

Version 1.0

220V350AH

**HIGH-VOLTAGE LITHIUM IRON
PHOSPHATE BATTERY**

USER MANUAL

NEW ENERGY TECHNOLOGY -- LIFE CHANGING

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I. Installation instructions

1.1 To carry or move

Lithium batteries in the carrying or movement process, should avoid inverted handling or side sleeping handling, should be handled with care and to avoid collision.

1.2 Open-box inspections

Check the battery for damage during transportation. Check the packing list (to actual supply prevail)

N0.	Annex Name	Color/material/specification	Quantity	Unit	Remarks
1	Battery power cable	Black	22	Piece	
2	Core acquisition cable	x P through wall terminals	22	Piece	
3	Communication between battery modules	RJ 45 connector (network cable)	7	Piece	
4	Dry contact signal	2P through wall terminals	2	Piece	
5	Grounding mark	φ5	3	Piece	
6	Ground wire	Yellow green	3	Piece	
7	Grounding screws	Stainless Steel Combination M 5*12	3	Piece	
8	Front Shade Panel		6	Piece	
9	Front panel support		15	Piece	
10	Front fixing screws		Several	Piece	
11	Battery Module Fixer	Stainless Steel Combination M 5*12	Several	Piece	

1.3 Installation

1.3.1 Confirm the installation environment and location.

The battery needs to be installed in a ventilated and dry environment. Considering that the battery adopts natural air cooling, the battery should not be too close to the source of heat, so as to ensure the ambient temperature and maintenance space around the battery.



It is forbidden to place batteries in any of the following environments.



High temperature



Rainfall



Source of fire



Corrosion



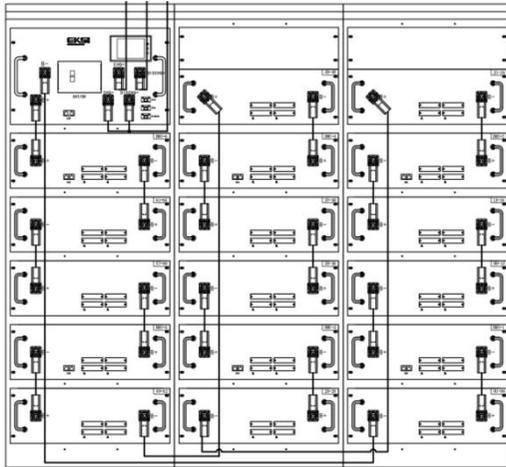
Slope

1.3.2 Installation

Put the battery rack in the specified position and fix it (pay attention to the direction of the battery rack), and put the battery module on the shelf according to the battery layout diagram, as shown below:



▲ Local drawing (module with label)



▲ Battery module layout and wiring diagram



▲ Overall



Battery modules must be placed in the specified order. Battery module is heavy, in order to reduce the risk of injury, please do a good job of protective measures.

After the battery module is arranged as required, connect each battery module according to the battery line connection diagram.

If the battery module is placed for too long time, check the appearance of each battery module for damage and deformation before wiring for safe operation and compliance. Without the above situation, the voltage value of each battery module is measured by multimeter in turn. When the maximum and minimum voltage difference of the battery module exceeds 0.5 V, it can not be connected directly. The battery module needs to charge and discharge separately so that the voltage difference is within 0.5 V.

When the battery module is connected in series, use the battery connection we provide to ensure that the terminal positive (+) on the adjacent battery module is connected to the negative (-), negative (-) to the positive (+) and tighten the bolt.



All wiring must be done by professionals.

1. Please follow the following steps to implement battery connection:



Remove orange and black connectors from battery module



Insert the connector into the connectors



Tighten the bolt with an inner hexagonal wrench stuck M 6 the connector base



Use multimeter to measure the B+ and B- on the high-volt battery box to see if the total pressure is normal



Test the temperature on the connector with a temperature measuring gun after electrification for a period of time to prevent the bolt from not tightening and cause the temperature to rise at the connection joint, resulting in the hidden danger of safety



When connecting a longer battery connection cable, when one end terminal is fixed, be sure to hold the other end of the battery connection to prevent danger from falling off against the battery pole of other battery modules.

