



User Manual

BSM48314H UNIT

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1. Introduction

1.1 Important Safety Instructions



Danger!

- Please do not put the battery into water or fire, in case of explosion or any other situation that might endanger your life.

- Please connect wires properly while installation, do not reverse connect.

To avoid short circuit, please do not connect positive and negative poles with conductor on the same device.

- Please avoid any form of damage to battery, especially stab, hit, trample or strike.



Danger!

- Please shut off the power completely when removing the device or reconnecting wires during the daily use or it could cause the danger of electric shock.

- Please use dry powder extinguisher to put out the flame when encountering a fire hazard, liquid extinguisher could result in the risk of explosion.

- For your safety, please do not arbitrarily dismantle any component in any circumstances. The maintenance must be implemented by authorized technical personnel or our company's technical support. Device breakdown due to unauthorized operation will not be covered under warranty.



Caution!

- Our products have been strictly inspected before shipment. Please contact us if you find any abnormal phenomena such as device outer case bulging.

- The product shall be grounded properly before use in order to ensure your safety.

- To assure the proper use please make sure parameters among the relevant device are compatible and matched.

- Please do not mixed-use batteries from different manufacturers, different types and models, as well as old and new together.



Caution!

- Ambient and storage method could impact the product life span, please comply with the operation environment instruction to ensure device works in proper condition.

- For long-term storage, the battery should be recharged once every 6 months, and the amount of electric charge shall exceed 80% of the rated capacity.

- Please charge the battery in 18 hours after it fully discharged or over-discharging protection mode is activated.

- Formula of theoretical standby time: $T=C/I$ (T is standby time, C is battery capacity, I is total current of all loads).

1.2 Brief Introduction

BSM48314 lithium iron phosphate battery system is a standard battery system unit, customers can choose a certain number of BSM48314 according to their needs, by connecting in series to a larger capacity battery pack, to meet the user's long-term power supply needs. The product is especially suitable for energy storage applications with high operating temperatures, limited installation space, long power backup time and long service life.

1.3 Product Properties

BSM48314 energy storage product's positive electrode materials are lithium iron phosphate, battery cells are managed effectively by BMS with better performance, the system's features as below:

- The whole module is non-toxic, non-polluting and environmentally friendly;
- Cathode material is made from LiFePO₄ with safety performance and long cycle life
- Battery management system with better performance, possesses protection function like over-discharge, over-charge, over-current, abnormal temperature.
- Self-management on charging and discharging, Single core balancing function.
- Intelligent design configures integrated inspection module.
- Flexible configuration, multiple battery modules can be in series for expanding capacity and power.
- Flexible configurations allow series of multi battery for longer standby time.
- Self-ventilation with lower system noise.
- Less battery self-discharge, then recharging period can be up to 10 months during the storage.
- No memory effect so that battery can be charged and discharged shallowly.
- With wide range of temperature for working environment, -10°C ~ +50°C, circulation span and discharging performance are well under high temperature.
- Small size and light weight, embedded designed module is comfortable for installation and maintenance;

2. Product Specification

2.1 Performance Parameter

Table 2-2 BSM48314 performance parameter

Basic Parameters	BSMH-51.2 * N-314
Nominal Voltage (V)	51.2 * N
Nominal Capacity (KWH)	16.076* N
Usable Capacity (KWH)	16.076* N*90%
Battery Controller Name	BSMC-1000-300
Battery Module Name	BSM48314
Battery Module Quantity	N
Battery Module Capacity(KWH)	16.076
Battery Module Voltage(V dc)	51.2
Battery Module Capacity (Ah)	314
Battery System Charge Voltage(V dc)	56* N
Battery System Charge Current(Normal)	157
Battery System Charge Current (Max)	314
Battery System Discharge lower-Voltage(Vdc)	44.8 * N
Battery System Discharge Current (Standard)	157
Battery System Discharge Current(Normal)	314
Efficiency	96%
Depth of Discharge	RS485/ CAN
Working Temperature	0 °C ~ 50 °C Charge -10 °C ~ 50 °C Discharge
Shelf Temperature	-20 °C ~ 60 °C
Communicaiton	RS485/ CAN
Certification	CE/ IEC/ UL/ UN38 .3/ MSDS
Design Life	10 years+
Cycle Life	>6000
Other:	
1) Battery Controller Dimensions (W * D * H)	543 * 500 * 235
2) Battery Module Dimensions(W * D * H)	895*500 *235



