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D148N58A-2P6S 电池模组
D148N58A-2P6S Battery Module

产品规格书
Product Specification

D148N58A-2P6S-GGS

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D148N58A-2P6S 电池模组产品规格书

Product Specification of D148N58A-2P6S Battery Module

1 概述 Overview

D148N58A-2P6S 电池模组为中创新航设计的通用型三元金属壳电池模组。本说明书用于指导电池模组的选择及应用。

D148N58A-2P6S battery module is a general-purpose ternary metal-back battery module designed by CALB Co.,Ltd. The Specification is used to guide the selection and application of battery module.

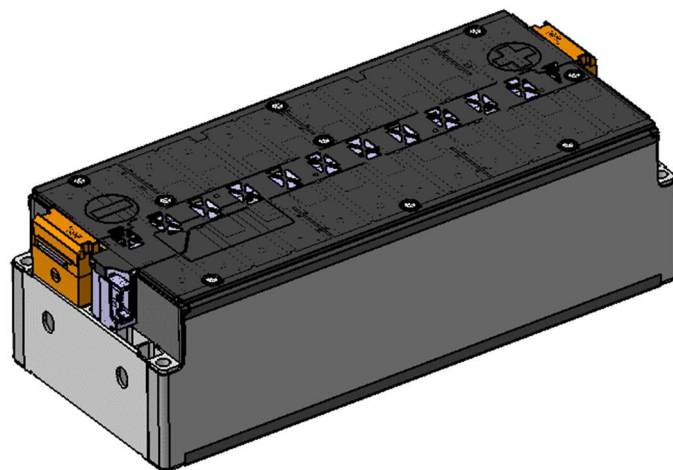


图 1 D148N58A-2P6S 型电池模组外观示意图
Fig. 1 Appearance Diagram of D148N58A-2P6S Battery Module

2 模组规格及主要性能参数 Module Specification and Main Performance Parameters

表 1 模组规格及主要性能参数（58Ah 电池）
Table 1 Module Specification and Main Performance Parameters (58Ah battery)

序号 S/N	参数 Parameter	D148N58A-2P6S	备注 Remarks
1	电池型号 Battery model	L148N58A	/
2	额定容量 Rated capacity	116Ah@1C 118Ah@1/3C	/
3	额定电压 Rated voltage	22.02V@1C 22.38V@1/3C	/
4	总长尺寸 Total length size	355±1mm	/
5	宽度尺寸 Width size	151.3±1mm	
6	总高尺寸 Total height size	108.1 (-1.1, +0.9) mm	
7	重量 Weight	12.0±0.3kg	/
8	工作电压 Operating voltage	16.5~26.1V@0°C≤T≤55°C 13.2~26.1V@-30°C≤T<0°C	对应单体电池电压 Corresponding to the single cell voltage 2.75~4.35V@0°C≤T≤55°C 2.2~4.35V@-30°C≤T<0°C

9	内阻 Internal resistance	<6.7mΩ	25°C,50%SOC, 2C, 10s
10	推荐SOC使用窗口 The window is recommend for the use of SOC	5%~97% (97%SOC, 4.3V)	
11	工作温度 Operating temperature	-30°C~55°C (Discharge) -20°C~55°C (Charge)	
12	循环寿命 Cycle life	<p>环境温度 25±2°C，循环 1000 圈，SOH≥80%。 At the ambient temperature of 25±2°C, cycle life ≥1000,SOH ≥80%.</p> <p>试验方法： Test procedure :</p> <p>将模组固定在固定工装上。 \Fix the module on the fixed tooling.</p> <ol style="list-style-type: none"> 1、25°C 下热平衡； \25°C thermal equilibration; 2、step charge，静置 60min； \Step charge, wait for 60min; 3、以 1Cm 电流放电至 2.75V，静置 60min； \ Discharge to 2.75V with 1Cm current and stand for 60min; 4、重复步骤 2~3 直到 80%SOH (EOL) 。 \ Repeat steps 2-3 until 80% SOH (EOL). <p>注： Step charge: 0.05C (5.8A) 恒流充电至模组任一单体电芯电压达到 3.248V； \charge with 0.05C (5.8A) until the maximum cell voltage 3.248V ;</p> <p>1.0C (116A) 恒流充电至模组任一单体电芯电压达到 3.89V； \charge with 1C (116A) until the maximum cell voltage 3.89V;</p> <p>0.85C (98.6A) 恒流充电至模组任一单体电芯电压达到 3.95V； \charge with 0.85C (98.6A) until the maximum cell voltage 3.95V;</p> <p>0.75C (87A) 恒流充电至模组任一单体电芯电压达到 4.08V； \charge with 0.75C (87A) until the maximum cell voltage 4.08V;</p> <p>0.5C (58A) 恒流充电至模组任一单体电芯电压达到 4.19V； \charge with 0.5C (58A) until the maximum cell voltage 4.19V;</p> <p>0.33C (38.28A) 恒流充电至模组任一单体电芯电压达到 4.21V； \charge with 0.33C (38.28A) until the maximum cell voltage 4.21V ;</p> <p>0.15C (17.4A) 恒流充电至模组任一单体电芯电压达到 4.27V； \charge with 0.15C (17.4A) until the maximum cell voltage 4.27V;</p> <p>0.1C (11.6A) 恒流充电至模组任一单体电芯电压达到 4.3V。 \charge with 0.1C (11.6A) until the maximum cell voltage 4.3V .</p>	

