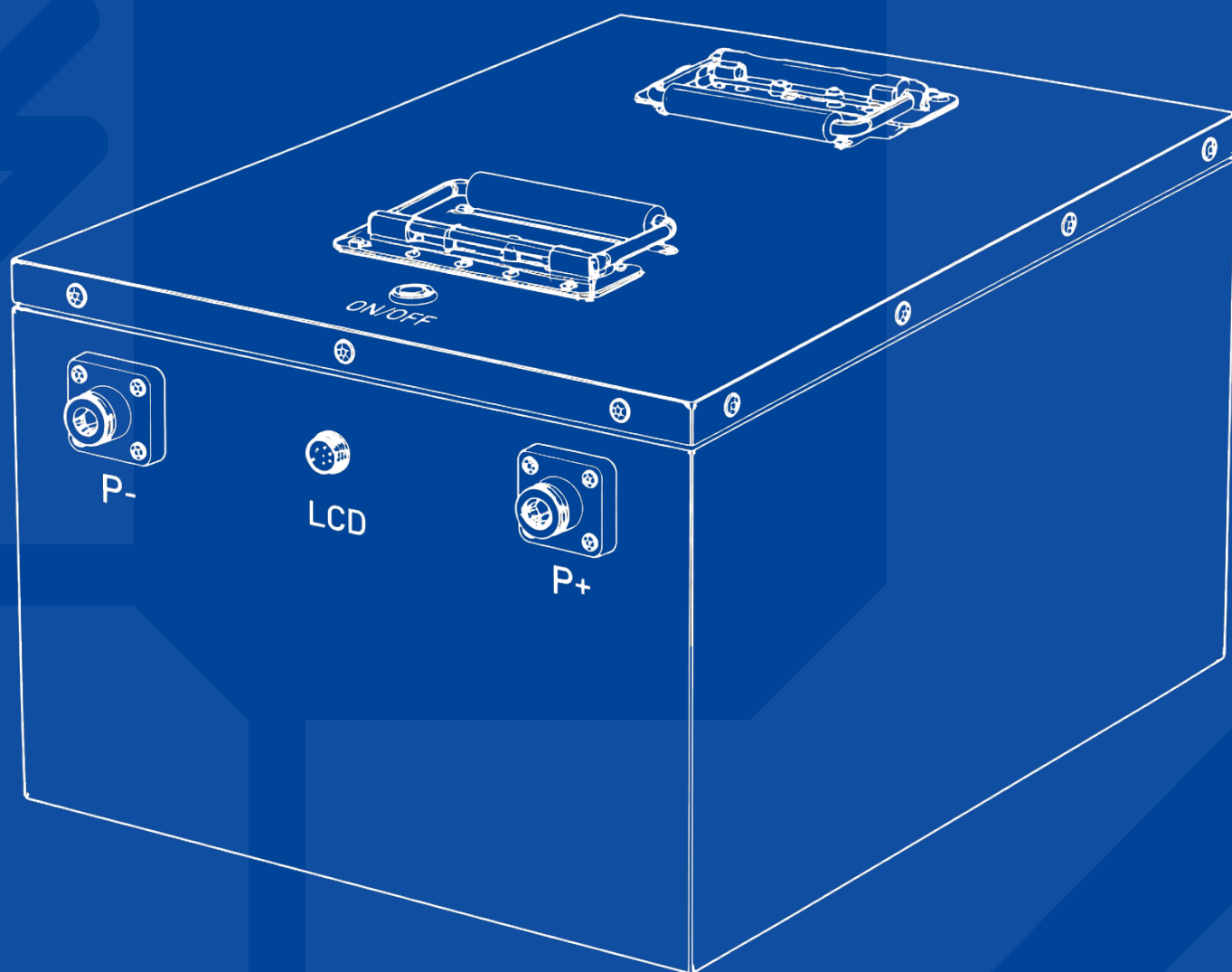


48V105Ah BATTERY PACK



锂离子电池技术规格书

Lithium-ion Batteries Technical Specification

品名：高尔夫球车电池组

Product Name: Golf Cart Battery Pack

型号：48V105Ah

Model: 48V105Ah

项目 / Item	参数 / Parameter
型号 Model	48V105Ah
额定电压 Nominal Voltage	51.2V
额定容量 Nominal Capacity	105Ah
额定能量 (Wh) $\pm 5\%$ Nominal Energy (Wh) $\pm 5\%$	5376
电芯类型 Cell Type	磷酸铁锂 / LiFePO ₄
日期 Date	

