

SPECIFICATION FOR APPROVAL

承认书

客户 / CUSTOMER	:	
客户型号 / CUSTOMER P/N	:	
产品名称 / ITEM	:	DC4槽LCD AA/AAA镍氢充电器/ DC 4slot LCD AA/AAA NI-MH charger
产品种类 / DESCRIPTION	:	槽充/ slot charger
本公司产品型号 / OUR MODEL NO.	:	CH-RMH221-02
标准 / STANDARD	:	
额定 / RATING	:	I/P:DC 12V 500mA
		O/P AA :DC 0.5AX4CH
		AAA :DC 0.5AX0.5X4CH
备注 / REMARKS	:	

注意:在贵司出单前,请确认签回以下项目/ Attention: Before placing orders, please confirm to sign back the followings:

- ☐ 产品规格(首页) /Production Spec(Front Page)
- ☐ 铭牌规格(如有) /Nameplate Spec(if any)
- ☐ 包装规格(如有)/Packing Spec(if any)

版本 REV	描述/DESCRIPTION	日期 DATE
A0	首次发行/FRIST EDITION	2011-12-8
A1	修改格式/CHANGE FORMAT	2019-01-15

瑞鼎电子/ Ryder Electronics	
	批准/ Approved by
签名 Signature	衣绍鹏
日期/DATE	2019-01-15

客户/ CUSTOMER	
确认	
Approved by	
	(签字或公司盖章)
日期/DATE	

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1 产品特点 Product Characteristics

- 本充电器是一款配 AC 适配器 12.0V /0.5A DC 输入，采用单片机智能控制，精确监测电池电压，确保充电电池不过充、不欠充。It is a smart charger with AC adapter (12.0V/500mA DC output). It adopts intelligent single chip microcomputer control. With accurate detection of battery's status, each channel can control charging quality to prevent insufficient charge and overcharge.
 - 4 槽独立充电，AA 与 AAA 电池可混充（AA 与 AAA 切换）。4 slots charging separately. It can charge AA/AAA battery.
 - 本充电器适用于 1.2V AA/AAA 镍氢电池。This charger is only suitable for 1.2V NI-MH battery.
 - 本充电器采用恒流充电模式， $-\Delta V$ 检测,确保对电池快速充电。Constant current charge. $-\Delta V$ detection to ensure quick charge.
 - 8 小时充电安全时间限制，确保使用安全。Limitation of 8 hours charging time for safety.
 - 连接好适配器与充电器，将电池正确插入充电槽，适配器接入市电即可进行充电，使用方便。Convenience with AC connection and correct battery placing.
 - 能识别坏电池及劣质电池，对坏电池及劣质电池自动停止充电。Battery auto detection function. Charger can check battery's state and stop charge load except for battery.
 - 内置过温度保护电路，当电池温度上限超过 $55^{\circ}\text{C} \pm 3^{\circ}\text{C}$ 充电器将停止充电，以确保充电安全。Temperature protection. Charger stop charging when battery's temperature is higher than $55^{\circ}\text{C} \pm 3^{\circ}\text{C}$.
 - LCD 背光屏显示充电状态，显示直观。LCD display.
 - 配套的 DC 适配器 AC 宽电压输入，适应全球电压；使用方便。Input voltage: 100V-240V~ 50Hz/60Hz (accessory adapter).
- 注意：请不要拿本充电器充适应范围以外的其它电池及电池包，本规格书所提及的所有电池均指 **1.2V AA/AAA 镍氢电池**。

2 电气性能 Electrical Characteristics

2.1 配套 AC 电源适配器输入输出特性 Accessory AC adapter input/output characteristics

2.1.1 配套 AC 电源适配器输入电压 Accessory AC adapter input voltage

输入电压 input voltage: AC 100V-240V~ 50HZ/60HZ

2.1.2 配套 AC 电源适配器输出直流空载电压 Accessory AC adapter output DC no-load voltage

输出 DC output DC voltage: $12.0 \pm 0.5\text{V}$

2.1.3 配套 AC 电源适配器额定输出电流 Accessory AC adapter rated output current

在恒流模式额定输出电流 rated output current in constant voltage mode: $>0.5\text{A}$

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2.2 本充电器输入特性 Charger's Input characteristics

2.2.1 输入电压 Input voltage

输入电压 input voltage: DC 10V-14V

2.2.2 输入电流 Input current

输入电流 input current: 0.5A

2.3 本充电器输出特性 Charger's Output characteristics

2.3.1 空载电压 no-load voltage

空载电压 no-load voltage: 2.5V-5V

2.3.2 额定充电电流: (正常充电条件下) Rated charge current(normal condition)

