名称 Name: 102Ah Cell

型号 Model: 50160116

容量 Capacity: 102Ah

客户确认 Confirmed by Customer	签名Signature:	公司印章Stamp of Customer:
	日期Date:	
	客户代码Customer Code:	

修订历史 Revision History

版本 Rev	修订内容说明 Revised content description	发行日期 Date of issue	修订人 Revised by	批准人 Approved by
A	首次发布 First issue	2023.10.13	Colvin	夏勇亮

目录 Contents

术语定义 Terms Definition

术语 Terms	定义 Definition
产品 Product	本技术协议中的“产品”是指 RJETech 生产的 102Ah 3.2V 储能用磷酸铁锂电池。 Means the 102Ah 3.2V rechargeable lithium ion phosphate cells produced by RJETech.
客户 Customer	指《RJETech 产品销售合同》中的买方 Means the customer in the 《RJETech product sales contract》
环境温度 Ambient Temperature	电池所处的环境温度。 Means the ambient temperature of the environment which the products are exposed to.
电池管理系统（BMS）	客户用于监测和记录产品在整个服务期限内运行参数的追踪和控制系统。其追踪和记录的参数包括但不限于电压、电流、温度等，以控制产品的运行并确保产品运行环境及运行条件符合本规格书的规定。 Means an active tracking and control system to be developed and implemented by RJETech to monitor and record the operating parameters, including but not limited to voltage, current and temperature, of each product in its entire service life, and to control the operation of each product to ensure a safe operation of product.
电芯温度 (Cell Temperature)	由接入电池的温度传感器所测量的电芯温度，温度传感器和测量线路的选择由融捷能源和客户共同商定。 Means the temperature of the cell measured by the temperature sensor connected to the main part of cell. Selection of the temperature sensor and measurement line will be mutually agreed by RJETech and the Customer.
充电倍率（C-Rate）	充电电流与电池额定容量的比率。例如：电池额定容量为 102Ah，充电电流为 51A 时，则充电倍率为 0.5C。当电池容量衰减为 96Ah，充电电流为 48A 时，则充电倍率为 0.5C。 The ratio of charge current to battery rated capacity. For example, when the capacity of the battery is 102Ah and the charge current is 51A, the charge rate is 0.5C. when the battery capacity fades to 96Ah and the charge current is 48A, the charge rate is 0.5C.
放电倍率（C-Rate）	放电电流与电池额定容量的比率。例如：电池额定容量为 102Ah，放电电流为 51A 时，则放电倍率为 0.5C。当电池容量衰减为 96Ah，放电电流为 48A 时，则放电倍率为 0.5C。 The ratio of discharge current to battery rated capacity. For example, when the capacity of the battery is 102Ah and the discharge current is 51A, the discharge rate is 0.5C .when the battery capacity fades to 96Ah and the discharge current is 48A, the discharge rate is

	0.5C.
循环（Cycle）	电池按规定的充放标准充放一次为一个循环。循环包括短时的正常充电或者再生充电和放电过程的组合，在充电过程中有时只有正常充电而无再生充电的情况，放电可以由一些部分放电组合在一起形成。 Each charge or discharge of a battery according to the regulated charge and discharge standard is deemed as a cycle. A cycle consists of short normal charge or the combination of regenerative charge and discharge processes. In the charge process, sometimes there is only normal charge but no regenerative charge. In the discharge process, which may consist of a summation of a few segments of partial discharges.
生产日期（Production Date）	电池的制造日期。每个相关电池的顶端刻码上标示的明确的日期代码为制造日期。 Means the production date of the cell marking on the top of the cell by date code.
开路电压（OCV）	没有接入任何负载和电路时测得的电池电压。 Battery voltage measured with no load and no circuit connected
可恢复容量（Recoverable Capacity）	电池按本规格书所规定条件储存后，按照本规格书所定义的标准充放电条件进行容量标定所测得的容量。 The measured capacity of the battery shall be measured on calibration subject to standard charge/discharge conditions defined herein after the batteries are stored in accordance with the conditions prescribed herein.
产品供货协议（Product Supply Agreement）	融捷能源和客户共同签定的有关本规格书产品的交易条款。 The transaction terms signed by RJETech and the Customer in relation to the product described in this Specification.
充电状态（SOC）	在无负载的情况下，以安培小时或者以瓦特小时为单位计量的电池充电容量状态的所有的线性关系。100%的充电状态表示电池满充到 3.65V，0%的充电状态表示电池完全放电到 2.5V。 All linear relationships of battery charge capacity state measured in ampere hours or watt hours without load. The state of charge of 100% SOC indicates that the battery is fully charged to 3.65V, and the state of charge of 0% SOC indicates that the battery is completely discharged to 2.5V.
健康状态（SOH）	指的是电池容量、健康度、性能状态，即电池使用一段时间后性能参数与标称参数的比值。 Means the battery capacity, health, performance status, that is, after a period of battery performance parameters and nominal parameters ratio.
测量单位 Units of Measure	“V”（Volt）伏特（V），电压单位 “A”（Ampere）安培（A），电流单位 “Ah”（Ampere-Hour）安培-小时（Ah），负荷单位