承认信息 / Received

客户承认章 Customer Approval Stamp	公司承认章 Company Approval Stamp	研发部 R&D Dept.
部门: Dept.:	部门: Dept.:	版本: A/0 Ver.: A/0
		页数: 以实际为准 Pages: Subject to actual
		编制: Prepared by:
生效日期: Effective Date:	生效日期: Effective Date:	审核: Reviewed by:
		批准: Approved by:

版本变更履历表 / Version Change History

版本编号 Version No.	主要变更履历描述 Major Change Description	编制人 Prepared by	生效日期 Effective Date
A/0	首次发行 First release		

一、产品概述 / Product Overview

本产品由 16 串电芯组成的磷酸铁锂电池组（含 BMS），本产品适用于工作电流在 150A 范围已内的负载设备。

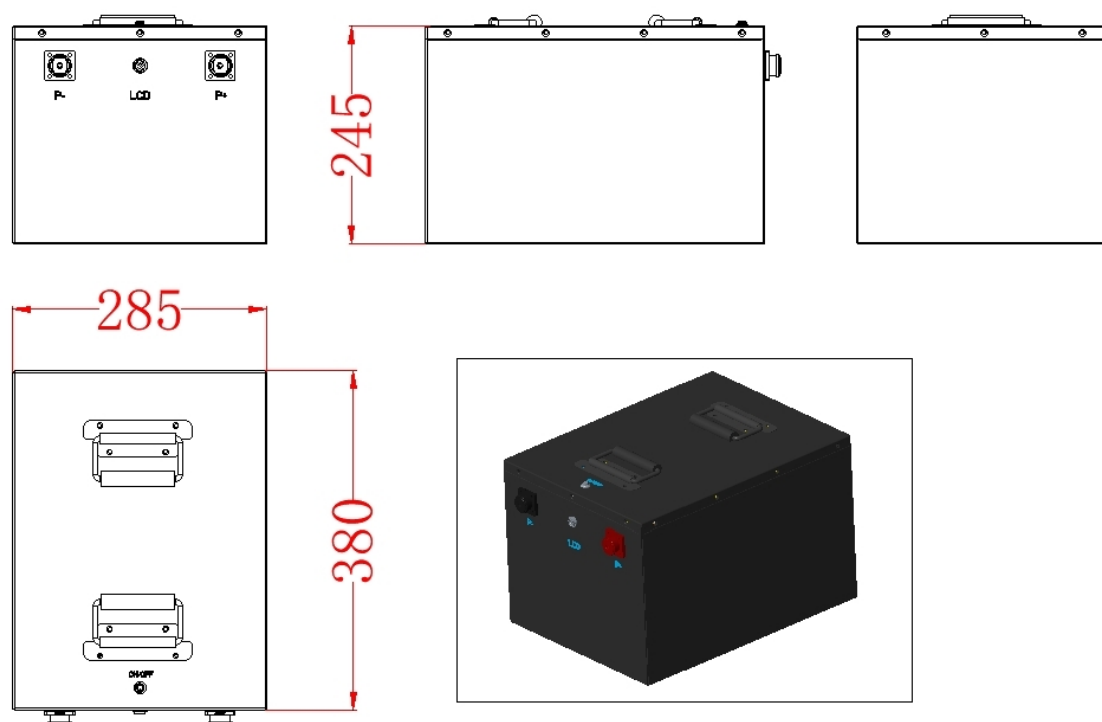
This product is a LiFePO₄ battery pack (BMS included) composed of 16 cells connected in series. It is suitable for load equipment with an operating current within the 150A range.

二、产品技术规格 / Product Specifications

本产品型号为 48V105Ah 电池组，由 16S1P 电芯组成，最大持续充放电电流 150A，带蓝牙功能，带主动均衡功能，带存储功能，机箱颜色为黑色。

This product is the 48V105Ah battery pack, composed of 16S1P cells, with a maximum continuous charge/discharge current of 150A. It features Bluetooth, active balancing and data storage, and the enclosure is black.