2. List of tools required for installation:

No.	Annex Name	Color/material/specification	Quantity	Unit	Remarks
1	Insulation gloves		Several	pair	
2	Protective gloves		Several	pair	
3	Flat head screwdriver	φ3	1	Piece	
4	Cross screwdriver	Routine	1	Piece	
5	Inner hexagonal wrench	M6	1	Piece	
6	Multimeter		1	Piece	
7	Insulation tape	Black	1	Piece	
8	Banding	Black	1	Bag	

II. Product profile

This product is composed of high quality lithium iron phosphate core (series-parallel connection) and advanced BMS management system. It can be used as independent DC power supply or as "basic unit" to form a variety of energy storage lithium battery power supply systems. It has high reliability and long life. Products developed for applications such as power grid energy storage, industrial and commercial energy storage, home high voltage energy storage, high voltage UPS, and data room.

The product adopts modular design, higher integration, saving installation space; adopts high performance lithium iron phosphate cathode material, good core consistency, design service life of more than 10 years; one-key switch machine, front operation, front wiring, convenient installation and maintenance, easy operation; various functions, with single over-voltage / under-voltage, total voltage under-voltage / over-voltage, charge / discharge over-current, high temperature, low temperature, insulation and short circuit protection and recovery functions; strong compatibility, seamless docking with UPS, photovoltaic power generation and other main equipment; communication interface forms, CAN / RS 485 and so on can be customized according to customer needs, convenient system remote monitoring and flexible use. High energy, low power lithium electric equipment, achieve higher energy supply, lower energy consumption, and reduce environmental pollution; adopt all-round, multi-level battery protection strategy and fault isolation measures to ensure the safe operation of the system.

- Small, maintenance-free
- Environmental protection non-polluting materials, no heavy metals, green environmental protection
- Standard cycle life over 5000 cycles
- Accurately estimate the charge state of the battery pack, that is, the remaining battery quantity, to ensure that the battery pack quantity is maintained within a reasonable range
- Built-in BMS management system with full protection and monitoring control

III. Systemic statements

3.1 System composition

Components	Function Description
BCU	Master-slave communication, external communication, state estimation, safety management, charge-discharge management, control output, control input, total voltage detection, insulation detection
BMU	Master- slave communication, 4~48 series single cell voltage acquisition, 4 channels/ channel temperature acquisition
CSU	Current sampling, support Hall sensor and JDI shunt
Wire harness	Voltage detection, temperature detection, communication connection, power supply connection, sensor continuity, control connection
LCD	Data display, parameter configuration, fault alarm
DTU	Remote data upload, remote data download, mobile phone application

3.2 System parameters

Parameters	Minimum value	Typical values	Maximum value	Unit	Note
Total voltage detection range	12	\	900	V	Default detection V 12~900
Total voltage detection accuracy	\	\	\	%	≤0.2%
Number of total voltage test paths	\	\	2	\	Two relay adhesions can be detected
Total number of batteries detected	4	\	240	S	BMU support up to 25
Single cell voltage detection range	0	\	5	V	\

Single voltage detection Accuracy	\	\	0.5	%	$\leq 0.2, \pm 5$ mV error
Current detection range	-600	\	600	A	
Current detection error	0	1	1% FSR	A	Typical value \pm A 1
Number of channels for temperature detection	1	4:1	300	piece	
Temperature detection range	-40		125	$^{\circ}\text{C}$	\
Temperature detection accuracy	0	1	2	$^{\circ}\text{C}$	NTC ,100KB3950
Insulating resistance detection error	0	10K Ω	10%	K Ω	0~200 K Ω , error <15 K Ω ; >200 K Ω , error \leq \pm 15%
Equilibrium current	0	40	90	mA	\
Equilibrium opening minimum voltage difference	30	50	800	mV	
CAN number of channels	\	\	3	\	CAN2.0B
485 communications	\	\	1	\	Support 1 channel
Number of relay output channels	\	\	4	\	active, lasting 1 A, instantaneous 5 A
Number of level input channels	\	\	2	\	High level effective
Main slave maximum cascades	0	\	25	\	Advice: system string <240, Temperature <200, total frame <200
SOC estimation error	0	3%	5%	\	\leq 5%
SOH estimation accuracy	0	5%	10%	\	

