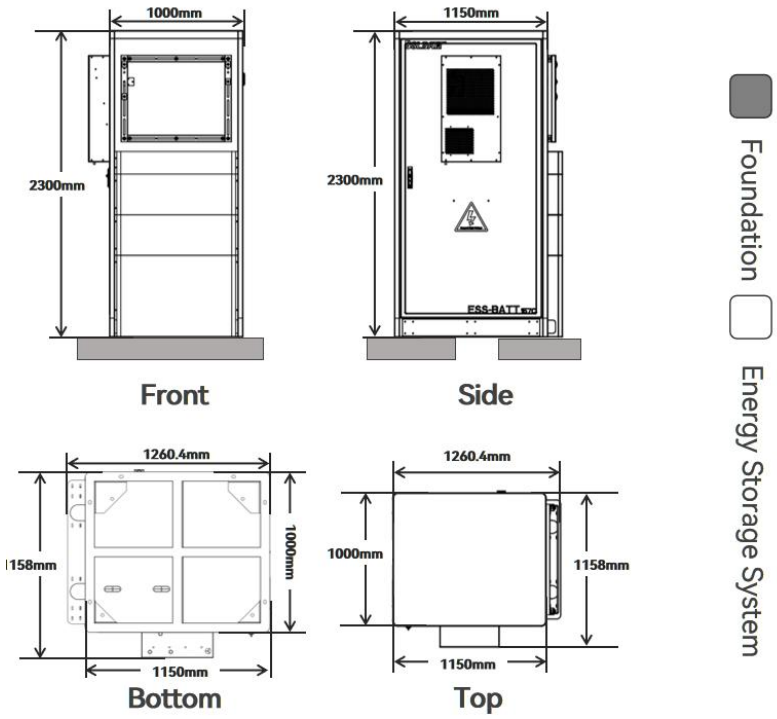


Figure 4.3

Illustration: For reference only - Not for construction

Foundation Design Requirements:

1. The foundation elevation must exceed the local historical highest water level by at least 300mm above ground level;
2. Drainage facilities shall be constructed according to local geological conditions and municipal drainage requirements to prevent water accumulation. The foundation must meet drainage capacity for local historical maximum rainfall, with discharged water treated in compliance with local regulations;
3. The energy storage system must be installed on concrete or other non-combustible surfaces. The installation plane shall be level, solid, flat, and with sufficient load-bearing capacity. Depressions or inclinations are strictly prohibited;
4. Foundation design must account for total equipment weight. If bearing capacity is insufficient, reinforcement is required. The foundation pit bottom must be compacted and leveled. Excavated foundations must not be water-soaked or disturbed; if occurring, continued excavation and backfilling replacement are mandatory;
5. Cable routing provisions (trenches or entry conduits) must be incorporated during foundation construction. All reserved openings and bottom cable entries shall be properly sealed;

Illustration: All on-site foundation surveys, designs, and construction plans must be executed and verified by qualified design institutes or certified professionals in strict compliance with local regulations, industry standards, and actual engineering conditions.

4.4 Preparation Before Installation

1. Before installing the product, check whether the product is intact. If any damage is found, please keep the evidence and contact the equipment manufacturer.
2. If you are sure that there is no abnormality with the product, please check according to the delivery list to see whether the accessories are complete.
3. Users are required to prepare relevant installation tools before installation.

NO.	Inspection items	Treatment measures
1	Check whether the fasteners are tightened.	If it is loose, tighten the screws again
2	Whether the space environment meets the installation size requirements.	If there is insufficient space, it is recommended to redesign and install
3	Check whether the air duct is unobstructed and free of foreign matter.	If there is any foreign matter,please clean it up. If it is not smooth, eliminate the cause

Table 4.4-1

NO.	Name	Quantity	Remark
1	DC battery cabinet	1 set	Including cabinet key

2	User Manual	1 copy
3	Product Test report	1 copy
4	Quality Control Report	1 copy
5	Packing List	1 copy

Table 4.4-2

NO.	Tool Name	legend
1	Insulating gloves	
2	Protective glasses	
3	Insulated shoes	
4	Work clothes	
5	Helmet	
6	Screwdriver	
7	Wire strippers	
8	Hydraulic pliers	
9	Heat Gun	
10	Multimeter	
11	Torque wrench	
12	Marking pen	

Table 4.4-3

Illustration: This table is for reference only. Actual construction must comply with local installation standards.