2.1 电池组产品结构图 / Product Structure Diagram



2.2 电池系统技术参数 / Battery System Technical Parameters

项目 Item		规格 Specification	备注 Remarks
产品型号 Product Model		48V105Ah	48V/105AH
标称容量 Nominal Capacity		105AH	16 串 1 并(16S1P) 16S1P
标称电压 Nominal Voltage		51.2V	3.2*16
额定能量 (Wh) $\pm 5\%$ Nominal Energy (Wh) $\pm 5\%$		5376	
显示屏 Display		2.2 寸显示屏 2.2-inch display	
充电方式 Charging Method		CC-CV (恒流恒压) CC-CV (constant current / constant voltage)	
放电方式 Discharging Method		恒流放电 Constant current discharge	
充放电端口 (共口或分口) Charge/Discharge Port (common/separate)		共口 Common port	
冷却方式 Cooling Method		自然冷却 Natural cooling	
充电温度 Charge Temperature		-10°C~70°C	
放电温度 Discharge Temperature		-20°C~70°C	
存储温度 Storage Temperature		0°C~50°C	
存储湿度 Storage Humidity		25%~70%	
防护等级 Protection Rating		IP55	
运行功耗 Operating Power Consumption		≤ 800 mW	
电池箱尺寸(长*宽*高) (mm) Battery Box Dimensions (L*W*H) (mm)		380*285*245mm	
电池重量公差 ± 2 kg Battery Weight Tolerance $\pm$ 2kg		39KG	
充电 Charging	建议充电电流 Recommended Charge Current	90A	

项目 Item		规格 Specification	备注 Remarks
	截止电压 Cut-off Voltage	58.4V	
	最大持续电流 Max. Continuous Current	150A	
	标准模式 Standard Mode	在环境温度 (25±2) °C的条件下充电恒压 58.4V, 对电池以恒流 90A 恒流充电 At an ambient temperature of (25±2)°C, the battery is charged at a constant voltage of 58.4V and a constant current of 90A.	
放电 Discharging	建议放电电流 Recommended Discharge Current	90A	
	截止电压 Cut-off Voltage	43.2V	
	最大持续电流 Max. Continuous Current	150A	
	标准模式 Standard Mode	在环境温度 (25±2) °C的条件下放电恒压 43.2V, 对电池以恒流 60A 恒流放电 At an ambient temperature of (25±2)°C, the battery is discharged at a constant voltage of 43.2V and a constant current of 60A.	

三、电池管理 (BMS) 系统 / Battery Management System (BMS)

3.1 BMS 系统功能概述 / BMS Function Overview

3.1.1 电芯和电池电压检测。

Cell and battery voltage monitoring.

3.1.2 电池充放电电流检测。

Battery charge and discharge current monitoring.

3.1.3 电芯、环境和功率温度检测。

Cell, ambient and power temperature monitoring.

3.1.4 电池容量计算及循环次数功能。

Battery capacity calculation and cycle counting.

3.1.5 充放电 MOSFET 开关功能。

Charge/discharge MOSFET switching.

3.1.6 电池充电均衡功能。

Battery charge balancing.

3.1.7 按键开关功能。

Push-button switch function.

3.1.8 历史数据存储功能。

Historical data storage.

3.1.9 加热功能（选配）。

Heating function (optional).