额定充电电流 rated charge current: 0.5A±10% &AA 通道 X4CH

额定充电电流 rated charge current: 0.25A ±10%(平均值) &AAA 通道 X4CH; 即: 充 0.5 秒停 0.5 秒; (for instance: charge for 0.5s then stop charge for 0.5s)

2.3.3 涓流充电电流 Trickle current

涓流充电电流 trickle current : 50mA (平均值 avg value) &AA 通道 X4CH; 即: 充 1 秒停 10 秒; (charge for 1s then stop charge for 10s)

涓流充电电流 trickle current : 25mA (平均值 avg value) &AAA 通道 X4CH; 即: 充 0.5 秒停 10 秒(charge for 0.5s then stop charge for 10s)

2.3.4 充电方式 Charge method

采用恒流充电方式

constant current charge method

2.3.5-△V 检测精度

-△V 检测精度 -△V detection accuracy ≤10mV

2.3.6 输出短路保护 Output short circuit protection

短路保护功能, 短路电流小于 50mA, LCD 屏报错显示。

When charger's output short circuit current≤50mA, LCD will show the error.

2.3.7 电池反接保护 Output reversely connection protection

当电池正负极接反时, 反接电流小于 50mA, LCD 屏报错显示。不损坏充电器;

When battery's polarities was wrongly connected and charger's output short circuit current≤50mA, LCD will show error.

注意: 不得长时间将电池反向放置在充电器内。

Caution : don't placing battery reversely in charger for a long time.

2.3.8 输出反向漏电流: Output leakage current

当输入电源停电时, 电池反向漏电流: ≤1mA, 尽量保持已充入电池的电量。

If the input AC source is disconnected, battery's leakage current: ≤1mA,

2.3.9 最长充电时间限制 Maximum limitation of the charging time

在放入电池开始充电起计时, 8 小时后无论是否充电完成, 充电器将停止充电, 保证电池安全。

The charger will stop charging since the battery was placed in charger for 8 hours no matter

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whether battery was fully charged or not.

2.3.10 电池最高温度限制 Temperature Limitation

产品内置过温保护电路，当电池充电过温超 $55^{\circ}\text{C} \pm 3^{\circ}\text{C}$ 时其充电器将停止充电，以确保电池充电安全。

Temperature protection. Charger stop charging when battery's temperature is higher than $55^{\circ}\text{C} \pm 3^{\circ}\text{C}$.

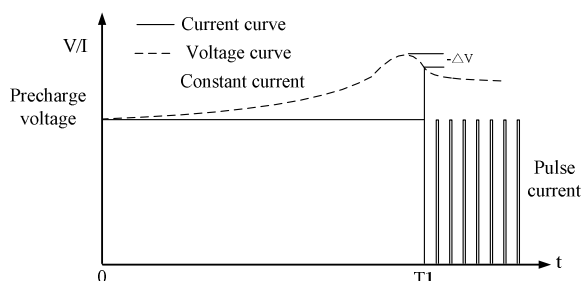
2.3.11 适用电池 Suitable battery

本充电器适合 1.2V NI-MH AA/AAA 电池

This charger is suitable for 1.2V AA/AAA NI-MH battery.

3 充电方式及 LCD 指示状态 Charge and LCD indication

3.1 充电器输出特性曲线 Charger's output curve



T0-T1: 恒流充电阶段,在此阶段，检测电池的 $-\Delta V$ ，当检测到 $-\Delta V$ 时，就会转入充饱阶段；LCD 指示充饱状态。

T0-T1: Constant current charge. In this period, charger will turn to fully-charge period once there is a $-\Delta V$. LCD show fully-charge state.

T1- : 充饱阶段，充电器转入脉冲涓流状态（占空比约：10%）。

T1- : Full-charge period. In this period, charger will apply trickle charge. (duty: aprx 10%)

3.2 LCD 指示状态: LCD Indication

A. Start-up:

LCD light up for 1s then light off when power on. (no battery)

B. Charge:

CHG light up and the correspond battery pattern is dynamicaly show up.

C. Full-charge:

The correspond battery pattern keep full.

