

# Battery System Specification 电池系统规格书

## XBmax5.1L-12B Battery System XBmax5.1L-12B 电池系统

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## XBmax5.1L-12B Battery System

Type/类型	Parameter/参数
Product Name/产品名称	Battery System/电池系统
Product Model/产品型号	XBmax5.1L-12B
Product Specification/产品规格	100Ah4S4P
Prepared by/拟制	JJ. Zhang
Examined by/审核	GA. Huang/YB. Tian
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## Revision Records/修订记录

Revision 版本	Date 日期	Reasons for Revision 修订原因	Revised by 修订人	Released by 发布
A	2023.12.1	The first official release	JJ. Zhang	-
B	2024.1.25	Change logo	JJ. Zhang	-

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## Preface/前言

The document covers the specifications of the battery system of XBmax5.1L-12B manufactured by RoyPow TECHNOLOGY CO.,LTD .

本文件描述了由惠州市乐亿通科技股份有限公司生产的 XBmax5.1L-12B 电池系统的规格。

## 1. Product Overview/产品概况

XBmax5.1L-12B includes the battery core and the controller of battery modules, furnishing power output of low-voltage system for electric vehicles

XBmax5.1L-12B 电池系统，包括电池电芯和电池模块控制器，将给电力车辆提供低压系统动力输出。

### 1.1. Product Information/产品信息

System 系统	Version 版本	Remarks 备注
Battery system 电池系统	B	XBmax5.1L-12B
Battery cell 电芯	-	100Ah
Battery management system 电池管理系统	-	-

## 1.2. Product Functions/产品功能

- The battery system is provided with the function of power output providing.  
电池系统能提供动力输出
- The battery system is provided with the function of monomer voltage detection.  
电池系统具备单体电压检测功能
- The battery system is provided with the function of total voltage detection.  
电池系统具备总电压检测功能
- The battery system is provided with the function of temperature detection.  
电池系统具备温度检测功能
- The battery system is provided with the function of current detection.  
电池系统具备电流检测功能
- The battery system is provided with the function of charging overcurrent protection.  
电池系统提供过流充电保护功能

### 1.3. Information on Battery System / 电池系统信息

#### Description of battery system/ 电池系统信息描述

Item 项目	Unit 单位	Specifications 规格	Remarks 备注
Rated capacity 额定容量	Ah	400Ah	@ 0.5C, 25°C
Configuration 配置	-	4S4P	
Operating temperature 操作温度	Charging working temperature 充电工作温度	°C	0~55
	Discharge working temperature 放电工作温度	°C	-20~55
Storage temperature 存储温度	Short-term (within 1 month) 短期 (1 个月内)	°C	-20~45
	Long-term (within one year) 长期 (一年内)	°C	0~35
Rated voltage 额定电压	V	12.8	Cell 3.2V
Maximum voltage 最大电压	V	14	Cell 3.65V
Minimum voltage 最小电压	V	10	Cell 2.5V
Standard capacity 常规容量	kWh	≥5.12	@ 0.5C, 25°C
Weight 重量	Kg	45±2	
Maximum discharge current 放电最大电流 (@5S, 25°C, SOC50%, BOL)	A	300(30S)	

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Maximum charging current 充电最大电流 (@5S, 25°C, SOC 50% BOL)	A	276(5S)	
Continuous discharge current 连续放电电流 (@25°C, SOC50%, BOL)	A	220	
Continuous charging current 连续充电电流 (@25°C, SOC 50% BOL)	A	100	
SOC status of battery system before shipment Standard Charge (@ 25°C ) 标准充电		Constant Current: ≤0.5C Constant Voltage:3.60V End Condition(Cut off): ≥0.02C	
出货前电池系统 SOC 状态	-	SOC 30%±3%	
Self-discharge rate 自放电率 (@SOC 100%, 25°C , Loss/Month, @BOL)	%	Max 3	
Safe reliability 安全可靠	-	GBT Certificate	cell
Insulativity 绝缘	MΩ	Min 20MΩ/1000VDC	@25°C±5°C, RH50%
Cooling mode 冷却方式	-	Natural(Passive) Convection	
Heating function 加热功能	-	Temperature rises by 15 degrees in 1 hour. 1h 温升 15 度	充电模式加热 Heating by charging mode
	-	On: Minimum temperature ≤0degrees 开启: 最低温度≤0 度	
	-	Off: Minimum temperature ≥2 degrees 关闭: 最低温度≥2 度	
Working range of SOC SOC 工作范围	%	0~ 100%	