4.5 Mechanical Installation

The first step is to make sure that the product is normal and all accessories are complete, and then refer to the following suggestions for mechanical installation:

1. Select the equipment installation location in advance according to the product size, and do a good job of positioning and fixing.
2. Refer to the product weight and select an installation location that has sufficient load-bearing strength;
3. The grounding point is reliable and the grounding resistance is guaranteed to be less than 4Ω.

The second step is to remove the bottom panel of the equipment after removing the wooden box. Keep the removed panel and screws away and reinstall them after the equipment is in place.

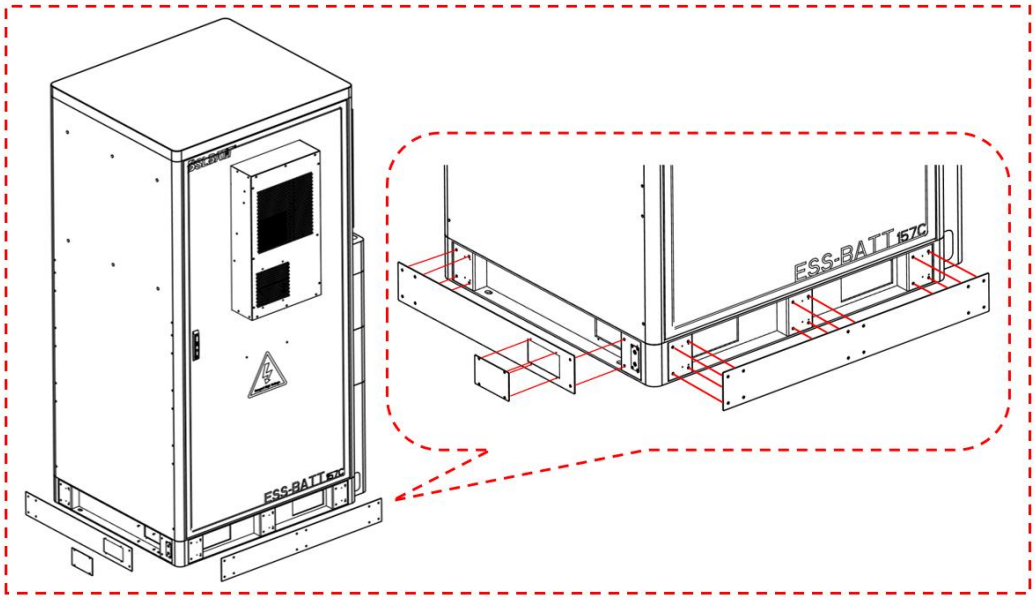


Figure 4.5-2

The third step is to use a forklift to place the equipment on the foundation, align the equipment fixing holes with the embedded nuts on the foundation, and tighten them with M16X40 bolts.

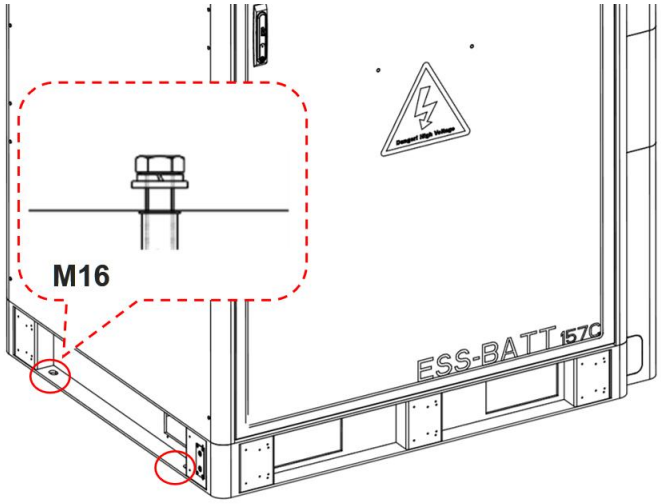


Figure 4.5-3

4.6 Electrical Installation

The cubicon lite series cabinet adopts modular design, and the internal wiring is pre-completed. During on-site installation, you only need to connect the output port of the battery system and the electrical cable for external communication. According to the product power and cable specifications, a wiring reference is provided as shown in Table 4.6-1.The selection of cable diameter should comply with local cable standards. Factors affecting cable selection include: rated current, cable type, laying method, ambient temperature and maximum acceptable line loss.