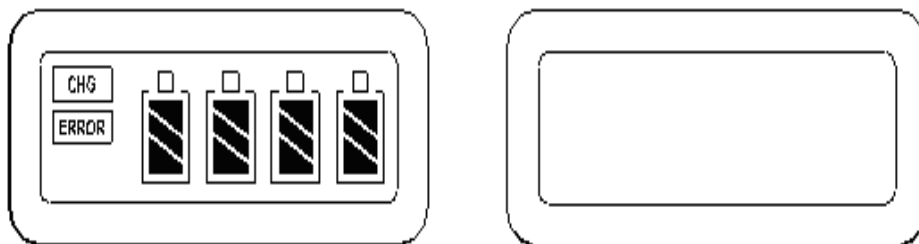
D. Error:

The correspond battery pattern keep empty and ERROR light up.

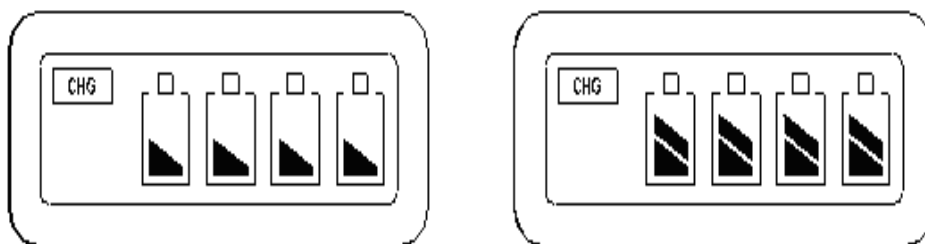
If battery's polarity is wrong placing, the correspond battery pattern will flash.

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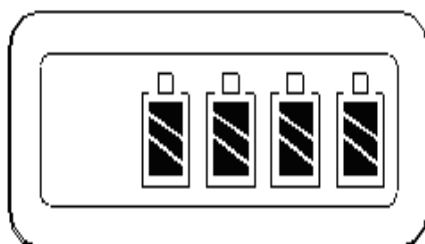
- A、开机启动：
无电池时，充电器连接通电源，LCD全屏显示，约1秒后自动熄灭。



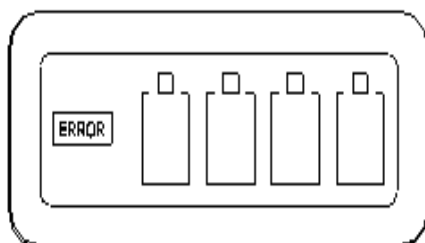
- B、电池充电状态：
放入电池时，LCD屏CHG充电指示亮起，同时显示对应电池槽位电池容量格数，电池容量格上下跳动显示充电状态。



- C、电池充满状态：
当电池充满时，其对应槽位LCD屏满格指示并不再闪烁。

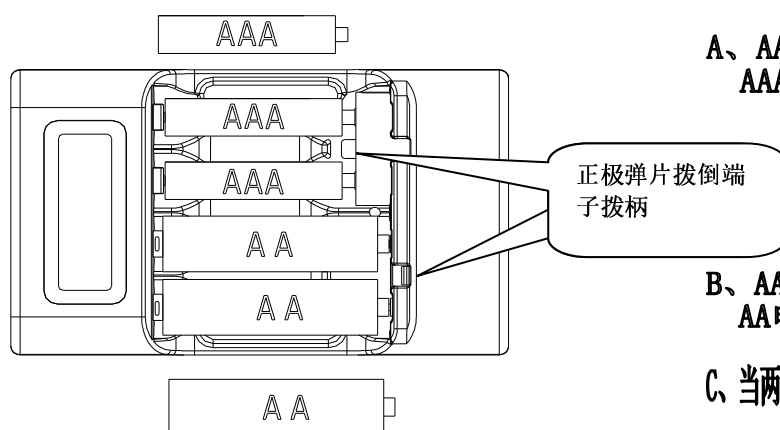


- D、电池异常指示：
在充电过程中，出现LCD屏ERROR错误指示。若某槽位电池以静止边框显示，则表示该槽位电池损坏，对应槽位停止充电。若槽位电池以边框闪烁显示，表示对应电池反接；同时充电器全部停止充电。正确放置该槽位电池，即可恢复充电。



3.3AA/AAA 电池放置操作示意图: AA/AAA battery charge instructions

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A、AAA电池放置时：
 AAA电池放置时需把正极弹片拨至AAA状态。

