

Specification Approval Sheet

产品规格书

Customer Name 客户名称: _____

P/N 料号: _____

Product Model 产品型号: 12V/230Ah

Prepared by 制作	Checked by 审核	Approved by 批准
Customer Approved 客户承认		

Edit Record

修改记录

version 版本	Describe 描述	The date 日期	Reviser 修订者
A0	The official version 正式版本		

Catalogue

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1. Scope 概述

This specification is applied to Lithium Polymer Battery manufactured by Huizhou Rui Dejin New Energy Co., Ltd .

The product is ROHS compliant

本产品符合 ROHS 标准

This product specification specifies the performance requirements, test methods, transportation, storage requirements and precautions of lithium-ion battery.

本产品规格书规定了型锂离子电池的性能要求、试验方法、运输、贮存要求和注意事项等。

Reference standard 参考标准:

GB/T 31484—2015 电动汽车用动力蓄电池循环寿命要求及试验方法

GB/T 31484—2015 Electric vehicle power battery cycle life requirements and test methods

GB/T 31485—2015 电动汽车用动力蓄电池安全要求及试验方法

GB/T 31485—2015 Safety requirements and test methods for power batteries for electric vehicles

GB/T 31486—2015 电动汽车用动力蓄电池电性能要求及试验方法

GB/T 31486—2015 Electric performance requirements and test methods of power batteries for electric vehicles

GB/T 19596—电动汽车术语

GB/T 19596—Electric Vehicle Terminology

2. Product and Model Name 产品种类及型号

2.1 Product 产品种类: Lithium iron phosphate power battery in aluminum case 铝壳磷酸铁锂动力电池

2.2 Model Battery 电池型号: 12V230Ah

3. Product basic information 产品基本信息

No.	Items 项目	Parameter 参数	
3.1	Battery model 电芯型号	12V230Ah	
3.2	The anode material 正极材料	磷酸铁锂	
3.3	Nominal capacity 标称容量	230Ah (1C 室温 At room temperature)	
3.4	Nominal voltage 标称电压	12V	
3.5	Energy 能量	2944Wh	
3.6	Shipment voltage 出货电压	10-14.6V	
3.7	Peak charging current 峰值充电电流	≤200A (持续时间The duration of the 10S)	
3.8	Maximum charge current 最大持续充电电流	≤200A	
	Standard charging current 标准充电电流	≤100A	
3.9	Peak discharge current 峰值放电电流	≤600A (持续时间The duration of the 10S)	
3.10	Maximum discharge current 最大持续放电电流	≤200A	
	Standard discharge current 标准放电电流	≤100A	
3.11	Operating Temperature 工作温度	Charge 充电	0°C~55°C
		Discharge 放电	-20°C~55°C
3.12	Storage temperature 贮存温度	≤20°C~55°C	
3.13	The battery weight 电池重量	19.1±0.05kg	

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3.14	Standard Charge 标准充电(CC&CV)	Under the condition of ambient temperature (25 ± 2)°C, the charging method of constant current and then constant voltage is adopted. The constant current current is 1I1(A), and the constant voltage voltage is 14.6V. In the constant voltage process, when the current drops to 0.05I1(A), the charging is terminated and the charging is left for 1 hour. 在环境温度(25 ± 2)°C条件下，采用先恒流再恒压方式充电。恒流电流为 1I1(A)，恒压电压为 14.6V，在恒压过程中当电流降至0.05I1(A)终止充电，静置 1 小时。
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4.electrical 电性能

4.1 Standard test conditions 标准测试条件

Batteries should be new products (stored less than 1 month after manufacture) with less than 5 cycles. Unless otherwise For clarification, all test conditions in this specification are as follows: Temperature: 25 ± 5 °C , humidity: 15%~90% RH, air pressure: 86kPa~106kPa. Room temperature in specifications Refers to 25 ± 2 °C, 1I1(A) current is 200A.

电池应为新产品(在制造后少于 1 个月储存)，循环次数少于 5 次。除非另有说明，本规范中的所有测试条件如下：

温度: 25 ± 5 °C，湿度: 15%~90% RH，气压: 86kPa~106kPa。规格书中室温指的是 25 ± 2 °C，1I1(A)电流为 200A。

4.2 Accuracy of test equipment 测试设备精度

- (1) Voltage measurement accuracy 电压测量精度: ≥ 0.5 级.
- (2) Accuracy of current measurement 电流测量精度: ≥ 0.5 级.
- (3) Accuracy of temperature measurement 温度测量精度: ± 0.5 °C.
- (4) Accuracy of time measurement 时间测量精度: $\pm 0.1\%$.
- (5) Accuracy of dimensional measurement 尺寸测量精度: $\pm 0.1\%$.