3.2 BMS 系统参数设置 / BMS Parameter Settings

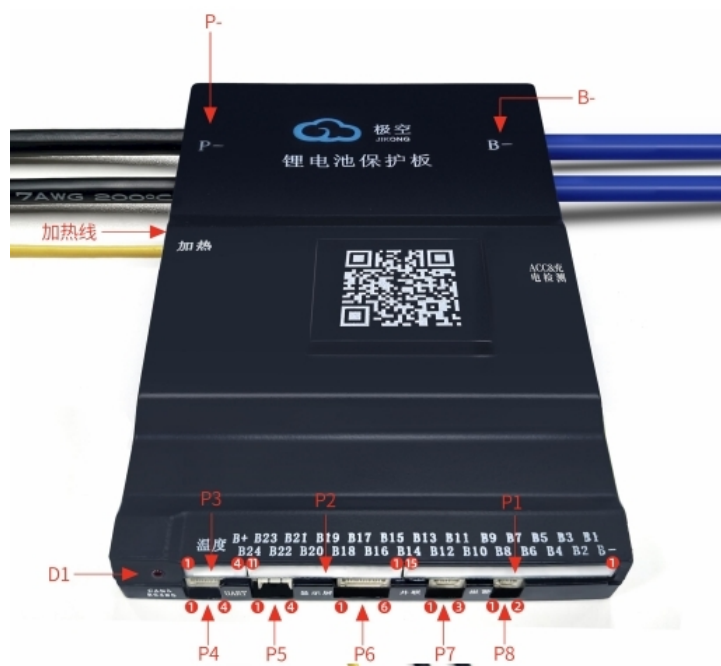
项目名称 Item Name	指标项目 Parameter	标准数值 Standard Value
单体过充保护 Cell Overcharge Protection	过充保护值 Overcharge protection value	3.65±0.05V
	过充恢复值 Overcharge recovery value	3.45±0.05V
单体过放保护 Cell Over-discharge Protection	过放保护值 Over-discharge protection value	2.7±0.05V
	过放恢复值 Over-discharge recovery value	2.9±0.05V
电池组过充保护 Pack Overcharge Protection	过充保护值 Overcharge protection value	58.4±0.05V
	过充恢复值 Overcharge recovery value	55.2±0.05V
电池组过放保护 Pack Over-discharge Protection	过放保护值 Over-discharge protection value	43.2±0.05V
	过放恢复值 Over-discharge recovery value	46.4±0.05V

项目名称 Item Name	指标项目 Parameter	标准数值 Standard Value
充电过流保护 Charge Overcurrent Protection	充电过流保护 Charge overcurrent protection	150A
	充电过流延时 Charge overcurrent delay	3S
放电过流保护 Discharge Overcurrent Protection	放电过流保护 Discharge overcurrent protection	150A
	放电过流延时 Discharge overcurrent delay	300S
温度保护 Temperature Protection	充电高温保护 Charge high-temperature protection	70±2 °C
	充电高温恢复 Charge high-temperature recovery	60±2 °C
	充电低温保护 Charge low-temperature protection	-10±2 °C
	充电低温保护恢复 Charge low-temperature protection recovery	0±2 °C
	放电高温保护 Discharge high-temperature protection	70±2 °C
	放电高温恢复 Discharge high-temperature recovery	60±2 °C
	放电低温保护 Discharge low-temperature protection	-20±2 °C
	放电低温保护恢复 Discharge low-temperature protection recovery	-10±2 °C

3.3 保护板尺寸实物图 / Protection Board Dimensions

保护板尺寸 162mm×102mm×20.4mm 如下图所示

The protection board dimensions are 162mm × 102mm × 20.4mm, as shown below.



四、测试条件 / Test Conditions

特殊情况除外，所有测试条件都以标准测试条件为准：

Unless otherwise specified, all test conditions shall be based on the standard test conditions:

环境温度：25±5 °C；环境湿度 40%-80%RH

Ambient temperature: 25±5°C; ambient humidity: 40%-80% RH

“标准充电” 即在环境温度为 25°C±5°C 的条件下，先以恒定电流 0.2C 充电至 58.4V，再以 58.4V 的恒压充电至电流小于 0.02C。

"Standard charge" means that, at an ambient temperature of 25°C±5°C, the battery is first charged at a constant current of 0.2C to 58.4V, and then charged at a constant voltage of 58.4V until the current falls below 0.02C.

“标准放电” 即在环境温度为 25°C±5°C 的条件下，以恒定电流 0.2C 放电到 43.2V。

"Standard discharge" means that, at an ambient temperature of $25^{\circ}\text{C}\pm 5^{\circ}\text{C}$, the battery is discharged at a constant current of 0.2C to 43.2V.