3.3 Technical features

Support 8-channel relay control;

Support 3 channels CAN communication function; support 1 channel RS485 communication function;

Support battery status data management, real-time drawing battery cluster information, complete processing to achieve power battery management and control; independent total voltage acquisition, acquisition range 0~900 V, to achieve real-time detection of group terminal voltage;

Support SOC/SOH estimation, high-precision estimation of cell and battery SOC, SOH; support Bootloader, can be online through the CAN bus application upgrade;

Can support fault detection function, according to voltage, current, temperature, SOC, SOH and other threshold alarm function, as well as limit alarm threshold circuit cut off protection function;

Support data storage function, support system running data local storage and power-down storage function;

3.4 Product Graphics and Technical Parameters





▲ Battery module



▲ Stack of batteries

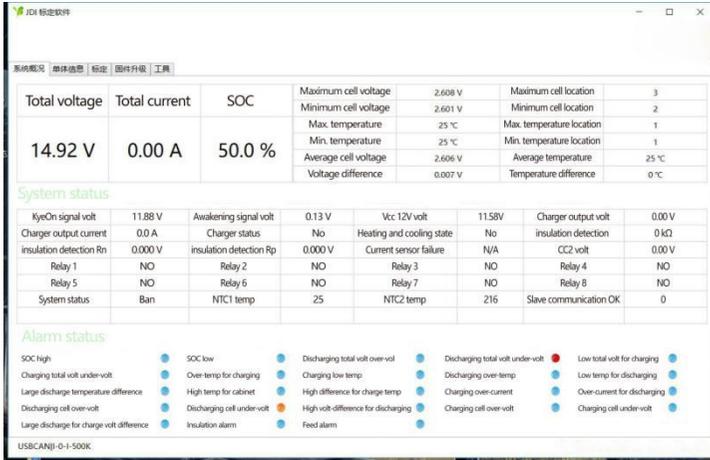
Product technical parameters:

Model	GBP 96100	GBP 96200	GBP 192100	GBP 192200	GBP 220100	GBP 220200	GBP 360100	GBP 360200	GBP 384100	GBP 384200
Type of core	Lithium iron phosphate									
Rated energy (KWH)	10	20	20	40	22	44	36	72	40	80
Nominal capacity (AH)	100	200	100	200	100	200	100	200	100	200
Nominal voltage (VDC)	96		192		220.8		358.4		384	
Operating voltage range (VDC)	78~112.5		156~225		179~259		391~420		312~450	
Recommended Charge Voltage (VDC)	105		210		242		392		420	
Recommended discharge cutoff voltage (VDC)	91.5		183		210		342		366	
Standard charging current (A)	20	40	20	40	20	40	20	40	20	40
Maximum continuous charge current (A)	100	200	100	200	100	200	100	200	100	200
Standard discharge current (A)	20	40	20	40	20	40	20	40	20	40
Maximum continuous discharge current (A)	100	200	100	200	100	200	100	200	100	200
Working temperature	-20~65°C									
Protection level	IP20									
Communication interface	RS485/CAN two choose one									
Reference Weight (Kg)	140	280	280	560	300	600	470	940	500	1000
Reference size (D*W*H mm)	530* 550* 760	625* 550* 970	530* 550* 1180	625* 550* 1600	530* 650* 1180	625* 550* 1810	530* 550* 1810	(625* 550* 2040)*2	530* 550* 2020	(625* 550* 1600)*2

The above are regular product technical parameters, such as voltage, capacity can be customized.

Overview of Upper Computer Software

As the visual display area of battery basic information, the main interface is selected as the upper computer function window, the BMS basic information is displayed, and the battery fault is prompted.