5. Electrical Characteristics and reliability requirements 电气特性和可靠性要求

No.	Items 项目	Test Method 测试方法	The performance requirements 性能要求
1	Room temperature discharge capacity (initial capacity) 室温放电容量 (初始容量)	1) Test temperature: $25 \pm 2^\circ\text{C}$ 2) Fully charge the battery according to 3.14 3) Discharge the battery at 1I1(A) current to 10V and record the discharge capacity (Ah) 1) 测试温度: $25 \pm 2^\circ\text{C}$. 2) 根据 3.14 将电池充满电. 3) 将电池以 1I1(A)电流放电至 10V 并记录放电容量 (Ah).	110%* Rated capacity \geq Discharge capacity $\geq 100\%*$ Rated capacity 110%*额定容量 \geq 放电容量 $\geq 100\%*$ 额定容量
2	Charge at room temperature 室温倍率充电	1) Test temperature: $25 \pm 2^\circ\text{C}$ 2) Discharge the battery at 1I1(A) to 10V and let it stand for 1h 3) Charge the battery with 2I1(A) current to 14.6V. The total charging time shall not exceed 30min and stand for 1h 4) Discharge the battery at 1I1(A) current to 10V and record the discharge capacity (Ah) 1) 测试温度: $25 \pm 2^\circ\text{C}$. 2) 将电池以 1I1(A)放电至 10V, 并静置 1h. 3) 将电池以 2I1(A)电流充电至 14.6V 总充电时间不超过 30min 并静置 1h. 4) 将电池以 1I1(A)电流放电至 10V 并记录放电容量 (Ah).	Discharge capacity $\geq 85\% *$ initial capacity 放电容量 $\geq 85\%*$ 初始容量
3	Discharge at room temperature rate 室温倍率放电	4) Test temperature: $25 \pm 2^\circ\text{C}$ 5) Fully charge the battery according to 3.14 6) Discharge the battery at 2I1(A) current to 10V and record the discharge capacity (Ah) 1) 测试温度: $25 \pm 2^\circ\text{C}$. 2) 根据 3.14 将电池充满电. 3) 将电池以 2I1(A)电流放电至 10V 并记录放电容量 (Ah).	Discharge capacity $\geq 90\%*$ initial capacity 放电容量 $\geq 90\%*$ 初始容量
4	Discharge of high temperature 高温放电	1) Fully charge the battery according to 3.14 2) Leave the battery at $55 \pm 2^\circ\text{C}$ for 5h 3) Discharge the battery to 10V with 1I1 (A) current at $55 \pm 2^\circ\text{C}$ and record the discharge capacity (Ah) 4) Leave the battery at $25 \pm 5^\circ\text{C}$ for 12h and check its appearance 1) 根据 3.14 将电池充满电 2) 将电池在 $55 \pm 2^\circ\text{C}$ 静置 5h. 3) 在 $55 \pm 2^\circ\text{C}$ 下将电池以 1I1(A)电流放电至 10V 并记录放电容量(Ah). 4) 将电池在 $25 \pm 5^\circ\text{C}$ 静置 12h 并检查电池的外观.	No deformation, expansion or other abnormalities; Discharge capacity $\geq 95\% *$ initial capacity 无变形、膨胀或其他异常情况; 放电容量 $\geq 95\%*$ 初始容量

