瑞浦能源 REPT

Product Specification Sheet for Lithium-ion Power Battery CB 71173200PA-220Ah

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Catalogue

1 Scope of Application

This product specification document specifies the performance requirements, testing methods, transportation and storage requirements, as well as precautions for the IFP71173200-220Ah lithium-ion battery.

2 Normative Reference Document

The following documents are essential for the application of this document. For dated references, only the version dated applies to this document. For undated references, their latest version (including all change orders) applies to this document.

GB/T 31484—2015 Cycle Life Requirements and Test Methods for Power Batteries Used in Electric Vehicles

GB/T 31485—2015 Safety Requirements and Test Methods for Power Batteries Used in Electric Vehicles

GB/T 31486—2015 Electrical Performance Requirements and Test Methods for Power Batteries Used in Electric Vehicles

GB/T 19596 Electric Vehicle Terminology

3 Performance Index

Note: The indicator is specific to new batteries only.

Order number	Project	Specifications	Remarks
3.1	Nominal capacity	220Ah	0.5°C, room temperature
3.2	Nominal voltage	3.2V	
3.3	Operating voltage range	2.5-3.65V	
3.4	Standard discharge current	220A	Room temperature
3.5	Maximum continuous discharge current	330A	Room temperature
3.6	Peak discharge current	440A	@30s，SOC≥30%
3.7	Standard charging current	220A	Room temperature
3.8	Maximum continuous charging current	330A	Room temperature
3.9	Peak charging current	440A	@30s，SOC≤70%
3.10	End-use temperature	Charging: 0°C~55°C Discharge: -20°C to 55°C	
3.11	Storage temperature	-40℃~60℃	
3.12	Battery size	Thickness: $71.5^{+1}_{-0.55}$ mm Width: 173.8±0.5 mm Shoulder height: 200.5±0.6 mm Total height: 207.1±0.6 mm	
3.13	Anode material	Lithium iron phosphate	

3.14	Battery weight	5.2±0.16kg	
3.15	Energy density	135Wh/kg	
3.16	Direct current internal resistance	＜0.5mΩ	@10s，50%SOC
3.17	Standard charging mode (CC&CV)	Under ambient temperature conditions (25±2)℃, charging was performed using a constant current followed by constant voltage method. The constant current was set at 1A, and the constant voltage was maintained at 3.65V. Charging termination occurred when the current decreased to 0.05A during the constant voltage phase, followed by a 1-hour resting period.	

4 Electrical Properties

4.1 Standard Test Conditions

The battery should be a new product (stored for less than 1 month after manufacturing) with fewer than 5 cycles. Unless otherwise specified, all test conditions in this specification are as follows:

Temperature: 25 ± 5℃, humidity: 15%~90% RH, air pressure: 86kPa~106kPa. The room temperature in the specification refers to 25±2℃,1I_1(A) current is 220A.

(1) Charging mode:

Cell temperature	Standard charging	Quick charge
<0℃	Charging is not allowed	Charging is not allowed
0℃≤T<10℃	0.2I_1(A) Charge to 3.65V	0.5I_1(A) Charge to 3.5V, reduce power 0.2I_1(A) Charge to 3.65V
10℃≤T<20℃	0.5I_1(A) Charge to 3.65V, then switch to 3.65V constant voltage charging until the current drops to 0.05I_1(A) Terminate	1.0I_1(A) Charge to 3.65V, then switch to 3.65V constant voltage charging until the current drops to 0.05I_1(A) Terminate
15℃≤T<55℃	1.0I_1(A) Charge to 3.65V, then switch to 3.65V constant voltage charging until the current drops to 0.05I_1(A) Terminate	1.25I_1(A) Charge to 3.5V, reduce power 1I_1(A) Charge to 3.65V, switch to 3.65V constant voltage charging until current drops to 0.05I_1(A) Terminate
>55℃	Charging is not allowed	

(2) Discharge mode:

Parameter	Size of product	Condition
Standard discharge	220A	25±2℃
Maximum continuous discharge current	330A	25±2℃
Maximum pulse discharge current (long pulse)	440A	25±2°C, SOC≥30%,30-second pulse
Minimum pulse discharge cutoff voltage	2.5V	25±2℃

Standard discharge temperature	25±2℃	—

(3) Pulse discharge mode:

SOC	Cell temperature					
	<-20℃	≥-20℃	≥0℃	≥10℃	≥20℃	>55℃
≥30%	Not allow	110A/30s	220A/30s	330A/30s	440A/30s	Not allow

4.2 Test Equipment Accuracy

(1) Voltage measurement accuracy: ≥0.5 class.