	“Wh”（Watt-Hour）瓦特-小时（Wh），能量单位 “Ω”（Ohm）欧姆（Ω），电阻单位 “mΩ”（milliohm）毫欧姆（mΩ），电阻单位 “℃”（degree Celsius）摄氏度（℃），温度单位 “mm”（millimetre）毫米（mm），长度单位 “s”（second）秒（s），时间单位 “Hz”（Hertz）赫兹（Hz），频率单位

1. 产品介绍 Product introduction

1.1 适用范围 Scope of application

本规格书详细描述了广州融捷能源科技有限公司（如下简称：融捷能源或 RJETech）生产的 3.2V 102Ah 储能用磷酸铁锂电池的产品性能指标以及产品使用条件及风险警示。该产品经过客户确认，且符合客户的采购需求。

This specification describes in detail the performance of the 3.2V 102Ah lithium iron phosphate battery for energy storage purpose manufactured by Guangzhou Rongjie Energy Technology Co., Ltd. (hereinafter RJETech), as well as the service conditions and risk warning. The products have been confirmed by the Customer and meet the Customers' requirements.

1.2 基本性能 Basic performance

除另有规定外，本产品规格书中的所有带“*”的参数是针对新电芯，即 REJTech 出货 14 天之内制造的且未使用的产品。如被客户使用过或者在客户处存储超过 14 天的产品可能会显示出低于标准的数值参数，客户同意此类情况的发生不被视为产品规格不合格的表现。

Unless otherwise specified, all specifications marked with an "*" in this Specification refer to new cells; unused Products manufactured within 14 days of shipment from REJTech. If the product used by the Customer or stored for more than 14 days at the Customer facility may exhibit sub-standard numeric parameters, Customer agrees that this will not be considered an indication of non-conformance in the Specification.

No.	参数 Parameter	产品规格 Specification	条件 Condition
1.2.1	*标准容量 Typical capacity	102Ah	标准充电后，进行标准放电，25±2℃ After standard charge mode，and then standard discharge, 25±2℃
1.2.2	*标准能量 Typical energy	326.4Wh	标准充电后，进行标准放电，25±2℃ After standard charge mode，and then standard discharge, 25±2℃
1.2.3	工作电压 Operating voltage	2.5V~3.65V 2.0V~3.65V	T>0℃ T≤0℃
1.2.4	电池内阻(1KHz) Impedance (1KHz)	≤0.4mΩ	新电芯状态，30%SOC New cell status, 30% SOC
1.2.5	标准充电电流 Standard charge current	0.5C=51A	25±2℃
1.2.6	标准放电电流 Standard discharge current	0.5C=51A	25±2℃

1.2.7	出货容量 Shipping capacity	20~50%的充电状态 20~50% SOC	N.A
1.2.8	工作温度(充电) Operating temperature (charge)	0~55℃	
1.2.9	工作温度(放电) Operating temperature (discharge)	-20~55℃	
1.2.10	电池重量 Battery weight	1.97±0.10 kg	
1.2.11	电池尺寸 Typical dimension	请参考本规格书第 1.5 条 See paragraph 1.5	

1.3 充电模式/参数 Charge /Parameters

No.	参数 Parameter	条件 Condition
1.3.1	标准充电模式 Standard charge mode	25±2℃环境中，0.5C 恒流持续充电至 3.65V，再 3.65V 恒压充电至电流降低为 0.05C，充电截止 Continuously charge at 0.5C constant current to 3.65V, then charge at a constant voltage of 3.65V until the current is reduced to 0.05C , and charging is stopped, in 25±2℃ ambient temperature
1.3.2	最大充电电流 Maximum charge current	25±2℃环境中，1C 恒电流持续充电 Continuously charge at 1C constant current in 25±2℃ ambient temperature
1.3.3	标准充电温度 Standard charge temperature	25±2℃

1.3.4 工作温度范围内最大允许持续充电电流(BOL)

The maximum allowable continuous charge current within the range of working temperature

