Lithium ion power battery
product specification

Product name: iron lithium battery pack

Product model: 51.2V400A

Product specifications: 51.2V 400Ah

Date of preparation: 2025-06-18

Fabrication Producer	Examine and verify Auditor	Ratify Ratifier

Chage record

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	Before the change	After change			

1. Range of application

This specification describes the technical requirements, measurement methods, transportation, storage, and precautions for lithium batteries.

2. Product overview

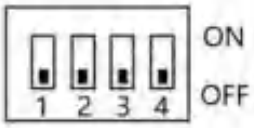
This product is an iron lithium battery pack, consisting of 64100Ah lithium iron phosphate cells connected in series and parallel. The battery pack features a scientifically designed internal structure and advanced manufacturing processes, offering high specific energy, long life, safety, reliability, and a wide operating temperature range. It is a green energy storage solution.

3. Product technical specifications and parameters

Cell	Specifications and models	Lithium iron-100Ah
	Capacity	100Ah
	Nominal voltage	3.2V
	Nominal internal resistance	≤2mΩ
	Compound mode	Four strings in series
	Pairing criteria	Tolerance ≤1%
		The maximum internal resistance of a section is less than or equal to 0.2mΩ
		The voltage difference of a single section is less than or equal to 5mV
		Charge retention capacity is greater than or equal to 90%
Production parameters	Nominal voltage （V）	51.2
	Nominal capacity （Ah）	400
	Minimum capacity (Ah)	400
	Charging cut-off voltage (V)	58.4
	Discharge cut-off voltage (V)	40

	USB output voltage (V)	not have
	Maximum continuous discharge current (A)	200
	Display screen	Have
	Bluetooth function	Have
	Standard charging current (A)	50
	Charging is suitable for temperature	0℃～45℃
	Discharge is suitable for temperature	- 20℃～65℃
	Battery size	305*721*938±3mm (No casters on the main body)
	Battery weight	About 188Kg
	Storage temperature range	-20℃～45℃
	Storage environmental humidity (RH)	5%~95% (no condensate)
Management system	Single overvoltage protection value	3.65V
	Overvoltage release value	3.5V
	Single under-voltage protection value	2.5V
	Undervoltage release value	3.0V
	Overcurrent protection value	210A

When the battery pack is connected in parallel, the baby needs to set a unique Addr/ID for each battery through the switch on the BMS:



Battery ADDR Address Dialing Table

Address	Dial switch position			
	#1	#2	#3	#4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

Summary of communication protocol inverter list (RS485)			
Inverter brand		**communication mode**	**Display protocol options**
Pain	PYLONTECH	RS 485-9600	Pylon
Gurewatt	Growatt	RS485-9600	Growatt
Shuo Ri		RS485-9600	WOW/Pace
Virtue	Deye 德业	RS485-9600	Pylon
Year of the Sun and Moon	Voltronic Power	RS485-9600	Voltronic
first flight		RS485-9600	Sorfar

Smanco		RS485-9600	SMK
Three subjects		RS485-9600	Pylon
Schneider		RS485-9600	Sneider

Summary of communication protocol inverter list (CAN)

Inverter brand		communication mode	Display protocol options
Pain		CANBUS-500K	Pylon
Goodwill		CANBUS-500K	GoodWe
Gurewatt		CAN	Growatt
SMA		CANBUS-500K	SMA
Victron		CANBUS-500K	Victron
MUST		CANBUS-500K	Must
Megraen		CANBUS-500K	Pylon
Virtue		CANBUS-500K	Deye
Invt		CANBUS-500K	Invt
first flight		CANBUS-500K	Sorfar
Sorel		CANBUS-500K	Revo
Sol-Ark		CANBUS-500K	Pylon
Luxpower		CANBUS-500K	Lux
		CANBUS-500K	Pylon
Jinlang		CANBUS-500K	Pylon

Schneider		CANBUS-500K	Sneider
AOTAI	AOTAI	RS 485-9600	Pylon
			ZC
			Kspp
			Sunsynk

Description of indicator light working status

state	normal/give an alarm / protect	RUN	ALM	Power indicator LED				describe
		●	●	●	●	●	●	
Shutdown	hibernate	extinguish	extinguish	extinguish	extinguish	extinguish	extinguish	Completely extinguished
Standby	normal	Flash 1	extinguish	According to the electrical instructions				Standby
	give an alarm	Flash 1	Flash 3					Low battery warning
charge	normal	Light	extinguish	According to the electrical instructions (The highest LED indicator in the battery flashes 2)				The highest battery LED flashes (Flash 2), overcharge alarm ALM does not blink
	give an alarm	Light	Flash 3					
	overcharge protection	Light	extinguish	Light	Light	Light	Light	If there is no mains power, the indicator light will switch to standby mode
	Temperature, overcurrent, and failure protection	extinguish	Light	extinguish	extinguish	extinguish	extinguish	Stop charging
discharge	normal	Flash 3	extinguish	According to the power indicator				
	give an alarm	Flash 3	Flash 3					
	under voltage protection	extinguish	extinguish	extinguish	extinguish	extinguish	extinguish	Stop discharging
	Temperature overcurrent short circuit reverse connection failure, protection	extinguish	Light	extinguish	extinguish	extinguish	extinguish	Stop discharging
fault		extinguish	Light	extinguish	extinguish	extinguish	extinguish	Stop charging and discharging