B、AA电池放置时：
 AA电池放置时需把正极弹片拨至AA状态。

C、当两正极弹片处于不同状态时，可同时对AA、AAA电池混充。

4 适用说明 Applicable environments

4.1 工作温度 Working temperature

0~+35℃

4.2 工作湿度 Working humidity

≤90% （不结露 no condensation）

4.3 贮存温度 Storage temperature

-20~+80℃

4.4 存储湿度 Storage humidity

相对湿度: relative humidity: ≤85%

4.5 大气压力 Atmospheric pressure

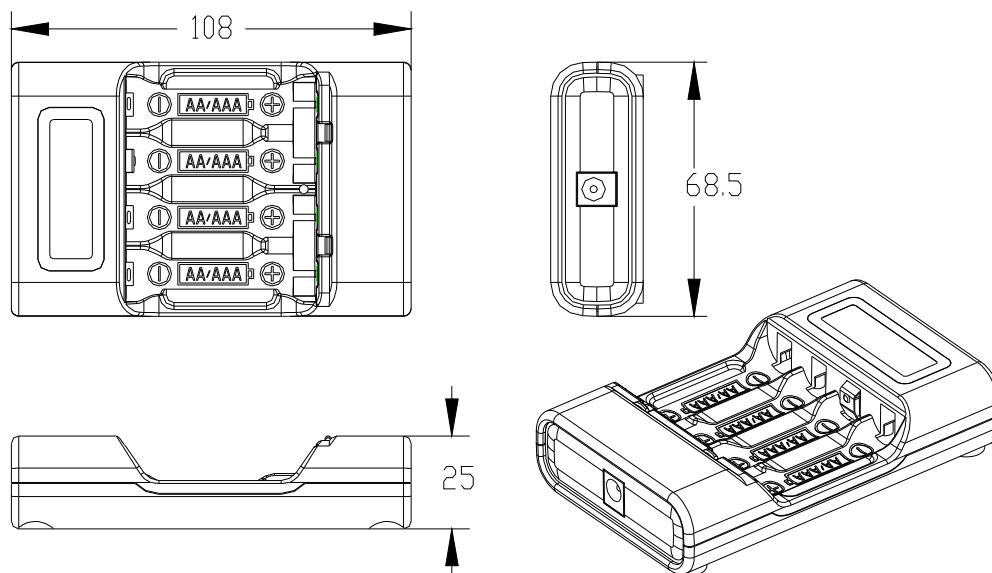
70~106KPa

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5 机械 Mechanics

5.1 本充电器外观图 Appearance

具体外观颜色及印字按客户要求定制
Appearance and print can be customized.



5.2 本充电器铭牌标贴 Label

按客户要求订制 Label can be customized.

5.3 适配器外观图 Adapter appearance

配套 AC 适配器具体外观颜色及 AC 输入插头标准按客户要求定制。

Accessory AC adapter's appearance and AC input plug standard can be customized.

6 可靠性能 Reliable characteristics

1. 高温试验：实验温度为 $65^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ，产品不包装，持续时间为 5 小时。在常温下放置待恢复后对其外观、绝缘强度、指示功能及电气性能进行重新测试；外观应平整无划痕、毛刺以及其它机械损伤；外露金属部分不应有锈蚀；绝缘测试无击穿、飞弧现象；LCD 指示功能及电气性能正常。
High temperature test: under $65^{\circ}\text{C} \pm 2^{\circ}\text{C}$, the charger without packing, last for 5 hours. Then take it into the room temperature, test its appearance, LCD and electrical specification. The appearance should have no scratches, burrs and other mechanical damage, metal parts rust should have no corrosion. Insulation test has no breakdown or arcing phenomenon .LCD indication function and electrical performance works normally.
2. 低温试验：实验温度为 $-20^{\circ}\text{C} \pm 3^{\circ}\text{C}$ ，产品不包装，持续时间为 8 小时。在常温下放置待恢复后对其外观、绝缘强度、指示功能及电性能进行重新测试；外观应平整无划痕、毛刺以及其它机械损伤，外露金属部分不应有锈蚀；绝缘测试无击穿、飞弧现象；LCD 指示功能及电气性能正常。
Low temperature test: under $-20^{\circ}\text{C} \pm 3^{\circ}\text{C}$, the charger without packing, last for 8 hours. Then take it into the room temperature, test its appearance, LCD and electrical specification. The

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appearance should have no scratches, burrs and other mechanical damage, metal parts rust should have no corrosion. Insulation test has no breakdown or arcing phenomenon. LCD indication function and electrical performance works normally.

