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LFP26148100-40Ah 锂离子电池规格书

Specification for Lithium Ion Battery of LFP26148100-40Ah

生产

山东玉皇新能源科技有限公司
Shandong YuHuang New Energy Technology Co.,Ltd.

LFP26148100-40Ah 锂离子电池规格书

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文件变更记录

版本/版次	变更前叙述	变更后叙述	变更日期	修改人
A00	/	首版发行	2020-07-11	曹彩云
A01	电池外形图：防爆阀圆孔	电池外形图：防爆阀椭圆孔	2020-10-07	李博
A02	电池外形图：厚度 26.5+1/-0	电池外形图：厚度 27+1/-0.5	2020-11-13	曹彩云
A03	出货电压：40%SOC；正常循环	出货电压：20%~40%SOC；夹具循环	2021-03-08	曹彩云
A04	出货电压：20%~40%SOC	出货电压：20%SOC	2021-03-15	曹彩云

1. 适用范围 Scope of application

本规格书规定了山东玉皇新能源科技有限公司（简称山东玉皇新能源）生产的 LFP26148100-40Ah 锂离子电池的技术参数、测试条件及方法、电性能、出货状态、包装、存储及运输等。

This specification specifies the technical parameters, test conditions and methods, electrical performance, shipping status, packaging, storage and transportation of LFP26148100-40Ah lithium ion battery produced by Shandong Yuhuang New Energy Technology Co., Ltd.

本规格书适用于本公司生产的 LFP26148100-40Ah 锂离子电池。

This specification applies to the LFP26148100-40Ah lithium ion battery produced by our company.

2. 说明 Explanation

2.1 产品 product：磷酸铁锂锂离子电池 Lithium iron phosphate lithium ion battery.

2.2 电池型号 battery model：LFP26148100-40Ah.

3. 参照标准 Reference standards

GB/T31484-2015

GB/T31485-2015

GB/T31486-2015

UN38.3

4. 技术指标 Technical indicators

4.1 技术参数 Technical parameters

该指标只针对于新电池 This indicator is only for new batteries

序号 Number	项目 Item	特性 Characteristic
1	标称容量 Standard capacity	40Ah
2	标称电压 Nominal Voltage	3.2V
3	最大充电电压 Max Charge voltage	3.65 ±0.05 V
4	放电截至电压 Cut-off voltage	2.0 ±0.05 V

5	标准充放电电流 Standard –charge and discharge current	0.5C(20A)	
6	最大持续充电电流 Max continuous charge current	1C	
7	最大脉冲充电电流 Max Pulse charge current	2C ≤10s	
8	最大持续放电电流 Max continuous discharge current	1C	
9	最大脉冲放电电流 Max Pulse discharge current	3C ≤10s	
10	操作温度 Operate temperature	充电	0°C ~55°C
		放电	-20°C ~55°C
		储存	-20°C ~45°C
11	内阻 Internal Impedance	≤1.0mΩ(AC Impedance, 1000 Hz)	
12	电池重量（参照） Battery weight (reference)	0.88±0.05kg	
13	循环寿命(25±2°C) Cycle life(25±2°C)	≥2000 周；≥2000 cycles	
14	低温放电容量 Low temperature discharge capacity	-20°C，放电容量≥70% -20 °C, discharge capacity ≥ 70%	
15	常温倍率放电容量 Normal temperature rate discharge capacity	1C，放电容量≥95% 1C, discharge capacity ≥ 95% 2C，放电容量≥90% 2C, discharge capacity ≥ 90%	
16	常温与高温荷电保持与容量恢复能力 Normal temperature and high temperature charge retention and capacity recovery capability	荷电保持率≥90%（≥36Ah） Charge retention rate ≥ 90% (≥ 36Ah)	
		荷电恢复率≥92%（≥36.8Ah） Charge recovery rate ≥ 92% (≥ 36.8Ah)	

