125KW/261KWH OutdoorLiquidCooling Rack Product Specifications

ProductName: BSM125-261

Responsible agency:	Zhang	Confidential level:	Confidential
Drafted by:	Conner Dai	Due date of	2024.08.13
Protocol number:	BSM125-261	confidential:	Until the product is eliminated

CONTENTS

Home.....1

Directory.....2

Acronyms and Abbreviations.....3

1. Overview.....4

1.1 Scope of application.....4

1.2 Test conditions for product performance commitment.....4

1.3 Key standards.....4

1.4 Application.....4

2. Product introduction.....5

2.1 Container disgram.....5

2.2 Appearance.....6

2.3 Structure.....7

2.4 Product Specification.....8

3. Technical specifications of the key equipment of systems.....9

3.1 Control Box Interface.....10

3.2 Battery Interface.....11

3.3 125KW PCS.....12

3.4 Chiller.....13

3.5 EMS.....14

3.6 Fire protection system.....21

4. Maintance.....22

5.Troubleshooting.....23

6. Transport requirements.....23

7. Precautions for installation.....23

Acronyms and Abbreviations	
ACAN	CAN between BMU and HCU
BMU	Battery Management Unit
BMS	Battery Management System
BOL	Begin of Life
CAN	ControllerArea Network
CCAN	CAN between BMU and CSC
CSC	Cell Supervision Circuit
CSU	CSU
DCAN	CAN for calibration
EOL	End of Life
ETH	Ethernet Module
MSD	Manual Switch Disconnector
SBMU	Slave Battery Management Unit
SCAN	CAN between BMU and CSU
SOC	State of Charge
SOE	State Of Energy
SOH	State of Health
SOP	State Of Power

1 .Overview

1.1 Scope of application

The Product Specification (hereinafter referred to as "the Specification") describes the technical indicators of each system of the Liquid Cooled Energy Storage Integrated Machine. The product includes the battery pack, the high-voltage box, the liquid cooler, the fire protection system, PCS, and the distribution system. For the avoidance of doubt, the Specification is only applicable to 125kW/261product models.

1.2 Test conditions for product performance commitment

Unless otherwise specified, the tests set out in the Specification shall comply with the following conditions:

1、 Temperature: 25±2°C
2、 Humidity: 35%~85%
3、 Charging and discharging power: 0.5 P

1.3 Key standards

IEC62619
IEC60730
CE-EMC
UN38.3/
MSDS

1.4 Application

1.4.1 Utility & Grid applications

Ancillary Services

Energy Shifting

1.4.2 Commercial & Industry Applications

Increase Savings
Peak Shaving
Load Shifting
Demand Response
Backup Power
Solar self consumption