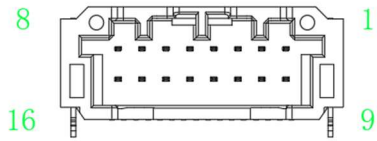
		<p>环境温度 $40\pm 2^{\circ}\text{C}$，循环 1000 圈，SOH$\geq 75\%$。At the ambient temperature of $40\pm 2^{\circ}\text{C}$, cycle life ≥ 1000, SOH $\geq 75\%$.</p> <p>试验方法： Test procedure :</p> <p>将模组固定在固定工装上。 \Fix the module on the fixed tooling.</p> <p>1、40°C 下热平衡； \40$^{\circ}\text{C}$ thermal equilibration; 2、step charge，静置 60min； \Step charge, wait for 60min; 3、以 1Cm 电流放电至 2.75V，静置 60min； \Discharge to 2.75V with 1Cm current and stand for 60min 4、重复步骤 2~3 直到 75%SOH (EOL)。 \Repeat steps 2-3 until 75% SOH (EOL)。</p> <p>注：Step charge: 0.05C (5.8A) 恒流充电至模组任一单体电芯电压达到 3.248V； \charge with 0.05C (5.8A) until the maximum cell voltage 3.248V ; 1.0C (116A) 恒流充电至模组任一单体电芯电压达到 3.89V； \charge with 1C (116A) until the maximum cell voltage 3.89V; 0.85C (98.6A) 恒流充电至模组任一单体电芯电压达到 3.95V； \charge with 0.85C (98.6A) until the maximum cell voltage 3.95V; 0.75C (87A) 恒流充电至模组任一单体电芯电压达到 4.08V； \charge with 0.75C (87A) until the maximum cell voltage 4.08V; 0.5C (58A) 恒流充电至模组任一单体电芯电压达到 4.19V； \charge with 0.5C (58A) until the maximum cell voltage 4.19V; 0.33C (38.28A) 恒流充电至模组任一单体电芯电压达到 4.21V； \charge with 0.33C (38.28A) until the maximum cell voltage 4.21V ; 0.15C (17.4A) 恒流充电至模组任一单体电芯电压达到 4.27V； \charge with 0.15C (17.4A) until the maximum cell voltage 4.27V; 0.1C (11.6A) 恒流充电至模组任一单体电芯电压达到 4.3V。 \charge with 0.1C (11.6A) until the maximum cell voltage 4.3V .</p>
13	储存 Storage	<p>环境温度 45°C，模组 100%SOC 存储 30 天后，荷电保持率$\geq 95\%$。 At 45°C ambient temperature, module with 100%SOC, after 30 days storage, the charge retention rate $\geq 95\%$.</p> <p>环境温度 60°C，模组 100%SOC 存储 30 天后，荷电保持率$\geq 90\%$。 At 60°C ambient temperature, module with 100%SOC, after 30 days storage, the charge retention rate $\geq 90\%$.</p>

3 接口定义及安装说明 Interface Definition and Installation Instruction

3.1 模组低压接口 Module Low Voltage Interface

模组内包含与极柱相连的 FPC 母排，对外引出端为意立速 IMSA-13065B-2-16A-TR 型接插件，对应型号及引脚定义分别见表 2。

The module contains FPC busbar connected with battery post, and the external leading-out terminal is IRISO IMSA-13065B-2-16A-TR connector. The corresponding model and pin definition are shown in Table 2.

