锂离子电芯规格书

PRODUCT SPECIFICATION

电芯型号：**SP-LFP200AhA**

Cell Type: SP-LFP200AhA

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Revision 版次	Date 日期	Revised page 页数	Reason of Revision 修订记录
A/00	2012/10/15	12	初版发行
A/01	2014/03/25	12	电芯尺寸、常规指标修改
A/02	2015/08/15	12	电芯尺寸、存储条件及常规指标修改
A/03	2015/09/15	12	电芯厚度由 69±0.5mm 调整为 69±1mm

Contents 目录

1. SCOPE 适用范围

The product specification describes the requirement of the square Lithium-ion Cell to be supplied to the customer by Shenzhen Wei technology co., ltd.

本规格书规定了由深圳市伟创源科技有限公司生产的 200Ah 方型锂离子电芯的技术要求，测试方法及注意事项。

2. DESCRIPTION AND MODEL 型号及说明

SP - LFP - 200AhA

① ② ③ ④

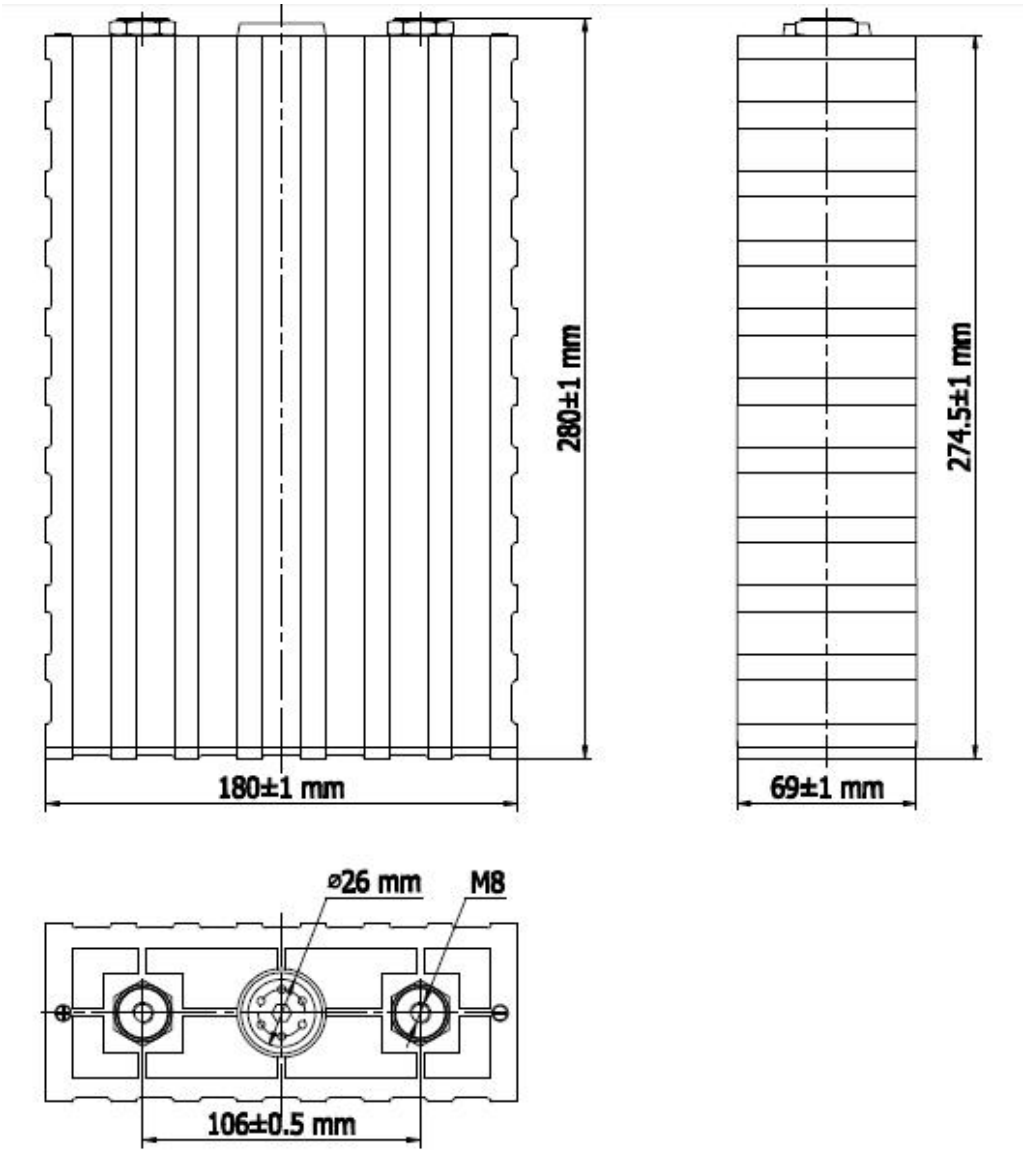
① “SP”代表制造厂

② “LFP”代表电池正极材料是 $LiFePO_4$的方形电芯

③“200Ah”代表单体电芯的标称容量 200Ah

④“A”表示同一型号产品的不同类别，分别用 A、B、C、D……来区别。

3. Cell Size 电芯尺寸



4. GENERAL SPECIFICATIONS 常规指标

Item 项目		specification 标准	Remark 备注
Product Model 产品型号		SP-LFP-200AhA	
Nominal Capacity 标称容量		200 Ah	0.33C，2.5V
Nominal Voltage 标称电压		3.2 V	
Weight 重量		5.8±0.2 Kg	
Internal Impedance 交流内阻		≤0.4mΩ	AC1kHz
Cycle Life 循环寿命		≥2000 Times	80%DOD
Self-discharge rate 自放电率		≤5%/ month	25℃，month
Dimension 规格	Length 长	280±1	mm/unit
	Width 宽	180±1	
	Thickness 厚	69±1	
Charge 充电	Standard Current 标准电流	66A	CC&CV
	Max. Current 最大电流	1C(200A)	
	Limited Voltage 限制电压	3.65V	
	End Current 截止电流	6.6A	0.033C
Discharge 放电	Standard Current 标准电流	63A	