T(℃)/SOC	0%~100%
≤0	禁止充电 No Charge
[0~5)	0.05C
[5~10)	0.20C

[10~15)	0.30C
[15~20)	0.50C
[20~45)	1.0C
[45~50)	0.50C
[50~55)	0.25C
⩾55	禁止充电 No Charge

备注：该矩阵表中电流为电芯初始状态电流阈值表，随着循环的进行，电芯 SOH 会发生变化，持续充电电流应随之变化，BMS 需要根据电池 SOH 实时调整充电电流；

Note: The current in the matrix table is the threshold table of the initial state current of the cell, with the progress of Cycle, the SOH of the cell will change, the continuous charge current should change accordingly, the BMS needs to adjust the charge current according to the SOH of the battery in real time;

1.4 放电模式/参数 Discharge/Parameter

No.	参数 Parameter	条件 Condition
1.4.1	标准放电模式 Standard discharge mode	25±2℃，采用 1.3.1 标准充电模式满充，0.5C 恒流放电至 2.5V，放电截止 At 25±2℃, fully charged in the standard charge mode specified in 1.3.1, and 0.5C constant current discharged to 2.5V, until the termination of discharge
1.4.2	最大放电电流 Maximum discharge current	25±2℃环境中，1C 恒电流持续放电 1C constant current continuous discharge in 25±2℃ environment
1.4.3	标准放电温度 Standard discharge temperature	25±2℃

1.4.4 工作温度范围内大允许持续放电电流(BOL)

The maximum allowable continuous discharge current within the range of working temperature

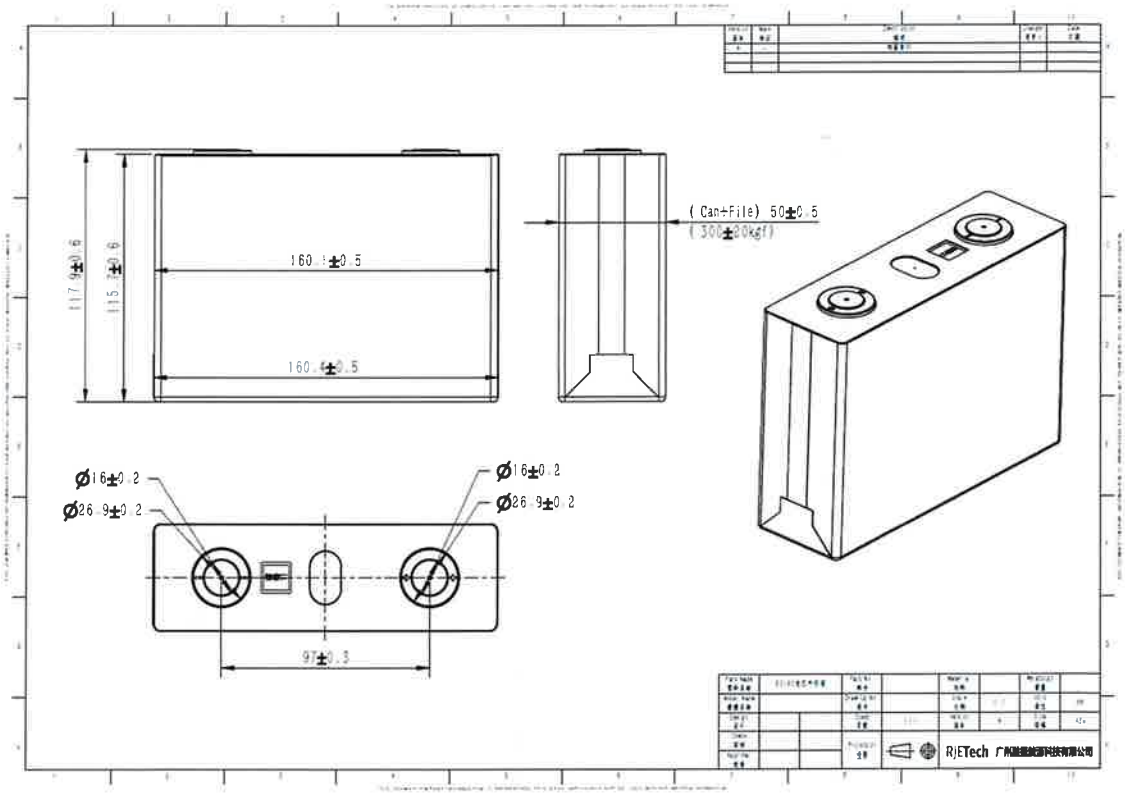
T(℃)/SOC	0%~100%
<-20	禁止放电 No discharge
[-20~0)	0.20C
[0~10)	0.40C
[10~20)	0.80C
[20~45)	1.0C