17	外观 Appearance	外观不得有变形及裂纹、表面干燥、无外伤 The appearance must not be deformed and cracked, the surface should be dry and free from trauma
18	外形尺寸 Boundary dimension	参照图示 Refer to the icon
19	大气压力及相对湿度 Atmospheric pressure and relative humidity	86～106kPa
		15%～90%RH

4.2 充电模式/参数 Charging mode / parameters

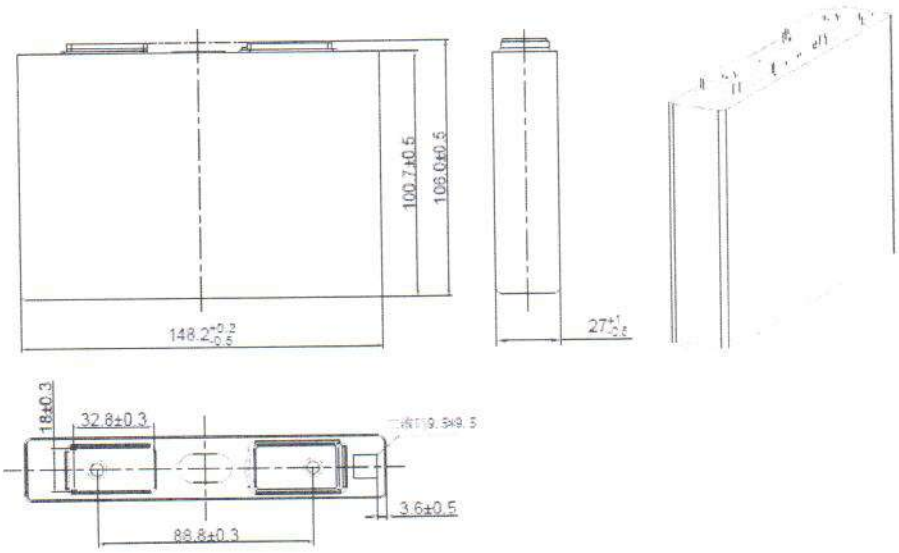
序号 Number	温度 Temperature	最大允许充电电流 Maximum allowable charging current
1	T＜0℃,	不允许充电 No charge allowed
2	5℃>T≥0℃	0.2C
3	15℃>T≥5℃	0.5C
4	45℃>T≥15℃	1C
5	55℃>T≥45℃	0.2C
6	T＞55℃	不允许充电 No charge allowed

4.3 放电模式/参数 Discharge mode / parameters

序号 Number	温度 Temperature	最大允许放电电流 Maximum allowable discharge current
1	T<-20℃	不允许放电 No discharge allowed
2	-10℃>T≥-20℃	0.3C
3	5℃>T≥-10℃	0.5C
4	55℃>T≥5℃	1C
5	T＞55℃	不允许放电 No discharge allowed
6	备注：电池容量≥30%SOC Note: battery capacity ≥ 30% SOC	

5. 外形及尺寸 Shape and size

单体电池尺寸参考图，以实物为准 Single cell size reference drawing, subject to actual product.



6. 测试条件 Test Conditions

6.1 测试条件 Test Conditions

若无特别要求，此规格书上的产品测试条件均为温度：25°C±2°C，湿度：15%~90%RH，大气压力：86~106KPa。

If there is no special requirement, the test conditions of the products in this specification are temperature: 25°C± 2°C, humidity: 15% ~ 90% RH, atmospheric pressure: 86 ~ 106KPa.

6.2 测试设备精度 Test equipment accuracy

6.2.1 电流表和电压表 Ammeter and voltmeter

电压及电流测量装置不低于 0.5 级。

The ammeter and voltmeter shall have an accuracy of not less than grade 0.5 respectively.

6.2.2 游标卡尺 Slide caliper

游标卡尺要符合 JIS B7507 标准(游标卡尺)和 0.01mm 度数。

The slide caliper shall meet with JIS B7507 standard (slide caliper) and have a scale of 0.01mm.