Ingress protection IP 防护等级	-	IP65	
Attended mode 连接方式	-	Supports a maximum of four batteries in parallel 最多支持 4 个电池并联	
Cycle life 循环寿命		>3500	@25°C, 0.5C charge, 1C discharge, DOD 70%(SOC0~100%)
Remaining capacity at the end of life 寿命终止剩余容量		EOL 70%	

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## 1.4. Technical Terms / 技术术语

BOL: 寿命开始

SOC: 荷电状态

EOL: 寿命终止

DOD: 放电深度

RH: 相对湿度

RT: 室温

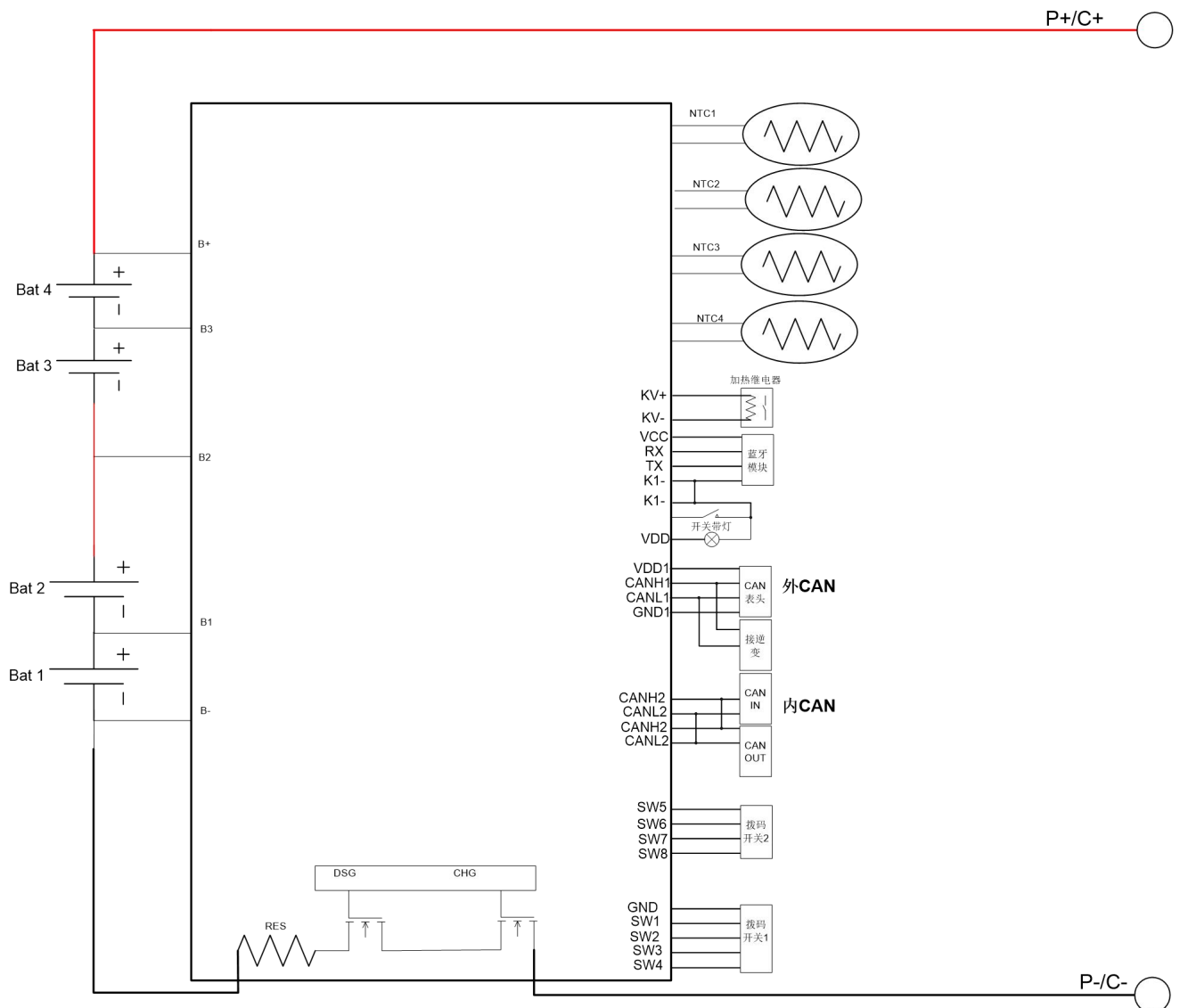


Figure 1. Schematic Diagram of Battery System

图 1. 电池系统原理图

