

苏州润能动力科技有限公司

Li-ion Battery Specification

锂离子电池规格书

Model/型号: 48V80Ah

| | | |
|--------------------------|-------------------------|--------------------------|
| Prepared by 编制 | Checked by 审核 | Approved by 批准 |
|--------------------------|-------------------------|--------------------------|

| | |
|-------------------------------------|--|
| Customer Name 客户名称 | |
| Customer Approval 客户确认/盖章 | |
| Date/日期 | |

Note (注意):

1. Kindly please sign specification back to us, if the sample has been approved.

如果样品已确认, 请回签规格书给我司。

2. Kindly please contact us as soon as possible if the sample has not been approved. Thanks!

如果样品未确认, 请尽快与我司联系, 谢谢!

Suzhou Runneng PowerTechnology Co., Ltd.

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1. Scope/适用范围

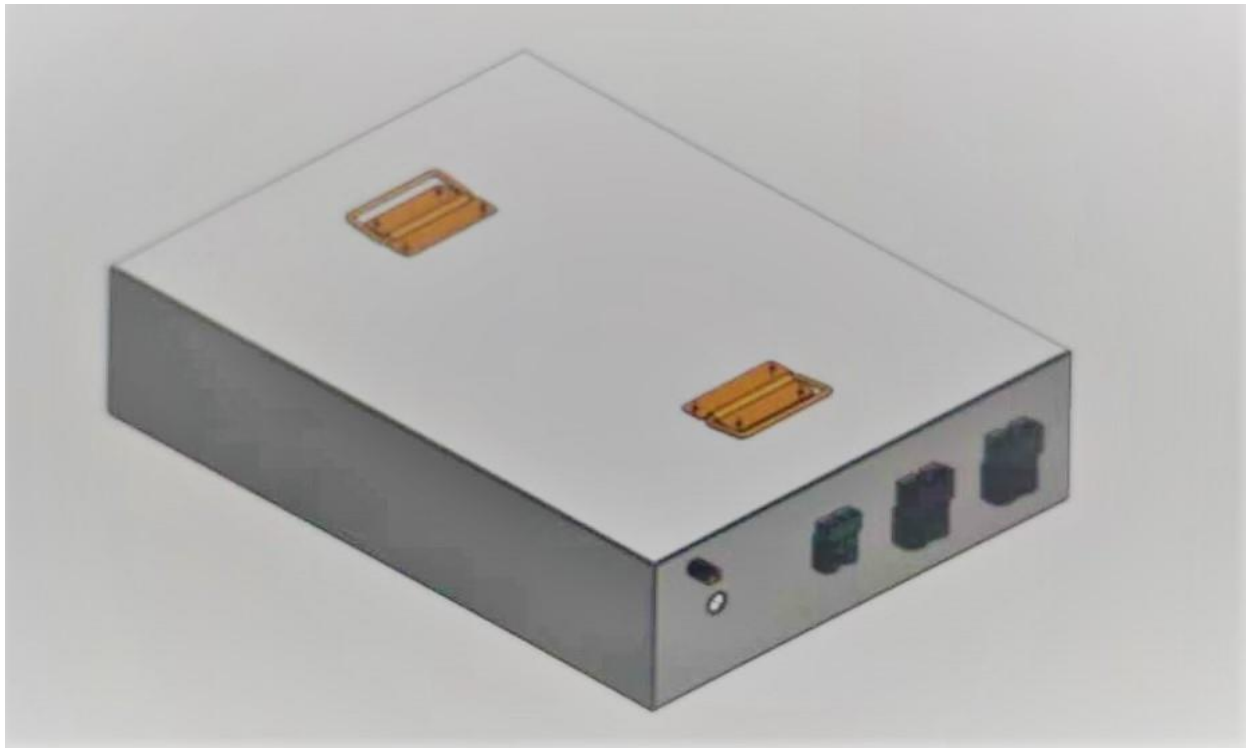
This specification is applied to 48v80Ah Manufactured by Suzhou Runneng Power Technology Co., Ltd.