6.2.3 内阻仪 Impedance meter

内阻测试仪测试频率为交变电流 1 kHz。

The impedance meter shall be operated at 1 kHz.

7. 电池测试规范 Battery test specification

7.1 电性能要求及试验方法 Electrical performance requirements and test methods

序号 Number	测试项目 Test Item	测量程序 Measuring Procedure	检验标准 Criteria
1	标准充电 Standard charging	先以恒定电流 0.5C 充电至 3.65V， 再以 3.65V 恒压充电至电流小于 0.05C。 Charging the battery at a constant current of 0.5C until the voltage is 3.65V, then charged at a constant voltage of 3.65V until current is less than 0.05C.	
2	标准放电 Standard discharge	0.5C 恒流放电至 2.0V。 Discharge to cut-off voltage 2.0V at a constant current of 0.5C.	
3	标称容量 Standard capacity	标准充电后，以 0.5C 恒流放电至 2.0V 所放出的容量值。 After standard charging, the capacity value discharged to cut-off voltage 2.0V at a constant current of 0.5C.	≥40Ah
4	高温放电容量 High temperature discharge capacity	标准充电后，将电池放入 55±2°C的高温箱中恒温 5 小时，然后以 1C 电流放电至终止电压 2.0V。 After standard charging, and stored in an ambient temperature of 55±2°C for 5hours, then discharge to cut-off voltage 2.0V at a constant current of 1C.	≥38Ah (≥95%)
5	低温放电容量 Low temperature	标准充电后，将电池放入-20±2°C的低温箱中恒温 24 小时，然后以 1C 电流放电至终止电压 2.0V。	≥28Ah

	discharge capacity	After standard charging, stored in an ambient temperature of -20±2°C for 24 hours, then discharge to cut-off voltage 2.0V at a constant current of 1C.	(≥70%)
6	室温倍率放电容量 Room temperature rate discharge capacity	25±2°C条件下，标准充电后的电池以 2C 电流放电至终止电压 2.0V。 After standard charging, discharge to cut-off voltage 2.0V with constant current 2C at temperature of 25±2°C.	≥38Ah (≥95%)
7	常温荷电保持与容量恢复能力 Normal temperature capacity retention and recovery capability	标准充电后，将电池在 25±2°C放置 28 天，然后以 1C 恒流放电至 2.0V。 After standard charging, stored in an ambient temperature of 25±2°C for 28 days, then discharge to cut-off voltage 2.0V at a constant current of 1C.	≥36Ah (≥90%)
		将电池在 25±2°C充满电，然后以 1C 恒流放电至 2.0V。 Fully charge the battery at 25±2°C, then discharge to cut-off voltage 2.0V at a constant current of 1C.	≥36.8Ah (≥92%)
8	高温荷电保持与容量恢复能力 High temperature capacity retention and recovery capability	标准充电后，将电池在 55±2°C放置 7 天，将电池取出后在 25±2°C环境中静置 5h，然后以 1C 恒流放电至 2.0V。 After standard charging, stored in an ambient temperature of 55±2°C for 7 days, take it out and leave it in 25±2 °C for 5h, then discharge to cut-off voltage 2.0V at a constant current of 1C.	≥36Ah (≥90%)
		将电池在 25±2°C充满电，然后以 1C 恒流放电至 2.0V。 Fully charge the battery at 25±2°C, then discharge to cut-off voltage 2.0V at a constant current of 1C.	≥36.8Ah (≥92%)
9	循环寿命(25±2°C) Cycle life (25±2°C)	(1) 电池在 300kgf 夹具下； The battery at 300kgf clamp pressure;	2000 周≥80%＊额定容量

		（2）充电：以 0.5C 恒流充电至 3.65V，恒压 3.65V 充电至截止电流 0.05C Charge:0.5C CC to 3.65V, 3.65V CV charge to 0.05C cut-off; （3）搁置 30min Rest 30 minutes; （4）放电：以 0.5C 恒流放电至 2.0V Discharge: 0.5C to 2.0V; （5）搁置 30min Rest 30 minutes; （6）循环（2）~（5）Cycle（2）~（5）.	（≥32Ah） Discharge capacity of 2000cycle≥80% * original capacity （≥32Ah）