## 2. Assembly/装配

### 2.1. Mechanical Architecture/机械架构

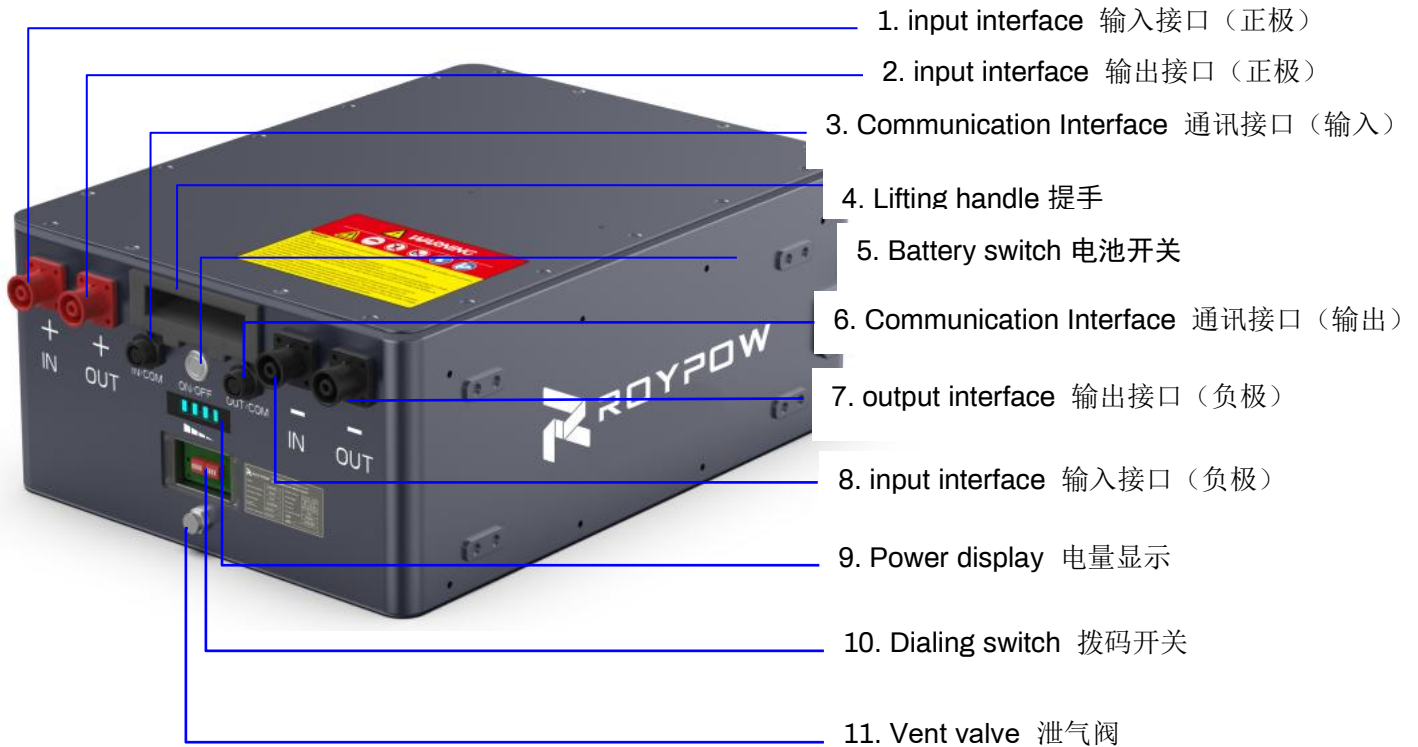


Figure 2. Schematic diagram of battery system

图 2. 电池系统示意图

No. 序号	Part Name 零件名称	Description 描述	Quantity 数量
1	input interface 输入接口(正极)	-	1
2	input interface 输出接口(正极)	-	1
3	Communication Interface 通讯接(输入)	-	1
4	Lifting handle 提手	-	2
5	Battery switch 电池开关	-	1
6	Communication Interface 通讯接(输出)	-	1
7	output interface 输出接门(负极)	-	1
8	input interface 输入接口 (负极)	-	1
9	Power display 电量显示	-	1
10	Dialing switch 拨码开关	-	1
11	Vent valve 泄气阀	-	1