5	Low temperature discharge 低温放电	1) Fully charge the battery according to 3.14 2) The battery was left at $-20 \pm 2^\circ\text{C}$ for 24h 3) Discharge the battery at A current of 1I1(A) to 10V at $20 \pm 2^\circ\text{C}$ and record the discharge capacity (Ah) 4) Stand the battery at $25 \pm 5^\circ\text{C}$ for 12h and check the appearance of the battery 1) 根据 3.14 将电池充满电 2) 将电池在 $-20 \pm 2^\circ\text{C}$ 下静置 24h. 3) 在 $-20 \pm 2^\circ\text{C}$ 下将电池以 1I1(A) 电流放电至 10V 并记录放电容量(Ah). 4) 将电池在 $25 \pm 5^\circ\text{C}$ 静置 12h 并检查电池的外观	No deformation, expansion or other abnormal conditions; Discharge capacity $\geq 70\% * \text{initial capacity}$ 无变形、膨胀或其他异常情况; 放电容量 $\geq 70\% * \text{初始容量}$
6	Cycle life 循环寿命	1) Test temperature: $25 \pm 2^\circ\text{C}$ 2) The charging mode is first constant current and then constant voltage. The constant current current is 0.5I1(A), and the constant voltage voltage is 14.6V. In the constant voltage process, the charging can be stopped when the current drops to 0.05I1(A), and the charging can be left for 30min 3) Discharge the battery at 0.5I1(A) current to 10V and let stand for 30min 4) Repeat steps 2) and 3) until the battery capacity is less than 70% of the initial capacity and record the number of cycles. 1) 测试温度: $25 \pm 2^\circ\text{C}$. 2) 采用先恒流再恒压方式充电, 恒流电流为以 0.5I1(A), 恒压电压为 14.6V, 在恒压过程中至电流降到 0.05I1(A) 即可终止充电, 静置 30min. 3) 将电池以 0.5I1(A) 电流放电至 10V, 并静置 30min. 4) 重复 2) 和 3) 步骤, 直到电池容量小于 70% 的初始容量, 并记录循环次数。	Cycle life ≥ 5500 times 循环寿命 ≥ 5500 次
7	Room temperature storage and recovery 室温存储和恢复	1) Test temperature: $25 \pm 2^\circ\text{C}$ 2) Fully charge the battery according to 3.14 3) Store the battery at room temperature for 28 days 4) Discharge the battery at 1I1(A) current to 10V and record the remaining capacity (Ah) 5) Fully charge the battery according to 3.14 6) Discharge the battery at 1I1(A) current to 10V and record the recovery capacity (Ah) 1) 测试温度: $25 \pm 2^\circ\text{C}$ 2) 根据 3.14 将电池充满电 3) 将电池在室温下存储 28 天 4) 将电池以 1I1(A) 电流放电至 10V, 并记录剩余容量	No deformation, expansion or other abnormal conditions; Residual capacity $\geq 90\% * \text{initial capacity}$; Restored capacity $\geq 94\% * \text{Initial capacity}$ 无变形、膨胀或其他异常情况; 剩余容量 $\geq 90\% * \text{初始容量}$; 恢复容量 $\geq 94\% * \text{初始容量}$

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	(Ah). 5) 根据 3.14 将电池充满电. 6) 将电池以 1I1(A)电流放电至 10V， 并记录恢复容量 (Ah)		
8	High temperature storage and recovery 高温存储和恢复	1) Fully charge the battery according to 3.14 2) The battery was stored at 55 ± 2 ° C for 7 days 3) After the battery was removed and left at 25 ± 2 ° C for 5h, the battery was discharged at 1I1(A) current to 10V, and the remaining capacity (Ah) was recorded 4) Fully charge the battery according to 3.14 5) Discharge the battery at 1I1(A) current to 10V and record the recovery capacity (Ah) 1) 根据 3.14 将电池充满电 2) 将电池在 55 ± 2 °C 存储 7 天. 3) 将电池取出并在 25 ± 2 °C 静置 5h 后,将电池以 1I1(A)电流放电至 10V， 并记录剩余容量(Ah). 4) 根据 3.14 将电池充满电. 5) 将电池以 1I1(A)电流放电至 10V， 并记录恢复容量 (Ah)	No deformation, expansion or other abnormal conditions; Residual capacity $\geq 90\%^*$ initial capacity; Restored capacity $\geq 94\% \times$ Initial capacity 无变形、膨胀或其他异常情况;剩余容量 $\geq 90\%^*$ 初始容量;恢复容量 $\geq 94\%^*$ 初始容量