	Max. Current 最大电流	1C(200A)	
	End Voltage 截止电压	2.5V	
Operation Temperature 工作温度	Charge 充电	0℃～45℃	Optimal Charge Temperature 15℃～35℃ 最佳充电温度 15℃～35℃
	Discharge 放电	-20℃～55℃	
Storage Condition 存储条件	Storage Temperature 存储温度	-10℃~40℃	Optimal Storage Temperature 5℃~35℃ 最佳存储温度 5℃~35℃
	Storage Humidity 存储湿度	25~85% RH	
	State of Charge 荷电状态	40%~50%	

5. Construction 电芯结构

A cell is made of cathode, anode, plastic can and pole

电芯由正极、负极、隔膜、塑料壳体和极柱组成

6. TEST CONDITION AND DEFINITIONS 测试条件和定义

6.1 Measuring Equipment 测试设备

6.1.1 Voltmeter 伏特计

Inner impedance>1000Ω/V. 内阻>1000Ω/V

6.1.2 Ampere-meter 安培表

Total external resistance(ammeter and wire)<0.01Ω. 总外阻抗（安培表和线路）<0.01Ω

6.1.3 Slide caliper 游标卡尺

The slide caliper should have a scale of 0.02mm. 游标卡尺精度为0.02mm

6.1.4 Impedance meter 内阻测试仪

The impedance meter should be operated at AC 1kHz. 在1kHz交流条件下进行内阻测试

6.2 Unless otherwise specified, all tests shall be performed at 25±2°C and humidity of 65±20% RH.

除特殊要求外，所有测试均在标准温度25±2°C和标准湿度65±20% RH的条件下进行。

6.3 Charge method 充电方式:

6.3.1 Standard Charge: Charging shall consist of charging at a 66A constant current rate until the cell voltage reaches 3.65V. The cell shall then be charged at constant voltage of 3.65 volts while tapering the charge current. Charging shall be terminated when the charging current has tapered to 6.6A.