(2) Current measurement accuracy: ≥0.5 class.

(3) Temperature measurement accuracy: ±0.5℃.

(4) Time measurement accuracy: ±0.1%.

(5) Dimension measurement accuracy: ±0.1%.

4.3 Testing Procedure

Order number	Project	Testing procedure	Standard
4.3.1	Room temperature discharge capacity (initial capacity)	1) Test temperature: 25±2℃. 2) Charge the battery according to Section 3.17. 3) Discharge the battery at a current of $1I_1$(A) to 2.5V and record the discharge capacity (Ah).	110%*rated capacity ≥ discharge capacity ≥ 100%*rated capacity
4.3.2	Room temperature rate charging	1) Test temperature: 25±2℃. 2) Discharge the battery at $1I_1$(A) to 2.5V and leave it undisturbed for 1h. 3) Charge the battery at 440A current to 3.65V and let it stand for 1 hour. 4) Discharge the battery at a current of $1I_1$ (A) to 2.5V and record the discharge capacity (Ah).	Discharge capacity ≥ 80%*initial capacity
4.3.3	Room temperature rate discharge	1) Test temperature: 25±2℃. 2) Charge the battery according to Section 3.17. 3) Discharge the battery at a current of 440A to 2.5V and record the discharge capacity (Ah).	Discharge capacity ≥ 80%*initial capacity
4.3.4	High temperature discharge	1) Charge the battery according to Section 3.17 2) The battery was left at 55±2°C for 5 hours. 3) The battery was discharged at a current of 1 I_1(A) to 2.5V at 55±2℃ and the discharge capacity (Ah) was recorded. 4) Store the battery at 25±5°C for 12 hours and inspect its appearance.	No deformation, swelling, or other abnormalities; discharge capacity ≥ 90%*initial capacity
4.3.5	Cryogenic discharge	1) Charge the battery according to Section 3.17	No deformation, swelling, or other abnormalities

		2) The battery was stored at-20±2°C for 24 hours. 3) The battery was discharged at a current of $1I_1$ (A) to 2.0V at-20±2℃ and the discharge capacity (Ah) was recorded. 4) Store the battery at 25±5°C for 12 hours and inspect its appearance.	Abnormal condition; Discharge capacity ≥70%*~~initial~~ capacity
4.3.6	Cycle life	1) Test temperature: 25±2℃. 2) Charge by first constant current and then constant voltage method, the constant current is $1I_1$(A), the constant voltage is 3.65V, during the constant voltage process, the charging can be terminated when the current drops to $0.05I_1$(A), and rest for 30min. 3) Discharge the battery at a current of $1I_1$(A) to 2.5V and leave it for 30min. 4) Repeat steps 2) and 3) until the battery capacity falls below 80% of the initial capacity, and record the number of cycles.	Cycle life ≥4000 cycles
4.3.7	Storage and recovery at room temperature	1) Test temperature: 25±2℃. 2) Charge the battery according to Section 3.17. 3) The batteries were stored at room temperature for 28 days. 4) Discharge the battery at $1I_1$(A) current to 2.5 V and record the remaining capacity (Ah). 5) Charge the battery according to Section 3.17. 6) Discharge the battery at $1I_1$(A) current to 2.5 V and record the recovery capacity (Ah).	No deformation, expansion, or other abnormalities; residual capacity ≥ 90%*of initial capacity; restored capacity ≥ 94%*of initial capacity
4.3.8	High-temperature storage and recovery	1) Charge the battery according to Section 3.17. 2) The batteries were stored at 55±2°C for 28 days. 3) After removing the battery and leaving it at 25±2℃ for 5h, discharge the battery at $1I_1$(A) current to 2.5V and record the remaining capacity (Ah). 4) Charge the battery according to Section 3.17. 5) Discharge the battery at $1I_1$(A) current to 2.5 V and record the recovery capacity (Ah).	No deformation, expansion, or other abnormalities; residual capacity ≥ 90%*of initial capacity; restored capacity ≥ 94%*of initial capacity