[45~50)	0.80C
[50~55)	0.50C
⩾55	禁止放电 No discharge

备注：该矩阵表中功率为电芯初始状态电流阈值表，随着循环的进行，电池 SOH 会发生变化，持续放电电流应随之变化，BMS 需要根据电池 SOH 实时调整放电电流。

Note: The currentr in the matrix table is the threshold table of the initial state current of the cell, with the progress of cycling, the SOH of the battery will change, and the continuous discharge current should change accordingly, the BMS needs to adjust the charge current according to the SOH of the battery in real time;

1.5 图纸 Drawing



2. 电性能参数 Electrical performance parameter

2.1 循环性能 Cycle performance

No.	参数 Parameter	产品规格 Specification	条件 Condition
2.1.1	循环寿命（70%SOH） Cycle life（70%SOH）	≥6000 次 ≥6000 times	25±2℃，初始夹紧力 300Kgf，标准充电方法/标准放电方法，剩余容量≥71.4Ah 25±2℃, initial clamping force 300Kgf, Standard discharge mode/Standard discharge mode, residual capacity≥71.4Ah

2.2 高低温性能参数 High/ low temperature performance parameter

No.	参数 Parameter	产品规格 Specification	条件 Condition
2.2.1	25℃的容量 Capacity of 25℃	≥102Ah	新电芯状态，25±2℃，标准充电后，标准放电 New cell status, 25±2℃, after standard charge, standard discharge
2.2.2	55℃的容量 Capacity of 55℃	≥102Ah	新电芯状态，25±2℃，标准充电后，55±2℃ 0.5C 放电至 2.5V Fresh cell, 25±2℃, after standard charge, 55±2℃ 0.5C discharge to 2.5V
2.2.3	-10℃的容量 Capacity of -10 ℃	≥81.6Ah	新电芯状态，25±2℃，标准充电后，-10±2℃ 0.5C 放电至 2.0V Fresh cell, 25±2 ℃, after standard charge, -10±2℃ 0.5C discharge to 2.0V

2.3 倍率放电性能参数 Rate discharge performance parameter

No.	参数 Parameter	产品规格 Specification	条件 Condition
2.3.1	0.25C 放电容量 0.25C discharge capacity	≥102Ah	新电芯状态，25±2℃，标准充电，0.25C 放电至 2.5V, Fresh cell , 25±2℃, standard charge, 0.25C discharge to 2.5V
2.3.2	0.5C 放电容量 0.5C discharge capacity	≥102Ah	新电芯状态，25±2℃，标准充电，0.5C 放电至 2.5V Fresh cell , 25 ± 2 ℃, standard charge, 0.5C discharge to 2.5
2.3.3	1.0C 放电容量 1.0C discharge capacity	≥98Ah	新电芯状态，25±2℃，标准充电，1.0C 放电至 2.5V Fresh cell , 25±2℃, standard charge, 1.0C discharge to 2.5V

2.4 存储性能 Storage performance

No.	参数 Parameter	产品规格 Specification	条件 Condition
2.4.1	常温可恢复容量 Normal temperature recoverable capacity	≥100Ah	25±2℃，30%SOC，存储 28 天 25±2℃, 30% SOC, stored for 28 days
2.4.2	高温可恢复容量 High temperature recoverable capacity	≥100Ah	55±2℃，30%SOC，存储 7 天 55±2℃, 30% SOC, stored for 7 days
2.4.3	自放电率 Self-discharge rate	≤3%/月 ≤3%/month	新生产出货电芯，25±2℃，30%存储 3 个月 Newly manufactured cell shipment, 25± 2℃, 30% for 3 months

当电芯存储时间小于三个月时，建议存储温度为 0℃-45℃，≤90%RH，SOC 区间为 20%-50%SOC；

当电芯存储时间大于三个月，建议存储温度为 15℃-30℃，≤90%RH ，SOC 区间为 20%-50%SOC。

当电芯存储时间超过 6 个月，需要进行一次充放电调整电芯 SOC 至 20-50%SOC，≤90%RH，建议存储温度 5-25℃。

电芯存储时不允许高 SOC(>50%SOC)存储，禁止满电存储。

When the storage time of the cell is less than three months, it is recommended to store at a temperature of 0-45 ℃, ≤ 90% RH, and an SOC range of 20%-50% SOC;

When the cell is stored for more than three months, it is recommended to store at a temperature of 15-30 ℃, ≤ 90% RH, and an SOC range of 20%-50% SOC.