EV-Charging carport

2. Product introduction

2.1 Container disgram

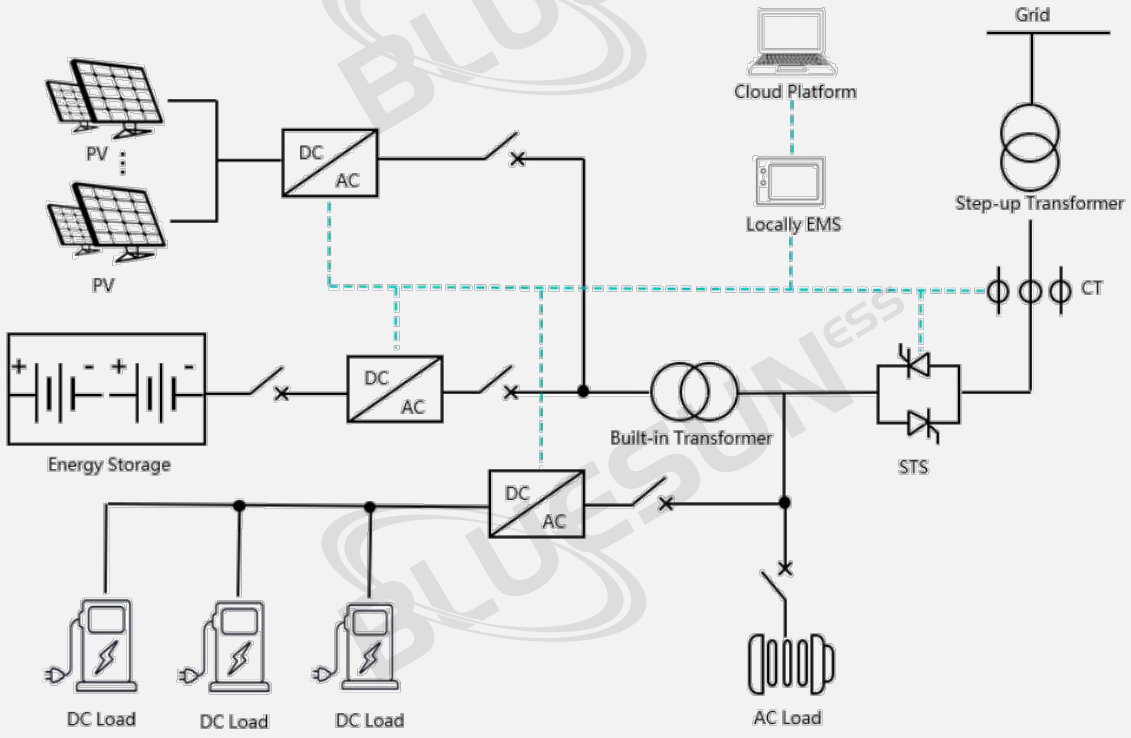


Figure 1 System diagram

Optional STS
Clients provide distributions

On/off grid and microgrid multi scenarios

2.2 Appearance

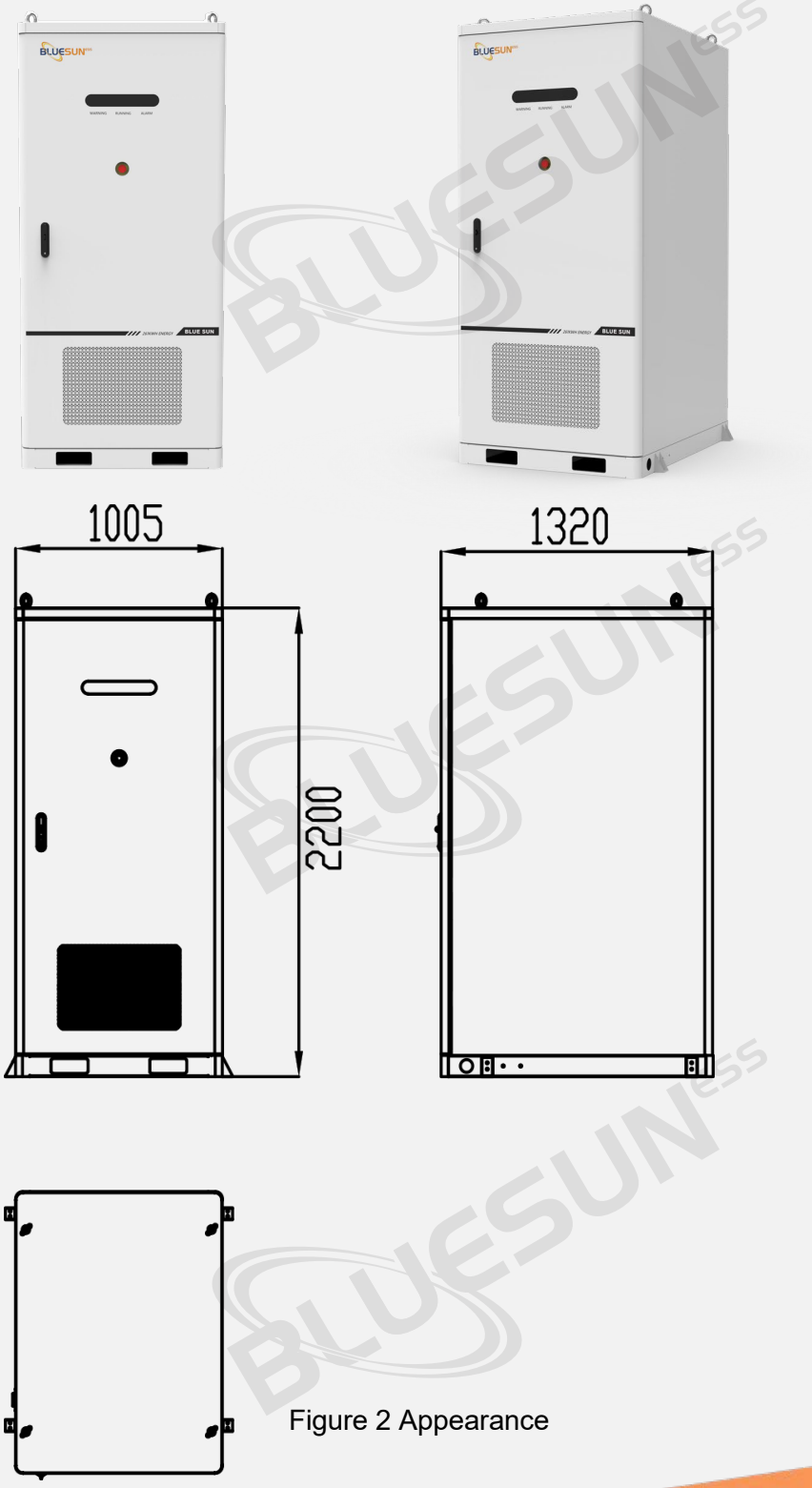


Figure 2 Appearance

2.3 Structure



Figure 3 Structure

Components	Number	Remark
Rack Frame	1	1005mm(L)*1320mm(W)*2200mm(H)
Battery Modules	8	With CSC
Control Box	1	Maximum currrent 250A
Chiller	1	Rated power 5KW
Fire protection	1	Including smoke detector, heat detector and aerosol
EMS	1	EMS
Dehumidifier	1	Keep the humidity in the cabinet
Cabinet	1	IP65

2.4 Product Specification

125KW 261KWH ENERGY STORAGE SYSTEM			
NO	**Item**		**Specification**
Battery Side			
1	Configuration		1P260S
2	Rated Energy		261kWh
3	Rated Voltage		832VDC
4	Voltage Range		728~936VDC
5	Charging/Discharging Current	Rated	314A
		Maximum	359A
8	General Parameters	Size	1005mm(L)*1320mm(W)*2200mm(H)
		Weight	2.5T
		IP Level	IP66
		Cooling mode	Liquid Cooling
		Communication agreement	CAN
		Coolant	50% Ethylene glycol aqueous solution
AC Side (Grid Connection)			
Rated Voltage(V)			230/400
AC Output Type			(3W + N + PE) three-phase four line
Rated Output Power(KW)			125
Rated Grid Frequency(Hz)			50/60
AC Side (off-grid)			
Rated Output Voltage			230/400
Rated Output Power			125
Maximum Apparent Power (KW)			138
Maximum Output Current (A)			200