## 2.2. Mechanical Interface/机械界面

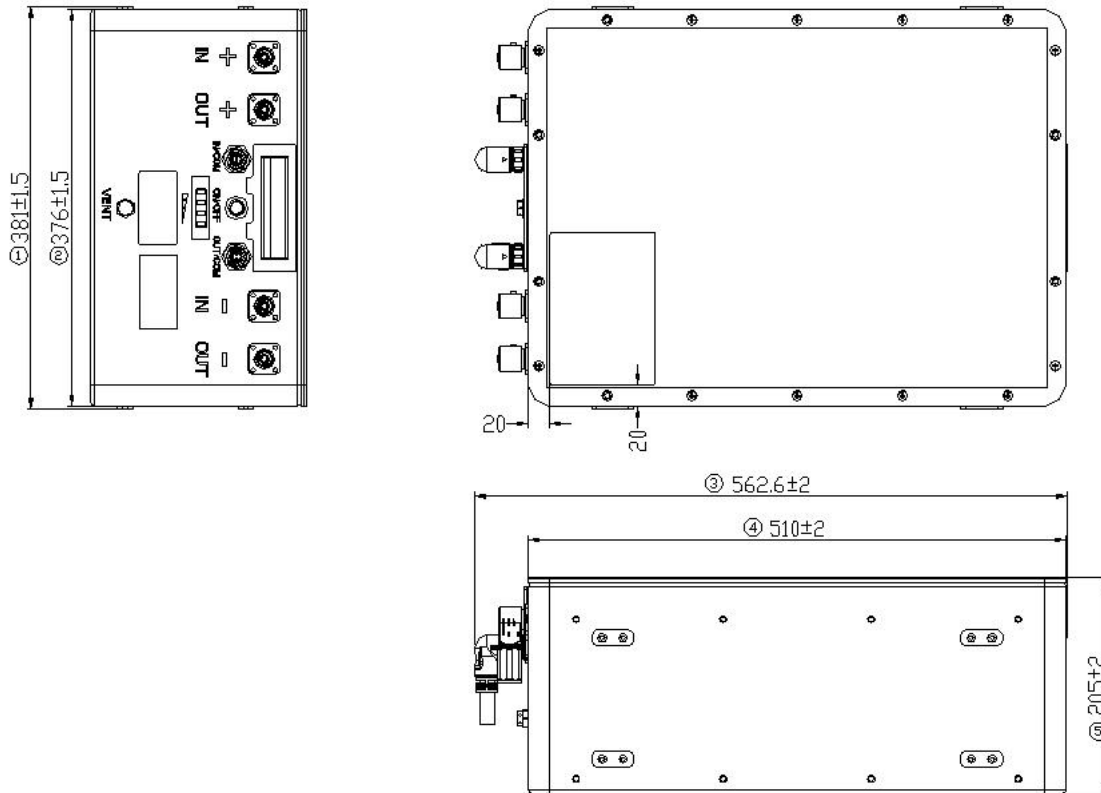


Figure 3. System Tolerance

图 3. 系统公差

### Basic Dimensions/基本尺寸表

Name 名称	Size 尺寸
Size of battery system 电池系统尺寸(mm)	562.6(L) x 381(W) x205(H)

## 2.3. BMS/保护板

### Parameters BMS 参数

NO. 序号	Item 项目	Standard 标准
1	Self-discharge Current (Active mode) 自耗电	$\leq 40\text{mA}$
	Self-discharge Current (Error mode) 自耗电	-
	Self-discharge Current (Shutdown mode) 自耗电	$\leq 400\mu\text{A}$
	Max Charge/Discharge Current 最大充电/放电电流	276 A/ 300A
	System Inrush Current 系统浪涌电流	300A/2S
2	Over Charge Protection Voltage 过充保护电压	$3.65 \pm 0.03 \text{ V}$
	Over Charge Release Voltage 过充恢复电压	$3.34 \pm 0.03\text{V}$
3	Over Discharge Protection Voltage 过放保护电压	$2.7 \pm 0.05\text{V}$
	Over Discharge Release Voltage 过放恢复电压	$3.0 \pm 0.03\text{V}$
4	Charge Over Current Protection Current 充电过流保护电流	$276\text{A} \pm 10\text{A}$
	Charge Over Current Protection Delay 充电过流保护延时	5S
	Charge Over Current Protection Release 充电过流解除	Restart