7.2 安全要求及试验方法

项目 Item	测试方法 Test Methods	标准 standard
过放电 Over-Discharge	电池标准充电结束后，以 1C 电流放电 90 分钟，观察 1 小时。 After standard charging, the cell was discharged at a constant current of 1C for 90 minutes , observe 1 hour.	不爆炸，不起火，不漏液 No explosion, no fire and no leakage
过充电 Overcharge	电池标准充电结束后，以 1C 电流恒流充电至电压达到充电终止电压的 1.5 倍或充电时间达 1h 后停止充电，观察 1 小时。 After standard charging, the cell was charged at 1C constant current to 1.5 times the charge termination voltage or charging time of 1 hour to stop charging, observe 1 hour.	不爆炸，不起火 No explosion and no fire
短路 External short	电池标准充电结束后，外部短路 10min，外部线路电阻小于 5 毫欧，观察 1 小时。 After standard charging, the cell terminals are short-circuited with a external resistance of less than 5mΩ for 10minutes, observe 1 hour.	不爆炸，不起火 No explosion and no fire

跌落 Drop	电池标准充电结束后，电池正负极端子朝下，从 1.5 米高自由跌落到水泥地面上，观察 1 小时。 After standard charging, drop a fully charged battery with positive and negative electrode towards down onto a concrete floor from a height of 1.5 meters, observe 1 hour.	不爆炸，不起火，不漏液 No explosion, no fire and no leakage
热冲击 Thermal shock	电池标准充电结束后，将温度箱的温度以 5℃/min 的速度升温至 130℃±2℃，在 130 ℃ 下保持 30min，观察 1 小时。 After standard charging, put the battery into an oven, and increase the temperature at a rating of 5°C/min to 130±2°C, after the oven temperature reached to 130±2°C, maintain for 30 minutes at that temperature before the test is discontinued, observe 1 hour.	不爆炸，不起火 No explosion and no fire
挤压 Crush	电池标准充电结束后，用半径为 75mm 的半圆柱体以（5±1）mm/s 速度挤压电池，电压达到 0V 或变形量达到 30%或挤压力达到 200 kN 后停止挤压，观察 1 小时。 After standard charging, crush cell with half cylinder at a speed of (5±1)mm/s. The radius of the half cylinder is 75mm. Stop to crush when voltage reached 0V or deformation amount reached 30% or pressure reached 200 kN, observe 1 hour.	不爆炸，不起火 No explosion and no fire
海水浸泡 Saltwater immersion	电池标准充电结束后，将单体蓄电池浸入 3.5% NaCl 溶液中 2 小时，水深需完全没过单体蓄电池。 After standard charging, immerse the whole cell into NaCl solution of 3.5% for 2hours.	不爆炸，不起火 No explosion and no fire
温度循环 Temperature cycling	电池标准充电结束后，60 分钟内降温至-40℃并保温 90 分钟、60 分钟内升温至 25℃、90 分钟内升温至 85℃并保温 110 分钟、70 分钟内降温至 25℃。循环 5 次后观察 1 小时。 After standard charging, reducing the chamber temperature to	不爆炸，不起火，不漏液 No explosion, no fire and no leakage

	-40°C within 60 minutes and maintaining this temperature for 90 minutes, raising the chamber temperature to 25 °C within 60minutes, raising the chamber temperature to 85°C within 90minutes and maintaining this temperature for 110 minutes, Reducing the chamber temperature to 25°Cwithin 70minutes. Repeating the sequence for a further 4cycles, observe 1 hour.	
低气压测试 Low pressure test	电池标准充电结束后，单体电池放入低气压箱中，调节试验箱中气压为 11.6Kpa，温度为室温，静止 6 小时，观察 1 小时。 After standard charging, cells are to be stored for 6 hours at an absolute pressure of 11.6 kPa and a room temperature, observe 1 hour.	不爆炸，不起火，不漏液 No explosion, no fire and no leakage