3. 恒定湿热试验：实验温度为 $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ，湿度为 90%~95%，产品不包装，持续时间为 48 小时。测试后对其外观、绝缘强度、指示功能及电性能进行重新测试。外观应平整无划痕、毛刺以及其它机械损伤，外露金属部分不应有锈蚀；绝缘测试无击穿、飞弧现象；LCD 指示功能及电气性能正常。

The constant humidity and heat test: under $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$, humidity 90%~95%, the charger without packing, last for 48 hour. Then test its appearance, LCD and electrical specification.

The appearance should have no scratches, burrs and other mechanical damage, metal parts rust should have no corrosion. Insulation test has no breakdown or arcing phenomenon. LCD indication function and electrical performance works normally.

4. 振动试验：频率为 10~55HZ，振幅为 0.35mm，每个方向上扫频循环次数为 10 次。实验后对其外观、绝缘强度、指示功能及电性能进行重新测试。外观应平整无划痕、毛刺以及其它机械损伤，外露金属部分不应有锈蚀；绝缘测试无击穿、飞弧现象；LCD 指示功能及电气性能正常。

Vibration test: 10~55HZ, amplitude 0.35mm, Sweep cycles in each direction 10 times. Then test its appearance, LCD and electrical specification. The appearance should have no scratches, burrs and other mechanical damage, metal parts rust should have no corrosion.

Insulation test has no breakdown or arcing phenomenon. LCD indication function and electrical performance works normally.

5. 跌落试验：高度为 1 米，实验台厚度为 20mm 的硬木板，6 个表面，每个方向 1 次。实验后对其外观、绝缘强度、指示功能及电性能进行重新测试。产品内部无异响，外观无机械破损，外露金属部分不应有锈蚀；绝缘测试无击穿、飞弧现象；LCD 指示功能及电气性能正常。

Drop test: from 1M, the test platform is the hardboard with 20mm thickness. 6 surface, once in each direction. Then test its appearance, Dielectric strength, LCD and electrical specification.

The appearance should have no damage, no abnormal noise inside; metal parts rust should have no corrosion. Insulation test has no breakdown or arcing phenomenon. LCD indication function and electrical performance works normally.

7 外观要求 Appearance requirements

充电器外壳表面平整无划痕，毛刺及其它机械损伤，丝印完整清晰，外露金属部份无锈蚀。

Charger case should be smooth and have no scratches, burrs and other mechanical damage, complete and clear screen, the exposed metal parts has no rust

8 体积与重量 Volume And Weight

8.1 体积 Volume

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L 108* W68.5 *H25 mm3

8.2 重量 Weight

net: 92g

9 抽样标准 Sampling Standard

产品抽样检验参照 MIL-STD-105E 标准制定满足本公司产品品质检验之抽样计划，并严格督导实施。
当客户或合同有特殊要求时。可按客户和合同要求执行。

Product sampling reference MIL-STD-105E standards to meet the company's products quality inspection of the sampling plan, and implement strict supervision. It also can be based on the customer's requirements.

10 包装 Packing

产品可配套吸塑包装，具体包装方式可按客户要求订制。

11 使用注意事项 Caution

1. 本充电器指定使用配套的 AC 适配器。

Please use the accessory AC adapter.

2. 不可以拿本充电器充适应范围以外的电池。

Only suitable for 9V NI-MH battery.

3. 不可在超过 40℃ 环境使用本充电器对电池充电；建议在 35℃ 以下的环境下充电，电池在充足的时候有轻微的发热，属正常现象，请放心使用。

Do not use the charger to charge when temperature is over 40℃, temperature below 35℃ is recommended. It is normal that there is some heat when battery was fully charged.

4. 为了安全，建议使用 TENERGY 公司的 AA/AAA 镍氢电池。

For safety, AA/AAA NI-MH battery made by TENERGY Co.,Ltd is recommended to use.

5. 充电时请远离热源和火源。

Far away from heat and fire.

6. 请勿在酸、碱、和有腐蚀的环境中使用本充电器及电池。

Do not use the charger under the environment of acids, alkalis, and corrosion.

7. 请勿将充电器进水或淋雨，以免引起安全问题。

Do not place the charger into rain or water, or may cause problems.

8. 请勿自行拆开充电器和电池，以免发生危险。

Do not disassemble charger and battery, to avoid danger.

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9. 不得让小孩单独使用本充电器；请勿将充电器放置小孩可接触接触到的地方，以免发生危险。

Do not let children use the charger alone. Please place the charger out of the reach of children,
or it may cause dangerous.

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