Shenzhen Braun Power Energy Storage Co., Ltd.

12V300AH Battery Pack Product Specification

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Shenzhen Braun Power Energy Storage Co., Ltd.

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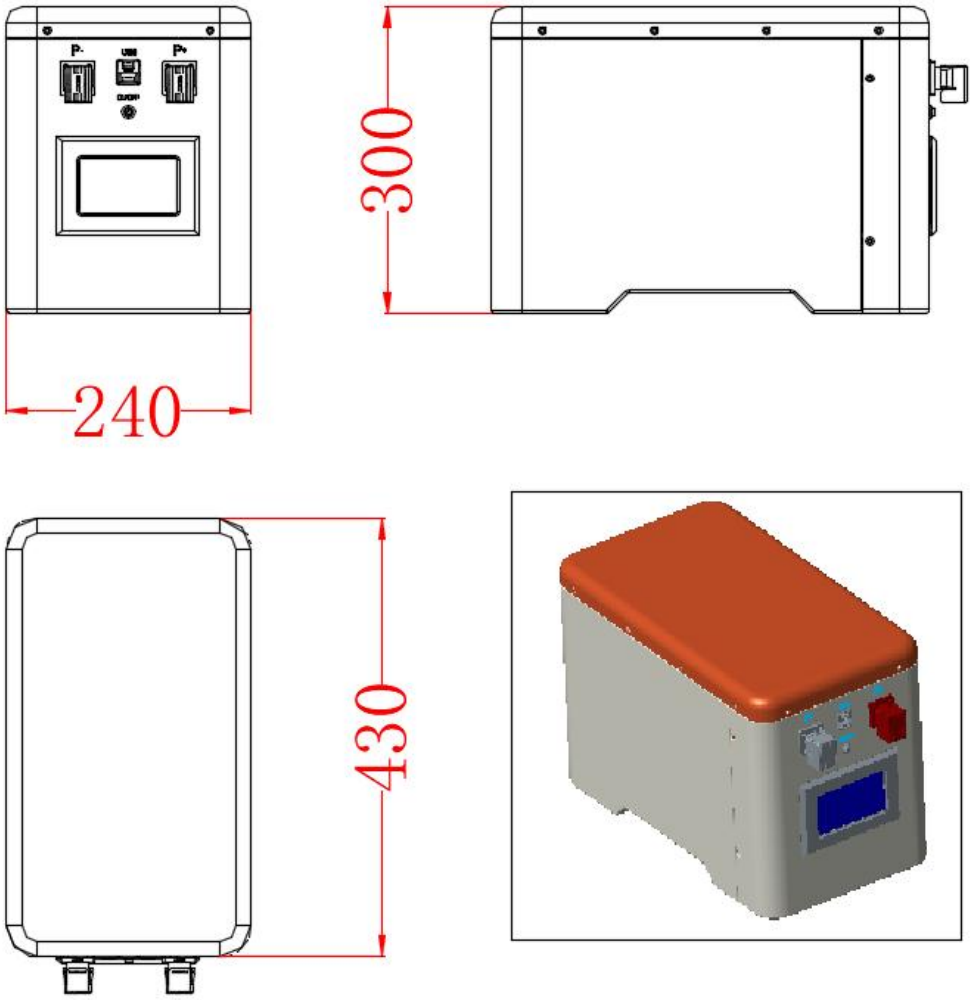
1. Product Overview

This product consists of a lithium iron phosphate battery pack (with BMS) composed of 4 strings of cells, this product is suitable for load equipment with an operating current within the range of 200A.

2. Product technical specifications

This product model is 12V300Ah battery pack, composed of 4S1P cells, maximum continuous charging and discharging current 200A, with Bluetooth communication function, the shell is made of sheet metal casing, and the shell color is white and orange.