8. 出货及运输 Shipping and transportation

单体电池应在 20%SOC（可根据客户要求定制）荷电状态下包装成箱进行运输，在运输中不得受剧烈机械冲撞、暴晒、雨淋、不得倒置，应适用汽车、火车、轮船、飞机等普通运输工具.在装卸过程中，应轻搬轻放，严防摔掷、翻滚和重压。

Cells should be packed into boxes for transportation under the state of charge of 20%SOC (the power can be customized according to customer requirements), and they should not be subjected to severe mechanical impact, exposure, rain, and inversion during transportation. They should be suitable for ordinary transportation vehicles such as cars, trains, ships, and aircraft. During loading and unloading, it should be handled gently to prevent falling, rolling and heavy pressure.

9. 标志 Sign

电池产品上应有下列标志：制造厂名、产品型号或规格、制造日期、商标、极性符号、电池安全注意事项及警示。

包装箱外壁应有下列标志：产品名称、型号规格、数量、制造厂名、厂址、邮编、产品标准编号、每

箱的净重和毛重、标明防潮、不准倒置、轻放等标志。

Battery products should have the following signs: manufacturer name, product model or specification, manufacturing date, trademark, polarity symbol, battery safety precautions and warnings.

The outer wall of the packaging box shall have the following signs: product name, model specifications, quantity, manufacturer name, factory address, zip code, product standard number, net and gross weight of each box, marked with moisture-proof, no upside-down, and light-off signs.

10. 包装 Packing

电池的包装应符合防潮防震的要求；包装箱内应装入随同产品提供的文件：装箱单（指多只包装）、产品合格证、产品使用说明书，包装方式详见电池包装规格书。

The packaging of the battery should meet the requirements of damp-proof and shock-proof; the packing box should be filled with the documents provided with the product: packing list (referring to multiple packages), product certification, and product instruction manual.

11. 贮存 Storage

电池应贮存干燥、清洁及通风良好的仓库内；应不受阳光直射，避免与腐蚀性物质接触，距离热源不得少于 2 米；不得倒置及卧放，并避免机械冲击或重压。电池贮存过程中每三个月维护一次，超出三个月以上未进行产品维护，将会对产品寿命造成较大影响，由此造成的产品违规质量问题，不在我公司质保范围之内。

The battery should be stored in a dry, clean and well-ventilated warehouse; it should not be exposed to direct sunlight, avoid contact with corrosive substances, and should not be less than 2 meters away from the heat source; it should not be placed upside down and lying, and avoid mechanical shock or heavy pressure. The battery is maintained every three months during storage. If the product is not maintained for more than three months, it will have a greater impact on the product life. The resulting product quality violations are not within the scope of our company's warranty.

12. 使用说明及安全规程 Instructions for use and safety regulations

1) 电池必须按技术要求中规定的正常状态进行使用，如出现产品使用方法错误、电路连接错误或采用的输入电源、负载功能参数与产品规格书所标性能参数不符等现象均属使用不当

The battery must be used in the normal state specified in the technical requirements, such as product use method errors, circuit connection errors, or the use of input power, load function parameters and the performance parameters marked in the product specifications do not match the improper use

2) 严禁将电池浸入海水或水中，保存不用时，应放置于阴凉干燥的环境中

Never throw the battery into water, keep it under dry, shady and cool circumstance when not use

3) 禁止将电池在热高温源旁，或者将其丢与其中

Never keep the battery beside high temperature source, or throw it in it

4) 充电时请选用锂离子电池专用充电器

Please use the stated charger when charging

5) 严禁颠倒正负极、平放、倒立及侧向使用电池

Never reverse the positive and negative, flat, inverted lateral use of battery

6) 禁止用导体对同一电池正负极进行短接或一起运输及储存

Never use conductors to short or transport and store the positive and negative poles of the same battery together

