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TECHNICAL SPECIFICATION
技术规格书

LITHIUM-MANGANESE BUTTON BATTERY
锂-锰扣式电池

MODEL/型号：CR2016

Typed/制作	Dong Shi Jie
Approved/审批	Yu Shao Xing
Date/日期	2025/3/7

Customer approval 客户确认	Signature/签字	Date/日期
	Company name/公司名称	
	Company stamp/公司印章	

Amendment Records/修正记录

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A0	First Publish/首版	Dong Shi Jie	Yu Shao Xing	2025/3/7

The Manufacturer reserves the right to modify product specification and data stated herein without prior notice
生产商对本产品的技术规格如有更改，不另行通知

1.Scope/范围

This specification applies to lithium manganese dioxide button battery made by Zhuhai Top Battery Co.,Ltd.

本规格书的各种技术参数适用于珠海市冠力电池有限公司生产的锂锰扣式电池。

2.Model/型号：CR2016

Reference Document/参考标准：IEC60086-1-2021，IEC60086-2-2021
GB/8897-1-2021, GB/8897-2-2021

3.Battery specification and parameter table/电池规格参数表

项目 Project	单位 Unit	技术指标 Qualification	检测条件 Test conditions
外形尺寸 Outline dimension	mm	直径/Diameter： 20.00(-0.30) 高度/Height： 1.60(-0.20)	用精度不小于0.02 mm的游标卡尺测试 Test with a vernier caliper with an accuracy not less than 0.02 mm
公称电压 Nominal voltage	V	3.0	/
开路电压 Open circuit voltage	V	≥3.15V	无负载 non-loaded
负载电压 Load voltage	V	≥3.10V	15KΩ电阻 15KΩload
公称容量 nominal capacity	mAh	80	在20±2℃条件下30KΩ负载连续放电，截至2.0V 30KΩ load to discharge continuously at 20 ± 2℃, up to 2.0V
标准放电电流 Standard discharge current	mA	0.1	30KΩ电阻 30KΩload
最大持续放电电流 Maximum continuous discharge current	mA	2.0	/
最大脉冲放电电流 Maximum continuous discharge current	mA	15	/

储存温度 Storage temperature	℃	20±5	环境湿度 /Ambient humidity 55%±20%RH
工作温度 Working temperature	℃	-30~70	环境湿度 /Ambient humidity 55%±20%RH
标准重量 Standard weights	g	≈1.6	裸电池 Naked battery
自放电率 Self-discharge rate	年 Year	≤2%	温度20±5℃,相对湿度55%±20%RH的条件下储存 Store at temperature 20 ± 5℃, relative humidity 55% ± 20% RH
Pour/注： 1.电池外观应无变形、无凹痕、无污点、无漏液、密封部件无拱形或毛边，电池接线端应无覆盖物或异物，以免影响实际使用或电池性能。 The appearance of the battery shall have no deformation, dent, stains, leakage, sealing parts without arch or margin, and the battery terminal shall have no cover or foreign body, so as not to affect the actual use or battery performance.			

4.Discharge performance/放电性能

	Minimum average duration 最小平均持续时间（h）	Conditions/条件
New battery/新电池 Tested within 30days after delivery在交付后30天内进行测试	760	Continuous discharge at 20±2℃,55±20%RH under load 30KΩ for 24 hrs/day to EPV 2.0V 在20±2℃, 55±20%RH负载电阻30KΩ下连续放电，终止电压2.0V
At 20±2℃ for 12 months 在20±2℃下存放12 个月	745	
At 45±2℃ for 3 months 在45±2℃下存放3 个月	745	

Acceptance Standard 验收标准

(1)Test eight batteries.

抽取8只电池放电。

(2)Calculate the average without the exclusion of any result.

计算8只电池的平均放电时间。

(3)If this average is equal to or greater than the specified figure and no more than one battery has a service output of less than 80% of the specified figure, the battery are considered to conform to service output.