本规格书适用于苏州润能动力科技有限公司生产的48V80Ah 电池。

2.Product Configuration/产品配置

| No./序号 | Item/项目 | SPEC/规格 | Remark/备注 |
|--------|---------------------|-------------------|-----------|
| 1 | Cell/电芯 | INR26650P-3300mAh | |
| 2 | PCBA/保护板 | 通用锂电池 15串保护板 | |
| 3 | Terminal block/接线端子 | 安德森插头 | |

3.Product Dimension/产品尺寸



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4.ProductSpecification/产品规格

| No.序号 | Items/项目 | RatedPerformance/额定性能 | Remarks/备注 |
|-------|--|-----------------------|--------------------------|
| 1 | RatedCapacity/标称容量 | 80Ah | |
| 2 | M inimum Capacity/最小容量 | 78.4Ah | |
| 3 | NominalVoltage/标称电压 | 48V | |
| 4 | Chargevoltage/充电电压 | 54.75V | |
| 5 | Dischargecut-offvoltage 放电截止电压 | 45V | |
| 6 | Energy/能量 | 3840W h | |
| 8 | VoltageatendofDischarge 放电保护电压 | 44V | |
| 9 | ChargingProtectionVoltage 充电保护电压 | 54.8V | |
| 10 | Overdischargecurrent/放电保护过流 | 100A | |
| 11 | AC Impedance/电池阻抗 | ≤100mΩ | |
| 12 | StandardCharge/标准充电 | 0.2C | 16A |
| 13 | StandardDischarge/标准放电 | 0.5C | 40A |
| 14 | FastCharge/快速充电 | 0.5C | 40A |
| 15 | FastDischarge/快速放电 | 100A | |
| 16 | M aximum ContinuousChargeCurrent/ 最大持续充电电流 | 40A | |
| 17 | M aximum ContinuousDischarge Current/最大持续放电电流 | 100A | |
| 18 | M ax.PluseDischargeCurrent 最大脉冲放电电流 | 200A/1S | |
| 19 | OperationTemperatureRange 工作温度范围 | Charge 充电:0~45℃ | Humidity/湿度 60±25% |
| | | Discharge 放电:-10~60℃ | |
| 20 | StorageT/H Range 存储温、湿度范围 | -20~60℃/60±25% | |
| 21 | W eight/重量 | approximately/大约:kg | |
| 22 | ProductDimension/产品尺寸 | 长度 Length:600mm | Initialdimension 初始尺寸 |
| | | 宽度 W idth:450mm | |
| | | 高度 Height:150mm | |

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5. Product Performance/产品性能

Standard Testing Conditions/标准测试环境

Temperature/温度: $25 \pm 5^{\circ}\text{C}$

Humidity Range /湿度: 25 ~ 85%范围内进行。

Test method and request/检测方法与要求

| No. 序号 | Items /项目 | Test Method /检测方法 | Request/ 要求 |
|--------|---------------------------|--|---|
| 1 | Appearance 外观 | By sight 目测 | No obvious flaw、blot、scratch distorted.无凹陷、划痕、污渍、变形等缺陷。 |
| 2 | Open-Circuit Voltage 开路电压 | Shipped with a millimeter test voltage 用万用表测试出货电压 | $\geq 48\text{V}$ |
| 3 | Impedance 内阻 | AC Impedance Resistance 交流阻抗电阻 | $\leq 100\text{m}\Omega$ |
| 4 | Nominal Capacity 标称容量 | 1C discharge 1C 放电容量 | Discharge Capacity/放电容量 $\geq 80\text{Ah}$ |
| 5 | Cycle Life 循环寿命 (1C) | 测试条件 /Test condition 第 1 步: 0.5C 充电至 54.75V Step1: Charged the cell at 0.5C to 54.75V 第 2 步: 静置 3 分钟 Step 2: Standby 3min 第 3 步: 1C 放电至 45V Step3: Discharge the cell at 1C to 45V 第 4 步: 静置 3 分钟 Step 4: Standby 3min 第 5 步: 重复第 1 步至第 4 步 1000 次, 记录 1000 周循环后容量与第 1 次循环容量的比值 Step5: Repeat step1 to step4 for 1000 times. Measure the capacity of 1st cycle capacity at 1C discharge of Operation | 1)容量保持率不低于 80% Capacity retention $\geq 80\%$ of initial capacity |