表 2 D148N58A-2P6S 模组引脚定义 Table 2 Pin Definition of D148N58A-2P6S Module		
接插件型号: IMSA-13065B-2-16A-TR Model of connector: IMSA-13065B-2-16A-TR 厂家:意立速 IRISO Manufacturer: IRISO FPC 端对插面视图 View of FPC terminal surface	引脚 Pin	引脚定义 Pin definition
	1	T2-
	2	空 Suspended
	3	V1
	4	PWR
	5	V4
	6	V0
	7	空 Suspended
	8	T1+
	9	V5
	10	T2+
	11	V3
	12	空 Suspended
	13	V6
	14	V2
	15	GND
	16	T1-

温度传感器:
Temperature sensor:
型号: SEMITEC 103KT1608T -1P
Model: SEMITEC 103KT1608T -1P
标准阻值: 10kΩ@25°C
Standard value of resistance: 10KΩ @ 25°C

3.2 模组高压接口 Module High Voltage Interface

模组高压接口处预置 M6 嵌装螺母，通过该嵌装螺母固定主电极导电排与模组间连接线，实现模组与外部的高压连接。

The M6 embedded nut is preset at the high-voltage interface of the module, and the connecting wire between the main electrode conducting bar and the module is fixed by the embedded nut to realize the high-voltage connection between the module and the outside.

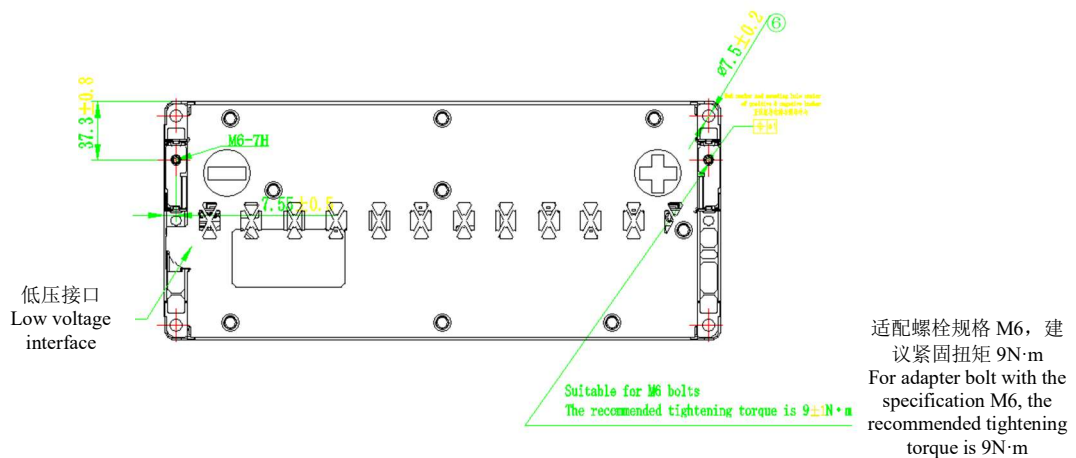


图 2 D148N58A-2P6S 模组高低压接口示意图
Fig. 2 High-low Voltage Interface Diagram of D148N58A-2P6S Module

3.3 模组机械接口 Module Mechanical Interface

模组端板中预置通孔作为其与箱体连接的机械接口，安装孔尺寸请参见图模组外形尺寸图。

The preset through-hole in the end plate of the module is used as the mechanical interface for the connection between the hole and the box. For the size of the mounting hole, please refer to Fig. Module Overall Dimension Diagram.

推荐采用在箱体底部设置焊接螺母，通过长螺栓穿过安装通孔的方式将模组与箱体固定；推荐在模组上端部增加固定板将各模组之间互相连接，增强箱体整体刚度。

It is recommended to set the welding nut at the bottom of the box, and fix the module and the box through the way of the long bolt passing through the installation through-hole; It is recommended to add a fixed plate at the upper end of the module to connect the modules to enhance the overall stiffness of the box.