3 . Technical specifications of the key equipment of systems

3.1 Control Box Interface

The panel diagram of control box is shown as figure 4:

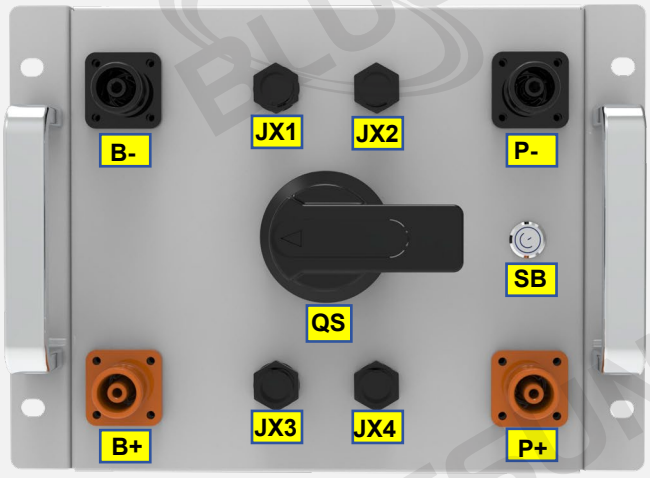


Figure 4 Control box panel

NO	Connector	Definition	Remark
1	JX1	TO Upper Computer	IES-WPC-06110SA000
2	JX2	TO Battery	IES-WPC-06110SA000
3	JX3		IES-WPC-06110SA000
4	JX4		IES-WPC-06110SA000
5	B+	Positive Input	HVQLZ00M6KP-U
6	B-	Negative Input	HVQLZ00M6KN-U

7	P+	Positive Output	HVQLZ00M6KP-U
8	P-	Negative Output	HVQLZ00M6KN-U
9	QS	To connect and cut off the power supply of control system	NDM3Z-320VZ/3300 320A CS1-A
10	SB	To cut off the output of battery system	Nonstick button\Φ16 mm

3.2 Battery Interface

The panel diagram of battery is shown as figure 5:



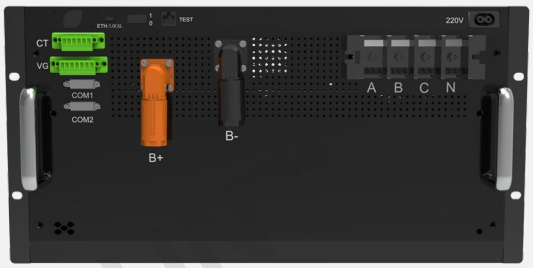
Figure 5 Battery panel

NO	Connector	Definition	Connector information
1	B+	Positive Output	HVQLZ00M6KP-U
2	B-	Negative Output	HVQLZ00M6KN-U
3	FF	Fire Fignting	WZ-1230-3/1.6-2U
4	MSD	Manual Switch Disconnector	MSD-T/MSD-Z
5	SV	Safety Valve	VE-P708-00-KS1
6	COM1/COM 2	Communication between battery cells	DJ06Y-1.8-21

Battery Rack Specification			
NO	**Item**		**Specification**
1	Configuration		1P13S
2	Rated Energy		261kWh
3	Rated Voltage		832VDC
4	Voltage Range		728~936VDC
5	Charging Current	Rated	314A
		Maximum	359A
6	Discharging Current	Rated	314A
		Maximum	359A
7	Operating Ambient Temperature	Charge	0~50℃
		Discharge	-10~50℃

3.3 125KW PCS





Specification		125KW
DC side		
1	Voltage range (V)	650~950 (3W+N+PE)
2	Full load voltage range	680~950 (3W+N+PE)
3	Input path number	1
4	Max current	203
AC side (ON-GRID)		
5	Rated voltage (V)	400
6	Voltage deviation	-15%~15%
7	AC output type	3W+N+PE
8	Rated output power	125
9	Max output power	138
10	Max current	200
11	Rated grid frequency	50/60
12	Power factor	0.99
13	Power factor range	1(Look head)~1(Lag)
14	Current distortion rate	<2% (rated power)
15	DC component	<0.5%
16	Overload capacity	110% long time
17	Max efficiency	98.5%
AC side(OFF-GRID)		
18	Rated output voltage (V)	400
19	Ac voltage harmonics	<3% (Linear load)
20	Rated Frequency	50/60
21	Rated output power(KW)	125
22	Max apparent power (KVA)	138
23	Max output current (A)	200

3.4 Chiller



Specification		5KW
Environmental protection & performance		
1	Work temperature range(℃)	-30~+55
2	Storage environment range(℃)	-40~+70
3	Noise grade(dBA) (℃)	70
Cooling/heating capacity		
4	Refrigerating capacity@L35/W18	5.0
5	Heating capacity@Tu=10(℃)	2.0
6	outlet water temperature(℃)	18
Data setting		
7	Liquid setting range(℃)	10~35
8	Default cooling setting temperature	18
9	Default heating setting temperature	15
10	Communication protocol	RS485/CAN
Consumed power		
11	Refrigeration input power@L35/W18(KW)	2.5
12	Heating input power@Tu=10℃(KW)	2.35
13	Self-circulating model (single pump operation) power	0.25
14	Maximum power consumption	3.6