如果平均值等于或大于规定值，且不超过一个电池的服务输出小于指定数字的80%则判放电时间合格。

(4)One re-test is allowed to confirm the previous result.

如以上结果不合格，可做一次重测。

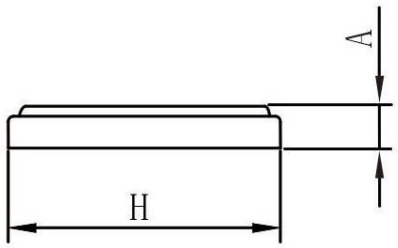
5.Test instruments and methods/检测仪器与方法

项目 Project	仪器 Instrument	测试方法 Test method	要求 Require
电压 Voltage	电压表 Voltmeter	采用电压表，使用区间为 0V 到20V，电压表的精确度为± 1mV，或者用更精确的输入阻抗超过10MΩ的万用表测试。 Use a voltmeter with a range of 0V to 20V, voltmeter accuracy ± 1 mV, or a more accurate multimeter with input impedance over 10 MΩ.	在规定值范围 In the specified value range
电阻 Resistance	内阻测试仪 Internal resistance tester	采用内阻测试仪测试，公差不超过 0.5%，交流信号源 1KHz。 Using the internal resistance tester, the tolerance shall not exceed 0.5%, and the AC signal source is 1 KHz.	在规定值范围 In the specified value range
尺寸 Size	游标卡尺 Vernier calipers	测量应采用卡尺（其量程为 0 到 150 mm、不小于0.02 mm）， 或更加精确的量具。 The measurement shall be with calipers (0 to 150 mm, not less than 0.02 mm) or a more accurate measuring tool.	在规定值范围 In the specified value range
外观 Appearance	目视 Visual	采用目视检查。 A visual inspection was performed.	无划痕 No scratches
漏液检测 Fluid leakage detection	目视 Visual	查耐漏性能需在无遮盖的情况下，距 40 瓦日光灯 1 米，置与离眼睛 30 厘米处观察电池，要求表面光洁、无污浊。 The leakage resistance performance should be in the case of no cover, from the 40 watt fluorescent lamp 1 meter, placed and 30 cm from the eye to observe the battery, the surface is clean, no dirt.	无漏液 No leakage

6.Compliance & Environmental information/环保法规信息

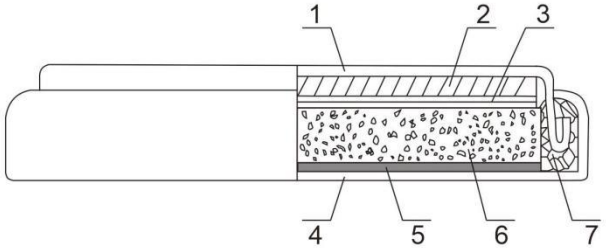
This product complies with EU Battery Directive (EU)2023/1542, RoHS Directive
本产品符合欧盟电池指令(EU)2023/1542 和RoHS 指令。

7.Battery dimensions 电池尺寸



H= 19.7~20.0mm　　A=1.4~1.6mm

8.Cut away diagram of the battery/电池剖面图



1、负极壳　　2、负极锂片　　3、隔膜　　4、正极壳
5、正极集流网　　6、正极片　　7、密封胶

1、Cathode Shell　　2、Cathode(slice of lithium)　　3、Gaket
4、Anode Shell　　5、Anode collector net　　6、Anode（Mno2）
7、Anode collector net

9.Battery Terminal Material/电池端子材质

(1)Positive and extreme materials/正极端材料：　　SUS430
(2)Negative extreme materials/负极端材料：　　SUS430