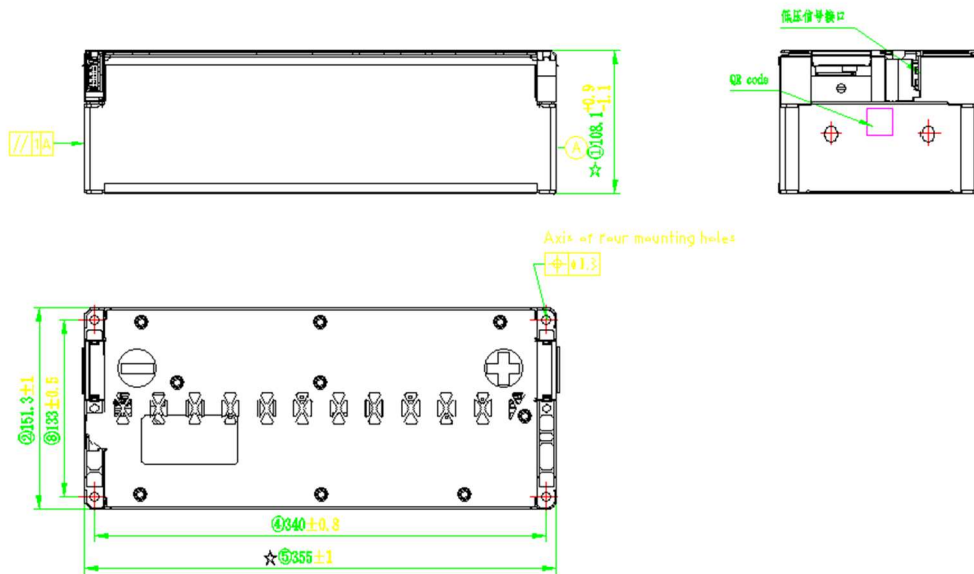


图 3 D148N58A-2P6S 模组外形尺寸示意图
Fig. 3 Overall Dimension Diagram of D148N58A-2P6S Module

3.4 模组安装补充说明 Supplementary Instruction for Module Installation

模组与箱体装配可通过端板吊装孔进行操作安装；模组端板刻有二维码可供追溯查询；吊装孔及二维码尺寸见下图。

The assembly of the module and the box can be operated and installed through the lifting hole at end plate; the end plate of module is engraved with a QR code for traceability; For the size of the lifting hole and QR code, please refer to following Fig.

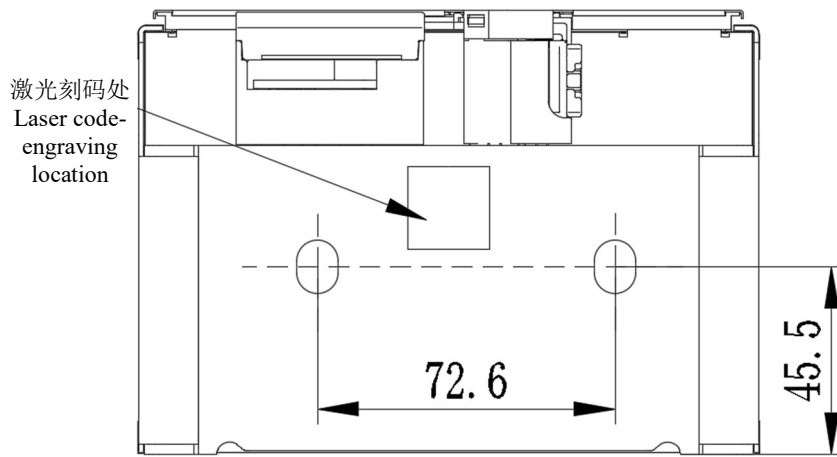
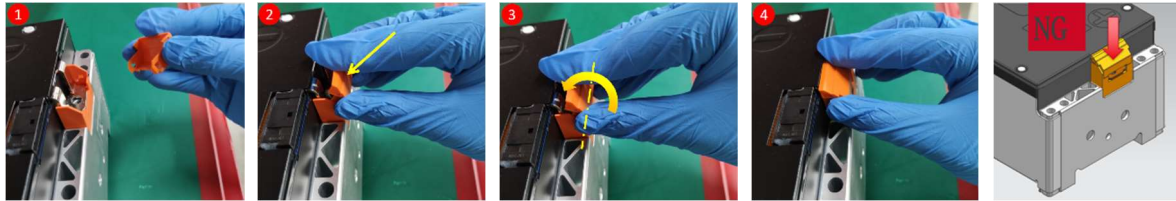