6. safety performance 安全性能

No.	Items 项目	Test Method 测试方法	Criteria 标准
1	Vibration 振动	<p>1) Fully charge the battery according to 3.14</p> <p>2) The battery is fixed to the vibration test bench, and the linear frequency sweep vibration test is carried out according to the following conditions:</p> <p>---Discharge current:1/3 I1(A)</p> <p>--- The vibration direction: Single up and down vibration</p> <p>--- The vibration frequency: 10~55Hz</p> <p>--- Maximum acceleration: 30m/s²</p> <p>--- Sweep cycle: 10 times</p> <p>--- Vibration time: 3h</p> <p>1) 根据 3.14 将电池充满电</p> <p>2) 将电池固定到振动实验台上, 按下述条件进行线性扫频振动试验:</p> <p>--- 放电电流: 1/3 I1(A)</p> <p>--- 振动方向: 上下单振动</p> <p>--- 振动频率: 10~55Hz</p> <p>--- 最大加速度: 30m/s²</p> <p>--- 扫面循环: 10 次</p> <p>--- 振动时间: 3h</p> <p>3) 测试过程中观察电池现象</p>	<p>No current fluctuation, no abnormal voltage; No deformation, leakage or other abnormality</p> <p>无电流波动,无异常电压;无变形、无泄露或其他异常</p>
2	Depression 低气压	<p>1)Test temperature: 25±2°C.</p> <p>2)Fully charge the battery according to 3.14</p> <p>3)The battery was placed in a low pressure chamber with the pressure kept at 11.6kPa for 6h</p> <p>4)Observe the battery for 1h</p> <p>1)测试温度: 25±2°C.</p> <p>2)根据 3.14 将电池充满电.</p> <p>3)将电池放入低气压箱中, 气压保持为 11.6kPa, 静置 6h.</p> <p>4)观察电池 1h.</p>	<p>No explosion, no fire, the external temperature of the battery should not exceed 150°C</p> <p>不爆炸、不起火，电池外部温度不应超过 150°C。</p>
3	The overcharge 过充	<p>1)Test temperature :25±2°C</p> <p>2)Fully charge the battery according to 3.14</p> <p>3)Charge the battery at 1I1(A) current for 1h or the voltage reaches 16V</p> <p>4)Observe the battery for 1h</p> <p>1)测试温度:25±2°C.</p> <p>2)根据 3.14 将电池充满电.</p> <p>3)将电池以 1I1(A)电流充电 1h 或者电压达到 16V.</p> <p>4)观察电池 1h.</p>	<p>No fire 、 no explosion</p> <p>无着火、无爆炸</p>
4	A put 过放	<p>1)Test temperature: 25±2°C</p> <p>2)Fully charge the battery according to 3.14</p> <p>3)Discharge the battery at 1I1(A) current for 90min</p> <p>4)Observe the battery for 1 hour</p> <p>1)测试温度: 25±2°C</p> <p>2)根据 3.14 将电池充满电.</p>	<p>No fire, no explosion, no leakage</p> <p>无着火、无爆炸、无泄露</p>

		3)将电池以 1I1(A)电流放电 90min. 4)观察电池 1h.	
5	A short circuit 短路	1)Test temperature: $25 \pm 2^\circ\text{C}$ 2)Fully charge the battery according to 3.14 3)The battery is short-circuited externally for 10 minutes. The resistance of the external circuit is less than or equal to $5\text{m}\Omega$ 4)Observe the battery for 1 hour 1)测试温度: $25 \pm 2^\circ\text{C}$. 2)根据 3.14 将电池充满电。 3)将电池经外部短路 10min, 外部线路的电阻≤ $5\text{m}\Omega$. 4)观察电池 1h.	No fire, no explosion 不爆炸、不起火
6	Temperature Cycle 温度循环	1) Fully charge the battery according to 3.14. 2) Put the battery into the oven. The temperature of the oven changes 5 times according to Table 6.1 and Figure 6.2 4) Observe the battery for 1h. 1) 按照 3.14 给电池充满电。 2) 将电池放入烤箱。温度 根据表 5.1 和图 5.1, 烤箱更换 5 次。 3) 观察蓄电池 1 小时。	No fire, explosion or leakage 不起火、爆炸或泄漏
7	Sea water immersion 海水浸泡	1) Fully charge the battery according to 3.14. 2) Immerse the battery in 3.5% NaCl solution for 2h. 3) The water depth should be completely under the battery. 1) 按照 3.14.2 对电池进行完全充电。 2) 将电池浸入 3.5% NaCl 溶液中 2 小时。 3) 水深应完全低于电池	No fire or explosion 不爆炸、不起火
	Fall 跌落	1) Fully charge the battery according to 3.14. 2) Drop the positive and negative terminals of the battery freely from a height of 1.5m to the concrete floor; 3) Observe the battery for 1h. 1)根据 3.14 给电池完全充电。 2) 将蓄电池正负端子从 1.5m 高度自由跌落至混凝土地面； 3) 观察蓄电池 1h.	No fire, explosion or Leakage 无火灾、爆炸或泄漏
	Thermal stability 热稳定性	1) Fully charge the battery according to 3.14. 2) Put the battery in the oven, the battery temperature reaches $130 \pm 2^\circ\text{C}$ at $5^\circ\text{C}/\text{min}$ and keep it for 30min. 3) Observe the battery for 1h. 1)根据 3.14 给电池完全充电。 2)将电池放入烤箱, 在 $5^\circ\text{C}/\text{min}$ 时, 电池温度达到 $130 \pm 2^\circ\text{C}$, 并保持 30 min。 3)观察电池电量 1 小时。	No fire or explosion 不爆炸、不起火