标准充电：66A恒流充电至3.65V，再以3.65V恒压充电至电流衰减为6.6A。

6.4 Discharge method 放电方式:

6.4.1 Cells shall be discharged at a constant current of 66A to 2.5 volts

66A恒流放电至2.5V

6.5 Definitions 定义:

I_3Rate ("C"): The rate (mill amperes) at which a fully charged cell is discharged to its end voltage in three (3) hour.

I_3倍率（"C"）：满电电芯3小时放电至终止电压所用的电流大小（A）。

7. CHARACTERISTICS 电性能

Electrical Characteristics tests 电性能测试

Item	Test Instructions	Criteria
Discharge capacity 放电容量	Full charge at 6.3.1, rest for one hour, then discharge at the same temperature with 66A to 2.5 V. 按照 6.3.1 的标准方式充满电，静置 1 小时，然后在相同的温度下用 66A 电流放电到 2.5V	Discharge Time≥180min 放电时间大于等于 180 分钟
High Current Discharge capacity 高倍率放电容量	Full charge at 6.3.1, rest for one hour, then discharge at the same temperature with 200A to 2.5V 按照 6.3.1 的标准方式充满电，静置 1 小时，然后在相同的温度下用 200A 电流放电到 2.5V	Discharge Time≥57min 放电时间大于等于 57 分钟
High temp. discharge capacity	Full charge at 6.3.1, store at 55±2℃ for 5h, then discharge at the same temperature with 66A to 2.5 V.	Discharge Time≥173min

高温放电容量	按照 6.3.1 的标准方式充满电，在 55±2℃环境下静置 5 小时，然后在相同的温度下用 66A 电流放电到 2.5V	放电时间大于 173 分钟
Low temp. discharge capacity 低温放电容量	Full charge at 6.3.1, store at -20℃±2℃ for 16h~24h, then discharge at the same temperature with 66A to 2.0 V. 按照 6.3.1 的标准方式充满电，在-20℃±2℃环境下静置 16h~24 小时，然后在相同的温度下用 66A 电流放电到 2.0V	Discharge Time≥126min 放电时间大于 126 分钟
Normal temperature Capacity Retention and recovery ability of capacity 常温荷电保持与容量恢复	A cell is full charged at 6.3.1,and stored in an ambient temperature of 20℃±5℃ for 28d,after staying at 25℃±2℃ for 5h,then discharged at 6.4.1; A cell is full charged at 6.3.1, then discharged at 6.4.1, repeat 3 cycles, at least 1 cycle reaches the criteria. 电芯按 6.3.1 规定充电结束后，在环境温度为 20℃±5℃条件下，将电芯搁置 28 天；然后 在 25℃±2℃环境下，放置 5h，按 6.4.1 规定放电至 2.5V，电芯按 6.3.1 规定充电结束后，再以 6.4.1 放电至终止电压，重复 3 次循环，至少 1 次满足标准要求。	Capacity retention: ≥95%；Recovery ability of capacity: ≥95% 容量保持率≥95% 容量恢复率≥95%
High temperature capacity retention and recovery ability of capacity 高温荷电保持 与容量恢复	A cell is full charged at 6.3.1,and stored in an ambient temperature of 55℃±2℃ for 7d, recovery in the temperature of 25℃±2℃ for 5h, then discharged at 6.4.1; A cell is full charged at 6.3.1, then discharged at 6.4.1,repeat 3 cycles, at least 1 cycle reaches the criteria. 电芯按 6.3.1 规定充电结束后，在环境温度为 55℃±2℃条件下，将电芯搁置 7 天，在环境温度为 25℃±2℃条件下，恢复 5h 后，再以 6.4.1 放电至终止电压。电芯按 6.3.1 规定充电结束后，再以 6.4.1 放电至终止电压，重复 3 次，至少 1 次满足标.	Capacity retention: ≥90% Recovery ability of capacity: ≥90% 容量保持率： ≥90% 容量恢复率≥90%
Cycle Life 循环寿命	Full charge at 6.3.1, rest for 30 min, discharge at 6.4.1 Repeat above steps till retained capacity is 80%. 电芯按照 6.3.1 方式充满，按照 6.4.1 方式放电，按照以上步骤重复执行，直到剩余容量为初始容量的 80%。	≥2000 cycles ≥2000 次