Cable Diameter Comparison Table

Model capacity	AC cable	Neutral	Ground	Positive and negative DC input (female)
50kW	≥3*35mm²	≥35mm²	≥25mm²	≥2*50mm2
100kW	≥3*70mm²	≥70mm²	≥50mm²	≥2*50mm2
125kW	≥3*95mm²	≥95mm²	≥70mm²	≥2*50mm2

Table 4.6-1

Danger:

When performing electrical installation, you can refer to the following suggestions for electrical installation:

1. Before wiring, check that all switches in the equipment are in the off state and ensure that the equipment is not powered;
2. Disconnect the power grid switch before wiring to ensure that the cables are not energized;
3. Make sure the phase sequence of the cables is correct. You can add yellow, green, red, and black insulation sheaths or logos to distinguish them to prevent incorrect phase sequence.
4. The connection between the cable terminal and the copper busbar needs to be tightened, and the screw length should be moderate to avoid affecting insulation and tightening;
5. Lay communication cables and power cables separately as much as possible, and ensure that the insulation layer of the cables is not damaged during the laying process;
6. The grounding cable must be reliably connected to the grounding copper busbar, and the cable cross-sectional area must meet the design requirements;
7. All AC cables must enter the device through the inlet and outlet holes at the bottom of the device and then be connected to the corresponding phase sequence;
8. After wiring is completed, use fireproof mud to seal the wiring gaps to prevent external insects and rodents from entering and damaging equipment or cables.

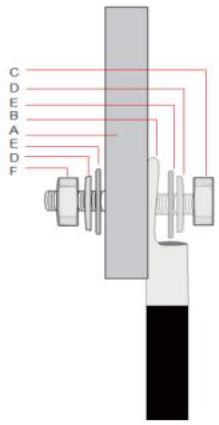
In order to prevent the terminal from loosening due to force, causing poor contact, increased contact resistance, and heat generation, etc., it is necessary to ensure that the

bolts tightening the terminal meet the torque requirements listed in Table 4.6-2:

Screw size	M4	M5	M6	M8	M10	M12	M14	M16
Torque (N*m)	1.8~2.4	4~4.8	7~8	22~29	44~58	76~102	121~162	189~252

Table 4.6-2

The installation diagram of the terminals and fixing screws used for system power cable wiring is as follows:



NO.	Name
A	Busbar
B	Terminal Block
C	Screw
D	Spring Washer
E	Flat Washer
F	Nut

Figure 4.6

Notice:

1.When using copper core cables or copper clad aluminum cables, please use copper terminal blocks.

2.When using aluminum alloy cables, please use copper-aluminum transition terminals, or aluminum terminals with copper-aluminum transition gaskets.

4.6.1 External Connections of Battery Cabinet

Illustration: When you receive the product, the corresponding battery cables have already been installed. The steps for connecting the external cables are shown in the following diagram.