When the storage time of the cell exceeds 6 months, it is necessary to adjust the SOC of the battery cell to 20-50% SOC, ≤ 90% RH, and the recommended storage temperature is 5℃-25 ℃.

High SOC (>50% SOC) storage is not allowed during cell storage, and full charge storage is prohibited.

2.5 温升性能 Temperature rise performance

电池应在环境温度较为稳定且空间足够大的房间里接受自然对流冷却。每个电池温度测量应选取经过校正的可以记录时间数据的温度感应器。在这种条件下，温升是指放电后的温度减去放电前的温度。

Cells should be cooled by natural convection in a room with a stable ambient temperature and sufficient space. Each cell temperature measurement should use a calibrated temperature sensor capable of recording time data. In this case, the temperature rise is the temperature after discharge minus the temperature before discharge.

No.	参数 Parameter	产品规格 Specification	条件 Condition
2.5.1	持续放电温升 Continuous discharge temperature rise	≤10℃	电芯以 0.5C 恒流放电至截止电压时所测量的温升 Temperature rise measured when cell is discharged at 0.5C current to cut-off voltage
2.5.2	脉冲放电温升 Pulse discharge temperature rise	≤5℃	在任何充电状态下，每个电池以 2C 电流放电 10 秒 The cell is discharged at 2C for 10s under any SOC

3. 产品寿命终止管理 Product end of life management

电池的使用期限是有限的。客户应该建立有效的跟踪系统监测并记录每个使用期限内电池的容量和内阻。内阻的测量方法和计算方法需要客户和 RJETech 共同讨论和双方同意。当使用中的电池的内阻超过这个电池最初的内阻的 200%或容量小于等于标称容量 60%(25℃)时，应停止使用电池。违反该项要求，将免除 RJETech 依据产品销售协议以及本规格书所应承担的产品质量保证责任。

This cell is designed to service with a finite life time. The customer shall develop and implement an active tracking system to monitor and record capacity and impedance of each Product in its entire service life. The methods of measuring and calculating the internal resistance will require mutual discussion and agreement between the customer and RJETech. RJETech and/or its customer shall stop using any of the products when its resistance exceeds 200% of its internal resistance or it capacity fading to 60% of typical capacity (168Ah) @25℃. Violation of this requirement will relieve RJETech of its product quality warranty liability under the Sales Agreement and Specifications.

4. 安全性能参数 Safety performance parameter

4.1 使用条件说明：安全测试、寿命测试、系统成组设计需要施加夹具力。新鲜电池的初始夹具力范围为 300~500Kgf。建议的夹具力控制公差为±20Kgf。产品在使用过程中会产生膨胀，电芯在 300±20Kgf 初始条件下，衰减至 EOL 时的膨胀力约 1500Kgf~2000Kgf。客户在产品（模组或系统）设计过程中需要考虑结构件强度及其可靠性。

Instructions for use conditions: Safety testing, life testing, and system group design require the application of fixture forces. The initial clamp force range for fresh batteries is 300~500Kgf. The recommended fixture force control tolerance is ± 20Kgf. The product will experience expansion during use, and the expansion force of the cell at an initial condition of 300 ± 20Kgf will decay to approximately 1500-2000Kgf at EOL. Customers need to consider the strength and reliability of structural components in the product (module or system) design process.

4.2 电芯串并联使用时，如采用激光焊接的方式，需要选择合适的激光焊接参数，确保激光焊接对电芯的绝缘和密封性能无影响，需要特别注意，要求焊接前后极柱的包胶外观无变化（包胶材质 PPS 材料，熔点 260℃）。如因焊接导致的电芯绝缘或密封失效，RJETech 不承担产品质量保证责任。

When the electric cells are used in series and parallel connection, if the laser welding mode is adopted, it is required to select appropriate laser welding parameters to ensure that the laser welding has no influence on the insulation and sealing performance of the electric cells, and it is required that the appearance of the coating of the pole is not changed before and after the welding (the coating material is PPS material, the melting point is 260.degree. C.). RJETech will not be liable for the product quality warranty if the insulation or the sealing failure is caused by welding.

4.3 该电芯产品可满足中国对锂离子电池强制认证要求，如 GB/T 36276-2018，且满足 UN38.3 电芯运输认证要求。

Such cell products can satisfy China's compulsory certification requirements for lithium-ion batteries, such as GB/T 36276 -2018, as well as UN38.3 cell transportation certification requirements.