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6. Cell Specification/电芯规格

| No. | 项目 /Items | 规格 /Specification | |
|-----|----------------------------------|--|---|
| 1 | 容量/Capacity | 标称容量 /Typical Rated Capacity | 1C 放电容量 3300mAh 3300mAh @ 1C discharge |
| | | 最小容量 /Minimum Rated Capacity | 1C 放电容量 3250mAh 3250mAh @ 1C discharge |
| 2 | 标准电压 /Nominal Voltage | 3.2V | |
| 3 | 内阻 /Internal Resistance | $\leq 50m \Omega$ | |
| 4 | 标准充电方式 Standard Charging method | 先用 1c 充电至 3.65V，再以 3.65V 恒压充电至电流小于 0.02c。 charge at 1c to 3.65V, then charge with constant voltage 3.65V until the current is less than 0.02c | |
| 5 | 标准放电方式 Standard Discharge method | 1C 恒流放电至 3V。 1C electric constant exile to 3V. | |
| 6 | 循环寿命 Cycle life | 循环 1000 次，容量 \geq 标称容量的 80% / Capacity \geq Standard Capacity*80% | |
| 7 | 贮存性能 Storage performance | 贮存 90 天的电池容量保持率 $\geq 95\%$ / Capacity can be kept Standard Capacity*95% (storage for 3 month) | |
| 8 | 过充性能 Over-charge performance | 不爆炸、不起火 /No exploding , no fire | |
| 9 | 过放性能 Over-discharge performance | 不爆炸、不起火、不漏液 /No exploding , no fire , no leak | |
| 10 | 电池重量 /Battery Weight | 80 \pm 1.5 g | |

7. PCMSpecificationandCharacteristic/保护板规格与特性

7.1PCM

Diagram/保护板元件图

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7.2PCM Electrical Characteristics (for individual cell) /保护板性能参数(单节电池)

| Item 项目 | Content 详细内容 | Criterion 标准 |
|--------------------------------|---|-------------------------------|
| Over charge Protection 过充保护 | Over charge detection voltage 过充电检测电压 | 3.65±0.05V |
| | Over charge detection delay time 过充电检测延迟时间 | 1000±500mS |
| | Over charge release voltage 过充电解除电压 | 3.6±0.05V |
| Over discharge protection 过放保护 | Over discharge detection voltage 过放电检测电压 | 3±0.10V |
| | Over discharge detection delay time 过放电检测延迟时间 | 1000±500mS |
| | Over discharge release voltage 过放解除电压 | 3.0±0.10V |
| Over current protection 过流保护 | Over current detection current 过电流保护电流 | 120 ± 20A |
| | Detection delay time 检测延迟时间 | 10~80mS |
| | Release condition 保护解除条件 | Removed load 断开负载 |
| | Release condition 保护解除条件 | Removed load 断开负载 |
| Temperature protection 温度保护 | Temperature protection 温度保护 | 75 ± 5°C |
| | Temperature protection release 温度保护恢复 | 55 ± 5°C |
| Cell Balance 均衡 | Bleed start point 均衡电压起点 | 4.19±0.03V |
| | Bleed current 均衡电流 | 40±10mA |
| Short protection 短路保护 | Detection condition 保护条件 | Exterior short circuit 外部电路短路 |
| | Detection delay time 检测延迟时间 | 600±300uS |
| | Release condition 保护解除条件 | Cut short circuit 断开短路电路 |
| Internal Resistance 内阻 | Discharge circuit 放电回路 | 30mΩ |
| Current Consumption 电流功耗 | Normal mode 正常模式 | 30~300uA |

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7.3PCM Connection To The Board/保护板连接方式

7.4PCM Content/保护板详细内容说明

| 端口 | 说明 | 端口 | 说明 |
|-----|-------------------------------------|----|-------------------|
| 通讯口 | 红线接 485AY/TX,绿线接 485BZ/RX, 黑线接 GND2 | B- | 连接到电芯组的负极端口 |
| P+ | 充电和放电正极端口即 B+ | P- | 放电口负极 (同口时不接) |
| C+ | 充电口正极 (接电池组正极) | C- | 充电口负极 (同口时也是负载负极) |

弱电开关功能：两根线通过开关闭合后为打开放电，两根线通过开关断开后为关闭放电，若不带弱电开关功能时此处不用接线为断开状态。

8.Packaging, StorageandTransportation/包装、储存和运输

8.1 Packaging/包装：

Using standardpackaging./采用功遂铭皓标准包装方式。

8.2 Storage/储存：

The Li-ion battery should be stored in a cool, dry and well-ventilated area, and should be far from the fire andthe high temperature.