5 Safety Performance

Order number	Project	Testing procedure	Standard
5.1	Temperature cycle	1) Charge the battery according to Section 3.17. 2) Place the battery in the oven. The oven temperature should be set according to Table 5.1 and Figure. 5.1 changes 5 times. 3) Observe the battery for 1 hour.	No ignition, explosion, or leakage
5.2	Heat endurance	1) Charge the battery according to Section 3.17.	No ignition or explosion

		2) Place the battery in the oven, allowing the temperature to rise at a rate of 5°C/min to reach 130 ±2°C and maintain this temperature for 30 minutes. 3) Observe the battery for 1 hour.	—
5.3	Decline	1) Charge the battery according to Section 3.17. 2) Drop the battery's positive and negative terminals downward from a height of 1.5 meters onto a concrete surface. 3) Observe the battery for 1 hour.	No ignition, explosion, or leakage
5.4	Vibrate	1) Charge the battery according to Section 3.17. 2) Secure the battery to the vibration test bench and perform linear frequency-sweep vibration testing under the following conditions: Discharge current: 1/3 I_1(A) Vibration direction: Up and down Vibration frequency: 10~55Hz ---Maximum acceleration: 30m/s ^{2} Scan cycle: 10 times Vibration duration: 3 hours 3) Battery phenomena were observed during the testing process.	No current fluctuation, abnormal voltage; No deformation, leakage, or other abnormalities;
5.5	Sea immersion	1) Charge the battery according to Section 3.17. 2) Immerse the battery in a 3.5% NaCl solution for 2 hours. 3) The water depth should completely submerge the battery.	No ignition or explosion
5.6	Cyclone	1) Test temperature: 25±2℃. 2) Charge the battery according to Section 3.17. 3) Place the battery in a low-pressure chamber, with the pressure maintained at 11.6 kPa, static for 6 hours. 4) Observe the battery for 1 hour.	No ignition, explosion, or leakage
5.7	Overcharge	1) Test temperature: 25±2℃. 2) Charge the battery according to Section 3.17. 3) Charge the battery with a current of 1I_1(A) for 1h or until the voltage reaches 5.5V. 4) Observe the battery for 1 hour.	No ignition or explosion
5.8	Overfall	1) Test temperature: 25±2℃. 2) Charge the battery according to Section 3.17. 3) The battery was discharged at a current of 1I_1(A) for 90min. 4) Observe the battery for 1 hour.	No ignition, explosion, or leakage
5.9	Short	1) Test temperature: 25±2℃. 2) Charge the battery according to Section 3.17. 3) Apply an external short circuit to the battery for 10 minutes, ensuring the resistance of the external circuit is ≤5 mΩ. 4) Observe the battery for 1 hour.	No ignition or explosion

Table 5.1 Changes in Time and Temperature During Temperature Cycling

Temperature (℃)	Interval (min)	Cumulative time (min)	Temperature change rate (℃/min)
25	0	0	0

-40	60	60	13/12
-40	90	150	0
25	60	210	13/12
85	90	300	2/3
85	110	410	0
25	70	480	6/7