10.Chemical system/化学构成：

Lithium-manganese dioxide/锂-二氧化锰

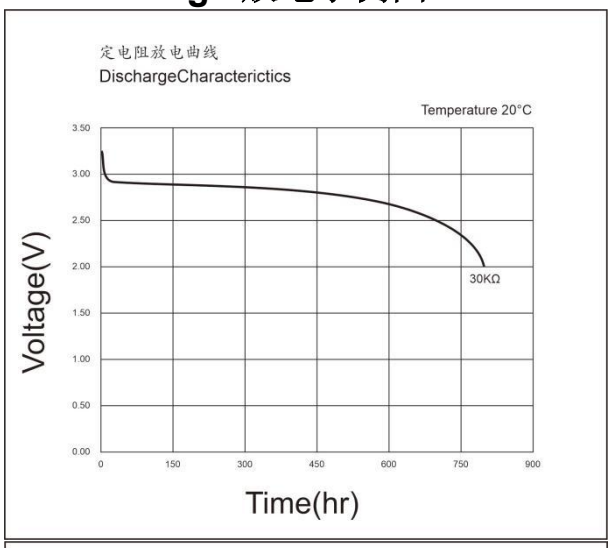
11.Marking on battery/标记

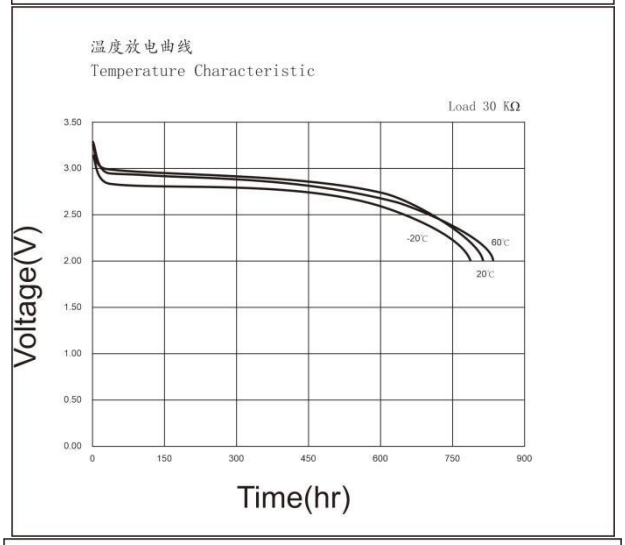
(1)Model/型号 CR2016
(2)Voltage/电压 3V
(3)Polarity marking/正极标记 “+”
(4)Brand of manufacturer/商标: GREAT POWER or EUNICE or No brand
(5)Manufacturing marks /制造标识: If required，the year and month of production shall be marked on the negative (-) terminal side
（如有要求，生产年月可在负极面(-)标识）

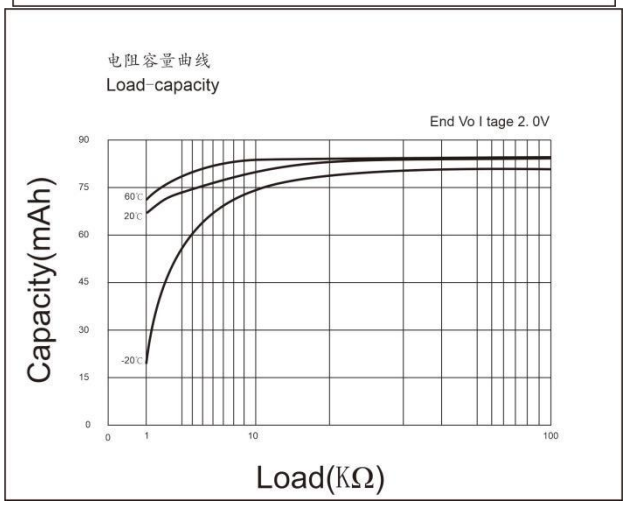


Month of production (1-9 means January-September, respectively. X,Y,Z means Oct, Nov, Dec)
月份（1~9 分别表示 1~9 月， X,Y,Z 分别表示 10,11,12 月份）
Year of production (The last number of Christian era)，For example 5 means 2025
年份的最后一位数（例如： 5 表示 2025 年）