Table 5.1 Time and temperature changes in the temperature cycle

表 5.1 温度周期中的时间和温度变化情况

temperature 温度(°C)	time interval 时间间隔(min)	Cumulative time 累计时间(min)	Temperature change rate 温度变化速率(°C/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	680	6/7

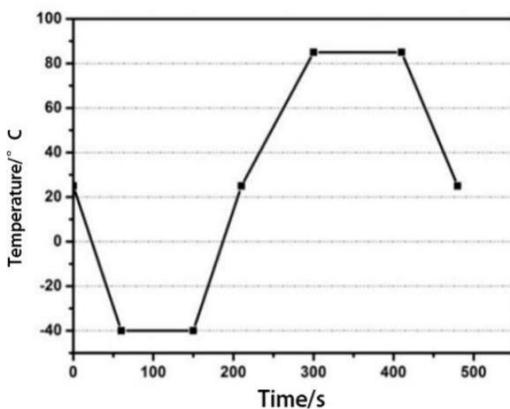


Fig. 5.2 Temperature time curve in temperature cycle 图 5.2 温度循环中温度时间曲线

7.Transportation and Storage 运输和储存

7.1 transport 运输

Select the appropriate battery packing method according to the destination and mode of transportation. In the process of transportation should be prevented from violent vibration, external impact or extrusion, to prevent the sun and rain, for the use of aircraft transportation in the transportation process to maintain less than 30% of the electricity, the use of cars, trains, ships and other means of transportation for transportation, to maintain 30%~50% of the electricity or according to the special requirements of customers.

应根据运输的目的地和运输方式，选定合适的电池包装方式。在运输过程中

应防止剧烈振动、外力冲击或挤压，防止日晒雨淋，对于使用飞机进行运输在运

输过程中保持<30%的电量，使用车、火车、轮船等交通工具进行运输，保持

30%~50%的电量或按照客户的特殊要求。

7.2 storage 存储

The ambient temperature is -20 to 55 ° C, the recommended temperature is -10 to 40 ° C, and the relative humidity is 10%-90% RH. Keep batteries away from corrosive substances or magnetic environments. Store batteries in a clean, dry, and well-ventilated environment away from fire and heat sources. When the battery is not in use, it is recommended that it be stored for no more than 3 months.