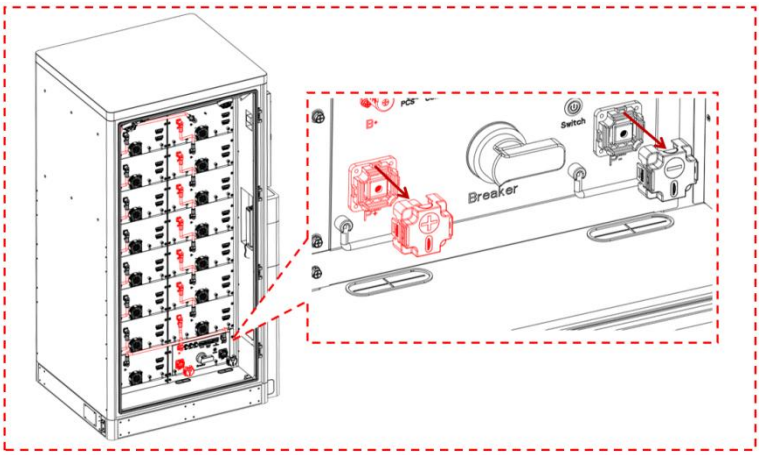


Figure 4.6.1-1

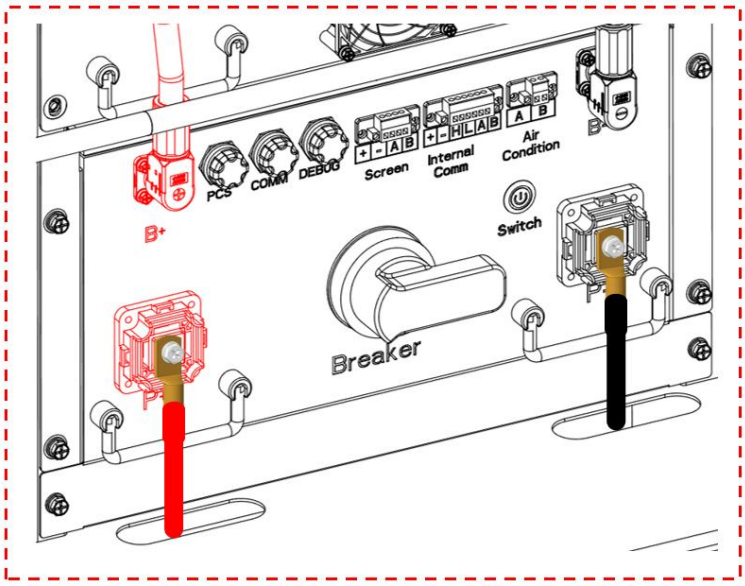


Figure 4.6.1-2

4.7 Post - Installation Inspection

Safety Checklist

NO.	Inspection items
1	Before measuring, disconnect the battery side and electrical side switches to ensure that the energy storage device is not energized.
2	The positive and negative poles of the battery and energy storage device are connected correctly and the AC phase sequence is correct and has been tightened. Measure the resistance between the three phases, which should be in the megohm level. If it is Kilo level or less, check the circuit.
3	The external control cables, grounding cables, and communication cables are fastened.
4	The grounding wire resistance is less than 4Ω, and the cable is intact without damage or cracks.
5	Clean the installation area and make sure no tools or foreign objects are left in the installation area.
6	Use fireproof mud to seal the gaps between cables to prevent small animals from entering.

Table 4.7

05 Startup and Debugging

5.1 Check Before Power On

1. Check whether the high-voltage box isolation switch in the DC battery cabinet is in the disconnected state;
2. Check whether the power cables in series between the battery packs and between the battery packs and the high-voltage box are connected reliably;
3. Check whether the connection terminals of all communication and power supply cables are connected reliably;
4. Check whether the communication, power supply harness and power cables on the high-voltage box panel are connected correctly;
5. Check all communication connections in the DC battery cabinet for problems.

5.2 Check Before Starting

Before operating the product, please ensure that the product has been installed in accordance with the specifications and conduct a comprehensive and detailed inspection of the machine to ensure that allindicators meet the requirements before starting the machine.

1) Appearance inspection:

a. The appearance of the equipment is intact, without damage, rust or paint peeling. If there is paint peeling, please repaint it;

b. Equipment labels must be clearly visible and damaged labels must be replaced in a timely manner.

2) Grounding check:

The box has a grounding point and is grounded securely; the grounding conductor inside the box is reliably connected to the grounding copper busbar of the box.

3) Cable inspection:

a. The cable protective layer is intact and has no obvious damage;

b. The terminal is manufactured in accordance with the specifications and the connection is firm and reliable;

c. The labels on both ends of each cable should be clear and unambiguous. The wiring should comply with the principle of separation of strong and weak electricity. A margin should be left at the bends and the cables should not be tightened.

d. The cable installation bolts have been tightened and the cables are not loose when pulled; the cable holes have been sealed.

4) Copper busbar inspection;

The copper busbar has no obvious cracks or deformation, the screws at the overlap are tightened, the markings are not misplaced, and there is no debris on the copper busbar.

5) Component inspection:

The circuit breakers are in the open position; the lightning arrester indicator is green.

Notice:

For transportation safety, we disconnect one section of the battery module DC cable, and the entire battery cluster is in an open circuit state. The DC cable needs to be connected before powering on. Please Notice that you need to wear insulating gloves when operating. When you hear a "click" sound when inserting the connector, it means it is in place.