五、电气性能、安全性能测试 / Electrical and Safety Performance Tests

5.1 电气性能测试 / Electrical Performance Tests

测试项目 Test Item	测试标准 Test Standard	技术要求 Technical Requirement
25°C 常温放电容量 Discharge capacity at 25°C	电池组在标准测试条件下先以 0.2C 电流进行充满电后，再以 0.2C 电流进行放电，记录电池组的放电容量。 After fully charging the battery pack at 0.2C under standard test conditions, discharge it at 0.2C and record the discharge capacity.	$\geq 100\%$ 标称容量 $\geq 100\%$ of nominal capacity
-10°C 低温放电容量 Low-temperature discharge capacity at -10°C	电池组在标准测试条件下先以 0.2C 电流进行充满电后，在 -10°C 低温环境温度存储 10H，以 0.2C 电流进行放电至终止电压，记录电池组的放电容量。 After fully charging the battery pack at 0.2C under standard test conditions, store it at -10°C for 10H, then discharge at 0.2C to the cut-off voltage and record the discharge capacity.	$\geq 75\%$ 标称容量 $\geq 75\%$ of nominal capacity
55°C 高温放电容量 High-temperature discharge capacity at 55°C	电池组在标准测试条件下先以 0.2C 电流进行充满电后，在 55°C 高温环境温度存储 5H，以 0.2C 电流进行放电至终止电压，记录电池组的放电容量。 After fully charging the battery pack at 0.2C under standard test conditions, store it at 55°C for 5H, then discharge at 0.2C to the cut-off voltage and record the discharge capacity.	$\geq 95\%$ 标称容量 $\geq 95\%$ of nominal capacity
荷电保持能力和容量恢复能力 Charge retention and capacity recovery	电池组在标准测试条件下先以 0.2C 电流进行充放电后，记录初始容量，在标准测试条件下充满电，在 $25^{\circ}\pm 5^{\circ}\text{C}$ 环境温度下搁置 30d，以 0.2C 电流进行放电至终止电压测试保持容量，以 0.2C 进行充电，再以 0.2C 进行放电，循环 3 次，第三次为恢复容量。 After charging and discharging the battery pack at 0.2C under standard test conditions, record the initial capacity. Fully charge it under standard test conditions, leave it at $25^{\circ}\pm 5^{\circ}\text{C}$ for 30d, then discharge at 0.2C to the cut-off voltage to measure the retained capacity. Charge at 0.2C and	荷电保持率 $\geq 95\%$; 容量恢复率 $\geq 95\%$ Charge retention $\geq 95\%$; capacity recovery $\geq 95\%$

测试项目 Test Item	测试标准 Test Standard	技术要求 Technical Requirement
	discharge at 0.2C for 3 cycles; the third cycle gives the recovered capacity.	
25°C 常温循环寿命 Cycle life at 25°C	电池组在标准测试条件下先以 0.2C 电流进行充满电后, 以 0.2C 电流进行放电, 25°C±5°C 环境温度持续充放电测试, 当放电容量≤初始容量的 80%时终止循环寿命测试。 After fully charging the battery pack at 0.2C under standard test conditions, discharge it at 0.2C and continue charge/discharge cycling at 25°C±5°C. The cycle-life test ends when the discharge capacity falls to ≤80% of the initial capacity.	≥8000 次 ≥8000 cycles
55°C 高温循环寿命 Cycle life at 55°C	电池组在标准测试条件下先以 0.2C 电流进行充满电后, 以 0.2C 电流进行放电, 60°C±5°C 环境温度持续充放电测试, 当放电容量≤初始容量的 80%时终止循环寿命测试。 After fully charging the battery pack at 0.2C under standard test conditions, discharge it at 0.2C and continue charge/discharge cycling at 60°C±5°C. The cycle-life test ends when the discharge capacity falls to ≤80% of the initial capacity.	≥4000 次 ≥4000 cycles

5.2 安全性能测试 / Safety Performance Tests

测试项目 Test Item	测试标准 Test Standard	技术要求 Technical Requirement
外部短路测试 External short-circuit test	电池组在标准测试条件下进行充电, 将充满电的电池组放置在防爆箱中, 用内阻小于 100mΩ 的导线短路于电池组外部的正负极, 试验过程中记录电池表面温度, 短路持续时间 10min, 即完成测试。 Charge the battery pack under standard test conditions. Place the fully charged battery pack in an explosion-proof chamber and short-circuit the external positive and negative terminals with a wire of less than 100mΩ internal resistance. Record the battery surface temperature during the test; the test is complete after 10min of short-circuiting.	不起火、不爆炸 No fire, no explosion
过充电测试 Overcharge test	电池组在标准测试条件下进行充电后, 用恒流恒压源对电池组某一单节进行 0.2C 充电, 恒流充电至 5V 后转为恒压充电, 直到截止电流到 0A, 结束试验。 After charging the battery pack under standard test conditions, charge one single	不起火、不爆炸 No fire, no explosion