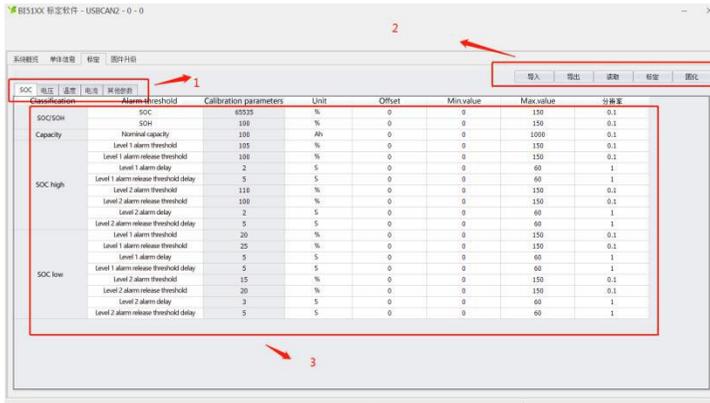
- Upper computer function area selection button: system overview / monomer information / calibration / firmware upgrade, click on the corresponding Chinese character area can be switched to the corresponding upper computer function window.
- VCC voltage is equal to Key ON or charge detection signal. If the difference is too large (more than 3 V), please contact BMS manufacturer for support.
- Charger output voltage / charger output current, these two displays are the charging data sent by the charger to the BMS during charging, which should be consistent with the charger display.
- Charging state / heating refrigeration state / current sensor fault three are customized functions, can be ignored.
- Insulation testing / insulation Rn / insulation Rp represents insulation values tested by insulation testing (no insulation function negligible).
- CC 2 represents the CC 2 voltage detected BMS the national standard fast charge (non-national standard fast charge can be ignored).
- Battery pack healthy state, button blue/green for normal, orange for slight fault, red for serious fault. Monomer Information Interface

Monomer Information Interface

Click on "monomer information" to enter the monomer information interface, which is mainly used as the visual display area of cell voltage and temperature information.



Calibration interface (password: jdi 123456)



Click "calibration" to enter the calibration interface-mainly as the function area of BMS parameter configuration, you can modify the parameters and simulate the fault function selection area. Click on the response of the Chinese character area to enter the corresponding functional parameters configuration interface.

IV. Maintenance and troubleshooting

4.1 Routine maintenance

- A. Clean battery dust regularly (6 months) and check battery connection wire for loosening.
- B. Long-term no power outage, it is recommended that the battery every 6 months artificial discharge.
- C. Found that the battery is not good, the whole battery bag should be replaced in time.
- D. Try to avoid battery depth charge and discharge.

Note: when maintaining, take off the ring, watch and other metal items. Use tools with insulated handles.

4.2 Notes

- A. The battery management system cannot be used in series
- B. When using the battery management system, the charging and discharging cabinet above 100 V cannot be used for charging and discharging cycles.
- C. Pay attention to anti-static, moisture-proof and waterproof during use.
- D. Please follow the design parameters and operating conditions during use, and should not exceed the values in this specification, otherwise the protection board may be damaged.



If you need to use the inverter and controller with other manufacturers, please communicate with our engineer in advance.

V. Lithium battery management requirements

Because lithium is a metal that is particularly prone to chemical reactions and is easy to extend and burn, it may lead to serious accidents ----- combustion and explosion if it is not treated as prescribed in packaging, transportation and storage.

In order to prevent the daily treatment of lithium batteries caused casualties and property losses, the following requirements are made for lithium battery management:

1. Basic requirements for battery warehouse management

The high temperature and wet temperature will accelerate the self-discharge of the battery due to the characteristic problem of lithium battery. It is recommended that the battery that does not open the package should be stored in a clean, dry and ventilated warehouse with ambient temperature of $-5^{\circ}\text{C} \sim 35^{\circ}\text{C}$ and relative humidity of not more than 90%. The warehouse should not contain corrosive gas.

Humidity requirements: effectively control warehouse humidity, avoid warehouse in extreme humidity for a long time (relative humidity above 90%).

The lithium battery warehouse shall be separated by brick wall entities, and the warehouse must be closed, explosion-proof or other corresponding safety electrical lighting equipment.

Storage of batteries should be equipped with a sufficient number of fire fighting equipment (carbon dioxide, dry powder fire extinguishers, fire hoses, fire sandboxes) and ensure that in good condition. It is recommended to install automatic rain sprinkler system under conditions. It can not be placed in the same warehouse with flammable materials (e.g. packing materials cartons, cartons, etc.), it is recommended to use a separate warehouse.