3.5 EMS

3.5.1 Function parameter



Bluesun G700 EMS is an innovative energy management product that integrates energy storage BMS and EMS system for energy storage scenarios developed by Udan Technology.
The module uses an 800MHz CPU, 512MB DDR3 memory on board, and 4GB eMMC storage. With rich functional interfaces,
With battery stack management, energy management, equipment management, data management and other functions, can meet the real-time monitoring of energy storage power station, diagnosis and early warning, panoramic points Analysis, advanced control and other needs to ensure the safe, reliable and stable operation of the power station.

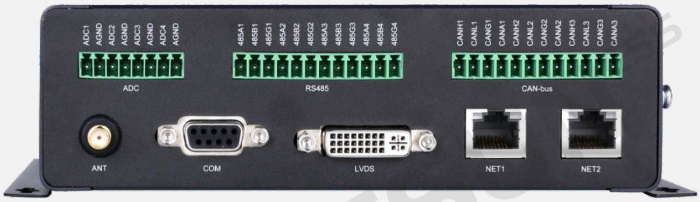
Function parameter		
Item	**Main parameter**	
Work temperature	-40~+70	
Work humidity	5%~95%	
Work voltage	DC9~36	
Rated power	8W	
Processor	800MHZ Main frequency processor	
Internal storage	DDR3 412MB	
Storage	eMMC 4GB	
Watch dog	Onboard independent hardware watchdog	
Hardware interface	Quantity	Remark
Ethernet	2	10/100Mbps
USB	2	Host
CAN-bus	3	Isolation
RS485	4	Isolation

RS232	1	Testing port
TF card	1	Standard TF
LVDS	1	DVI
ADC	4	0-20mA, 0-10V, accuracy 1%,sample rate 40SPS
DI	8	Opto-isolator
DO	8	Relay isolation
DOH	4	Isolated high side drive 2.5A
DOL	2	Isolated low side drive 2.5A
Super-capacitor	1	Power off endurance 5s
LED director	8	4 ways to edit

3.5.2 Interface definition



NO	Port	Terminal socket	Specification
1	Power	Power terminal socket	3.81-03P
2	DO	High and low side drive interface	3.5-8P
3	LED	Indicator light	Power/run/fault/STA
4	RESET	Touch button	Reset
5	USB1/USB2	USB double-deck socket	USB2.0*2
6	TF-Card	TF card socket	Standard
7	Nano-SIM	SIM card socket	Nano-SIM
8	DO(Mechanical relay/passive)	Isolated DO interface	3.5-08P
9	DO(Solid state relay/Passive)	Isolated DO interface	3.5-08P
10	DI(High level detection/passive)	Isolated DI interface	3.5-08P
11	DI(low level detection/active)	Isolated DI interface	3.5-08P

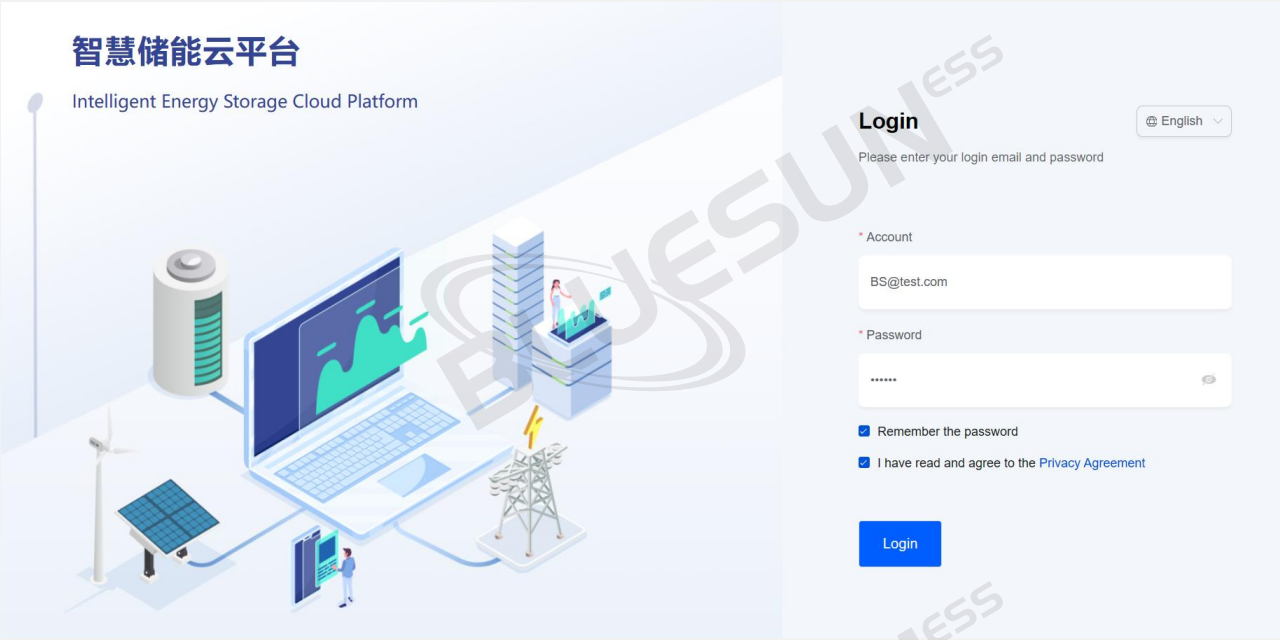


NO	Port	Terminal socket	Specification
1	ANT	Antenna	SMA
2	COM	Debugging serial port	DB9
3	LVDS	LVDS screen port	DVI
4	NET1	100 megabit network port	RJ45
5	NET2	100 megabit network port	RJ45
6	ADC	Isolated ADC interface	3.5-08P
7	RS485	Isolated RS485 interface	3.81-12P
8	CAN-BUS	Isolated CAN-BUS interface	3.81-12P