电池组应储存在阴凉、干燥、通风良好的地方。并应远离火和高温。

The best capacityin storage is 30%-50% (voltage between46-49V).

保持储容量最好是在 30%-50%（在 46-49V 之间的电压）。

The battery should bestored within the proper temperature andhumidity range specified by specification.

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电池应储存在产品规格书规定的温度和湿度范围内。

If stored for more than six months or longer, the battery will be suggested to charge.

如果电池存放时间超过六个月以上或更长，建议对电池进行充电。

8.3 Transportation/运输：

Forbidden to mix battery with other goods. /禁止将电池与其他货物混装。

Forbidden to immerse battery into liquid such as water or soak it with liquid. /禁止将电池浸入水中或弄湿。

Forbidden to deposit battery over 6 layers or upside-down. /禁止电池堆放超过 6 层或倒立。

The highest temperature during battery transportation should be lower than 65°C. /电池运输过程中最高温度应低于 65°C。

9. Use Attentions/使用注意事项

9.1 Attentions /注意事项 Avoid insolation or dropping into fire. /避免暴晒或投入火中。

Avoid shorting the battery. /避免将电池短路。

Avoid excessive physical shock or vibration. /避免电池过度冲击或振动。

Don't disassemble or deform the battery. /不得拆卸或扭曲电池

Don't immerse in water. /不得浸入水中

Don't use the battery mixed with other model or manufacturer batteries. /不要与其他型号或品牌的电池混合使用。

Battery usage by children should be supervised. /儿童使用电池应受到监督。

9.2 Charge/充电

Battery charge should be used appropriate charger. /电池充电必须使用专用的充电器。

Forbidden to use modified or damaged charger. /禁止使用改装或已损坏的充电器。

Forbidden to charge over 24 hours for battery. /禁止充电超过 24 小时。

Charge current: can't surpass the biggest charge current specified by battery specification.

充电电流：不能超过在规格书规定的最大充电电流。

Charge voltage: can't surpass the highest charge voltage specified by battery specification.

充电电压：不能超过在规格书规定的最高电压。

Charge temperature: The battery should be charged within proper temperature range specified in specification.

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充电温度：电池必须在规格书规定的环境温度范围内进行充电。

Forbidden of reverse charge: The battery should be connected correctly, the polarity has to be confirmed before wiring in case of the battery is connected improperly, the battery can't be charge. Simultaneously, the reverse charge may cause damaging to the battery which may lead to degradation of battery performance and damage the battery safety, and could cause heat generation or leakage.

禁止反充：电池应该当正确连接，配线前就要确认极性，万一连接不正确，电池将不能充电。同时，反充可能会损坏电池，会导致电池性能下降，破坏电池安全性，还可能导致发热或泄漏。

9.3 Discharge/放电:

Discharge current: can't surpass the biggest discharge current specified by battery specification.

放电电流：不能超过在规格书规定的最大放电电流。

Discharge temperature: The battery should be discharged within proper temperature range specified by specification.

放电温度：电池必须在规格书规定的环境温度范围内进行放电。

Over-discharge: it should be noted that the battery would be at over-discharged state by its self-self-discharge characteristics in case the battery is not used for long time. To prevent over-discharge, the battery shall be charged periodically to maintain between 48V and 52V.

过放：需要注意的是，在电池长期未使用期间，它可能会因其自放电特性而处于某种过放电状态。为防止过放电的发生，电池应定期充电，将其电压维持在 48 到 52V 之间。

9.4 Disposal/处置:

The disposal of battery should meet the local law.

电池的处理应当符合当地法律。

10.Warranty Period /保质期

Unless special declaration in product specification, the warranty period of battery is 12 months from the day of battery manufacture.

除在产品规格书中特别声明，电池保质期自制造之日起 12 个月内有效。

11.Note/注释

Any other items which are not covered in this specification shall be agreed with both parties.

任何其他不包括在本规范的项目，应由双方协商决定。