Where there are lithium batteries, there must be no smoking and other prohibited regulations.

Battery pack should be away from the source of fire and heat, not in the storage room, near the site may cause fire operations.

2. Good battery storage requirements

Batteries should be stored in well-ventilated, dry and cool places where high temperatures and humidity may impair battery performance or corrode battery surfaces.

Battery cartons should not be stacked above the arrival height of incoming materials, otherwise the batteries in the underlying cartons may be deformed and may leak.

Batteries should be avoided from storage or display in direct sunlight or rain. When the battery is drenched, the insulation resistance will decrease, and self-discharge and rust may occur. The rising temperature may damage the battery.

Store and display batteries in original packaging to avoid stacking batteries after removing packaging, which can easily cause battery short circuit and damage.

For contact with each other easy to cause combustion, explosion and fire

extinguishing methods of different items, should be isolated storage. After production, when the excess battery is returned, it is necessary to restore the original packing state (insulation) and store it.

3.Storage requirements for defective batteries

The following measures must be taken in order to deal with the serious defects such as leakage, bumping and breakage, short circuit and so on, such as the bad core and module which are returned from production:

- A. The core and module bad goods storehouse should be set up separately, the warehouse should be separated by brick wall entity, and should be equipped with fire fighting equipment and alarm facilities with sufficient variety.
- B. After technical and quality determination of the fire risk of the bad core and module, immediately buried in the sandbox and moved to the outdoor open, to prevent fire, and subsequent notification of professional qualifications of the disposal of dangerous waste units. At the same time do a good job of waste procedures.

For general poor performance of the core and module (size, capacity, appearance, etc), adopt the following measures:

- A. after technical and quality judgment is only a general failure of the core and battery:

If the incoming materials are bad, timely notify the purchasing department to return the goods quickly. If the work is bad, it is determined that it can not be repaired.

After the completion of the waste application, timely notification of professional qualifications of the disposal unit.

- B. for the bad battery in the storage period, it is necessary to do a good job in the battery insulation protection (to prevent accidental short circuit), as far as possible to restore to the original factory packaging, to ensure that the battery is safe and good protection.

4.Other requirements

The warehouse manager should check the goods information every day, if it is found that the storage is not correct, the account is not in conformity, the quality problem is timely feedback and handled, the work is over or off duty, the fire prevention inspection should be carried out, and the power supply should be cut off.

Keep safe passage in warehouse, prevent accumulation, ensure personnel safety and rapid transfer of goods. The planning area in the warehouse should be clearly marked, in which the material placement area should be classified and stored in sub-cell (to avoid spreading to the maximum extent when the fire occurs) and clearly marked.

Clean and tidy the warehouse area every day, clean up the dirt and sundries on the ground in time, and arrange the materials in the warehouse into the designated area to meet the requirements of neatness, neatness, cleanliness, hygiene and reasonable arrangement.

Follow the "first in, first out" principle to avoid battery performance degradation due to long-term inventory and accidental occurrence.

VI. Warranty services

Under the guidance of our company, customers return our products so that we can provide maintenance services or replace products of equal value. The customer needs to pay the necessary freight and other related expenses.

Any replacement or maintenance of the product will cover the remaining warranty period of the product. During the warranty period, if any part of the product or product is replaced by our company, all rights and interests of the replaced product or component shall be owned by Jiangsu GSO New Energy Technology Co., Ltd.

Product warranty services do not include damage due to:

- Damage to equipment during transportation (except for transportation by Jiangsu GSO New Energy Technology Co., Ltd)
- Damage caused by improper installation or debugging
- Damage caused by non-compliance with operating manuals, installation manuals or maintenance instructions
- Damage caused by modification, modification or repair of products
- Damage caused by improper use or operation
- Damage caused by inadequate ventilation of equipment
- Damage caused by non-compliance with applicable safety standards or related regulations
- Damage or force majeure caused by natural disasters (floods, lightning, storm snow, fire, etc.) In addition, normal wear or any other failure will not affect the basic operation of the product. Any external scratches, stains or natural mechanical wear do not represent defects in the product.

High- Voltage Lithium

Iron Phosphate Battery