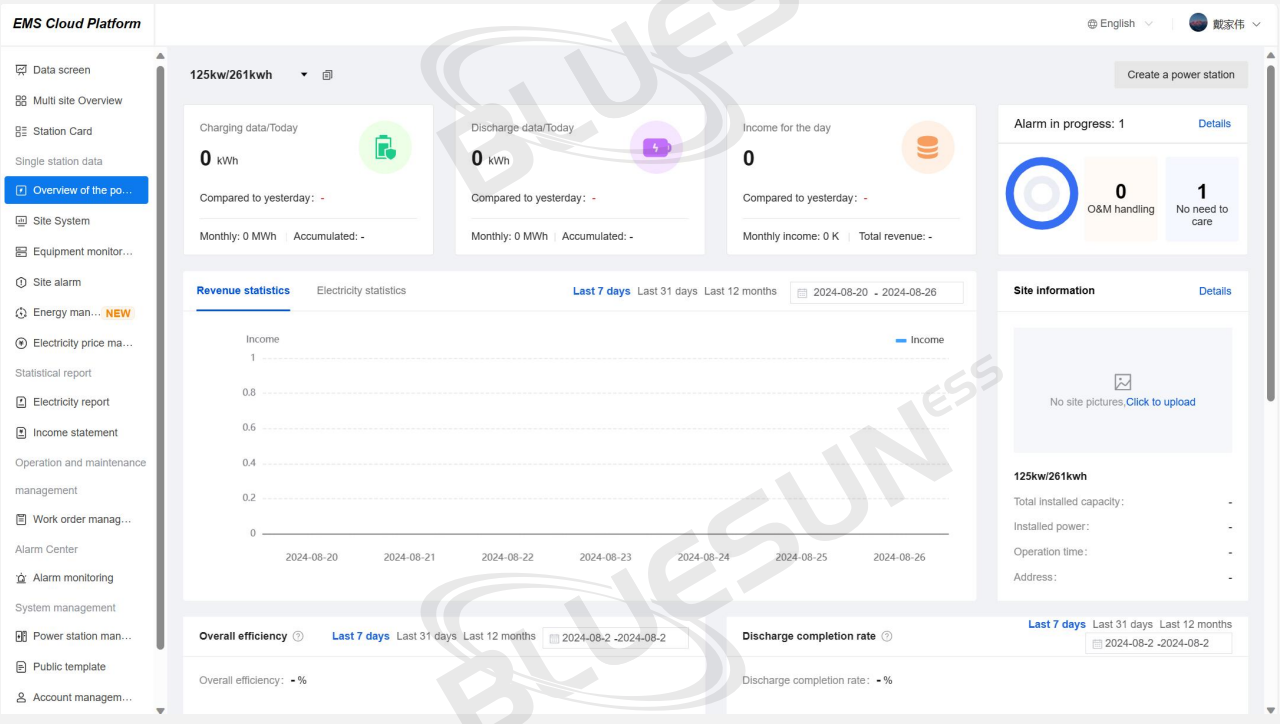
3.5.3 EMS platform introduction

3.5.3.1 Log in

Input platform - the browser address: https://www.iesscloud.com/#/ can enter the login page (it is recommended to use chrome), enter the corresponding user name and password to log in.
Testing account: BS@test.com
Password: 123456
To create a new account, the platform administrator needs to add it in [System Management] -- [Account Settings]