图 4 D148N58A-2P6S 模组吊装孔、二维码示意图
Fig. 4 Lifting Hole and QR Code Diagram of D148N58A-2P6S Module

模组保护盖安装步骤：三指夹持保护盖，斜向插入引出支座至卡扣处，以引出支座卡扣为轴线转动以完成保护盖安装。注意事项：禁止从盖板正上方下压安装保护盖；禁止暴力拆装、急速拆装；允许拆卸次数不大于 20 次。

Installation steps of module protection cover: use three fingers to clamp the protection cover, obliquely insert the lead-out abutment to the buckle, and rotate with the lead-out abutment buckle as the axis to complete the installation of protection cover. Notes: It is forbidden to press and install the protection cover right above the cover plate; Violent dismounting and rapid dismounting are prohibited; The number of allowable disassembly shall not be greater than 20 times.



模组盖板拆卸步骤：利用刀片插入卡销与盖板中间，旋转刀片，拆卸卡销（注意请勿划伤吸塑盖板）。注意事项：禁止撕扯模组盖板进行拆卸；禁止暴力拆装、急速拆装；卡销经一次拆卸后，建议更换新卡销。

Disassembly steps of module cover plate: use the blade to insert between the bayonet lock and the cover plate, rotate the blade and disassemble the bayonet lock (please do not scratch the blister cover plate). Notes: It is forbidden to tear the module cover plate for disassembly; Violent dismounting and rapid dismounting are prohibited; It is recommended to replace the bayonet lock with a new one, after the bayonet lock is disassembled once.



4 包装方案 Packaging Plan

上线包装采用专用料架包装，运输包装采用标准料架包装（纸箱包装一般作为样件包装和临时替代包装）。


On-line packaging adopts special shelf packaging, and transportation packaging adopts

standard shelf packaging (carton packaging is generally used as sample packaging and temporary alternative packaging).

4.1 上线包装 On-line Packaging

上线采用专用料架包装，下表为料架信息。

The on-line packaging adopts special shelf packaging, and the following table is about the information of shelf.

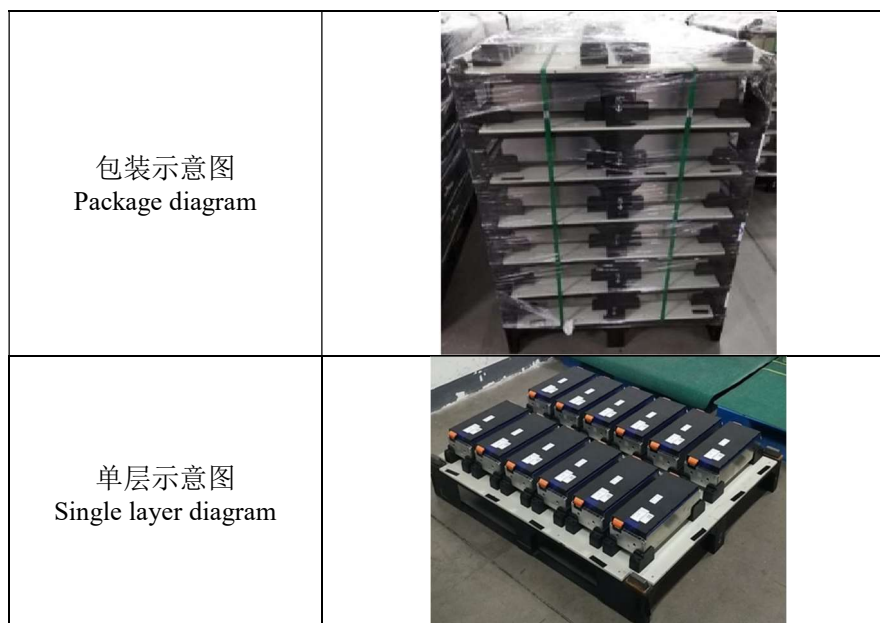
单包装尺寸/mm Single package size /mm	L1100mm×W1100 mm×H880
单包装装模组数量/个 Single package module quantity / Pcs.	24
总重/kg Total weight / kg	401
堆码层数 Stacking layer	2
包装示意图 Package diagram	
单层示意图 Single layer diagram	

4.2 运输包装 Transportation Packaging

运输采用通用料架包装，下表为料架信息。

The transportation packaging adopts general shelf packaging, and the following table is about the information of shelf.