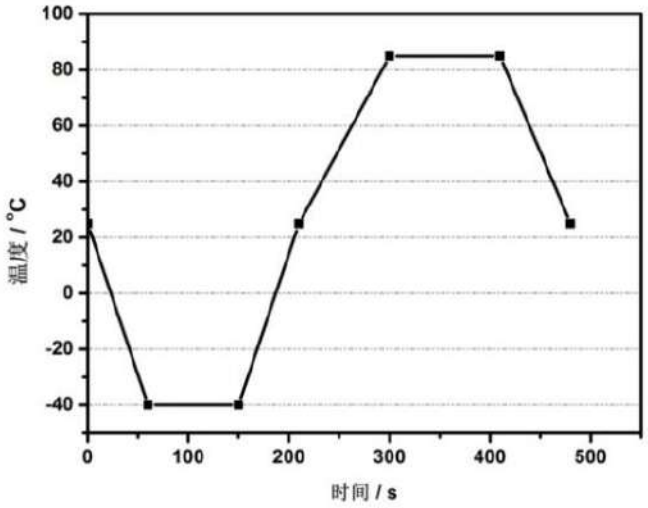


Figure 5.1 Temperature-Time Curve During Temperature Cycling

6 Transportation and Storage

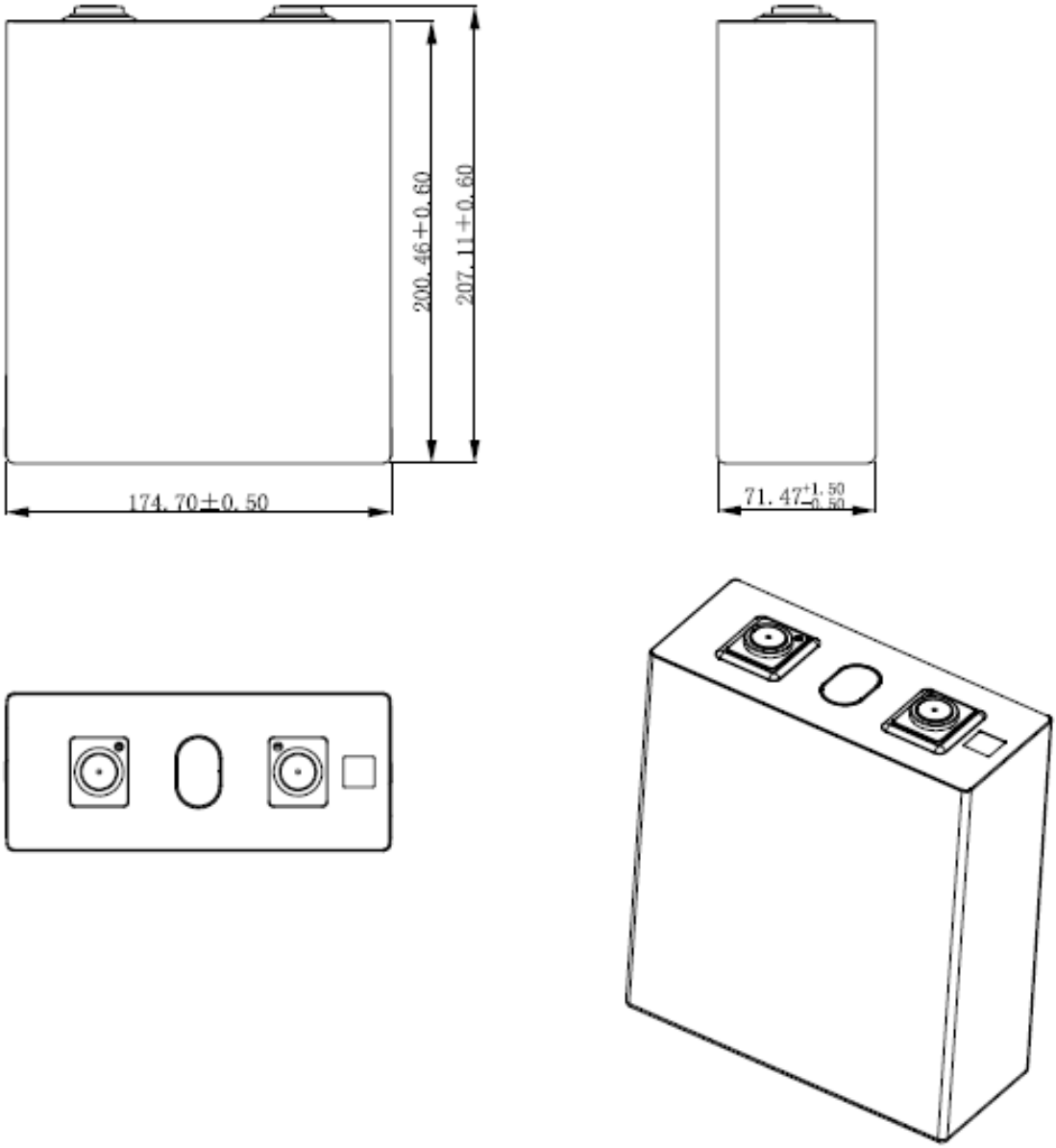
6.1 Transport

The appropriate packaging method for battery packs should be selected based on the transportation destination and mode of transport. During transportation, vigorous vibrations, external impacts or compression must be avoided, and exposure to sunlight or rain should be prevented. Vehicles such as trucks, trains, ships, or aircraft may be utilized for transportation. Throughout the transport process, a battery capacity of 10-30% should be maintained.

6.2 Memory

Batteries should be stored under conditions permitting ambient temperatures of-30°C to 60°C, with recommended storage temperatures ranging from-10°C to 40°C and relative humidity levels between 10%RH and 90%RH. Avoid exposure of batteries to corrosive substances or magnetic environments. Store batteries in clean, dry, and well-ventilated areas, away from ignition sources and heat sources. When not in use, batteries should not be stored continuously for more than 3 months.

7 Shell External Dimensions



8 Quality Assurance

The warranty period of the battery is determined by the commercial contract. Within this period, if battery issues are caused by user misuse rather than manufacturing process or quality management issues from the manufacturer, RuiPu Energy Co., Ltd. may provide technical guidance but does not guarantee free replacement services.

Ripu Energy Co., Ltd. shall not be held liable for any issues or safety incidents arising from the following circumstances:

1) Problems and safety incidents resulting from non-compliance with safety usage guidelines;

2) Defective batteries produced by users during battery assembly after shipment;

3) Problems arising from the combined use of batteries with circuits, battery packs, and chargers.

For safety considerations, if there are special applications such as supporting equipment design, lithium-ion battery system protection circuits, or high-current requirements, please consult Ruipu Energy Co., Ltd. for relevant matters.

9 Safety Guidelines