5	Discharge Over Current Protection1 放电过流保护 1	Discharge Over Current Protection Current 放电过流保护电流	300 ± 30 A
		Discharge Over Current Protection Delay 放电过流保护延时	30S
		Over Current Release 过流保护解除	After 5min release
6	Discharge Over Current Protection2 放电过流保护 2	Discharge Over Current Protection Current 放电过流保护电流	576A ± 50A
		Discharge Over Current Protection Delay 放电过流保护延时	1S
		Over Current Release 过流保护解除	Restart
7	Short Circuit Protection 短路保护	Short Circuit Protection Current 短路保护电流	> 1400A
		Release Condition 恢复条件	Replace fuse
8	Charge Over Temperature Protection 充电温度保护	Charge High Temperature Protection 充电高温保护	55°C
		Charge High Temperature Release 充电高温恢复	50
		Charge Low Temperature Protection 充电低温保护	0°C
		Charge Low Temperature Release 充电低温恢复	5°C(By heating)
9	Discharge Over Temperature Protection	Discharge High Temperature Protection 放电高温保护	60°C
		Discharge High Temperature Release 放电高温恢复	55
		Discharge Low Temperature Protection 放电低温保护	-20°C

	放电温度保护	Discharge Low Temperature Release 放电低温恢复	-10
10	Heater working condition 加热膜工作条件	Heater ON when cell temperature in charging 充电模式下加热膜开启时电芯温度	0°C
		Heater OFF when cell temperature in charging 充电模式下加热膜关闭时电芯温度	15°C
		Heater OFF when cell temperature in charging 放电模式下加热膜关闭时电芯温度	-°C
11	Communication Mode/通讯模式	CANBUS 250Kbs CAN 总线 250Kbs	-
12	In Parallel Function/并行功能	Support/支持	-



### 3. Requirements for Packaging/包装要求

#### 3.1. Schematic Diagram of Packaging/包装示意图



Figure 7. Skematic Daigram of Pakaging

图 7. 包装示意图

#### 3.2 Packing List/装箱清单

NO.	Part Name 产品名称	Part Number 产品编码	Product Specification 产品规格	Package Quantity 包装数量
1	Battery system 电池系统	XBmax5.1L-12B	100Ah 4S4P	1pcs

## 4. Precautions and Prohibitions in the Use of Lithium-ion Battery Module/锂离子电池模组的使用注意事项和禁忌

Before making use of battery modules, please be sure to read the user manual and precautions for dealing with battery modules.

在使用电池模块之前，请务必阅读电池模块处理用户手册和注意事项。

Improper operation of lithium-ion batteries may result in leakage, heating, smoking, explosion or fire. This may cause performance degradation or failure. Please be sure to operate the batteries in strict compliance with the instructions carefully.

锂离子电池操作不当可能导致泄漏、发热、冒烟、爆炸或火灾。这可能会导致性能恶化或失败。请务必认真按照说明操作。

### 4.1. Storage/存储

Time/时间	Temperature/温度
Short term (within 1 month) 短期 (1 个月内)	-20~45°C
Long term (within one year) 长期 (一年内)	0~35°C

Store battery modules at room temperature.在室温条件下储存电池模块

Customers are required to finish incoming inspection within one month upon the arrival of goods.

客户需要在到货后 1 个月内完成来料检

## 4.2. Safety Precautions and Prohibitions/安全注意事项及禁止事项

With an attempt to guarantee product safety, please list the following precautions in the instruction manual.

为确保产品安全，请在使用说明书中列出以下注意事项。

## 4.3. Electricity Abuse/电滥用

- Please make use of a dedicated charger.  
使用专用充电器
- Batteries can only be used or charged on special occasions.  
电池只能在专用场合使用或充电
- Reverse charging is strictly prohibited.  
禁止反向充电
- The charging current must be controlled at the value prescribed in the specifications of batteries.  
充电电流必须控制在电池规格中规定的值
- The cut-off voltage for charging is 14.6V(3.65Vx4)  
充电截止电压为 14.6V (3.65V x 4)
- The charger must have the specifications to stop charging batteries by detecting the specified cut-off current.  
充电器必须通过检测指定的截止电流来停止充电电池规格
- The discharge current must be controlled within the specification value prescribed by the product.  
放电电流必须控制在产品规定的规格值内
- The discharge cut-off voltage must be over 10V(2.5Vx4)  
放电截止电压必须超过 10V (2.5V x 4)