单包装尺寸/mm Single package size /mm	L1200mm×W1000 mm×H1323
单包装装模组数量/个 Single package module quantity / Pcs.	72
总重/kg Total weight / kg	1088
堆码层数 Stacking layer	2



4.3 纸箱包装 Carton Packaging

纸箱采用 0201 型双层瓦楞纸箱，每个包装装 1 个模组，缓冲采用 20mm 厚 EPE（珍珠棉）缓冲。单包装封箱后采用木托盘成垛打包，下表为包装信息。

The carton adopts 0201 double-layer corrugated box, each package contains 1 module, and the buffer adopts 20mm thick EPE (pearl wool) buffer. After the single package is sealed, the wooden pallet is used to pack in stacks. The following table shows the packaging information.

单包装尺寸/mm Single package size /mm	L455mm×W215 mm×H175mm
单包装装模组数量/个 Single package module quantity / Pcs.	1
总重/kg Total weight / kg	13.2
堆码层数 Stacking layer	5
每托模组数量/个 Module quantity per pallet / Pcs.	50
单托重量/kg Single pallet weight /kg	685

5 使用方法 Method of Use

5.1 充电使用说明 Instruction for Charge

1. 充电电流不得超过双方签订的充电策略中允许的充电电流，使用高于推荐值电流充电将可能引起电池的充放电性能、机械性能和安全性能的问题，并可能会导致电池发热或漏液。

The charging current shall not exceed the allowable charging current in the charging strategy signed by both parties. Charging with the current higher than the recommended value may cause problems in the charging and discharging performance, mechanical performance and safety performance of the battery, and may cause heating or liquid leakage of battery.

2. 充电电压不得超过双方签订的充电策略中允许的充电电压, 电池电压高于推荐值充电电压值时, 将可能引起电池的充放电性能、机械性能和安全性能的问题, 并可能会导致电池发热或漏液。

The charging voltage shall not exceed the allowable charging voltage in the charging strategy signed by both parties. When the battery voltage is higher than the allowable charging voltage, it may cause problems in the charging and discharging performance, mechanical performance and safety performance of the battery, and may cause heating or liquid leakage of battery.

3. 电池必须在双方签订的充电策略的充电温度内充电。

The battery must be charged within the charging temperature of the charging strategy signed by both parties.

4. 正确连接电池的正负极, 严禁反向充电。若电池正负极接反, 将导致电池报废并产生安全隐患。

Connect the positive and negative electrodes of the battery correctly, and reverse charging is strictly prohibited. If the positive and negative electrodes of the battery are connected reversely, the battery shall be scrapped, resulting in potential safety hazard.

5.2 放电使用说明 Instruction for Discharge

1. 放电电流不得超过双方签订的最大放电电流, 大电流放电会导致电池容量快速衰减并可能导致过热, 甚至会出现电池冒烟并喷出黑色物质等极端情况。

The discharging current shall not exceed the maximum discharging current signed by both parties. Large current discharge shall cause rapid attenuation of battery capacity, and may cause overheating, or even extreme conditions such as smoke and black substance emission.

2. 电池必须在规定放电温度-30℃~55℃的范围内进行放电。

The battery must be discharged within the range of specified discharging temperature: -30 °C ~ 55 °C.

3. 电池正常使用过程中, 应配备电池管理系统, 以防止电池过放电的发生, 若电池过放电, 将导致电池报废并产生安全隐患。

During the normal use of the battery, the battery management system shall be equipped to prevent the occurrence of battery over-discharge. If the battery is over discharged, it shall lead to the scrap of the battery and potential safety hazard.