2.2 Battery Module

2.2.1 Battery Module Information



Table 2-2 Module Information

No.	Product Type	BSM48314
1	Cell Technology	Li-ion(LFP)
2	Battery Module Capacity (KWH)	16.076
3	Battery Module Voltage (Vdc)	51.2
5	Battery Cell Voltage (Vdc)	3.2
6	Battery Cell Capacity (AH)	314
7	Battery Module Cell Quantity in Series and Parallel	16S1P
8	Battery Module Charge Voltage(Vdc)	56
9	Battery System Charge Current(Standard)	157
10	Battery Module Charge Current(Normal)	157
11	Battery Module Charge Current(Max)	314
12	Battery Module Discharge Lower-Voltage(Vdc)	44.8
13	Battery System Discharge Current (Standard)	157
14	Battery Module Charge Current (Normal)	157
15	Battery Module Charge Current (Max)	314
16	Efficiency	98%
17	Depth of Discharge	90%
18	Dimension(W* D * H, mm)	895*500 *235
19	Communication	RS485
20	Protection Class	IP22
21	Weight	120
22	Operation Life	>10 years
23	Operation Cycle Life	>6000
24	Operation Temperature	0 °C ~50 °C Charge -10 °C ~50 °C Discharge
25	Storage Temperature	-20 °C ~60 °C
26	Product Certificate	CE
27	Transfer Certificate	UN38.3/ MSDS

2.2.2 Battery Module Front Interface

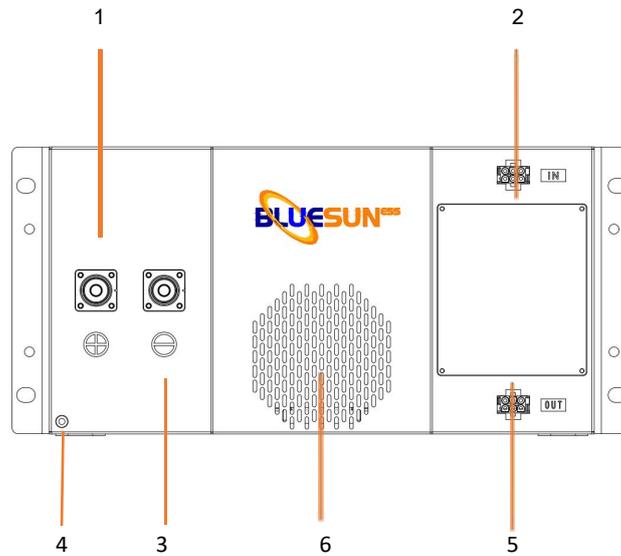


Table 2-3 Interface Definition

Item	Name	Definition
1	Positive socket	Battery output positive or parallel positive line
2	Communication Port IN	Support RS485 communication between battery module, and control module
3	Negative socket	Battery output positive or parallel positive line
4	Grounding	Shell ground connection
5	Communication Port OUT	Support RS485 communication between battery module, and control module
6	FAN	For Cooling

2.3 Control Module (internal power supply)

2.3.1 Control Module information



Table 2-4 High voltage control box information

Item	Basic Parameters	
	Related Product	1000V 300A
1	AC supply	--
2	System Operation Voltage (Vdc)	0-1000V
3	Nominal Current(A)	300
4	Self-consumption Power(W)	14
5	Dimension (W* D* H, mm)	543 *500 *235
6	Communication	RS485/ CAN
7	Protection Class	IP20
8	Weight(KGS)	20
9	Operation Life	10+
10	Operation Temperature	-20~65
12	Storage Temperature	-40~80