7) 禁止敲击或抛掷、踩踏电池；禁止直接焊接电池和用钉子或其它利器刺穿电池

Never knock, throw or trample the battery, and never direct weld of battery and pierce of battery with nails or other sharp weapons

8) 禁止在强静电和强磁场的地方使用，否则易破坏电池安全保护装置，带来不安全的隐患

Never use the battery under strong static and strong magnetic field, otherwise it will destroy the protecting device

9) 如果电池发生泄露，电解液进入眼睛，请不要揉擦，应用清水冲洗眼睛，并立即送医院治疗

If battery leaked, the electrolyte get into eyes, please don't knead, please wash eyes by water and send to hospital, otherwise it will hurt eyes

10) 电池在充电过程中出现任何异常，如异味，发热、变色、变形，立即将电池断电隔离并停用

If battery emit peculiar smell, heating, distortion or appear any unconventionality during using, storage or charging process, please take it out from device or charge and stop using

11) 如果电极脏污或氧化，使用细砂纸对锈蚀部分进行打磨处理后，再进行使用

If the pole was duty or oxidized, use fine sandpaper to polish the rusted part before use

12) 废弃电池按当地法律法规进行集中处理，不得随意丢弃，以免出现环境污染或安全隐患

Waste batteries shall be disposed in accordance with local laws and regulations, and shall not be discarded at will, so as to avoid environmental pollution or potential safety hazard

13) 废弃之电池应用绝缘纸包住电极，以防起火、爆炸

Please encase the pole with insulating paper when you want to abandon the battery to prevent exploding and getting into fire

13. 质量保证 Quality assurance

自出货之日起，单体电池的保质期限依合同而定。但是，在此期限内，如果非山东玉皇新能源科技有限公司的制程原因而是客户的误用造成的单体电池质量问题，山东玉皇新能源科技有限公司不承诺免费更换。

The Warranty period of cell is made according to business contract, However, even though the problem occurs within this period, Shandong YuHuang New Energy Technology Co.,Ltd. won't replace a new cell for free as long as the problem is not due to the failure of Shandong YuHuang New Energy Technology Co.,Ltd. manufacturing process or is due to customer's abuse or misuse.

山东玉皇新能源科技有限公司对违反安全守则操作所产生的问题不承担任何责任。

Shandong YuHuang New Energy Technology Co.,Ltd .will not be responsible for trouble occurred by handling outside of the precautions in instructions

山东玉皇新能源科技有限公司对与电路、电池组、充电器搭配使用所产生的问题不承担任何责任。

Shandong YuHuang New Energy Technology Co.,Ltd. will not be responsible for trouble occurred by matching electric circuit，cell pack and charger.

14. 产品部件符合 RoHS 要求 RoHS compliance is for all parts

15. 产品责任声明 Product liability statement

产品使用前，请用户仔细阅读产品规格书、使用说明书及使用注意事项等，了解产品的使用方法及应用范围；若出现产品使用方法错误、电路连接不对或采用的输入电源、负载功能参数与产品规格书所标性能参数不符等现象均属使用不当，由使用不当造成产品、负载及周边连接件的损坏，本公司均不承担任何责任。

本规格书中任何未提及的事项，须经双方协商确定。

Before using the product, please read the product specification, operation instruction and precautions carefully to understand the use method and application scope of the product; if there are errors in the use method of the product, incorrect circuit connection, or the input power supply and load function parameters used are inconsistent with the performance parameters marked in the product specification, it is improper use, resulting in the product and negative results from improper use The company shall not be liable for any damage to the load and surrounding connections.

Any matters not mentioned in this specification shall be determined by both parties through consultation.

16.联系方式

如有疑问，请按以下地址联系：

If in doubt，Please contact at the following address:

服务热线 TEL：0530-5818833

传真 FAX：0530-5818883

地址：山东省菏泽市开发区中华东路 888 号

Address：No 888 Zhonghua Road, Heze National Development Zone, Shandong Province

公司网址：http:// www.sdyhne.com