电池应存储允许环境温度为-20~55℃，建议保存温度为-10~40℃，相对湿度

为 10%RH ~90%RH 的条件下。电池应避免与腐蚀性物质或磁性环境接触，电池

存储在清洁、干燥、通风的环境中，远离火源及热源。电池不使用时，连续存放

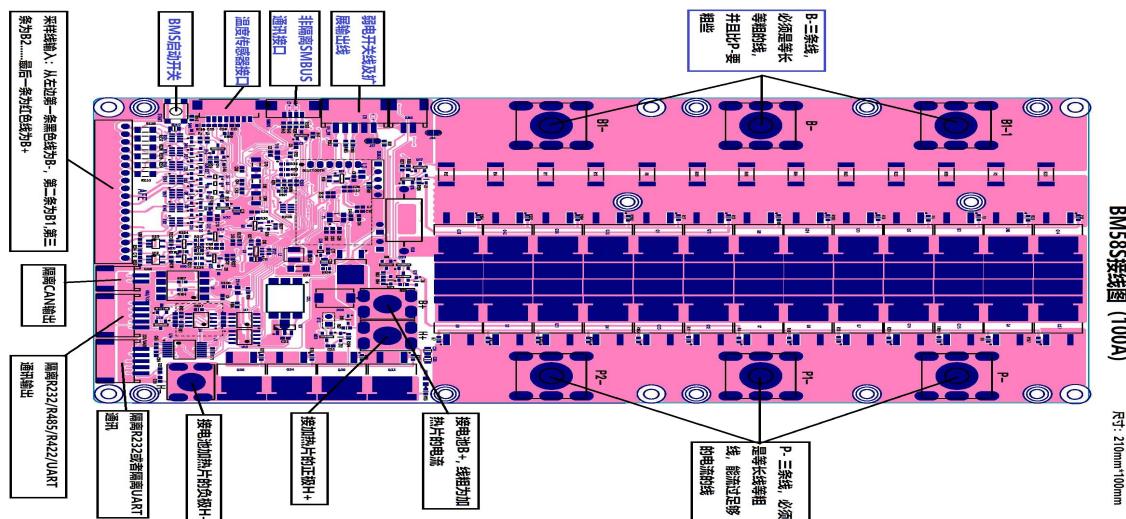
建议不超过 3 个月。

8. Dimensioning drawing 尺寸标注图 (单位: mm)



项目	均值 (mm)	公差 (mm)
Wide 宽度	240	±1
Long ¹ 长度 1	552	±1
Thick 厚度	218	±1

9. Protection Circuit 保护电路



10. PCM BOM

类型 Type	元器件名称/规格 Component Name	封装形式
集成电路 IC	MM3474DB1VBE*1	TSSOP-20
充电管 Charging MOS	CRSS037N10N/170N08BS*26	TO-263
放电管 Discharge MOS	CRSS037N10N/170N08BS*26	TO-263
插座 Socket	5Pin 2.00mm 间距*1	

11. PCM parameter PCM 参数

序号 No	检测内容 IT est content		出厂默认参数 Factory default parameters	单位 Unit	备注 Note
	放电 Discharge	持续放电电流 Continuous discharge current	200	A	
1	充电 Charging	充电电压 Charging voltage	14.6	V	
		持续充电电流 Continuous charging current	200	A	
2		均衡开启电压 Balance detect Voltage	3.35	V	
3	单体过充保护 Single overcharge	单体过充保护电压 Single overcharge protection voltage	3.65 ± 0.5	V	
		单体过充保护延时 Single overcharge protection voltage	3	S	
		单体过充保护解除电压 Single overcharge protection and release voltage	3.55 ± 0.5	V	

