



惠州市威源电子有限公司

Ni-MH BATTERY DELIVERY SPECIFICATIONS

镍氢电池规格书

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**1. Scope (适用范围)**

This specification governs the performance of the following WINPOW Nickel-Metal Hydride cylindrical battery.

本规格书适用于威源公司下述型号的可充性圆柱形镍氢电池。

2. WINPOW model (威源型号): AA1800 标准民用型号**3. External Appearance (外观)**

The cell / battery shall be free from cracks, scars, breakage, rust, discoloration, leakage and deformation. 电池/电池组外观无破裂、划痕、变形、生锈、污迹、电解液泄漏等不良现象。

4. Ratings (规定参数)

The data involving the nominal voltage and the approximate weight of the battery pack.

此资料包括电池的标称电压和大约重量。

Description 种类	Unit 单位	Specification 规格	Conditions 条件
Nominal Voltage 标称电压	V	1.20	Unit: cell 单位: 支
Nominal Capacity 标称容量	mAh	1800	Standard charging / discharging 标准充电/放电
Rated Capacity 额定容量	mAh	1750	Standard charging / discharging 标准充电/放电
Standard Charge 标准充电	mA	180 (0.1C)	Ta 环境温度=0~45°C (see note)
	hour	16	
Quick Charge 快速充电	mA	1800(1.0C) With charge termination control 用充电控制或保护	-ΔV=5~8mv/ cell Timer cutoff=120% input capacity Temp. cutoff= 45~50°C, Ta= 0~40°C dT / dt=0.5~1.0°C/ min
	minute	72 approx.(1.0C)	
Trickle Charge 涓流充电	mA	90(0.05C)	Ta 环境温度=0~40°C (see note)
Discharge Cut-Off Voltage 放电截止电压	V	1.0	Less than 0.5C discharge 少于 1.0C 放电
	V	0.9	0.5C~2.0C discharge 0.5C~2.0C 放电
Maximum Dischargeing Current(mA) 最大放电电流	mA	3600 (2.0C)	Ta= 0~50°C 环境温度
Storage Temperature (Percent 40-60 charged state) 储存温度 (充电 40-60%)	°C	-20~+40	Less than 30 days 储存时间少于 30 天
		-20~+30	Less than 90 days 储存时间少于 90 天
		-20~+25	Less than 180 days 储存时间少于 180 天
	%	65 ± 20RH	Relative humidity 相对湿度
Typical Weight 典型重量	g	28	Approx. 大约



5. Performance (电池性能)

Unless otherwise stated, tests should be done within one month of delivery under the following conditions:

除非另有说明, 测试应在到货之日起 1 个月内并且符合以下测试条件进行:

Relative humidity (相对湿度): 65 ± 20% RH.

Ambient Temperature (环境温度): 20 ± 5°C.

Notes: Standard charge / discharge condition (注意: 标准充电/放电条件)

Charge (充电): 180 mA (0.1C) x 16 hrs

Discharge (放电): 360 mA (0.2C) to 1.0V/cell.

The batteries must be standard discharged before charging (电池充电前必须先放电)。

Battery test vide infra (电池测试参见下文):

Test 测试项目	Unit 单位	Specification 规格	Conditions 条件	Remarks 备注
Capacity 容量	mAh	≥1750	Standard Charge / Discharge 标准充放电	Up to 3 cycles Allowed 允许循环 3 次
Open Circuit Voltage (OCV) 开路电压	V	≥1.35	Within 1 hr after standard charge 电池标准充电后 1 小时内	Unit: cell 单位: 支
Internal Impedance (Ri) 内阻	mΩ	≤35	Upon fully charge at 1Khz 电池充满电用 1Khz 下测试	Unit: cell 单位: 支
Rapid discharge 快速放电 (0.5C)	min	≥114	Standard charge, 30min rest before discharge at 0.5C to 1.0V/cell 标准充电, 搁置 30 分钟后以 0.5C 放电至 1.0V/支	Up to 3 cycles Allowed 允许循环 3 次
Over charge test 过充电测试	N/A	No explosion Leakage may occur 要求不爆炸, 可能 会出现泄气和漏液	Cell is discharged with 0.2C to 1.0V, then 0.1C for 48 hours 0.2C 放电至 1.0V, 0.1C 连续充电 48 小时	
Over discharge test 过放电测试	N/A	No explosion 要求不爆炸	Cell is discharged with 0.2C to 0.00V, then with 1C forced discharged for 1hours 0.2C 放电至 0.00V, 然后用 1C 强制放电 1 小时	
Charge Retention (20°C) 荷电保持率	mAh	≥1050(60%)	Standard charge, storage for 28 days at 20°C, standard discharge 标准充满电后在 20±2°C 环境温度下存放 28 天, 以标准 0.2C 放电至 1.0V	
	mAh	≥1050(60%)	Standard charge, storage for 7 days at 40°C, standard discharge 标准充满电后在 40±2°C 环境温度下存放 7 天, 以标准 0.2C 放电至 1.0V	
IEC Cycle life test IEC 寿命测试	cycle	≥500	IEC 61951-2 7.4.1.1	