12.Example diagram of discharge/放电示例图







13.Safety performance test/安全性能测试

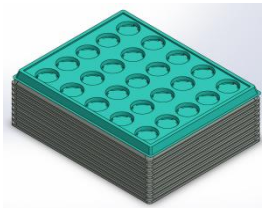
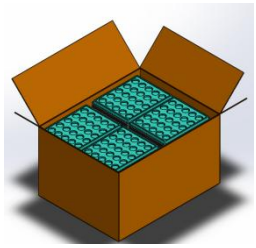
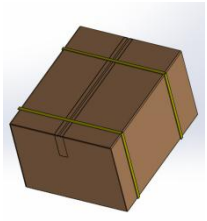
电池通过了第三方的UN38.3测试，测试项目如下：

The battery passed the third party UN38.3 test with the following test items:

序号 Number	项目 Project	测试方法 Test method	要求 Require
1	高空模拟 Altitude simulation	测试电池在压力为 11.6KPa或更低，温度为20℃ ±2℃的环境下至少放置6h。 The test battery was placed for at least 6h at a pressure of 11.6KPa, or lower and a temperature of 20℃ ± 2℃.	无质量损失、不 泄露、不泄放、不短路、不破裂、 不爆炸，不着火 No quality loss, no leakage,no leakage, No short circuit, no rupture,no explosion, no fire
2	热冲击 Thermal shock	被检测电池在温度为 72±2℃的环境下至少放置 6h,然后在-40±2℃的环境下至少放置6h，不同温度的转换时间应不超过30min,每个电池进行 10 个循环后，在环境温度下至少放置24h，检测电池前后重量损失及漏液安全情况。 The detected battery should be placed at the ambient temperature with a temperature of 72 ± 2℃ for at least 6h, and then at-40 ± 2℃ for at least 6h. The conversion time for different temperatures shall not exceed 30min. After 10 cycles of each battery, it should be placed for at least 24h at the ambient temperature, and detect the weight loss and the safety of liquid leakage.	同上 The same as above
3	振动 Vibrate	以能实传递振动但不致电池变形的方式将被检电池牢牢的固定在振动设备的振动平台上，对被检电池进行正弦波振动。在三个相互垂直固定的方位上每个方位各进行 12 次循环，每个方位循环 时间共计 3h。其中的一个方位应垂直于电池的极端面用做过热冲击检验的电池做该项检验。 Will be detected in a way that can truthfully transmit the vibration but does not deform the battery, and the battery is firmly fixed on the vibration platform of the vibration equipment, on the quilt Check the battery for sine wave vibration. Twelve cycles were performed for each orientation for a total of 3h. One of the directions should be perpendicular to the extreme face of the battery. Use the battery for overheating impact inspection for this inspection.	同上 The same as above
4	冲击 shock	用能支撑被检电池所有固定面的刚性支座将被测电池固定在检测设备上。每只被检电池在三个相互垂直固定的方位上每个方位各经受3次冲击， 共计 18次。 The rigid support supporting all the fixed surfaces of the inspected battery is fixed to the detection equipment. Each inspected battery experienced three shocks in each of the three vertically fixed positions, for a total of 18 shocks.	同上 The same as above