8. SAFETY 安全性能

Overcharge Test 过充测试	Batteries are discharged at 6.4.1，after continually to 5V at constant current of 1C$_3$A. 电芯按照 6.4.1 方式放电，然后用 1C$_3$A 电流充电到 5V	no fire or explosion 不起火、不爆炸
Forced discharge 过放电测试	Cells are charged at 6.3.1, then discharged at I$_3$A to 0V. 电芯按照 6.3.1 充电，然后 以 I$_3$A 放电至 0V。	No fire or，no explosion and leakage 不起火、不爆炸、不漏液
Needle puncture Performance 针刺性能	After standard charging put the cell on the bracket,penetrate through it with a 3mm-8mm diameter nail near the center of its biggest surface at the speed of	No fire or，no explosion 不起火、不爆炸

	10mm/s~40mm/s. 电池标准充电后，放在支座上，用Ø3mm~Ø8mm 的耐高温钢针、以 10-40mm/s 的速度，从电池的最大平面靠近中心的部位快速完全刺穿电池。	
Short-Circuit Test 短路测试	Batteries are short-circuited by connecting the positive and negative terminals with a resistance load of ≤5mΩ for 10 minutes 电芯正负极之间用≤5mΩ的负载连接 10 分钟	no fire or explosion 不起火、不爆炸
Heating Test 热冲击	Batteries are heated in a circulating air oven at a rate of 5℃±2℃ per minute to 85℃, and then placed for 120 minutes at 85℃. 电芯在有循环风的热风箱中以每分钟 5℃±2℃的速率加热到 85℃，然后在该环境中放置 120 分钟	No fire or explosion 不起火、不爆炸
Drop 跌落	After standard charging put the cell on the bracket, let itself faii off from a height of 1.5m(the lowest height) to a cement fioor with a thickness of 20mm.The drop is implemented.one time for every face. 电池标准充电后，将电池样品由高度（最低点高度）1.5m 的位置自由跌落到 20mm 厚的硬木地板上，每个面一次。	No fire or，no explosion and leakage 不起火、不爆炸、不漏液
Crush 挤压	After standard charging put the cell on the bracket, 1.Extrusion direction; perpendicular with the direction of the battery plates.2.Exteusion version; Diarneter of the half cylinder 75mm. 3.Extrusion degree; Until the batter shell ruptured or internal short circuit (battery voltage becomes 0V) 电池标准充电后，放在支架上，1.挤压方向：垂直于蓄电池极板方向施压。2.挤压板形式：直径为 75mm 的半球体。3.挤压程度：直至蓄电池壳体破裂或内部短路（蓄电池电压变为 0V）	No fire or explosion 不起火、不爆炸
Vibration Test 振动测试	Cells are vibrated 30 min in three mutually perpendicular directions with amplitude of 0.38mm(10~30Hz)or 0.19mm(30~55Hz) and the scanning rate of 1oct per min. 电池在三个互相垂直的方向振动 30 分钟，振幅为 0.38mm(10~30Hz)或者 0.19mm(30~55Hz)，扫描速率为每分钟一个面，	No fire or，no explosion and leakage 不起火、不爆炸、不漏液

9. precautions and safety instructions 安全守则

The cell includes the flammable objects such as the organic solvent. If the handling is missed there will be possibility that the cell rupture flames or hot, or it will cause the damage to the cell and/or personal injury. Please observe the following prohibitive matters. And also, add the protection device the equipment for fear that the trouble would affect the cell by the abnormality of equipment. Please read and observe the standard cell precautions below before using utilization.