2.1 Battery Pack Product Structure



2.2 Technical parameters of the battery system

	serial number	Project name	Basic parameters	note
battery pack	1	Product Model	12V300Ah	
	2	rated voltage	12.8V	
	3	Rated capacity	300Ah	
	4	energy rating	3840Wh	
	5	Cooling method	natural cooling	
	6	combinatorial approach	4 strings and 1 parallel	
	7	Charge and Discharge Ports (common or split)	common-language (e.g. mouth)	
	8	communication method	bluetooth	
	9	monitor	4.3 inch	
	10	heating function	None by default	
	11	Battery pack series-parallel connection	Supports parallel connection	default (setting)
	12	Battery pack charging cut-off voltage	14.6V	Charge protection voltage
	13	Battery pack discharge t-off voltage	10.8V	Discharge protection voltage
	14	Monoblock charging cut-off voltage	3.65	
	15	Single Discharge Cutoff Voltage	2.5	
	16	Charging operating temperature range	-0～55℃	
	17	Discharge operating temperature range	-20～60℃	
	18	standard charge	0.2C current continuous charge to 14.6V cutoff	
	19	standard discharge	1C current continuous discharge to 10.8V cutoff	

	20	Maximum allowable continuous charging current	200A	
	21	Maximum allowable continuous discharge current	200A	
	22	Discharge protection current	250A	
	23	Battery box size (L*W*Hmm)	430x240x300mm	Dimensional tolerance ±2mm
	24	Battery box weight tolerance (KG)	35	Weight tolerance ±2KG

3. Battery Management (BMS) System

3.1 BMS system parameterization

Project name	Indicator project	standard value
Monoblock overcharge protection	Overcharge protection value	3.65±0.05V
	Overcharge alarm value	3.55±0.05V
	overcharge recovery value	3.5±0.05V
Monomer overdischarge protection	overdischarge protection value	2.7±0.05V
	overdischarge alarm value	2.8±0.05V
	bleed-off recovery value	2.9±0.05V
Battery pack overcharge protection	Overcharge protection value	14.6±0.05V
	Overcharge alarm value	14.4±0.05V
	overcharge recovery value	14±0.05V
Battery pack over-discharge protection	overdischarge protection value	10.8±0.05V
	overdischarge alarm value	11.2±0.05V
	bleed-off recovery value	12±0.05V
Charge overcurrent protection	Charge overcurrent protection	250A
Discharge overcurrent protection	Discharge overcurrent 1 protection	250A
	Discharge overcurrent 2 protection	350A
short circuit protection	Short-circuit protection current	2000A
temperature protection	Charging High Temperature Protection	55±2 ° C
	Charge High Temperature Recovery	50±2 ° C
	Charging Low Temperature Protection	-5±2 ° C
	Charge cryoprotection recovery	0±2 ° C
	Discharge heat protection	60±2 ° C
	Discharge High Temperature Recovery	50±2 ° C

	Discharge cryoprotection	-20±2 ° C
	Discharge cryoprotection recovery	0±2 ° C
equalization function	Equalize opening differential pressure	20mA

3.2 Overview of BMS system functions

3.2.1 Unit overcharge protection and recovery

When the voltage of any battery cell is higher than the set value of single overcharge voltage and the duration reaches the single overcharge delay time, the system enters the overcharge protection state and shuts down the charging MOS, and cannot charge the battery.

After monomer overcharge protection, when all monomer voltages drop below the monomer overcharge recovery value, the overcharge protection state is released. It can also be discharged to release.

3.2.2 General overcharge protection and recovery

When the overall voltage is higher than the overall over-voltage setting value and the duration reaches the overall over-charging delay, the system enters into the over-charging protection state and closes the charging MOS, and cannot charge the battery.

When the overall voltage drops below the total voltage overvoltage protection restoration value, the overcharge protection state is released, and can also be discharged and released.

3.2.3 Monoblock overdischarge protection and recovery

When the lowest section voltage is lower than the single over-discharge voltage setting value and the duration reaches the single over-discharge delay time, the system enters into the over-discharge protection state, closes the discharge MOS and cannot discharge the battery.

After the occurrence of single unit over-discharge protection, charging the battery pack can release the over-discharge protection state.

3.2.4 General overdischarge protection and recovery

When the overall voltage is lower than the overall over-discharge voltage setting and the duration reaches the overall over-discharge delay, the system enters into the over-discharge protection state and shuts down the discharge MOS, and cannot discharge the battery.

After overall overdischarge protection has occurred, charging the battery pack can release the overdischarge protection state.

3.2.5 Charging overcurrent protection and recovery

When the charging current exceeds the charging overcurrent protection current and the duration reaches the overcurrent detection delay time, the system enters into the charging overcurrent protection state and cannot charge the battery. After over-current charging protection occurs, the delay time is automatically restored, if you do not want to restore automatically, you can set the corresponding release time longer; discharge can also be released from over-current charging state.