5	外部短路 External short circuit	电池在55±2℃的环境下达到温度平衡后，在相同温度下经受外部电路总阻值小于0.1Ω的短路，短路继续至外壳温度回落至55±2℃后，再持续 1h 以上。电池还需要继续被观察6h后，测试结束。 After the battery reaches temperature balance at 55 ± 2 ℃, it experiences a short circuit with the external circuit total resistance value less than 0.1 Ω at the same temperature, and the short circuit continues until the shell temperature drops to 55 ± 2 ℃, and then lasts for more than 1h. The battery still needs to be observed for 6h before the test is over.	不过热、不破裂、 不爆炸、不着火 No heat, no rupture, no explosion, no fire
6	挤压 Crimp	通过台钳或具有圆形活塞的液压油缸施加压力，使受检的单体电池或电池单元在两个平面之间被挤压，从最初的接触点开始，以约1.5cm/s的速度持续进行挤压，直至挤压力达到大约13kN立即释压。 Apply pressure through a holder or a hydraulic cylinder with a circular piston,The inspected single cell or cell is squeezed between the two planes, starting at the initial contact point, at a rate of about 1.5cm / s until the extrusion pressure reaches about 13 kN.	不过热、不爆炸、 不着火 No discharge, no explosion, no fire
7	强制放电 Forced discharge	在环境温度下，将已放电电池连接在12V 直流电源上，调节电阻，以规定的最大持续放电电流做为初始电流。强制放电结束后，观察受检电池7d。 At the ambient temperature, the discharged battery is connected to a 12V, DC power supply to adjust the resistance to take the specified maximum continuous discharge current as the initial current. After the forced discharge, observe the inspected battery for 7d.	不爆炸、不着火 No explosion, no fire

14.Packing Specifications/包装资料

包装名称 Packaging name		材料 Material	尺寸 Size	数量 Quantity
单体电池 Single Battery		/	Ø19.7~20.0mm Thickness:1.4~1.6mm	1（PCS）
托盘 Tray		塑料 Plastic	134*165*7.5(mm)	5*5=25（PCS）
内包装 Inner package		聚氯乙烯薄膜 PVC Film	135*165*50(mm)	20*25=250（PCS）
纸箱 Carton Box		A=B	34.5*27.5*23(cm)	500*20=10000（PCS）
密封箱 Sealing Box				

备注：包装数量以实际数量为准；包装方式如上，如有调整，以交货为准。

Note: Packaging quantity is subject to the actual quantity; packaging method as above, if any adjustment, delivery shall prevail.

15.Precautions for Mounting （安装注意项）

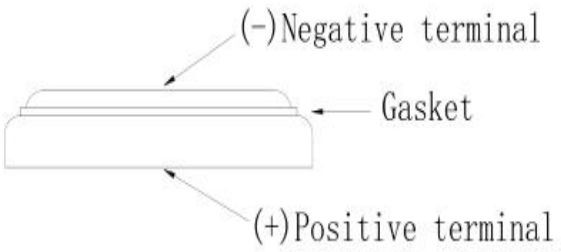
Unlike other electronic components, Lithium Manganese Dioxide Battery(Coin-type) may be externally short-circuited before and after it is installed in circuit boards and without the power being turned on. This causes power drainage. As a result, the battery may lose its capacity before the equipment is even used. As short-circuits tend to occur in the following cases, please take care when handling the battery.

（不同其它电子零件，锂-二氧化锰电池（扣式）在安装到电路板前后可能会外部短路，同时动力未开启。这会造成 动力流失。因此，甚至在设备使用之前电池就可能会损失它的容量。例如短路发生在以下情况下，请谨慎操作电池）

(1).Overlapping Batteries （重叠电池）

Lithium Manganese Dioxide Battery is shaped as shown below. It has exposed positive (+) and negative (-) metallic surfaces with a thin cylindrical seal, called the gasket, inbetween them. When the batteries are overlapped or mixed together in a disorderl way, their positive (+) and negative (-) terminals touch each other, causing short-circuits.

（锂-二氧化锰电池形状如下所示。它敞开的正极与负极间仅仅由一圈很窄的环状（密封圈）相隔离， 当电池杂乱地重叠堆放时，它们的正极 (+)和负极 (-) 端会相互接触而造成短路）





(2).The Batteries Put in a Metallic Container or on a Metallic Plate . （将电池放入金属容器或金属盘里）

Similar to the overlapping battery problem, when the batteries are put in a metallic container or on a metallic plate, their positive (+) and negative (-) terminals may short-circuit through the conductive surface, depending on how the batteries are position.