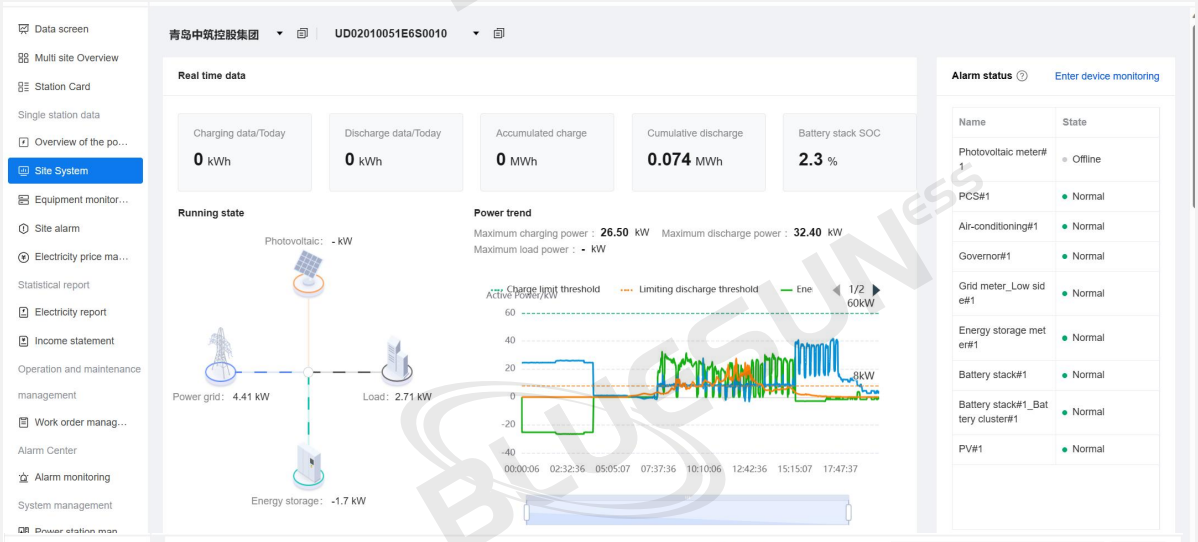


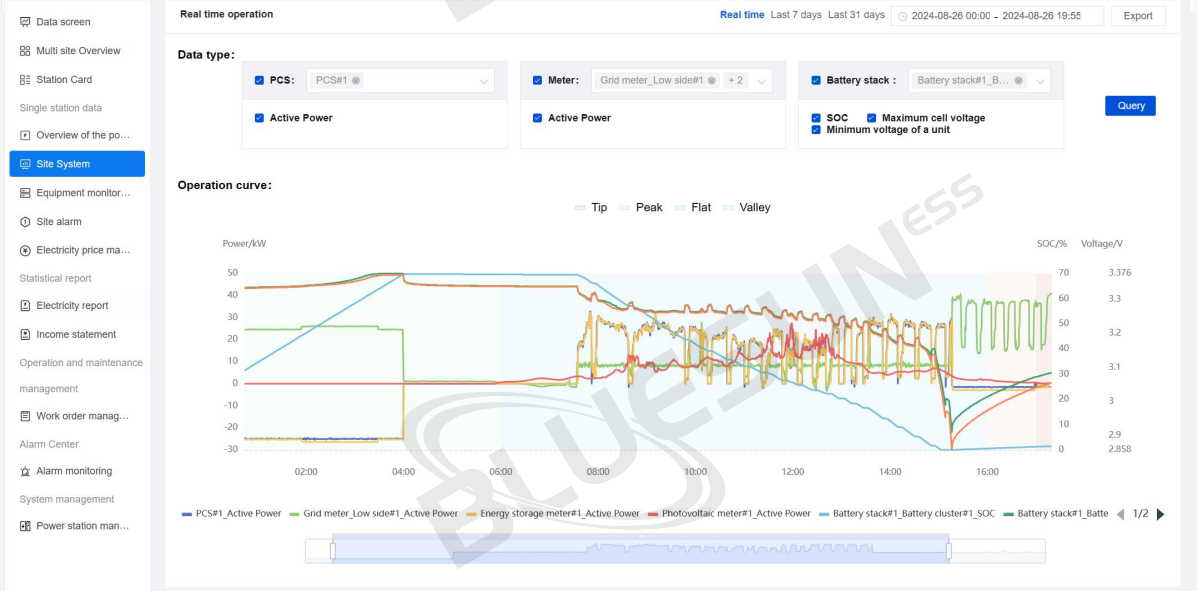
3.5.3.1 Multi-station overview



3.5.3.2 Site system

The site system displays the real-time data overview, energy flow chart, power data trend, alarm status, real-time device running trend, and real-time power income of the system in the cloud platform in card mode.
- Support to switch sites and systems on the current page.
- Support "Energy management" operations for individual systems on the current page.
- Real-time electricity revenue update revenue data on an hourly basis.
- Live Run - The data type filters the items displayed in the Run Curve according to the option.