3.2.6 Discharge overcurrent protection and recovery

When the discharge current exceeds the overcurrent protection current and the duration reaches the delay time of overcurrent detection, the system enters into the overcurrent protection state and shuts down the discharge MOS. the delay time automatically recovers after the overcurrent discharge occurs, if you want to avoid the automatic recovery, you can set the corresponding release time longer. Charging can also release the discharge overcurrent state. There are two levels of overcurrent protection for discharge, with different response speeds for different current values to protect the battery more reliably.

3.2.7 Charge/discharge high temperature protection and recovery

When the NTC detects that the temperature on the surface of the battery cell is higher than the set high temperature protection temperature during charging and discharging, the management system enters into a high temperature protection state, and the charging or discharging MOSFETs are turned off, and the battery pack cannot be charged or discharged in this state.

When the temperature on the surface of the cell drops to the high-temperature recovery setpoint, the management system recovers from the high-temperature state and re-conducts the charge/discharge MOS.

3.2.8 Charge/discharge low-temperature protection and recovery

When the NTC detects that the temperature on the surface of the battery cell is lower than the set low-temperature protection temperature during charging and discharging, the

management system enters the low-temperature protection state, and the charging or discharging MOSFETs are turned off, and the battery pack cannot be charged or discharged in this state.

When the temperature on the surface of the cell rises to the low temperature recovery setting, the management system recovers from the low temperature state and re-conducts the charge/discharge MOS.

3.2.9 Equalizing Functions

The management system adopts resistance bypass to equalize the battery cells, during the charging process, when the voltage of the highest single cell of the battery pack reaches the set equalization starting voltage value, and the voltage difference between the lowest voltage and the highest voltage of the single cell of the battery pack is greater than the set value, then the equalization function of the battery cell which reaches the condition will be turned on, and the equalization function of the two neighboring channels cannot be turned on at the same time.

Equalization stops when the cell pressure difference is less than the set value or the cell voltage is less than the equalization on voltage. Charge equalization mode and static equalization mode can be set.

3.2.10 Communication functions

Protection board three kinds of communication, UART and 485 need to be connected to the computer through the communication box, through the host computer way to view battery data. The Bluetooth module can be connected to view the battery data through the Bluetooth function of cell phone.

5. test condition

Except for special cases, all test conditions are based on standard test conditions:

Ambient temperature: 25±5 ℃; ambient humidity 40%-80%RH

"Standard charging" means charging at a constant current of 0.2C up to 14.6V at an ambient temperature of 25℃±5℃, and then charging at a constant voltage of 14.6V.

Electric to current less than 0.02C.

The "standard discharge" is a discharge to 10.8V at a constant current of 0.2C at an ambient temperature of 25°C±5°C. The discharge can be made at a constant current of 0.2C at an ambient temperature of 10.8V.

6. Electrical performance, safety performance testing

6.1 Electrical Performance Testing

Test items	test standard	technical requirement
25°C room temperature discharge capacity	The battery pack is first fully charged at 0.2C current under standard test conditions and then discharged at 0.2C current to record the discharge capacity of the battery pack.	≥100% of nominal capacity
-10°C low temperature discharge capacity	The battery pack is first fully charged with 0.2C current under standard test conditions, then stored for 10H at a low ambient temperature of -10°C, and discharged to the termination voltage with 0.2C current to record the discharging capacity of the battery pack.	≥75% of nominal capacity
55°C high temperature discharge capacity	The battery pack is first fully charged at 0.2C current under standard test conditions, then stored at 55°C high ambient temperature for 5H, and discharged to the termination voltage at 0.2C current to record the discharging capacity of the battery pack.	≥95% of nominal capacity
Charge retention and capacity restoration	Battery packs are first charged and discharged at 0.2C under standard test conditions, initial capacity is recorded, fully charged under standard test conditions, set aside for 30d at 25°±5C ambient temperature, discharged at 0.2C to the termination voltage to test the retention of capacity, charged at 0.2C, discharged at 0.2C, cycling for 3 times, and the third time for the recovery of capacity.	Charge retention ≥95%; Capacity recovery rate ≥95%
Cycle life at 25°C	Battery packs are fully charged at 0.2C current and then discharged at 0.2C current under	≥4000 times

	standard test conditions, with continuous charging and discharging test at 25°C±5°C ambient temperature, and the cycle life test is terminated when the discharged capacity is ≤ 80% of the initial capacity.	
55°C high temperature cycle life	Battery packs are fully charged at 0.2C current and then discharged at 0.2C current under standard test conditions, with continuous charging and discharging at 55°C±5°C ambient temperature, and the cycle life test is terminated when the discharged capacity is ≤ 80% of the initial capacity.	≥ 2000 times