5.3 Boot Steps

The startup process of the 157C DC battery cabinet is as follows:

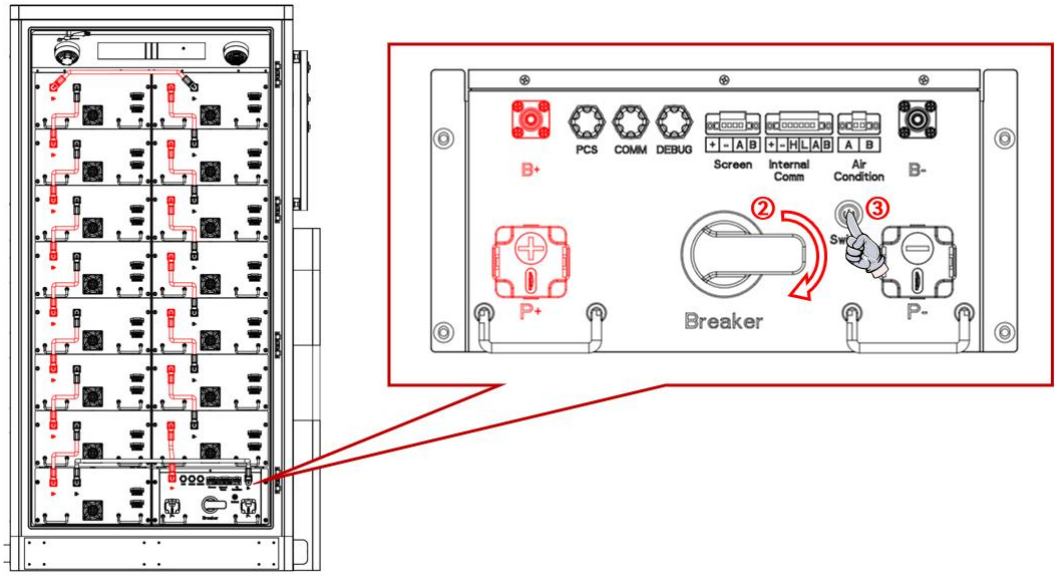


Figure 5.3

1. Use a multimeter to confirm that there is no voltage in the battery system

2. When using an external inverter, the DC output of the battery system should be connected to the battery port of the inverter, and the communication connection between the battery system and the inverter should be confirmed. When used in conjunction with an energy storage inverter cabinet and a photovoltaic DC cabinet, the DC output of the battery system needs to be connected to the battery port of the energy storage inverter cabinet, and the communication between the battery system, energy storage inverter cabinet and photovoltaic DC cabinet should be unimpeded.

3. Refer to Figure 5.3, close the high-voltage box isolating switch (rotate to the ON position), and press the "Switch" start switch on the high-voltage box.

Notice:

The integrated display and control screen is an optional accessory. Its configuration will be determined based on the specific needs of the project, and the actual delivery situation will be the final basis.

5.4 Communication Debugging

Battery Parameter Reading via Debug Port.

Notice:

Ensure the host computer software used is compatible with the battery system and updated to the latest version;