电芯含有有机溶剂等易燃物质，如使用不当可能引起电芯产热或起火，造成电芯的损害或人身的伤害。请 注意使用禁止事项，同时应增加保护装置以避免使用设备异常造成电芯事故。在使用锂离子可充电电芯以 前，请仔细阅读以下的安全守则。

9.1 Customer is required to contacts Sinopoly Battery Co.,Ltd. in advance, if and when the customer needs other applications or operating conditions than those described in this specification.

客户需要将电芯在该规格书说明以外的条件下操作或应用，请先咨询中聚电池有限公司相关事宜。

9.2 Sinopoly Battery Co.,Ltd. will take no responsibility for any accident when the cell is used under other conditions than those described in this specification.

在该规格书说明条件之外使用该电芯而产生的事故，中聚电池有限公司不承担任何责任。

9.3 WARNING 警告

9.3.1 Charging 充电

a) Charging voltage must be set 3.65V/cell. Cell life will be shorten by charging voltage above 3.65V

电芯充电电压设定为3.65V，充电电压高于3.65V会导致电芯循环寿命缩短。

b) The recommended charging temperature range is 15 ~ 35°C.

推荐的充电温度范围为15 ~ 35°C。

c) During the processes of charging and discharging, the maximum continuous discharge current should be no more than 1C. To optimize the battery life, we recommend discharging depth is within 90% (DOD) during operation.

电池组在充放电过程中，持续放电电流最大不超过1C。如要优化电池寿命，建议电池组使用时的放电深度在90%（DOD）以内。

d) Use a constant current, constant voltage (CC/CV) lithium-ion (Li+) cell charge controller. Do not use the continuous charging method. Do not continue to charge cell over specified time. No reverse charging.

使用恒压恒流锂离子电芯充电器，不可使用持续充电方式。不要超过标准时间持续充电， 不可反向充电。

e) In case of cell voltage is below 2.5V, cell should be charged with pre-charge that current is below 4A. Then cell voltage reach over 2.5V, standard chargestarts. And if cellvoltageneverreaches to 2.5V in specified period (timer), charger will stop charging.

当电芯电压低于2.5V时，必须使用低于4A电流对电芯进行预充电，直到电芯电压高于2.5V在进行标准方式充电。如果电芯电压在限定时间内无法充至2.5V，充电器需停止充电。

9.3.2 Don't use or expose the cell to extreme heat, flame, disposed in fire or water or get it wet. Don't modify or disassemble the cell. It will be dangerous, and may cause ignition, heating, leakage or explosion.

不要使用或放置电芯于过热，有火星的环境。不要将其投入火中，水中或使其吸湿。不要修理或拆解电芯，存在引发电芯起火、过热、漏液或爆炸的危险。

9.3.3 Don't short-circuit cell positive(+) and negative(-) terminals. Keep away from metal or other conductive materials. Jumbling the cells of direct contact with positive(+) and negative(-) terminals or other conductive materials may cause short-circuit. Don't reverse the positive (+) and negative (-) terminals for any reason.

不要将电芯混乱摆放，同时远离金属或导电材料，以避免正（+）负（-）极短路，不要颠倒电芯正（+）负（-）极使用

9.3.4 Don't use the unspecified charger and breach charging requirement. Cell charged with unspecified condition maybe lead cell to be overcharged or abnormal chemical reaction. It causes the generating heat, smoke, rupture or flame.