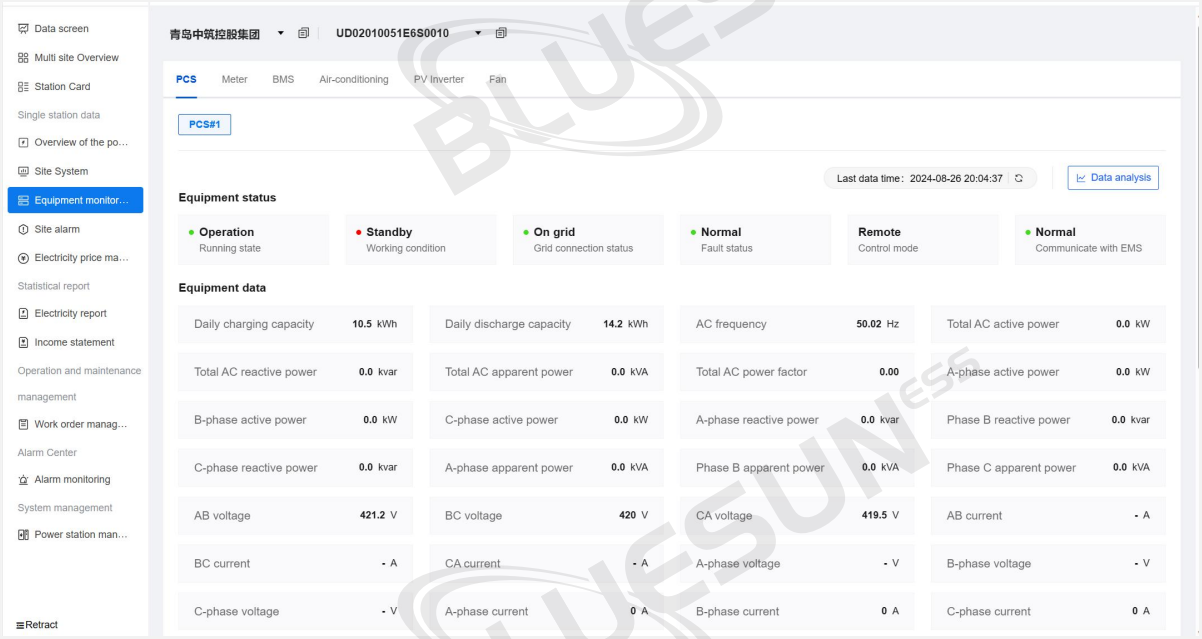


3.5.3.3 Energy Management

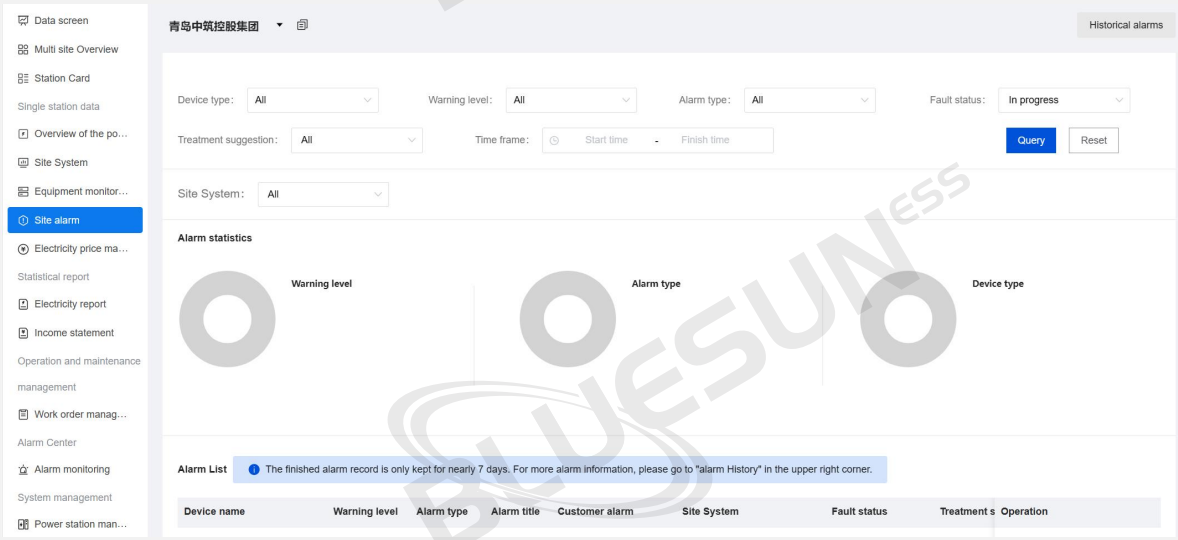
Energy management can realize the function of energy scheduling, formulate a reasonable scheduling strategy according to the change of energy demand, realize the reasonable distribution and utilization of energy, and avoid the storage equipment in the overload or overdischarge state for a long time.
Energy control:
- Achieve charge and discharge control capability by setting policy start time, end time, executing storage control class, planning power, target soc and sending to EMS.
Anti-overload:
- It means that during the charging process, the power of the connecting point is monitored in real time, and the charging power of the energy storage is adjusted in real time according to the set parameters to avoid the phenomenon of overload of the connecting point.
- You can set the charge limiting threshold, start threshold, and disable threshold and send the parameters to the EMS to prevent overload.
Anti-reflux:
- During the discharge process, the power of the connecting point is monitored in real time, and the energy storage discharge power is adjusted in real time according to the set parameters, so that the system will not send power to the grid.
- You can set the limiting threshold, starting threshold, and disabling threshold and send the parameters to the EMS to prevent countercurrent.
Manual control:
To test the EMS, you can adjust the EMS control mode and switch between manual and automatic modes.
- Manual mode: Self-control of charge and discharge, power, and standby operation, independent of energy control policies.
- Automatic mode: Automatically runs according to the energy control policy.

3.5.3.4 Device management

Displays the real-time data of the devices bound to the system. The specific device type and number can be configured based on the actual project.
- Supports switching between device types and multiple devices.
- Device data: Displays device status, real-time device data, and device fault words, and supports control capabilities based on device types.