2.3.2 Control Module has two types: internal and external power supply

Control Module (BSMC-1500-300) Front Interface

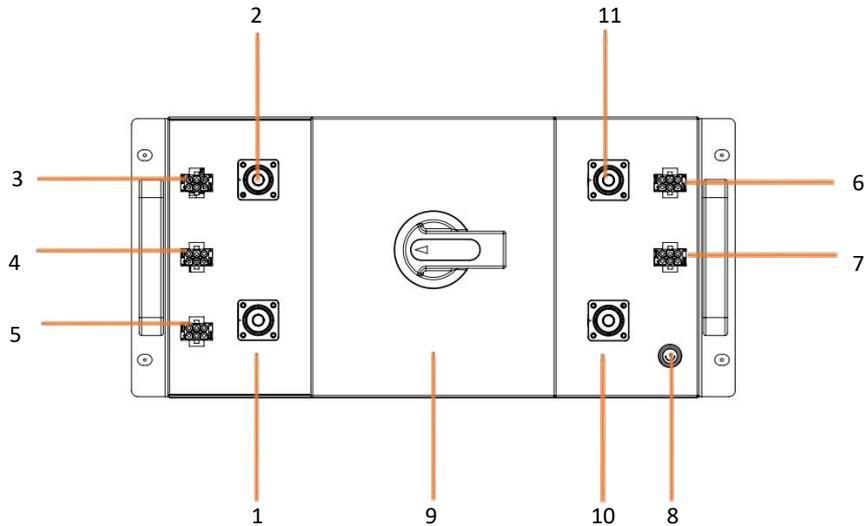


Table 2-5 High voltage controller box interface Definition

Item	Name	Definition
1	Positive socket battery side	Battery side negative socket
2	Negative socket battery side	Battery side positive socket
3	Communication Port to battery pack	Support communication between high voltage control module and battery pack
4	Communication Port to screen	Support RS485/ DC 24V to screen
5	Communication Port to inverter	Support RS485/CAN communication between cluster and inverter
6	DRY CONTACT	/
7	DRY CONTACT	/
8	BMS power switch	BMS OFF/ ON, must be in the "O N" state when in use
9	Breaker	Power Breaker must be in the "ON" state when in use
10	Positive socket power side	Battery output negative socket
11	Negative socket power side	Battery output positive socket

3. Installation and Configuration

3.1 Preparation for installation

3.1.1 Safety Requirement

This system can only be installed by personnel who have been trained in the power supply system and have sufficient knowledge of the power system.

The safety regulations and local safety regulations listed below should always be followed during the installation.

- If operating within the power system cabinet, make sure the power system is not charged. Battery devices should also be switched off.
- Distribution cable wiring should be reasonable and has the protective measures to avoid touching these cables while operating power equipment.
- when installing the battery system, must wear the protective items below:

		
<p>The isolation gloves</p>	<p>Safety goggles</p>	<p>Safety shoes</p>

3.1.2 Environmental requirements

Working temperature: $-10^{\circ}\text{C} \sim +50^{\circ}\text{C}$

Charging temperature range is $0^{\circ}\text{C} \sim +50^{\circ}\text{C}$,

Discharging temperature range is $-10^{\circ}\text{C} \sim +50^{\circ}\text{C}$

Storage temperature: $-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$

Relative humidity: 5% ~ 85%RH

Elevation: no more than 4000m

Operating environment: Indoor installation, sites avoid the sun and no wind, no conductive dust and corrosive gas.