Capacity indication description

state		charge				discharge			
Capacity indicator light		L4●	L3●	L2●	L1●	L4●	L3●	L2●	L1●
quantity of electricity (%)	0～25%	extinguish	extinguish	extinguish	Flash 2	extinguish	extinguish	extinguish	Light
	26～50%	extinguish	extinguish	Flash 2	Light	extinguish	extinguish	Light	Light
	51～75%	extinguish	Flash 2	Light	Light	extinguish	Light	Light	Light
	76～100%	Flash 2	Light	Light	Light	Light	Light	Light	Light
Operation indicator ●		Light				Flashing (Flashing 3)			

4. Test conditions, methods and performance

4.1 Test conditions

Except as specified, all tests are carried out in an environment with temperature of 15℃~35℃, humidity of 25%~85%, and atmospheric pressure of 86kPa~106kPa.

4.2 Measuring instruments

4.2.1 The accuracy of the DC voltmeter used for measuring voltage shall not be lower than 0.5 grade, and the internal resistance of the voltmeter shall not be lower than 1kΩ/V;

4.2.2 The accuracy of the DC ammeter used for measuring current shall not be lower than 0.5;

4.2.3 The thermometer used for measuring temperature should have an appropriate range, and its scale value should not be greater than 1℃;

4.2.4 The timer used for measurement should be divided by minutes, seconds and have at least ±1% accuracy.

4.3 Standard charging

Use a DC regulated power supply (switching power supply) to charge the current at a constant voltage of 58.4V and current of 0.25C (A) until the current drops to 0.02C (A).

4.4 Standard discharge

After charging according to method (4.3), discharge with constant current of 0.5C (A) using an electronic load until the total voltage is below 40.0V cutoff.

4.5 Battery capacity

Charge and discharge according to method (3.4), record the discharge time (h), capacity (Ah) = current (A) * discharge time (h).

4.6 Electrical performance

Test item	Test method	Technical requirement
Room temperature performance	After the battery pack is charged according to the standard specified in 4.3, it is left at room temperature of 20℃±5℃ for 2h, and then discharged according to the standard specified in 4.4 at the temperature	1. Discharge time> 120min; 2. No fire, no explosion
elevated temperature property	After the battery pack is charged according to the standard specified in 4.3, it is left at high temperature	1. Discharge time> 120min; 2. No fire, no

	of 55℃±2℃ for 2h, and then discharged at this temperature according to the standard specified in 4.4	explosion
Cryogenic property	After the battery pack is charged according to the standard specified in 4.3, it is left at low temperature of-20℃±2℃ for 2h, and then discharged at this temperature according to the standard specified in 3.4	1. Discharge time> 95min; 2. No fire, no explosion
Charge retention	After the battery pack is charged according to the standard specified in 4.3, it is left at room temperature of 20℃±5℃ for 30d, and then discharged at this temperature according to the standard specified in 4.4	Charged retention rate is greater than or equal to 95%
Multi-rate discharge performance	After the battery pack is charged according to the standard specified in 4.3, it is left at room temperature for 10min and discharged at 1C current with cut-off voltage 40.0V, and the discharge capacity is recorded	Discharge capacity is greater than or equal to 95%
Cycle life	Under the condition of 20℃±5℃, the battery pack is charged according to the standard specified in 4.3, left for 5min, and then discharged to the termination condition according to the standard specified in 4.4, and the cycle is repeated. The battery capacity is tested once every 25 cycles according to the standard charge and discharge, and the test is terminated when the capacity is less than 80% of the rated capacity	More than 3000 times

4.7 Environmental performance

Test item	Test condition	Testing standard
Constant temperature and constant heat test	According to 4.3, the battery pack after charging shall be left open for 48 hours under the conditions of ambient temperature 40℃±2℃ and relative humidity 90~95%, and then discharged according to 4.4 after being restored to the conditions of temperature 20℃±5℃ and relative humidity 25%~85%.	The battery pack has no obvious deformation, rust, smoke or explosion; the discharge capacity is more than 80% of the rated capacity.