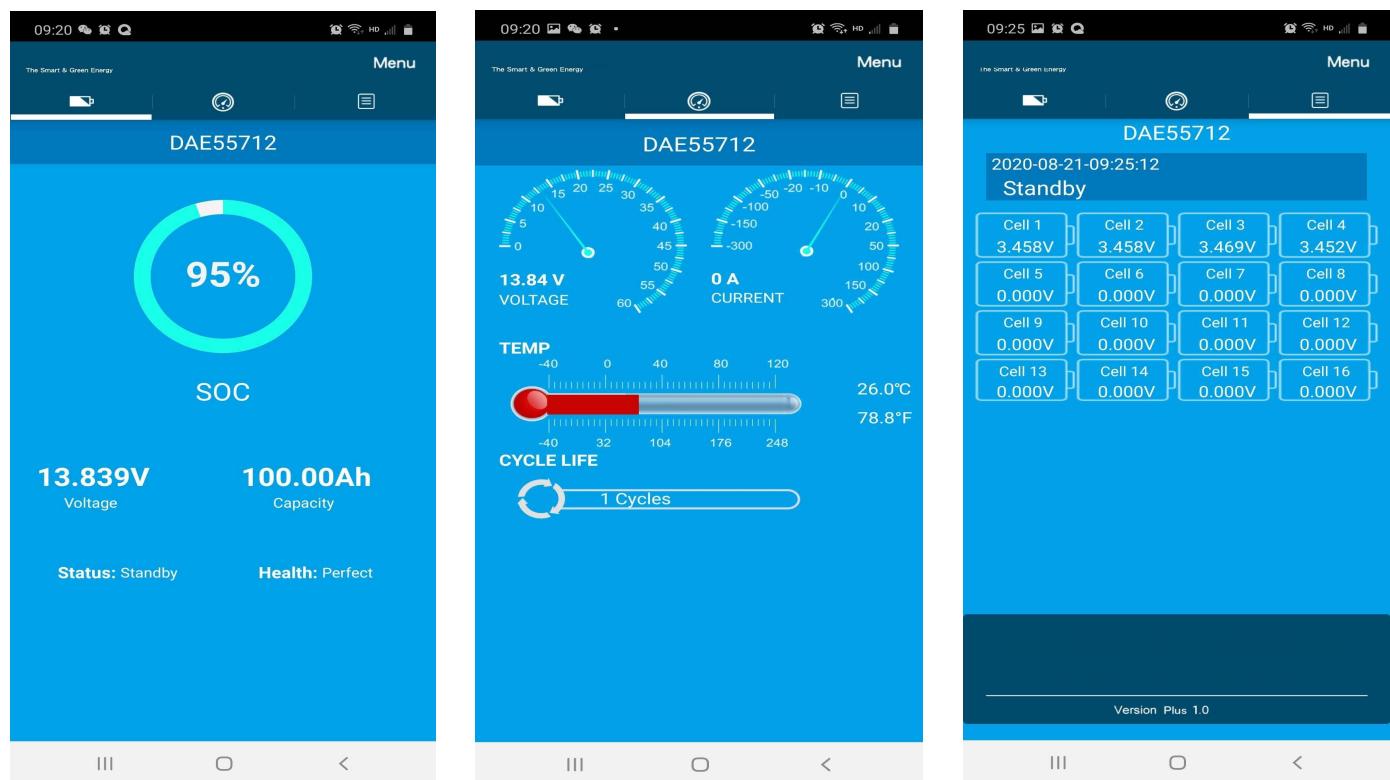
WISTEK 深圳市威泰能源有限公司 Shenzhen Wistek Energy Co.Ltd.		Number 编号: Edition 版本: A0	DOC No.	12V/230Ah		
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	protection	单体过充保护解除延时 Release delay of single overcharge protection	3	S		
4	单体过放保护 Monomer over-discharge protection	单体过放保护电压 Single over-release protection voltage	2.50±0.5	V		
		单体过放保护延时 Time-lapse of single over release protection	5	S		
		单体过放保护解除电压 Single over release protection and release voltage	2.70±0.5	V		
		单体过放保护解除延时 Discharge delay of monomer over discharge protection	1	S		
5	总压过充保护 Total overcharge protection	总体过充保护电压 Overall overcharge protection voltage	14.4	V	Deviation <3%FSR	
		总体过充保护延时 Overall overcharge protection delay	3	S		
		总体过充保护解除电压 Overall overcharge protection release voltage	14.2	V		
		总体过充保护解除延时 Overall release delay of overcharge protection	3	S		
		总体过放保护电压 Overall overcast protection voltage	10	V		
6	总压过放保护 Total pressure discharge protection	总体过放保护延时 Overall over-release protection delay	5	S	Deviation <3%FSR	
		总体过放保护解除电压 Overall over-release protection and release voltage	10.4	V		
		总体过放保护解除延时 Overall over release protection release delay	1	S		
		放电过流 1 级保护电流 Discharge current level 1 protection current	1500±3%	A		
		放电过流 1 级保护延时 Discharge current level 1 protection delay	1	S		
7	充/放电过流保护 Charge/Discharge overflow protection	放电过流 2 级保护电流 Discharge current level 2 protection current	/	A		
		放电过流 2 级保护延时 Discharge current level 2 protection delay	/	ms		
		解除条件 Discharge conditions	移除负载解除 Removing the load is lifted			
		充电过流保护电流 Charge the over current protection current	400±3%	A		
		充电过流保护延时 Charge over current protection delay	1	S		
		解除条件 Discharge conditions	移除充电器解除 Remove charger release			

表单编号:

8	短路保护 Remove charger release	短路保护条件 Short circuit protection conditions	外部负载短路 1600A External load short circuit 1600A		
		短路保护延时 Short circuit protection delay	70±5	uS	
		短路保护解除 Short circuit protection is lifted	移除负载解除延时 1 分钟 Removing the load is lifted delay 1 min		
9	通讯方式 Communication method	<input checked="" type="checkbox"/> UART <input type="checkbox"/> RS485 <input type="checkbox"/> CAN <input checked="" type="checkbox"/> 蓝牙 Bluetooth <input type="checkbox"/> GPS <input type="checkbox"/> LCD <input type="checkbox"/> 电量显示模块 SOC indicator			
10	休眠开关 Control switch	<input checked="" type="checkbox"/> 有 无			

Bluetooth connection mobile terminal interface 蓝牙连接手机端界面

Android and Apple IOS interfaces 安卓和苹果 IOS 界面



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12.Quality assurance 质量保证

The warranty period of the battery depends on the commercial contract. Rui Dejin New Energy Co., Ltd., if the battery problem is not caused by the manufacturer's process and quality, but by user misuse, during this period. Can provide technical guidance, do not promise free replacement service.