5. 应用条件 Application conditions

客户应当确保严格遵守以下与电池相关的应用条件：

Customer shall ensure that the following application conditions in connection with the products are strictly observed:

5.1 客户应配置电池管理系统，严密监控、管理与保护每个电池。电芯首次使用必须按照标准充电模式和标准放电模式激活，以保证后续使用中容量的充分发挥。

Customer shall procure that each product shall be used under the strict monitor, control and protection by the BMS incorporated by RJETech. When the cell is first used, it must be fully charged and discharged according the standard charge/discharge method to activate it.

5.2 客户应向 RJETech 提供电池管理系统详细的设计方案、系统特点、框架、系统数据、格式等相关信息，以供 RJETech 对该系统进行设计评估，并建立电池管理档案。

The customer shall provide to RJETech BMS the detailed design, system features, framework, system data, format and other relevant information for the battery management system in order for RJETech to perform design evaluation of the system and establish the battery management file.

5.3 未经 RJETech 同意，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。

Without the consent of RJETech, the customer shall not modify or change the design and framework of the BMS that would adversely affect the performance of the battery under normal operation.

5.4 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，RJETech 不承担产品质量保证责任。

Customers shall keep complete monitoring data of battery operation, which shall be used as reference for division of product quality responsibilities. RJETech will not be liable for product quality warranty in the absence of complete monitoring data during the service life of battery systems.

5.5 电池管理系统需满足以下最基本的检测和控制要求：

The BMS shall include the following monitoring and control features as a minimum requirement:

No.	参数	产品规格	保护动作
5.5.1	充电终止 Stop charge	3.65V	当电池电压达到 3.65V，电池管理系统申请终止充电 Stop charge when cell voltage reaches 3.65V
5.5.2	第一级过充电保护 First overcharge protection	≥3.75V	当电池电压达到 3.75V，电池管理系统强制终止充电 Stop charge when cell voltage reaches 3.75 V
5.5.3	第二级过充电保护 Second overcharge protection	≥3.85V	当电池电压达到 3.85V，电池管理系统强制终止充电,并锁定电池管理系统直到技术人员解决问题 When the battery voltage reaches 3.85V, the BMS is forced to terminate charge, and the BMS should be locked until technicians solve the problem
5.5.4	放电终止 Stop discharge	最小 2.5V (电芯温度＞0℃) Minimum 2.5V （Cell temperature ＞0℃）	当电池的电压到达 2.5V，电池管理系统申请终止放电 Minimize the discharge current when cell voltage reaches 2.5V
		最小 2.0V(电芯温度≤0℃) Minimum 2.0V （Cell temperature ≤0℃）	当电池的电压到达 2.0V，电池管理系统申请终止放电 Minimize the discharge current when cell voltage reaches 2.0V
5.5.5	第一级过放保护 First over discharge protection	最小 2.0V Minimum 2.0V	当电池的电压到达 2.0V，电池管理系统强制终止放电 Stop discharge when cell voltage reaches 2.0V
5.5.6	第二级过放保护 Second over discharge protection	最小 1.8V Minimum 1.8V	当电池的电压低于 1.8V 时，电池管理系统强制终止放电，锁定电池管理系统直到技术人员解决问题 Stop discharge when the cell voltage is less than 1.8V, and the BMS should be locked until technicians solve the problem
5.5.7	短路保护 Short circuit protection	不允许短路 No short circuit allowed	发生短路时，由过流器断开电池（电路） When a short circuit occurs, the battery (cell) is disconnected by the overcurrent device
5.5.8	过流保护 Over current	参考第 1.3.4 条和 1.4.4 条	电池管理系统控制充/放电电流符合规格 Control discharge current by BMS to values within

	protection	See paragraph 1.3.4&1.4.4	specification
5.5.9	过热保护 Over temperature protection	参考第 1.3.4 条和第 1.4.4 条 See paragraph 1.3.4&1.4.4	当温度超过本规格书规定时，终止充电/放电 Stop charge and discharge when temperature exceeds specification
5.5.10	充电时间过长保护 Protection for Long Charge Time	充电时间小于 8h Charge time within 8 hours	当充电时间超过 8h 时，终止充电 Terminate charge if the charge time is longer than 8 hours

5.6 避免电池到达过放状态。电池电压低于 2.0V 时，电池内部可能会遭到永久性的损坏，此时 RJETech 的产品质量保证责任失效。根据本规格书第 1.4.2 条，当放电截止电压低于 2.5V 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。

Prevent draining any product down to over discharge state. A product may be permanently damaged internally when the cell voltage is lower than 2.0 V and which shall be strictly prohibited, failing what RJETech's warranties under the contract shall cease to apply, thereby releasing the RJETech from any liability in connection therewith. After discharge cut-off in accordance with paragraph 1.4.2, when discharge cut-off voltage is lower than 2.5 V, internal power consumption of the system should be reduced to a minimum to prolong the idle time before recharge. Customer undertakes to educate the users of the products or other parties who may come to handle the products to recharge the cells at minimum time intervals to prevent reaching the over-discharge state.