测试项目 Test Item	测试标准 Test Standard	技术要求 Technical Requirement
	cell of the pack at 0.2C with a constant-current/constant-voltage source. Switch to constant-voltage charging after the constant current reaches 5V, and end the test when the cut-off current reaches 0A.	
过放电测试 Over-discharge test	电池组在标准测试条件下进行充电后，用负载设备对电池组进行 0.5C 持续放电，直到某一单节电池电压到达 0~0.5V 时，结束试验。 After charging the battery pack under standard test conditions, discharge it continuously at 0.5C with load equipment until the voltage of any single cell reaches 0~0.5V, then end the test.	不起火、不爆炸 No fire, no explosion

六、产品包装要求 / Product Packaging Requirements

6.1 电池箱外观良好，不能有掉漆、划伤、变形、破损等不良现象。

6.1 The battery box appearance shall be good, with no paint loss, scratches, deformation, damage or other defects.

6.2 包装前，电池要处于关机休眠状态。

6.2 Before packaging, the battery shall be switched off and in sleep mode.

6.3 电池外观要检验合格后，才能进行装箱。

6.3 The battery may only be packed after its appearance has passed inspection.

6.4 外包装采用木箱包装，木箱上信息要清晰，木箱四周打钉处理，增加木箱强度和硬度，保证运输中安全。

6.4 The outer packaging is a wooden crate. The information on the crate shall be legible, and the crate shall be nailed around its edges to increase its strength and rigidity and ensure safety during transport.

6.5 木箱内部要增加防护包材，以确保电池箱在运输中不被划伤。

6.5 Protective packing material shall be added inside the wooden crate to ensure the battery box is not scratched during transport.

6.6 木箱内部附有装箱清单。

6.6 A packing list shall be enclosed inside the wooden crate.

七、产品贮存与运输 / Product Storage and Transportation

7.1 产品贮存 / Product Storage

产品长期存放不使用时，应贮存在 10°C ~ 35°C 干燥、清洁及通风良好的仓库内，避开易燃易爆物品；每三个月定期对电池组进行充点电维护，确保电池处于最佳性能状态。

When the product is stored unused for a long period, it shall be kept in a dry, clean and well-ventilated warehouse at 10°C ~ 35°C, away from flammable and explosive materials. Perform charge maintenance on the battery pack every three months to keep it in optimum condition.

7.2 产品运输 / Product Transportation

电池组应经过外部包装后才能运输，在运输过程中应防止剧烈震荡、冲击或挤压，防止日晒雨淋。

The battery pack may only be transported after external packaging. During transport, protect it from severe vibration, impact or squeezing, and from direct sunlight and rain.

八、电池使用时警告及注意事项 / Warnings and Precautions for Battery Use

为防止电池可能发生泄漏、发热、爆炸，请注意以下预防措施

To prevent possible leakage, heating or explosion of the battery, please observe the following precautions.

警告!

WARNING!

- ① 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
- ① Never immerse the battery in seawater or water. When not in use, store it in a cool, dry environment.
- ② 严禁颠倒正负极使用电池;
- ② Never use the battery with the positive and negative terminals reversed.
- ③ 禁止用金属直接连接电池正负极短路;
- ③ Do not short-circuit the battery terminals by connecting them directly with metal.
- ④ 禁止将电池与金属,如发夹、项链等一起运输或贮存;
- ④ Do not transport or store the battery together with metal objects such as hairpins or necklaces.
- ⑤ 禁止敲击或抛掷、踩踏电池等;
- ⑤ Do not strike, throw or step on the battery.
- ⑥ 禁止直接焊接电池和用钉子或其它利器刺穿电池;
- ⑥ Do not weld the battery directly or pierce it with nails or other sharp objects.

注意!

CAUTION!

- ① 禁止在高温下（炙热的阳光下或很热的汽车中）使用或放置电池，否则可能会引起电池过热、起火或功能失效、寿命减短；电池长期储存建议最佳温度为 10-45℃。
- ① Do not use or leave the battery at high temperature (under blazing sun or in a hot car); otherwise it may overheat, catch fire, fail to function or have its life shortened. The recommended optimum temperature for long-term storage is 10-45℃.
- ② 禁止将电池丢于火或加热器中以防起火、爆炸及污染环境；报废电池应退回供应商或电池回收点处理。

② Do not throw the battery into fire or a heater, to prevent fire, explosion and environmental pollution. Scrapped batteries shall be returned to the supplier or a battery recycling point.

③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。

③ Do not use the battery in places with strong static electricity or strong magnetic fields; otherwise the battery safety protection device may be damaged, creating a safety hazard.