To prevent battery damage or personal injury caused by the misuse of prismatic lithium-ion battery modules, please carefully read the following safety guidelines before using prismatic lithium-ion batteries:

warn 

— Improper use and storage of batteries pose risks of fire, explosion, and burns. Do not disassemble, crush, incinerate, heat, or dispose of batteries in open flames.

— Keep batteries out of reach of children, do not remove the original packaging before use, and dispose of used batteries in accordance with local recycling or waste regulations.

— If battery replacement is required, batteries produced by the same manufacturer should be used. Using batteries provided by other manufacturers may pose risks of fire and explosion.

— Do not immerse batteries in water or wet them;

— Do not allow the battery's positive and negative terminals to contact the metal casing simultaneously.

— Do not short-circuit, overcharge, or overdischarge the battery;

— Do not use or store batteries near heat sources (such as fire or heaters);

— Do not reverse the polarity of the battery;

— Do not store batteries with coins, metal jewelry or other metal objects;

— Do not puncture the battery casing with nails or other sharp objects, and avoid hammering or stepping on the battery.

— Do not weld batteries directly;

— Do not disassemble or repair the battery in any way without authorization;

— Do not impact, throw, or subject the battery to mechanical vibration or natural drop.

— Do not mix lithium-ion batteries of different types or brands for use.

— Do not connect the negative electrode column to the housing (positive polarity).

— Do not use the battery if it emits an odor, generates heat, deforms, changes color, or exhibits any other abnormal phenomena, and remove the battery from the usage environment.

— In case of battery fire, extinguish it using dry powder, foam extinguisher, or sand, and remove the affected area from use.

10 Shipping Status

Unless otherwise specified by the customer, batteries come with approximately 50-60% battery capacity at the time of shipment.

11 Manufacturer Information

Manufacturer: Rephys Energy Limited

Address: No.2666 Longxiang Road, Longwan District, Wenzhou City, Zhejiang Province