#### 4.4. Environmental Abuse /环境滥用

- Never put batteries near fire or heat sources.  
不要把电池放在火源或热源附近
- Never throw the batteries into the fire.  
不要把电池扔进火里
- Never soak the batteries in water or seawater.  
不要将电池浸泡在水中或海水中

#### 4.5. Others/其他

- Never store metal objects such as keys or screwdrivers near batteries.  
不要将钥匙或螺丝刀等金属物品存放在电池附近
- Never intentionally short-circuit (+) and (-) terminals with metal objects.  
不要故意用金属物品短路(+)和(-)端子
- Never pierce the batteries with sharp objects such as needles or screwdrivers.  
不要用尖锐的东西如针或螺丝刀刺穿电池
- Never heat a part of the batteries with heating objects such as an electric soldering iron.  
不要用电烙铁等加热物体加热电池的一部分
- Never hit the batteries with heavy objects such as hammers or heavy objects.  
不要用重物如锤子或重物撞击电池
- Never step on the batteries or drop the batteries on the hard ground.  
请勿踩到电池上，将电池摔落在坚硬的地面上
- Never disassemble the batteries or modify the design of the batteries, including the circuits.  
不要拆卸电池或修改电池的设计，包括电路
- Never directly weld anything on the batteries.  
不要直接焊接电池上的任何东西
- Never make use of badly scarred or deformed batteries.  
不要使用严重疤痕或变形电池

- Never put batteries in microwave ovens, dryers or high-pressure containers.  
不要将电池放入微波炉、烘干机或高压容器中
- Never disassemble the batteries yourself.  
请勿自行拆卸电池。
- Never put the batteries in the water.  
不要放入水中。
- Never expose the batteries to splashing water.  
不要暴露在溅水的环境中。
- Never expose the batteries to humid environment.  
不要暴露在潮湿的环境中。
- Never use the batteries after a fall accident.  
坠落事故后请勿使用
- Please be sure to read the operating instructions of the charger before making use of the charger.  
使用充电器前，请务必阅读充电器的使用说明书。
- Please be sure to read the user manual of the application before installing and removing batteries from the application.  
在从应用程序中安装和移除电池之前，请务必阅读应用程序的用户手册
- Batteries or modules required to be stored for a long time should be removed from the application and stored in a suitable place at room temperature.  
电池或模块需要长时间存储，则应将电池或模块从应用程序中移除，并在室温条件下存储在适当的位置。
- When charging, using and storing batteries, please keep the batteries away from static objects and materials.  
电池充电、使用、储存时，应远离带静电的物体材料

## 4.6. Warning/警告

- In the event that the charging is not finished within the prescribed time, please stop charging.  
如未在规定时间内完成充电，请停止充电。
- If the batteries are abnormally heated, smelly, discolored, deformed or otherwise abnormal in the course of use, charging, discharging or storage, please stop making use of the modules.  
如果电池在使用、充电、放电或储存过程中出现异常发热、异味、变色、变形或其他异常情况，请停止使用模块。
- When leakage or odor is found, please stay away from fire or heat at once. In the event that liquid leaks to skin or clothes, rinse it off at once with plenty of clean water.  
当发现有泄漏或异味时，应立即远离火源或热源。如果液体泄漏到皮肤或衣服上，立即用大量的清水冲洗干净。
- Never rub your eyes in the event that liquid leaks out of the batteries and enters your eyes.  
如果液体从电池漏出进入眼睛，不要揉眼睛。
- Please immediately wash your eyes with plenty of water and seek medical treatment.  
用立即大量的清水清洗眼睛，并寻求医疗救助。
- In the case that the terminals of the batteries get dirty, please wipe them with a dry cloth before making use of the battery modules.  
如果电池的端子脏了，在使用电池模块之前用干布擦干净。
- The batteries can be used within the following temperature range, not beyond the temperature range of -20~55°C.  
电池可在以下温度范围内使用，不要超过温度范围: -20 ~ 55°C。
- Before disposing of the terminals, please cover the terminals of batteries with appropriate insulating tape.  
在处置端子之前，用适当的绝缘胶带覆盖端子。

# THANKS!

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