Short circuit test 短路测试	N/A	No fire No explosion 要求电池不着火、不爆炸	After 0.2C to 1.00V, cell is fully charged with 0.1C for 16hours(or with 0.5C for 2.2hours), then shorted for 1hour or longer with a 50~100mΩ load or less 0.2C 放电至 1.00V, 0.1C 充 16 小时或 0.5C 充电 2.2 小时, 然后用 50~100mΩ 铜线短路 1 小时。
Vibration test 振动测试	N/A	No physical change No leakage Cell electrical performances unchanged 无物理变化 不漏液 电池电性能无损失	Cell is vibrated continuously lengthwise for 60minutes Amplitude: 4mm Frequency: 1000times/minutes 电池持续振动 60 分钟按以下频率和振幅: 振幅: 4mm 频率: 1000 次/分钟
Drop test 跌落测试	N/A	No abruption No leakage No explosion 要求电池不破裂, 不漏液, 不爆炸	After 0.2C to 1.00V, cell is fully charged with 0.1C for 16hours, then cell is dropped 3 times from a 1.0m height onto solid wood (20mm thick) with random orientation 0.2C 放电至 1.00V, 0.1C 连续充电 16 小时, 然后电池从 1.0 米高向下跌落在 20mm 厚的坚实木板上, 按任意方向跌落 3 次
Safetydevice Operation test 安全阀测试	N/A	No explosion 不爆炸	Forced discharge at 0.2C to a final voltage of 0V, then the current be increased to 1C and forced discharge continue for 60 min 将电池用 0.2C 强迫放电至 0V 后转用 1C 强迫放电 60 分钟。

注: 破坏性测试均是采用单支电池测试。

Attention: The object of abuse test is unit cell.

补充: IEC61951-2 循环寿命条款 Append: IEC61951-2 Endurance in cycles

标准测试 (国际 IEC 标准) Normal Cycling Test:

循环工步号 Cycle No.	充电 Charge	搁置 Rest	放电 Discharge
1	0.1C × 16hrs	None	0.25C × 2hrs 20mins
2~48	0.25C × 3hrs 10mins	None	0.25C × 2hrs 20mins
49	0.25C × 3hrs 10mins	None	0.25C to 1.00V/cell
50	0.1C × 16hrs	1~4hrs	0.2C to 1.00V/cell
循环从工步 1 到工步 50 必须重复进行, 直到工步 50 的放电容量低于 3 小时 Cycle 1 to 50 shall be repeated until the discharge duration on any 50th cycle becomes less than 3hrs			

当这样的连续循环的持续放电时间均少于 3h 时, 寿命测试终止。实验结束时, 循环次数不得少于 500 次。
The endurance test is considered complete when two such successive cycles give a discharge duration less than 3h. The number of cycles obtained when the test is completed shall be not less than 500.



6. Configurations, Dimensions And Markings (外形尺寸)

Please refer to the related drawing.

电池外形尺寸请参见附图。

7. Warranty (保证)

The quality guarantee period for our products is one year.