Temperature ictus	After the battery pack is charged according to 4.3, it is placed in an open circuit in a temperature box 1) Start from-40℃±2℃ and keep low temperature for 120min; 2) Then the temperature was increased to 75℃±2℃ at 10℃/min; 3) Maintain 75℃±2℃ high temperature for 120min; 4) Reduce the temperature to-40℃±2℃ at 10℃/min Repeat 4 times, and after 4 complete cycles, the battery pack is restored to room temperature and taken out. The lithium battery pack is left at 25℃ for 120min to reach room temperature.	There is no deformation, cracking or leakage of the lithium battery pack; the open circuit voltage and charge capacity meet the requirements of product specifications, and can still be charged and discharged normally.

4.8 Safety performance

Test item	Test condition	Testing standard
squeezing test	After the battery pack is charged according to 4.3, it is placed between the two extrusion surfaces of the extrusion equipment, and the pressure is gradually increased to 13KN for 1min.	The battery pack does not explode or catch fire
pin-prick test	Charge the battery pack according to 4.3, place the thermocouple in the battery pack, and use a stainless steel needle Φ5 to penetrate the center of a group of batteries at a speed of 20-40mm/s.	The battery pack does not explode or catch fire
short-circuit test	After charging the battery pack according to 4.3, it is left at 20℃±5℃ for 1h. The battery is short-circuited externally for 10min, and the external line resistance is less than 10mΩ.	The battery pack does not leak, does not explode, does not catch fire
fall-down test	After charging the battery pack according to 4.3, it is left at 20℃±5℃ for 1h, and then dropped from a height of 1.5m to a wooden board at 20℃±5℃.	The battery pack does not leak, does not explode, does not catch fire

Overcharge test	Remove the protective plate, and charge the lithium battery pack continuously with a constant current and voltage source of 1C (A) at 20℃±5℃ ambient temperature until the voltage of a single battery is 3.65V.	The battery pack does not leak, does not explode, does not catch fire
Overdrive test	Remove the protective plate and discharge the battery at 0.5C (A) current until the voltage reaches 0V under 20℃±5℃ conditions.	The battery pack does not leak, does not explode, does not catch fire
Thermal box test	After charging the cell according to 4.3, it is put into the constant temperature heating box, and the constant temperature heating box heats the cell at a temperature rise rate of 5±2℃ per minute. When the temperature of the constant temperature box reaches 130±2℃, it is kept at a constant temperature for 30 minutes.	The battery pack does not leak, does not explode, does not catch fire

5. Product structure characteristics

Product appearance diagram:

6. Storage, maintenance and transportation

6.1 Storage

When the battery pack needs to be stored for a long time, charge it to about 50% (when fully discharged, charge until the battery display shows 50%). Store it in a dry and well-ventilated area, and cycle it every three months. The battery pack should be stored in a clean, dry, and well-ventilated place, avoiding contact with corrosive substances, and keeping it away from fire and heat sources.

6.2 Transportation

The battery pack should be packed and transported. During transportation, violent vibration, impact or compression should be prevented, sun exposure, rain exposure, and inverted. It can be transported by automobile, train, ship, aircraft and other means of transportation.

6.3 Maintenance

6.3.1 When the battery pack is stored, it should be stored at 40%~60% charge state;

6.3.2 When the battery pack is not used for a long time, it is recommended to recharge the battery every three months or so. Each time the battery is charged, charge the battery until the display shows 50% of the power;

6.3.3 During maintenance, please do not reinstall the batteries in the battery pack by yourself, otherwise it will cause the performance of the battery to decline;

6.3.4 Do not replace any battery in the battery pack without authorization, and do not dissect the battery.

7. Battery usage precautions

7.1 Do not reverse the positive and negative poles to prevent short circuit;

7.2 Do not put the battery pack into water or wet it;

7.3 Do not charge the battery pack under fire or extremely hot conditions! Do not use or store the battery pack near heat sources (such as fire or heater);

7.4 It is strictly prohibited to puncture the battery pack shell with nails or other sharp objects, and it is forbidden to hammer or step on the battery pack;

7.5 It is strictly prohibited to decompose the battery pack and battery in any way;

7.6 If the battery pack emits odor, heat, deformation, discoloration or any other abnormal phenomenon, it should be immediately removed from the appliance or charger and stop using;

7.7 If the electrolyte accidentally splashes into the eyes after the battery leaks, do not wipe it, but rinse with water immediately. In serious cases, seek medical assistance in time;

7.8 The ambient temperature will affect the discharge capacity. When the ambient temperature exceeds the standard environment (25℃±5℃), the discharge capacity will be slightly reduced;

7.9 If there is an unusual smell or abnormal sound during the charging process of the battery pack, please stop charging immediately;

7.10 If there is an unusual smell or abnormal sound during the discharge process of the battery pack, stop the discharge immediately;

7.11 If the above phenomenon occurs, please contact the manufacturer and do not dismantle it privately.