1. Connect to the "DEBUG" port in the battery system to avoid incorrect port connections.



CAN Serial port communication device

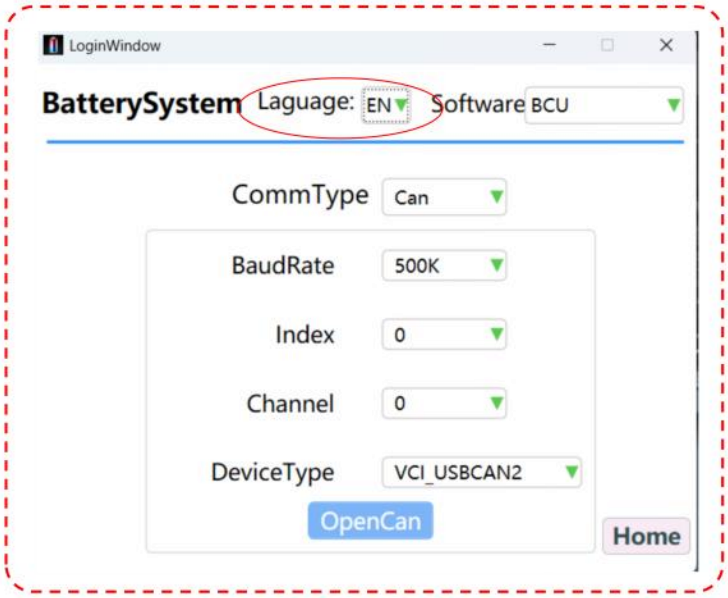




Figure 5.4

Illustration : After connecting the host computer to the battery system, users can monitor and extract a series of data covering battery status such as SOC (State of Charge percentage), SOH (State of Health percentage), including the system's total voltage, individual cell voltages, total current, as well as charging and discharging current data. At the same time,

users can also obtain the temperature of individual cells and the overall battery, along with usage history such as charge-discharge cycle count, cumulative charge and discharge amounts. Battery safety information, including fault codes and insulation status, is also available for query. In addition, users can access detailed system configuration information and perform device upgrades and debugging operations.

Notice: Under normal circumstances, no debugging port connection is required. For special requirements, please contact our company to obtain the host computer software.

06 Product Maintenance

6.1 Battery System Maintenance

On the battery system, operators must follow the following safety steps:
1.Disconnect the isolation switch on the high-voltage box panel and make sure it is in the OFF state.
2.Check the fire-fighting facilities to ensure they are in normal working condition.
After completing the maintenance and inspection work, the operator should ensure that:
1.The isolating switch is in the ON state.
2.Fire-fighting facilities continue to maintain normal working condition.
The cubicon lite series battery cabinet has a high level of protection and is suitable for outdoor environments. However, long-term operation in harsh environments may cause battery aging or internal equipment damage. To extend the service life and improve equipment performance, it is recommended to regularly perform the following maintenance checks on the DC battery cabinet : Replace aged or damaged parts. And due to factors such as ambient temperature, humidity, dust, vibration, and aging of internal components, there may be potential problems in the system during operation. To ensure the long-term and stable operation of the battery system, maintenance personnel should conduct regular inspections in accordance with the provisions of Table 5.1 to promptly detect and handle problems. The specific maintenance cycle recommendations are as follows:
1. For systems installed in areas with severe dust, high salt fog or heavy industrial parks, it is recommended to perform maintenance once a month.

2. In areas with good climate, it is recommended that the energy storage system be maintained every 3 months.

Battery System Maintenance Table

NO.	Maintenance steps	Reference Standards
1	Check the appearance of the	No obvious coating peeling, scratches or rust; no
2	Check cabinet vents	No dust accumulation in the ventilation openings
3	Check the cabinet door lock	The door lock is not damaged
4	Checking air conditioner noise	The fan and compressor rotate normally without
5	Clean air conditioning filter	The filter surface is clean and not clogged
6	Check the appearance of fire	No obvious coating peeling, scratches or rust
7	Check the fire protection	The wiring is firm and there is no breakage
8	Check the temperature and	The wiring is firm and there is no breakage
9	Check the access control travel	The wiring is firm and there is no breakage

10	Check the high voltage box	The panel surface is clean and free of blockage
11	Check the contact surface of	No corrosion, discoloration, or dust accumulation
12	Check battery module noise	The fan rotates without lag or abnormal noise
13	Check the battery Module	The connection line is not loose or falling off
14	Check the contact surface of	No corrosion, discoloration, or dust accumulation

Table 6.1

Notice:

The above maintenance operations are routine maintenance measures. If you encounter special circumstances not listed, please contact our production company in time.