我们对产品的保质期限为 1 年。

8. Cautions (使用注意事项)

1. Reverse charging is not acceptable.
应将电池极性正确连接，不可反接。
2. Charge before use, use the correct charger for Ni-MH batteries.
使用之前请充电，请使用 Ni-MH 专用充电器。
3. Do not charge / discharge with more than the specified current.
请不要超过规格要求电流对电池/电池组进行充放电。
4. Do not short circuit the cell / battery.
请不要将电池/电池组短路。
5. Do not incinerate or mutilate the cell/battery.
请不要将电池/电池组投入火中或试图拆解。
6. Do not solder directly to the cell / battery.
请不要在电池/电池组上直接焊锡。
7. The life expectancy may be reduced if the cell / battery is subjected to adverse conditions, like extreme temperature, deep cycling, excessive overcharge /over-discharge.
如果电池/电池组在极限条件下使用，可能减少寿命：
如：极限温度，深度循环，过充电或过放电。
8. Store the cell / battery in a cool dry place.
电池/电池组应储存在阴凉干燥处。
9. For charging methods please reference to TMK technical handbook.
充电方法请参考我们的技术手册。
10. When find battery power down during use, please switch off the device to avoid over discharge.
电池使用时发现功率下降，请关闭用电器开关以防止电池过放。
11. When not using a battery, disconnect it from the device.
当电池不使用时，请把它从装置上取下。
12. well-ventilated place out of direct sunlight.
电池使用后，如果电池发热，再次充电前，请在通风环境中冷却。
13. During long term storage, please activate the battery once every 3 months according to the following method:
Charge at 0.1C for 16hrs , rest 10 min, then discharge with 0.2C to 1.0V/cell, rest 10 min, then charge at 0.2C to 150min.
经过长时间存放，请每隔 3 个月按下面方法激活电池一次：0.1C 充电 16 小时，搁置 10 分钟，然后用 0.2C 放电至每支电池 1.0V，搁置 10 分钟，0.2C 充电 150 分钟
14. When the battery is hot, please do not touch it and handle it, until it has cooled down.
如果电池发烫，请勿触摸，直至冷却。



15. Do not mix TMK batteries with other battery brands or batteries of a different chemistry such as alkaline and zinc carbon batteries.
请不要将 TMK 电池与其他品牌的电池或者不同种类的电池，比如碱性锌电池混用。
16. Do not mix new batteries in use with semi-used batteries, battery may be over-discharged.
请不要将新旧电池混用, 可能会导致过放电。
17. Do not attempt to take batteries apart or subject them to pressure or impact. Heat may be generated or fire may result. The alkaline electrolyte is harmful to eyes and skin, and it may damage clothing upon contact.
请不要尝试分离、挤压、撞击电池，电池会发热或起火。电池中的碱液对皮肤、衣服和眼睛有害，而且会损伤衣服。
18. Keep away from children. If swallowed, contact a physician at once.
放在儿童拿不到的地方，如果发现吞食，请立即联系医生。



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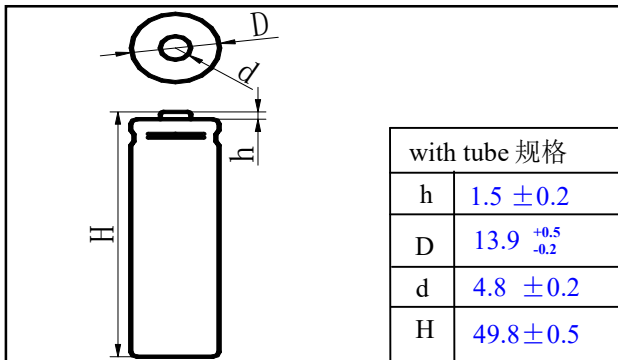
Ni-MH battery specifications (镍氢电池规格书)

Model No. (产品型号): AA1800C 1.2V

Specifications of single cell (单支电池规格)

Typical electrical performance(典型性能)

Dimensions 外形尺寸(mm)



Nominal Voltage 标称电压: 1.2V

Nominal Capacity 标称容量: 1800 mAh

Rated Capacity 额定容量: 1750 mAh

Standard Charge 标准充电: 180mA, 16 hours

Quick Charge 快速充电: 900mA, 140min

Continuous Discharge 持续放电: less than 3600mA

Discharge Cut-Off Voltage 放电截止电压: 0.9V

Weight 重量: 28g (Approx)

Service Life 循环寿命: ≥ 500cycles

(according to IEC discharge characteristics standard)

根据 IEC 标准测试

Internal Impedance 内阻: ≤35mΩ (1KHz)

Ambient Temperature 周边温度:

Standard charge 标准充电: 0 ~45℃

Quick charge 快速充电: 0 ~40℃

Standard discharge 标准放电: -20 ~ 50℃

Storage(贮存): 65+20% RH

Less than 30 days(少于 30 天): -20 ~ +40℃

Less than 90 days(少于 90 天): -20 ~ +30℃

Less than 180 days(少于 180 天): -20 ~ +25℃

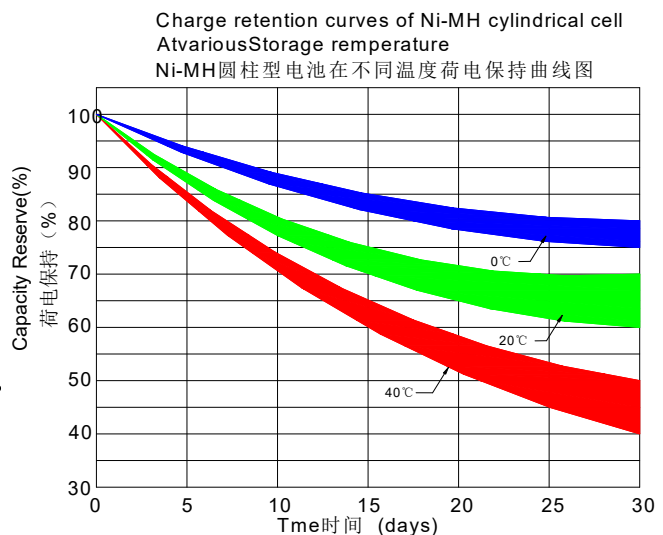
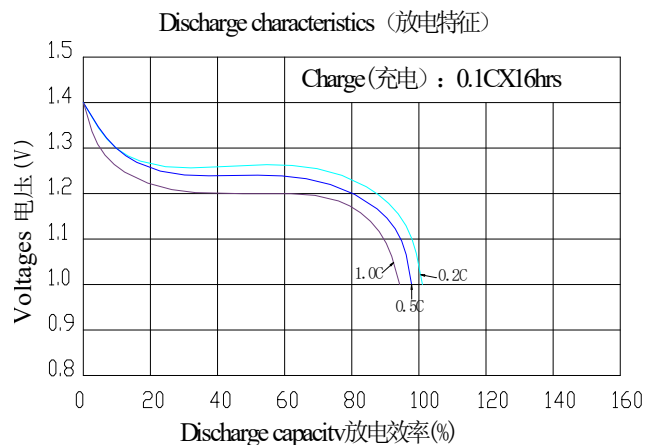
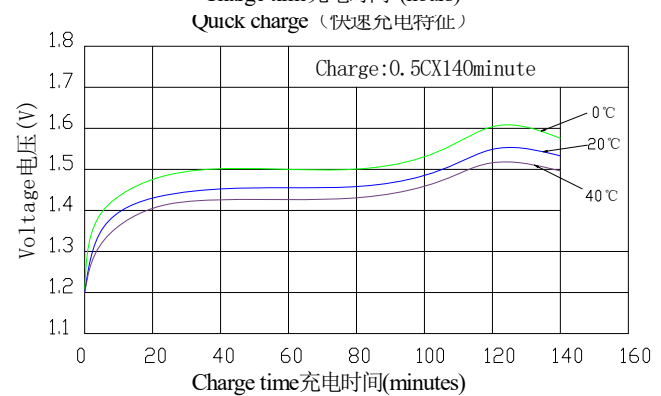
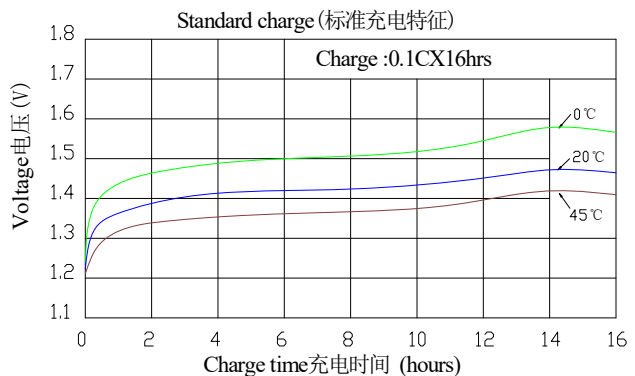
Note(注意):

1. After charge at 0.1C for 16hrs and discharge at 0.2C to 1.0V at 25℃.

0.1C 充电 16 小时后在 25℃ 温度下 0.2C 放电到 1.0V。

2. Control required: 充电控制条件

1) -ΔV: 5~8 mV 2) dT/dt: 0.5-1.0℃/min 3) Tco: 40~50℃



WINPOW reserve the right to alter or amend the design, model and specification without prior notice

威源保留在没有预先通知的情况下改变和修正样式和规格说明书的权力。

WINPOW Model No: REF-AA1500-A