And the following conditions are met:

- . Installation location should be away from the sea to avoid brine and high humidity environment.
- . The ground for product arrangement shall be flat and level.
- . No flammable explosive materials near the installation site.
- . The optimal ambient temperature is $15^{\circ}\text{C} \sim 30^{\circ}\text{C}$
- . Keep away from dust and messy zones

3.1.3 Tools and data

Tools and meters that may be used are shown in table 3-1.

Table 3-1 Tool instrument

NAME	
Screwdriver (Slotted 、 Phillips)	Multimeter
Torque wrench	Clamp current meter
Diagonal pliers	Insulation tape
Pointed nose pliers	Temperature meter
Pliers to hold the wire	Anti-static bracelet
Stripping pliers	Cable tie
Electric drill	Tape measure

3.1.4 Technical preparation

Electrical interface check

Devices that can be connected directly to the battery can be user equipment, power supplies, or other power supplies.

- Confirm whether the user's PV power generation equipment, power supply or other power supply equipment has a DC output interface, and measure whether the DC power output voltage meets the voltage range requirements in Table 2-2.
- Confirm that the maximum discharge current capability of the DC power interface of the user's photovoltaic power generation equipment, power supply or other power supply equipment should be higher than the maximum charging current of the products used in Table 2-2.

If the maximum discharge capacity of the DC power interface of the user's photovoltaic power generation equipment is less than the maximum charging current of the products used in Table 2-2, the DC power interface of the user's photovoltaic power generation equipment shall have a current limiting function to ensure the normal operation of the user's equipment.

- Verify that the maximum operating current of the battery-powered user equipment (inverter DC input) should be less than the maximum discharge current of the products used in Table 2-2.

The security check

- Firefighting equipment should be provided near the product, such as portable dry powder fire extinguisher.
- Automatic fire fighting system shall be provided for the case where necessary.
- No flammable, explosive and other dangerous materials are placed beside the battery.

3.1.5 Unpacking inspection

- When the equipment arrives at the installation site, loading and unloading should be carried out according to the rules and regulations, to prevent from being exposed to sun and rain.
- Before unpacking, the total number of packages shall be indicated according to the shipping list attached to each package, and the case shall be checked for good condition.
- In the process of unpacking, handle with care and protect the surface coating of the object.

- Open the package, the installation personnel should read the technical documents, verify the list, according to the configuration table and packing list, ensure objects are complete and intact, if the internal packing is damaged, should be examined and recorded in detail.

Packing list is as follows:

Item	Specification	Quantity	Figure
BSM48314	51.2V/314AH	N	
Copper Medal in series		N-1	
User Manual		1	