不要使用非规定充电设备和违反充电要求。非规定条件充电会引发电芯过充电或异常化学反应，发生产热，冒烟，破裂或起火情况

9.3.5 Don't overcharge, over-discharge, drive nail into the cell, strike it by hammer or tread it.

不要过充、过放、针刺、锤击或践踏电芯。

9.3.6 Don't give cell impact or drop, and not use the cell with conspicuous damage or deformation.

不要撞击或投掷电芯，不要使用受到明显的损害或变形的电芯

9.3.7 Don't connect cell to the plug socket or car-cigarette-plug. Don't use lithium-ion cell in mixture of different batch or use cell for other equipment.

不要将电芯与插座直接连接，不同批次锂离子电芯不可混合使用，或将电芯用于其它设备。

9.3.8 Do not use Lithium ion cell with the primary batteries or secondary batteries whose capacity or kinds or maker is different. If do that, the cell will be discharged or charged excessively in use. And it may cause the generating heat, smoke, rupture or flame because of the abnormal chemical reaction in cells.

不要将锂离子电芯与一次电芯或不同厂家生产的二次电芯混合使用，混合使用会造成电芯充电或放电过度，引发电芯由于非正常化学反应产热，冒烟，破裂或起火。

9.3.9 Do not use or leave the cell under the blazing sun (or in heated car by sunshine), and keep cell away from little children in order to avoid any danger.

不要将电芯放置在太阳光直射的地方（或阳光直接照射的车内），电芯要远离儿童放置以免危险事故发生。

9.2.9 If the cell gives off an odor, generates heat, becomes discolored, or in any way appears abnormal during use, recharging or storage, immediately remove(Don't touch a abnormal cell directly) it from the device or cell charger and stop using it.

电芯在使用、充电或储存过程中，出现释放气味、过度产热或变色等异常情况，立即将电芯从使用设备或充电器取出（不要直接接触异常电芯）并停止使用。

9.3.10 Do not continue to charge cell over specified time. If the cell is not finished charging over regulated time, let it stop charging. There is possibility that the cell might generate heat, smoke, rupture or flame.

电芯不要持续充电超过限定时间。如电芯在限定时间内仍无法完成充电，要停止充电，继续充电有可能发生电芯产热，冒烟，破裂或起火。

9.3.11 Do not get cell into a microwave or a high pressure container. It causes the generating heat, smoke, rapture or flame because of a sudden heat or damage of sealing condition of cell.

不要将电芯至于微波或高压容器内，突然高温或密封状态破坏会引起电芯产热，冒烟，破裂或起火。

9.4 Precautions on Handling Lithium Ion Cells 电芯使用方式

a) Under the same standard operating conditions (discharge rate, depth of discharge, and operating temperature), consistency of the voltage, internal resistance, capacity and self-discharge rate among all of the cells in the battery pack should be within ± 5% tolerance.

在放电率、放电深度、使用历程和使用温度相同的标准工况下，电池组中单体电池的电压、内阻、容量和自放电率的一致性误差≤±5%

b) Inspect voltage and internal impedance before using.

使用前需检测电芯电压及内阻。

c) All of our batteries use plastic cases. The plastic case not only increases the gravimetric energy density, but also increases the safety under abuse usage. When our battery is stressed by an external force, penetrated by a nail or short-circuited, energy stored inside the battery can be released momentarily, without causing self-ignition and explosion. However, plastic cases are easier to be deformed due to changes of external environmental temperature; cell(s) must be bonded tightly during operation.

我司生产的锂离子蓄电池外壳全部采用塑料，塑壳电池不仅能提高电池的能量密度，而且可以提高锂离子蓄电池在滥用的情况下的安全性；当电池在受到外界强烈挤压、针刺或短路时电池内部聚集的能量能够瞬间释放，不会发生自燃烧、爆炸等安全事故的发生；但是塑料电池壳易受到外界环境温度的变化而发生轻微形变，因此要求客户在使用过程中一定要将电池组处于加紧状态。

d) Do not use abnormal cell which has damages by shipping stress, drop, short or something else, and which gives off electrolyte odor.

不要使用由于运输损伤，跌落，短路或其它原因造成破损或漏液电芯。

e) Do not use or leave the cell under the blazing sun(or in heated car by sunshine).The cell may generate heat, smoke or flame. And also, it might cause the deterioration of cell's characteristics or cycle life.