5.7 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 RJETech 不承担质量保证责任。

Batteries should avoid charge at low temperatures prohibited by this Technical Agreement (including standard charge, fast charge, emergency charge and regenerative charge), otherwise accidental capacity reduction may occur. BMS should be controlled according to the minimum charge and regenerative charge temperature. It is forbidden to charge under the temperature stipulated in this technical agreement. Otherwise, RJETech will not undertake the responsibility of quality assurance.

5.8 电箱设计中应充分考虑电芯的散热问题，由于电箱散热设计问题导致的电芯或电池过热损坏，RJETech 不承担质量保证责任。

The design of the electric box must fully consider heat dissipation of cell. RJETech does not take the responsibility due to overheating or damage of the battery cells or batteries caused by the heat dissipation design of the electrical box.

5.9 电箱设计中应充分考虑电芯的防水、防尘问题，电箱必须满足国家有关标准规定的防水、防尘等级。由于防水、防尘问题而导致的电芯或电池的损坏（如腐蚀、生锈等），RJETech 不承担质量保证

责任。

The design of the electric box must fully consider the waterproof and dustproof problems of the cells. The electric box must meet the waterproof and dustproof grade stipulated by the relevant national standards. The RJETech does not take the responsibility due to damage to the cell or batteries (such as corrosion, rust, etc.) caused by water and dust.

6. 安全防范 Safety precautions

6.1 禁止将电池浸入水中。

Do not immerse cells into water.

6.2 禁止将电池投入火中或长时间暴露在超过本规格书第 1.2.10 条和第 1.2.11 条规定的温度条件的高温环境中，否则可能会导致火灾。在任何正常的充放电使用情况下，电芯温度不能超过 60℃， 如果电芯温度超过 60℃，电池管理系统需关闭电池，停止电池运行。

Do not drop cells into fire or expose them to any high temperature environment exceeding operation temperature as set out in paragraphs 1.2.10&1.2.11, otherwise it may cause fire. At all use time, cell temperature should not exceed 60℃, shut down system by BMS when it occurs.

6.3 禁止电池正负极短路，否则强电流和高温可能导致人身伤害或者火灾。由于电池的正负极暴露于塑料保护套中，在电池系统组装和连接时，应有足够的安全保护，以避免短路。

Do not short circuit cell terminals, otherwise high current and temperature may cause body injury or fire hazards. As the positive and negative electrodes of batteries are exposed in the plastic case, metallic cell terminals exposed from plastic packaging and ample safety precautions should be implemented to avoid short circuiting them during system integration or connections.

6.4 严格按照标示和说明连接电池正负极，禁止反向充电。

Always connect cell terminals according to its label(s) in right polarity. Reverse charge is strictly prohibited.

6.5 禁止电池过充，和禁止超过最大倍率进行充电，否则可能引起电池过热和火灾事故的发生。在电池安装和使用中，硬件和软件需实行多重过充失效安全保护。最低保护要求见本规格书第 5.5.3 和 5.5.6 条。

It is extremely dangerous to overcharge a cell which may cause overheating and fire hazards. Multiple level of fail-safe overcharge protection should be implemented by hardware and software. See paragraph 5.5.3&5.5.6 for minimum requirement to be adopted by the BMS for protection.

6.6 根据本规格书第 1.3.1 条充电后，应结束正常充电。当持续充电时间超过合理的时间限制，电池会出现过热现象可能会引起热失控和火灾。应安装上一个定时器加以保护。一旦充电电流达到过充状态而不能终止，定时器将会起作用从而终止充电，见本规格书第 5.5.10 条。

Normal charge shall terminate after charge in accordance with paragraphs 1.3.1. When the continuous charge period exceeds the reasonable time limit, the battery will overheat which may result in thermal loss control and fire. A timer shall be installed for protection. Once the charge current reaches an overcharge state and cannot be terminated, a timer is activated to terminate the charge, refer to paragraphs 5.5.10.

6.7 客户应将电池安全地固定在固体平面上，并将电源线安全地束缚在合适的位置，以避免摩擦而引起电弧和火花。

Products should be securely fixed to solid platform, and power cables should be securely attached by fastener to avoid intermittent contact which may cause arcing and sparks.