6.2 Cleaning

6.2.1 Preparation before cleaning

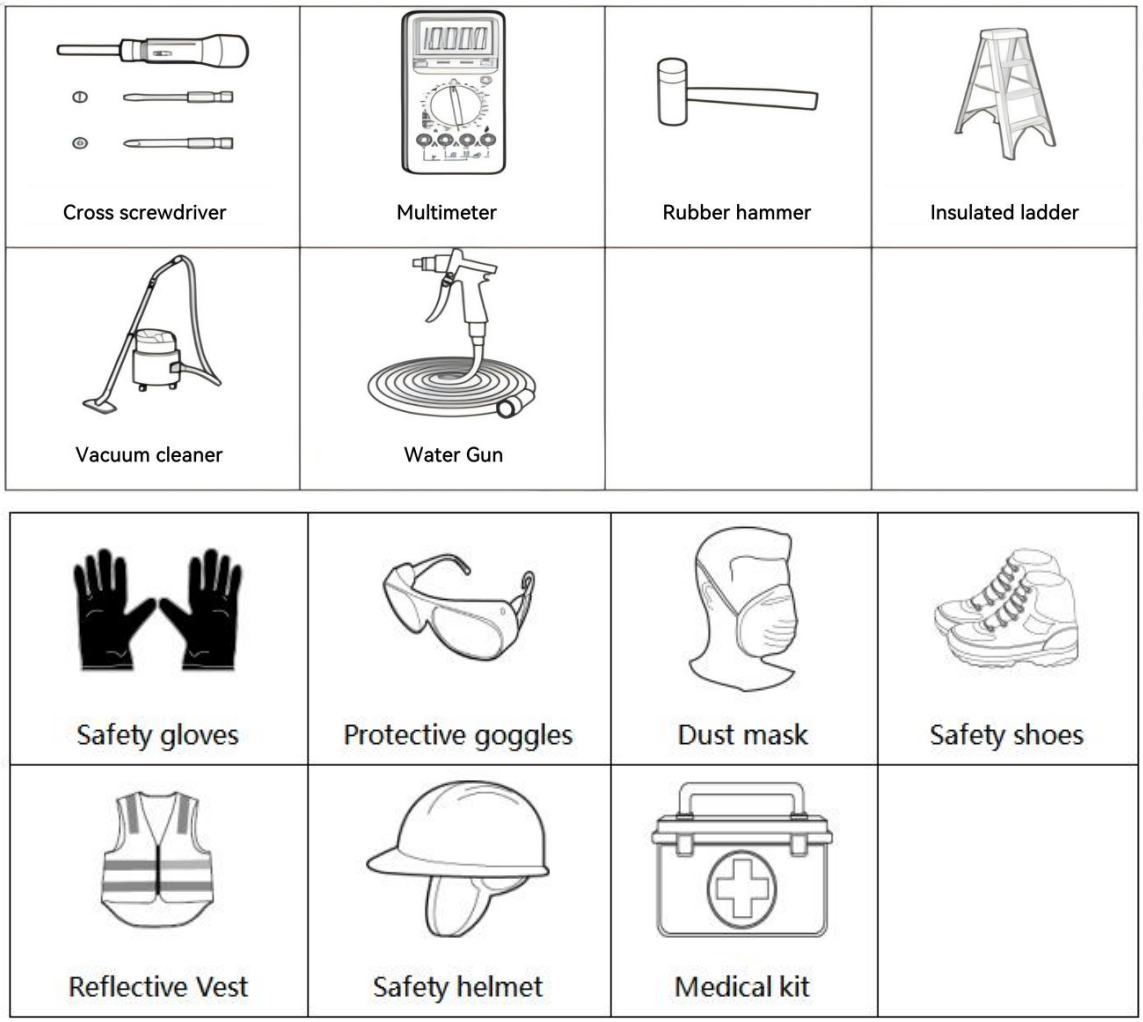


Figure 6.2.1

Notice:

Please prepare at least the above tools. If you do not have enough tools, you may not be able to complete the maintenance. The handles of the tools used, such as cross screwdrivers, need

to be insulated, or insulated tools should be used.

6.2.2 Cleaning and maintenance

Cleaning maintenance table

category	action	Reference Standards
Cabinet	Clean the vents	No dust accumulation in the ventilation openings
Cabinet	Cleaning dustproof cotton	No insects, rats, snakes or other animals can enter
Cabinet	Flush appearance	The dustproof cotton has no obvious discoloration and debris
Air conditioner	Clean the radiator	The radiator surface is clean and unobstructed; the fan rotates normally without jamming or abnormal noise
Power distribution area	Is there any foreign matter?	The area is clean and free of foreign matter
Notice: Before performing any cleaning or maintenance, ensure the equipment is powered off and remains idle for at least 15 minutes. In dusty areas, it is recommended to clean the filter every time a sandstorm occurs and clean the filter before summer; in other areas, ensure that the filter or condenser is not blocked according to actual conditions; the dustproof cotton can be used for up to 2 years. Recommended tools: water gun.		