3.5.3.5 Site warning



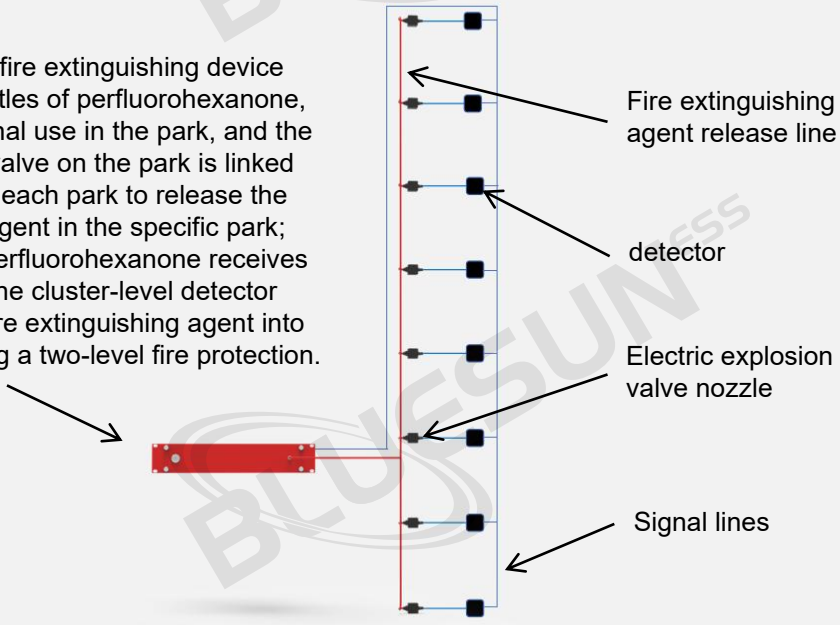
3.6 Fire protection system

3.6.1 Structural design

The fire protection system consists of rack-type temperature sensing automatic fire extinguishing device, combustible gas composite detector, flame retardant pipe, nozzle, selection valve, etc， Composition, rack-mounted temperature sensing automatic fire extinguishing device is pre-set according to preset conditions such as perfluorohexanone storage containers and spray componentsCount, assemble a complete set of self-starting fire extinguishing devices with linkage control function, and store 3 kg of perfluorohexanone in a container to extinguish the fire Dose.

Each battery module is equipped with a combustible gas composite detector and nozzle, which is connected to the rack-type temperature sensing automatic fire extinguishing device through a flame retardant pipe, and the characteristic changes of the battery in different stages of thermal runaway are analyzed and logically judged through the composite algorithm, so as to realize the monitoring of the early state of the battery thermal runaway, and carry out complete immersion release for the thermal runaway battery pack, rapid cooling and local suffocation, block the further reaction of the thermal runaway battery, and achieve the "inerting" effect, so that the inside of the battery, The reaction between the batteries is quickly relieved, so as to effectively extinguish the fire and solve the problem of thermal propagation of the battery.

The rack-mounted fire extinguishing device has two built-in bottles of perfluorohexanone, one bottle for internal use in the park, and the electric explosion valve on the park is linked by the detectors in each park to release the fire extinguishing agent in the specific park; Another bottle of perfluorohexanone receives the start signal of the cluster-level detector and releases the fire extinguishing agent into the cabinet, forming a two-level fire protection.



4 Maintance

- Battery maintenance must be carried out by professional personnel;
- If the battery has been continuously stored for more than six months, it must be fully charged once;
- The connection of battery communication and power cables should be checked for looseness every three months.

5 Troubleshooting

Troubleshooting can only be carried out by professional personnel. Before checking for faults, the correct conditions of all cable connections and circuit breakers must be checked.

S/N	Fault	Solution
1	Communication fault	Check if the communication cable is loose and if the BMS communication protocol matches the load or the inverter
2	Unable to start	Use a charging device to charge the battery. If it is still unable to be started, please contact for maintenance.
3	Abnormal SOC	When shutting down, turn off the soft start switch first, and then turn off the power switch after 1 second.
4	System malfunction and shutdown	First, search for the fault information, confirm the specific fault, and handle it based on the cause of the fault.

6 Transport requirements

(1) The packaging wooden box of the electrical cabinet must be properly placed to prevent strong vibrations, impacts, punctures, and heavy pressure during transportation;
(2) Do not transport together with flammable and explosive materials, toxic substances, etc.
(3) Prohibit stacking goods on the stack again;
(4) Maintain the original packaging state and keep the original identification intact;
(5) During transportation, the temperature should be controlled between -20 ℃ and 45 ℃, and the humidity should be controlled between 5% and 95% RH;
(6) The transportation tool must be equipped with a fire extinguisher special for lithium batteries in combination with fire water and fire sand.

6 Storage requirements

（1） The product should be stored in a place that is protected from rain, moisture, and sunlight. When storing, it should be ensured that the electric quantity of the product is not less than 40%;
（2） The storage location is equipped with a variety of lithium battery fire extinguishing devices on site, including fire sand, fire prevention and dry powder fire extinguishers;
（3） Place the battery according to the label on the packaging box, and never place the battery on its side;
（4） Charge the battery that has been stored for more than 6 months.

7 Precautions for installation

Installation can be done by two methods: lifting and forklift.

（1） The product should be stored in a place that is protected from rain, moisture, and sunlight. When storing, it should be ensured that the electric quantity of the product is not less than 40%;
（2） The storage location is equipped with a variety of lithium battery fire extinguishing devices on site, including fire sand, fire prevention and dry powder fire extinguishers;
（3） Place the battery according to the label on the packaging box, and never place the battery on its side;
（4） Charge the battery that has been stored for more than 6 months.
（5） At least two people are needed to operate the forklift or lift. One person operates and one person commands;
（6） If the product has defects, cracks or damage, please do not install it;
（7） Do not attempt to open, disassemble, repair, tamper with or modify the product when installing the electrical cabinet;
（8） Do not install in adverse weather such as rain and sandstorm;
（9） Do not hit, pull, drag or step on the product;
（10） Do not immerse the product or its components in water or other liquids.