6.8 严禁用塑料封装电池或用塑料进行电气连接。不正确的电气连接方式可能会造成电池使用过程中发生过热现象。

Do not service cells and electrical connections within plastic package of cell. Improper electrical connection within a cell may cause overheating in service.

6.9 当电解液泄露时，应避免皮肤和眼睛接触电解液。如有接触，应使用大量的清水清洗接触到的区域并向医生寻求帮助。禁止任何人或动物吞食电池的任何部件或电池所含物质。

When the electrolyte leaks, skin and eye contact with the electrolyte should be avoided. In case of contact, a large amount of clean water should be used to clean the contact area and seek help from the doctor. It is forbidden for any person or animal to swallow any part or substance contained in the battery.

6.10 尽力保护电池，使其免受机械震动、碰撞及压力冲击，否则电池内部可能短路，产生高温和火灾。

Protect cells from mechanical shock, impact and pressure. Internal electrical circuit may short circuit to generate high temperature and fire hazards.

6.11 在进行安全测试实验时如操作不当可能会引起电池起火或者爆炸。该测试实验只能由配备适当的防护装备的专业人员在专业的实验室进行。否则，可能会导致严重的人身伤害和财产损失。

Battery fire or explosion may be caused by improper operation during safety test experiment. The test can only be carried out in a professional laboratory by professionals equipped with appropriate protective equipment. Otherwise, it may lead to serious personal injury and property loss.

7. 免责声明 Disclaimer

7.1 如果由于产品需求单位不按本说明书中的规定进行使用，造成社会性影响，并对 RJETech 的声誉造成影响的，RJETech 将会追究产品需求单位的责任。

If the product demand unit does not use the product according to the provisions of this specification, causing social impact and affecting the reputation of RJETech, RJETech will investigate the responsibility of the product demand unit.

7.2 买方在订购 RJETech 产品前，需要与 RJETech 提前确认产品的最新状态。

Before ordering RJETech products, the buyer needs to confirm the latest status of the products in advance with RJETech.

8. 风险警告 Risk warning

警 告

电池存在潜在的危险，在操作和维护时必须采取适当的防护措施！
不正确地操作本规格书第 4 条所描述的测试实验，可能导致严重的人身伤害和财产损失！
必须使用正确的工具和防护装备操作电池。
电池的维护必须由具有电池专业知识并经过安全培训的人士执行。
不遵守上述警告可能造成多种灾难。

CELLS ARE POTENTIALLY DANGEROUS AND PROPER PRECAUTIONS MUST BE OBSERVED IN HANDLING AND MAINTENANCE.
IMPROPER OPERATION OF THE TESTING EXPERIMENT DESCRIBED IN ARTICLE 4 OF THIS SPECIFICATION MAY RESULT IN SERIOUS PERSONAL INJURY AND PROPERTY DAMAGE!
WORK ON CELLS MUST BE PERFORMED ONLY WITH PROPER TOOLS AND PROTECTIVE EQUIPMENT MUST BE USED.
CELL MAINTENANCE MUST BE CARRIED OUT BY PERSONNEL KNOWLEDGEABLE OF CELLS AND TRAINED IN THE SAFETY PRECAUTIONS INVOLVED.
FAILURE TO OBSERVE THE ABOVE MAY CAUSE VARIOUS HAZARDS.

8.1 警示声明

Warning statement

8.2 客户知悉在电池使用和操作过程中存在以下潜在的危险：

Customer acknowledges the following potential hazards in connection with the usage and handling of the Products:

8.2.1 操作者在操作时可能会受到化学品、电击或者电弧的伤害。尽管人体对遭受直流电与交流电的反应不同，但是高于 50V 的直流电压与交流电对人体的伤害是同样严重的，因此客户必须在操作中采取正确的操作方法及适当的防护以避免电流的伤害。

Working with battery can expose the handler to chemical, shock and/or arcing hazards. Although a person's body might react to contact with direct current voltage differently than from contact with alternate current voltage, Customer shall take an appropriate position and consider the risk of shock or electrocution to be the same for both alternate current and direct current exposures greater than 50V.

8.2.2 存在来自电池中的电解液的化学风险。

Cells expose its handler to chemical hazards associated with the electrolyte used in the cell.

8.2.3 在操作电池和选择个人防护装备时，客户及其雇员必须考虑到以上潜在的风险，防止发生意外短路，造成电弧、爆炸或热失控。

When selecting work practices and personal protective equipment, customer and its employees should consider potential exposure to these hazards and therefore prevent accidental short-circuit that can result in electrical arcing, explosion, and/or "thermal runaway" of the cells.