（与重叠电池问题相似，当电池放到金属容器或金属盘里，它们的正极 (+)和负极(-)端可能会通过导电性的表面和 电池的位置而造成短路）

(3). When The Battery is Held with Metallic Tweezers （当用金属镊子夹电池时）

When held with a pair of metallic tweezers as shown, the battery short-circuits through the tweezers.

（当用一副金属镊子夹电池时，电池通过金属镊子短路）

(4).When The Battery Lead Plates Touch Each Other （当电池引线相互接触时）

When the battery lead plates bend and touch each other or other either terminal, the battery short-circuits.（当电池引线弯曲并相互接触或其它接线端接触时,电池短路）

(5). Solder Bridge（焊桥）

Solder may bridge between circuit board conductors, causing a short-circuit and draining the battery.（焊接可能桥连电路板导体，造成短路，耗尽电池）

(6). Short-circuits through Soldering Irons （通过烙铁短路）

Similar to solder bridging, when the circuit board wiring is short-circuited by a soldering iron for an extended period the battery is drained and consumed. Complete short-circuits through soldering irons within 5 seconds.

（与焊桥相似，当电路板线路被烙铁超时接触时引起短路，电池能量将会流失并耗尽。通过烙铁短路应在 5 秒内结束）

(7). Short-circuits through Piled Circuit Boards （通过堆叠的电路板短路）

When circuit boards with the batteries are piled on top of one another, their conductive traces may touch and form a battery discharge circuit that consumes the battery's power.

（当加载电池的电路板相互堆叠，它们导电性的线路会接触而形成电池放电电路消耗电池能量）

(8).Discharge through Conductive Electrostatic Prevention Mats （通过导电的防静电垫短路）

Conductive mats are widely used to prevent static electricity from destroying semiconductors. If a circuit board with mounted battery is put on a conductive mat, the soldered conductors may touch the mat, providing a discharge path for the battery.

（导电垫广泛用于防止静电破坏半导体。如果安装电池的电路板放在导电垫上，焊接的导体会接触到导电垫，从而 为电池提供了放电电路）

(9). Improper Battery Mounting Polarity （不正确的电池极性安装）

When the battery's positive (+) and negative (-) terminals are reversed with respect to the battery mounting's polarity marks, the battery maybe discharged, depending on the type of electric circuit.

（当电池的正极 (+)和负极 (-)端相对电池极性安装标识而言颠倒安装时，电池可能会因电路的类型而放）

(10). Solder （焊接）

When the battery lead plates are dipped in a molten solder bath, the battery is temporarily short-circuited. Therefore, complete dipping within 5 seconds.

（当电池引线金属片同时浸入软焊料浴中，电池会暂时短路。因此,浸渍应在 5 秒内完成）

16.WARNING(警告)

(1) Never charge the battery. Charging the battery may cause seethe of the battery electrolyte or increase of the battery internal pressure. Leakage, heating, explosion or ignition of the battery may be caused as a result of it.

（切勿对电池充电。对电池充电会导致电池电解液沸腾或增加电池内部压力。正因如此，可能会导致电池漏液，发热，爆炸或着火）

(2) Keep away from infants. If infant happens to swallow the battery, consult a doctor Immediately.

（远离小孩。如果发生小孩吞食，请立即咨询医师）

(3) In case of eye contact with the battery electrolyte, immediately flush eyes thoroughly with water, and consult a doctor.

（万一电池电解液入眼，立即用水彻底地冲涮眼睛并咨询医师）

(4) In case the battery electrolyte happen to come into mouth, gargle well enough and consult a doctor immediately.

（万一电池电解液入口，充分地漱口并立即咨询医师）

(5) Do not heat or disposed in fire or water. Do not modify or disassemble the battery. It may damage the gasket, and may cause ignition, heating, leakage or explosion.

（切勿加热或丢入火、水中处理。切勿改变或分解电池。这样做可能会破坏密封胶圈，从而导致着火，发热，漏液或 爆炸）

(6) Do not short-circuit positive (+) and negative (-) terminals. Keep away from metal or other conductive materials. Jumbling the batteries of direct contact with positive (+) and negative (-) terminals and metal or other conductive materials may cause short.