We will not take any responsibility for the following problems and safety accidents

- 1) Problems and safety accidents caused by violation of the safety guide
- 2) Defective batteries produced by users during battery assembly after shipment
- 3) Problems with batteries used in combination with circuits, battery packs and chargers. For safety reasons, please consult for other special applications such as equipment design, lithium-ion battery system protection circuit or high current. Related matters.

电池的保质期限依商务合同而定。在此期限内，如果非制造厂商的制程和品质原因，而是用户误用造成的电池问题，可提供技术指导意见，不承诺免费更换服务。

对以下几种情况产生的问题及安全事故不承担任何责任：

- 1)违反安全使用指南所产生的问题及安全事故；
- 2)出货后用户在电池组装过程中产生的不良电池；
- 3)电池与电路、电池组和充电器搭配使用所产生的问题。为了安全起见，如有配套设备设计、锂离子电池系统保护电路或大电流等其它方面的特殊应用，请先咨询相关事宜。

13. Handling Instructions 电池使用指南

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

为避免滥用方形锂离子电池模块造成的电池损害或人身伤害，在使用方形锂

离子电池之前，请认真阅读下面的安全指南：

— Improper use and storage of batteries may cause risks of fire, explosion and burn. Do not decompose batteries.

Crush, incinerate, heat and throw into fire;

— 电池非正确使用和存放，具有火灾、爆炸和烧伤的风险，勿将电池分解、压碎、焚化、加热和投入火中；

— Keep the battery out of reach of children. Do not remove the original packaging before use. Dispose of used batteries in a timely manner according to local recycling or waste regulations;

— 将电池置于儿童能接触的范围之外，使用之前不得将电池原包装移除，应根据当地的回收或废弃物法规及时处理废旧电池；

— If you need to replace the battery, use the battery produced by the same manufacturer, and use the battery provided by another manufacturer. There may be a risk of fire and explosion.

— 如需更换电池，应使用同一制造商生产的电池，使用其他制造商提供的电池可能存在起火和爆炸的风险；

— Do not put the battery in water or get it wet.

— 勿将电池投入水中或将其弄湿；

— Do not contact the positive and negative electrodes of the battery with the metal shell at the same time;

— 勿将电池正负极与金属壳体同时接触；

- Do not short circuit, overcharge or overdischarge the battery;
- 勿将电池短路、过充或过放；
- Do not use or store batteries near heat sources such as fire or heaters.
- 勿在热源(如火或加热器)附近使用或贮存电池；
- Do not connect the positive and negative electrodes of the battery inversely;
- 勿将电池正负极接反；
- Do not place batteries with coins, metal ornaments or other metal objects.
- 勿将电池与硬币，金属饰品或其它金属物品放置在一起；
- Do not Pierce the battery shell with nails or other sharp objects. Do not hammer or pedal the battery.
- 勿用钉子或其它尖锐物体刺穿电池壳体，禁止锤击或脚踏电池；
- Do not weld the battery directly
- 勿直接焊接电池；
- Do not remove or trim the battery in any way without authorization
- 勿擅自以任何方式拆卸或修整电池；
- Do not hit, throw or cause the battery to be subjected to mechanical vibration and natural drop
- 勿撞击、投掷或者使电池受到机械震动及自然跌落；
- Do not mix different types and brands of lithium-ion batteries
- 勿将不同种类、不同品牌的锂离子电池混合使用；
- Do not connect the negative pole to the housing (positive electrode)
- 勿将负极柱与壳体(正电性)相连；
- If the battery gives off peculiar smell, heat, deformation, discoloration or any other abnormal phenomenon, do not use it and remove the battery from the operating environment
 - 如果电池发出异味、发热、变形、变色或出现其它任何异常现象时不得使用并将电池转移出使用环境；
 - If the battery catches fire, extinguish it with dry powder, foam extinguisher, or sand and keep it away from the environment.
 - 如果电池起火，需用干粉、泡沫灭火器、沙子等熄灭并远离使用环境。

14 . 出货状态 Shipment status

If the customer has no special requirements and does not use the aircraft transportation, the battery is delivered with about 30%~50% power.

客户若无特殊要求且不使用飞机运输时，电池出厂时具有 30%~50%左右的电量。

15 . Amendment of this Specification 产品规格书的修订

has the right to amend the specification of this product, and will inform the customer before amending.

本公司有权对本产品规格书进行修订，在对产品规格书修订前将会通知客户。