6.2 Safety Performance Testing

Test items	test standard	technical requirement
External Short Circuit Test	Battery pack in the standard test conditions for charging, will be fully charged battery pack placed in the explosion-proof box, with internal resistance of less than 100mΩ wire short-circuit in the battery pack outside the positive and negative electrodes, the test process to record the surface temperature of the battery, short-circuit duration of 10min, that is, to complete the test.	No fire, no explosion
Overcharge test	After the battery pack is charged under standard test conditions, a single cell of the battery pack is charged at 0.2C with a constant current and constant voltage source, and the constant current is charged to 5V and then switched to constant voltage charging until the cutoff current reaches 0A, ending the test.	No fire, no explosion
Over-discharge test	After the battery pack is charged under standard test conditions, the battery pack is continuously discharged at 0.5C with load equipment until the voltage of a single cell	No fire, no explosion

	reaches 0~0.5V, then the test is ended.	

7. Product Packaging Requirements

7.1 Batteries are in good appearance, no paint loss, scratches, deformation, breakage and other undesirable phenomena.

7.2 Before packing, the battery is to be put in a shutdown and dormant state.

7.3 The appearance of the battery should be inspected and passed before packing.

7.4 The outer package is packed in cartons, the information on the cartons should be clear, and the protective wrapping material should be added inside the cartons to ensure that the battery boxes are not scratched during transportation.

8. Product Storage and Transportation

8.1 Product storage

When the product is not used for long-term storage, it should be stored in a dry, clean and well-ventilated warehouse at 10℃~35℃, avoiding flammable and explosive substances; every three months, the battery pack should be regularly charged and maintained to ensure that the battery is in the best performance state.

8.2 Product transportation

Battery packs should be externally packaged for transportation, and should be protected from violent shocks, impacts or extrusion during transportation, and from sun and rain.

9. Warnings and Precautions for Battery Use

To prevent possible battery leakage, heat generation, and explosion, please observe the following precautions

Warning!

① Do not immerse the battery in seawater or water, and keep it in a cool and dry environment when it is not in use.

② Do not use the battery with the positive and negative terminals reversed;

③ Prohibit short-circuiting the positive and negative terminals of the battery by connecting them directly with metal;

④ Prohibit transportation or storage of batteries with metals such as hairpins and necklaces;

⑤ Prohibit knocking or throwing, stepping on batteries, etc;

⑥ Prohibit direct soldering of batteries and piercing of batteries with nails or other sharp objects;

Attention!

① It is prohibited to use or place the battery under high temperature (under hot sunlight or in a very hot car), otherwise it may cause overheating, fire or functional failure, and shorten the life span of the battery; the recommended optimal temperature for long-term storage of the battery is 10-45℃.

② Prohibit the disposal of batteries in the fire or heater to prevent fire, explosion and pollution of the environment; end-of-life batteries should be returned to the supplier or the battery recycling point for disposal.

③ Prohibit the use in the place of strong static electricity and strong magnetic field, otherwise it is easy to destroy the battery safety protection device and bring unsafe hidden danger.

④ If the battery leaks and the electrolyte gets into your eyes, do not rub it, flush your eyes with water immediately and take it to a hospital for treatment immediately, otherwise it will harm your eyes. If the battery emits a strange odor, becomes hot, discolored, deformed, or if any abnormality occurs during use, storage, or charging, the battery should be immediately removed from the device or charger and taken out of service.

⑤ Prohibit the positive and negative terminals of the battery to be directly inserted into the power socket, and a special charger for lithium-ion batteries must be used.

⑥ Check the battery voltage and connections before installation, and use only after everything is normal.

⑦ Battery half-electricity storage, if the battery has not been used for three months, it is necessary to carry out the supplementary electricity once.

⑧ If the electrode is dirty, wipe it with a dry cloth before use, otherwise it may lead to poor contact and functional failure.