（切勿让正极(+)、负极(-)端短路。远离金属或其它导电性的材料。把电池与金属或其它 导电性的材料混在一起而使电池正极(+)、负极(-)端直接接触会导致电池短路）

(7) When the battery is stored or disposed, isolate positive (+) and negative (-) terminals of the battery to avoid those terminals touch each other.

（当电池要被保存或处理，隔离电池的正极(+)、负极(-)端以免这些接线端相互接触）

(8) Insert the battery with positive (+) and negative (-) terminals correctly oriented.
（按正确的正极(+)、负极(-)端方向嵌入电池）

17.PRECAUTIONS(防范)

(1)Do not put the battery into microwave over or drying machine.

(不要将电池放入微波炉或烘干机中)

(2)Do not drop, apply excessive damage or deform the battery.

(不要跌落，使用过度损坏或变形的电池)

(3)Do not mix the used battery together with the new battery or different type of batteries.

(不要与新电池或不同型号的电池混合使用)

(4)Do not store the battery in high temperature and high humidity location and where the battery is exposed to sunlight to avoid performance deterioration, swelling or leakage, of the battery.

(不要将电池储存在高温高湿的场所或暴露于阳光下，以防电池性能退化，膨胀或漏液)

18.Battery display and storage（电池陈列与贮存）

(1)The storage area should be clean, cool, dry and ventilated for wind and rain. During normal storage, the temperature should be between + 15℃ and + 25℃, and must not exceed + 30℃. Avoid long periods under extreme humidity (above 95% or below 10%) that is harmful for both the battery and the battery packaging. Therefore, the battery should not be stored in the radiator or beside the boiler, nor should it be placed directly in the sun.

（贮存区应清洁、凉爽、干燥、通风能防风避雨。正常贮存时，温度应在+15℃~+25℃之间，绝不可超过+30℃。应避免长时间处于极端湿度(相对湿度高于 95%或低于 10%)下，因为这样的湿度对于电池和电池包装都有害。因此电池不应贮存在暖气片或锅炉旁，也不应直接置于阳光下。）

(2)Despite the longer storage life at room temperature, batteries are longer when stored at lower temperatures after special precautions. The battery should be sealed in protective packaging (such as sealed bags or other packaging, etc.), while the battery temperature rises to room temperature to avoid condensation on the battery, accelerated temperature rise is harmful.Cold storage batteries restored to room temperature can be used.

（尽管室温下电池的贮存寿命较长,但是在采取特殊预防措施后存放在较低温度下时电池的贮存寿命更长。电池应密封在保护性包装中(如密封包装袋或其他包装等)，在电池温度回升至室温过程中仍应保留包装，以免电池上出现冷凝水，加速回升温度是有害的。冷藏后恢复至室温的电池即可使用。）

(3)The height of the battery can be stacked obviously depends on the strength of the packing box. Generally speaking, the stacking height of the paper packing box shall not exceed 1.5m, and the wooden box shall not exceed 3m.

（电池可堆放的高度显然取决于包装箱的强度，一般规定，纸质包装箱堆放高度不得超过 1.5m，木箱不超过 3m。）

(4)The above recommendations may also apply to storage in long-haul transportation. Therefore, the battery should be placed far away from the ship's engine, and the summer should not be stuck in the unventilated metal shed car (container) for a long time. The produced batteries should be distributed immediately and transferred from the distribution center to the user. In order to implement the inventory in order of inventory (advanced goods first out,), the storage and display areas should be properly arranged and marked on the packaging.

（上述建议也适用于长途运输中的存放。因此，电池应放在远离船舶发动机的地方，夏季不应长期滞留在不通风的金属棚车(集装箱)内。生产出的电池应立即配送，由分配中心周转到用户，为了实行存货按次序周转(先进的货先出)应妥善安排好贮存和陈列区域，并在包装上作好标记。)