3.2 Equipment installation

3.2.1 Installation Steps

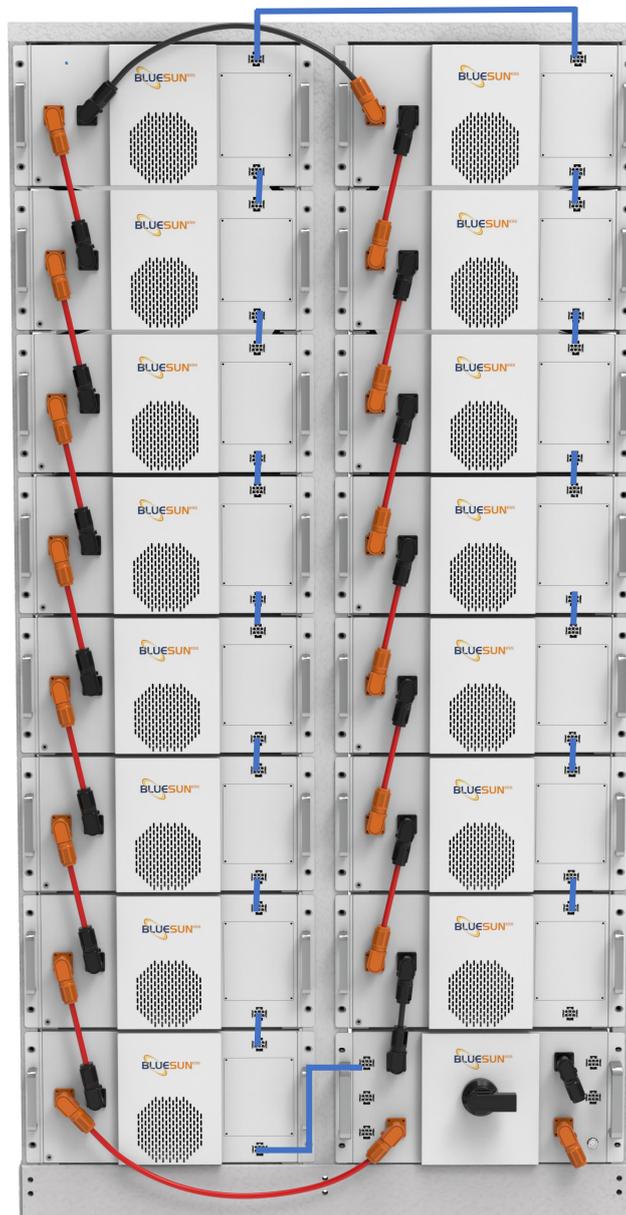
Step 1 Mechanical Installation

(1) Brackets installation:



Step 2 Electrical installation

(1) Wire Connection



4. Installation and Configuration

4.1 Battery system usage and operation instructions

After completing the electrical installation, follow these steps to start the battery system.

1. Press the BMS switch ON/OFF button to the ON position, wait BMS open, turn on the break.
2. Check the P+/P- voltage check if the voltage normal.



1. When BMS open, the red light and green light off on the high voltage controller Box, check the B+/B- side voltage, if the voltage is normal
2. When BMS open, the red light on the high voltage control box lighting, check the communication cable, if the cable connect good.
3. After confirming that the battery output P side voltage and polarity are correct, turn on the inverter, close the circuit breaker.
4. Check if the indicator of the inverter and battery connection (communication indicator and battery access status indicator) is normal. If it is normal, successfully complete the connection between the battery and the inverter. If the indicator light is abnormal, please refer to the inverter manual for the cause

4.2 Alarm description and processing

When protection mode is activated or system failure occurred, the alarm signal will be given through the working status indicator on the front panel of the BSM48314H. The network management can query the specific alarm categories.

If the fault such as single cell over voltage, charging over-current, under-voltage protection, high-temp protection and other abnormalities which affects the output, please deal with it according to Table 4-1.

Table 4-1 Main alarm and Protection

Statue	Alarm category	Alarm indication	Processing
Charge state	Over-current	RED	Stop charging and find out the cause of the trouble
	High temp	Red	Stop charging
Discharge state	Over-current	Red	Stop discharging and find out the cause of the trouble
	High temp	Red	Stop discharging and find out the cause of the trouble
	Total voltage undervoltage	Red	Start charging
	Cell voltage undervoltage	Red	Start charging

Emergency Situations

1) Leaking Batteries

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. If one is exposed to the leaked substance, immediately perform the actions described below.

Inhalation: Evacuate the contaminated area, and seek medical attention.

Contact with eyes: Rinse eyes with flowing water for 15 minutes, and seek medical attention.

Contact with skin: Wash the affected area thoroughly with soap and water, and seek medical attention.

Ingestion: Induce vomiting, and seek medical attention.

2) Fire

NO WATER! Only dry powder fire extinguisher can be used; if possible, move the battery pack to a safe area before it catches fire.

3) Wet Batteries

If the battery pack is wet or submerged in water, do not let people access it, and then contact Bluesun or an authorized dealer for technical support.

4) Damaged Batteries

Damaged batteries are dangerous and must be handled with the utmost care. They are not fit for use and may pose a danger to people or property. If the battery pack seems to be damaged, pack it in its original container, and then return it to Bluesun or an authorized dealer.

If you need any technical help or have any question, please contact the dealer in time.