Table 6.2.2

6.3 Warranty Service

6.3.1 Warranty Period

In case of correct use of the product, the warranty period agreed in the commercial contract shall prevail.

6.3.2 Warranty Scope

During the warranty period, if the product is caused by quality problems, our company will repair or replace the product for free.Customers should reserve a reasonable response time for our company's repair, and the replaced product will be handled by our company. Customers need to show relevant proof of purchase of the product and ensure that the product trademark is clearly visible,otherwise our company has the right to not provide warranty guarantee.

6.3.3 Disclaimer

In the following situations, our company has the right not to provide quality assurance, but can still provide paid maintenance services.

1. The warranty period has expired;
2. Failure to provide relevant proof of product purchase;
3. Damage caused during transportation, loading and unloading;
4. Damage caused by improper installation, modification or dismantling by unauthorized personnel;
5. Damage caused by operation under abnormal conditions or environment.

Appendix

Emergency handling measures for energy storage systems:

When the battery is dropped or subjected to strong impact

If there are obvious odors, damage, smoking, fire, or other such situations:

Evacuate personnel immediately, call the police, and contact professional personnel.

Professional personnel should use fire-fighting equipment to extinguish the fire under safe conditions.

If there is no obvious deformation or damage in appearance, and no peculiar smell, smoke or fire occurs:

Warehouse scenario: Evacuate personnel. Professional staff shall use mechanical tools to transfer the battery to an open and safe place, contact the service engineer, let the battery stand for 1 hour while monitoring its temperature (within the range of room temperature ±10℃) before handling it.

Energy storage system site: Evacuate personnel, close the door of the energy storage system. Professional staff shall transfer the battery to a safe place, contact the service engineer, and handle it after letting it stand for 1 hour.

When a flood occurs

If any part of the battery is submerged in water, do not touch the battery to avoid electric shock.

Do not use batteries that have been submerged in water; contact a recycling company for scrap disposal.

When a fire breaks out

Warning:

1.Power off the system under safe conditions.

2.Use carbon dioxide, FM-200, or ABC dry powder fire extinguishers to put out the fire.

3.Firefighters must avoid contact with high-voltage components to prevent the risk of electric shock.

4.High temperatures of the battery may cause deformation, electrolyte leakage, and release of toxic gases.

5.It is necessary to wear respiratory protection equipment, stay away from the scene, and avoid skin irritation and chemical burns.

When the audible and visual alarm is activated

Do not approach or open the door; move away immediately.

Remotely cut off the power supply under the condition of ensuring your own safety.

When the exhaust starts

On-site personnel protection: It is prohibited to operate directly facing the exhaust port.

Post-incident maintenance: Contact the service engineer for evaluation.

Emergency handling for air-conditioning refrigerant leakage

Warning:

1.Immediately cut off the power, evacuate personnel, and prohibit open flames/spark operations (to prevent deflagration).
2.After troubleshooting, clean the inside of the system, re-power it on and check whether the system is functioning normally. If there is any abnormality, please contact the relevant engineers in a timely manner for handling.

Maintenance Key Points:

Use a leak detector to locate the leak (check the compressor shaft seal and condenser joints);
For minor leaks: Recover the refrigerant and then tighten the seal;
For major leaks: Replace the air-conditioning components.

When fire extinguishing agent is discharged or a fire breaks out

Recommendations for operation and maintenance personnel:

Evacuate the site and call the police, providing information such as the type of battery pack, system capacity, and location distribution.
Do not re-enter the burning area or open the door of the energy storage system; isolate the site and keep watch.
Remotely power off the system (ensure personal safety).
Provide product information and user manuals to firefighters.
After the fire is extinguished, the site shall be handled by professionals; do not open the door without authorization.
Contact service engineers for maintenance evaluation.

Recommendations for firefighters:

Refer to the product information provided by operation and maintenance personnel.
Do not open the door of the energy storage system until safety is ensured.
Extinguish the fire through control measures to prevent the fire from spreading to surrounding energy storage cabinets.

BSLBATT®

Best Solution Lithium Battery

User Manual

BSL NEW ENERGY TECHNOLOGY CO., LTD

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