4. 当电池处于长期不工作的状态时, 为防止过放电的发生, 电池应定期充电, 让电池保持 10%~30%荷电状态。

When the battery is out of service for a long time, in order to prevent the occurrence of battery over-discharge, the battery shall be charged regularly to keep the battery at the state of 10% ~ 30% charge.

6 注意事项 Notes

1. 使用电池前, 请仔细阅读本规格书和注意电池表面标识。

Before using the battery, please read this Specification carefully and pay attention to the battery surface identification.

2. 在使用过程中，应远离热源、火源，切勿摔打电池，禁止坠落、冲击电池。

During the use, please keep away from heat & fire source, do not hit the battery, and do not drop or pound the battery.

3. 禁止直接焊接电池和用钉子或其它利器刺穿电池。

It is forbidden to weld the battery directly or pierce the battery with nail or other sharp tool.

4. 禁止将电池倒置，并避免敲击、抛掷、踩踏和弯折电池等。

It is forbidden to put the battery upside down and the knocking, throwing, trampling and bending of the battery shall be avoided.

5. 禁止短路电池，以免发生危险，电池严重损坏。

It is forbidden to conduct the short circuit of battery, to avoid danger and serious damage to the battery.

6. 废弃电池请安全妥当处理，不要投入火中或水中。

Wasted battery shall be handled safely and properly. Do not put them into fire or water.

7. 本电池只能使用锂离子电池专用充电器充电。

The battery can only be charged with a special charger for lithium ion battery.

8. 客户应具有电池管理系统详细的设计方案，并对系统特点、框架，系统数据、格式等相关信息进行评估，建立电池管理档案。

The customer shall have a detailed design plan of battery management system, evaluate the system characteristics, framework, system data, format and other relevant information, and establish battery management file.

9. 客户不可擅自修改或者改变电池管理系统的设计和框架，以免影响电池的使用性能。

Customer must not arbitrarily modify or change the design and framework of the battery management system, to avoid affecting the performance of the battery.

10. 客户应保存完整的电池运转的监测数据，用作产品质量责任划分的参考。不具备完整的电池系统使用期限内的监测数据的，中创新航不承担产品质量保证责任。

Customer shall keep complete monitoring data of battery operation, for the reference of product quality responsibility division. China Aviation Lithium Battery Co., Ltd. shall not undertake the responsibility of product quality guarantee, for those without complete monitoring data within the service life of the battery system.

11. 避免电池达到过放状态。电池电压低于 2.5V 时，电池内部可能会遭到永久性的破坏，此时中创新航的产品质量保证责任失效。当放电截止电压低于 2.7V 时，系统内部能耗降低到最小，并在重新充电之前延长休眠时间。客户需要培训使用者在最短的时间内重新充电，防止电池进入过放状态。

Avoid the over-discharge of battery. When the battery voltage is lower than 2.5V, the inside of the battery may be permanently damaged, as a result, the product quality guarantee responsibility of China Aviation Lithium Battery Co., Ltd. shall be invalid. When the cut-off voltage is lower than 2.7V, the internal energy consumption of the system shall reduce to the

minimum, and the sleep time shall be extended before recharging. Customer need to train users to re-charge in the shortest time to prevent the battery from over discharging.

12. 电池避免在本规格书禁止的低温条件下充电（包括标准充电，快充，紧急情况充电和再生充电），否则可能出现意外的容量降低现象。电池管理系统应依照最小的充电和再生充电温度进行控制。禁止在低于本规格书规定的温度条件下充电，否则中创新航不承担质量保证责任。

The charging of battery under the low temperature prohibited by this Specification (including standard charging, fast charging, emergency charging and regenerative charging) shall be avoided, otherwise unexpected capacity reduction may occur. The battery management system shall be controlled according to the minimum charging and regenerative charging temperature. It is forbidden to charge at the temperature lower than that specified in this Specification, otherwise China Aviation Lithium Battery Co., Ltd. shall not be responsible for quality guarantee.

7 免责声明 Disclaimer

该说明书仅供参考，任何本规格书中未提及的事项，请咨询本公司，当本规格书版本更新时，本公司不做另行通知。供货时模组的具体参数请以签订的技术协议为准。

This Specification is for reference only. Please consult our company for any items not mentioned in this Specification. When the version of this Specification is updated, our company shall not give further notice. Please refer to the signed technical agreement for the specific parameter of the module at the time of delivery.