④若电池发生泄露，电解液进入眼睛，千万不可揉擦，应立即用清水冲洗眼睛，并立即送医院治疗，否则会伤害眼睛。如果电池发出异味，发热、变色、变形或使用、贮存、充电过程中出现任何异常，应立即将电池从装置或充电器中移离并停用。

④ If the battery leaks and electrolyte gets into the eyes, never rub them. Immediately rinse the eyes with clean water and seek medical treatment at once, otherwise the eyes may be injured. If the battery emits an odour, heats up, changes colour or deforms, or if any abnormality occurs during use, storage or charging, immediately remove the battery from the device or charger and stop using it.

⑤禁止将电池正负极直接插入电源插座中，必须选用锂离子电池专用充电器。

⑤ Do not insert the positive and negative terminals of the battery directly into a power socket. A dedicated lithium-ion battery charger must be used.

⑥安装前需检查电池电压和连接件，一切正常后方可使用。

⑥ Before installation, check the battery voltage and connectors; the battery may only be used once everything is normal.

⑦电池半电存贮，若电池三个月没有用过，需进行补充电一次。

⑦ Store the battery at half charge. If the battery has not been used for three months, recharge it once.

⑧若电极弄脏，使用前应用干布抹净，否则可能会导致接触不良、功能失效。

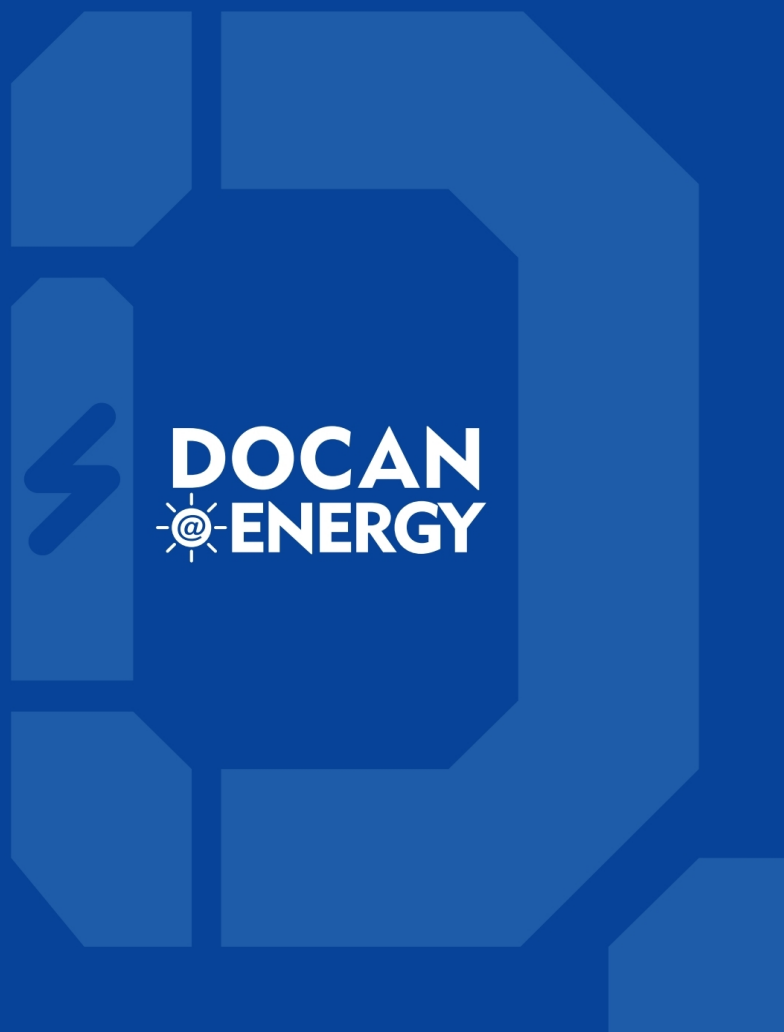
⑧ If the terminals become dirty, wipe them clean with a dry cloth before use; otherwise poor contact or malfunction may result.

九、APP 安装 / APP Installation

扫描下方二维码安装手机 APP，可通过蓝牙查看电池状态。

Scan the QR code below to install the mobile APP; the battery status can be viewed via Bluetooth.





CONTACT US

info@docanpower.com