不要使用或将电芯放在太阳光直射的地方（或阳光直接照射的车内）。这种情况会使得电芯产热，冒烟或起火，也可能使得电芯性能衰降及循环寿命缩短。

f) If the skin or cloth is smeared with liquid from the cell, wash with fresh water.It may cause the skin inflammation, see a doctor immediately.

如果电芯流出液体接触到皮肤或衣服，使用清水清洗。可能会引起皮肤炎症，请立即就医。

g) In order to monitor the voltage, current and temperature of the single cells of the battery pack in real-time and to effectively prevent overcharge, over-discharge and overheating of the cells, the battery pack must be configured with a battery management system (BMS),which has a complete and reliable performance and accurate data collection function.

为了实时监控电池组内单体电池的电压、电流和温度，有效防止发生电池过充、过放、过热现象，电池组必须配置功能完善、性能可靠、数据采集准确的电池管理系统（BMS）。

h) When the batteries are placed aside three months, the batteries should be activitated .The activation system is as follows (1) Rest: 10 minutes; (2) Discharge: CC(0.33C，66A) to 2.5V;(3) Rest: 10 minutes;(4) Charge: CC(0.33C,66A)to 3.65V, CV(3.65V) to 0.033C(6.6A); (5) Rest: 10 minutes;(6) Discharge: CC(0.33C,66A) to 2.5V; (7) Cycle from (3) to (6) 2 times; (8) Rest: 10 minutes; (9) Charge: CC(0.5C,100A) 60 minutes.

当电池连续3个月未使用时，应对电池进行活化处理。活化制度如下：（1）搁置10min；（2）0.33C（66A）恒流放电至2.5V；（3）搁置10min；（4）0.33C（66A）恒流恒压充电至3.65V, 截止电流0.033C（6.6A）；（5）搁置10min；（6）0.33C（66A）恒流放电至2.5V；（7）从（3）到（6）循环2次；（8）搁置10min；（9）0.5C（100A）恒流充电60min。

i) Cell(s) must be bonded tightly during operation.

电芯需在夹紧状态下使用。

10. Transportation 运输

The capacity of delivery cell is approximately at 50% of charging. During transportation, keep the cell from acutely vibration, impacting, solarization, drenching. Shipping environment temperature should

controlled at 0-40ºC.

出货电芯处于半充电状态，运输过程应防止剧烈振动、冲击、日晒雨淋。运输过程中，环境温度应当控制在0-40ºC。

11. Storage 储存

Any storage, cell should be in a dry area, ventilation and no corrosive gas and there is no press on the cell.

电芯应在干燥、通风和无腐蚀性气体的 环境下储存，不要让电芯承受任何压力。

When stored within 1 momth : -20℃~35℃

储存期1个月：-20℃~35℃

When stored within 6 momth : -20℃~25℃

储存期6个月：-20℃~25℃

When stored within 12 momth : -10℃~25℃

储存期12个月：-10℃~25℃

12. CONSULTATION 技术咨询

12.1 Any obscurity, please contact us as following.

Site: Five, building B, new musheng low carbon industrial park, No.6, Pinghu new wood road, Longgang district, Shenzhen city

Tel No.:86-0755-89635916

Fax No.:86-0755-89635636

http://www.victpower.com/

如有任何疑问，请按照以下方式咨询：

厂址：深圳市龙岗区平湖新木大道6号新木盛低碳产业园B栋5楼

12.2 For the sake of safety assurance, please discuss the equipment design, its system and protection circuit of Lithium-ion cell with Shenzhen Wei technology co., ltd. in advance. And consult about the high rate current, rapid charge and special application in the same way.

为了安全起见，如有设备设计，锂离子电芯系统保护电路或高电流，快速充电和其它方面的特殊应用,请先咨询深圳市伟创源科技有限公司相关事宜。