

SPECIFICATION FOR APPROVAL

承 认 书


客户 / CUSTOMER	:	
客户型号 / CUSTOMER P/N	:	
产品名称 / ITEM	:	四槽LCD多功能充电器/ 4-slot LCD Multi-function charger
产品种类 / DESCRIPTION	:	槽 充/slot charger
本公司产品型号 / OUR MODEL NO.	:	CH-RMU005-01
标准 / STANDARD	:	
额定 / RATING	:	DC 12V/1A
		O/P:DC 1.2V/3.6V/4.2V ,9V
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/FIRST EDITION	2016-05-22
A1	Modify document error	2017-03-23
A2	Modify document error, modify 13 hours charging time to 14 hours	2017-05-11
A3	修改短路电流参数/Modify the short current parameter	2018-04-08
A4	修改格式/CHANGE FORMAT	2019-01-16

瑞鼎电子/ Ryder Electronics	
	批准/ Approved by
签名 Signature	衣绍鹏
日期/DATE	2019-01-16

客户/ CUSTOMER	
确认	
APPROVED BY	
	(签字或公司盖章)
日期/DATE	

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1. 特点: Product Characteristics

- 本充电器是一款适用于锂电池、磷酸铁锂、镍氢、镍镉，9V 7 节镍氢电池的多功能充电器，使用微电脑芯片控制，根据不同电池类型，采用不同电池充满检测方式，确保充电的质量及安全。
This is a multi-function charger with microcomputer chip control. It suitable for Li-ion, LiFePO4, NI-MH, NI-Cd, 9V(7 series) NI-MH battery and adopts different full-charged detection methods according to battery's type.
- 镍氢镍镉电池，采用恒流充电方式， $-\Delta V$ 检测，确保电池快速充电及电池充电的饱和度。Constant current charging model, $-\Delta V$ detection, quick charge and full charged for NI-MH, NI-Cd battery.
- 锂电池、磷酸铁锂电池，采用恒流恒压充电方式。Constant current and voltage charging model for Li-ion, LiFePO4 battery.
- 14 小时充电安全时间限制，确保使用安全。Limitation of 14-hours charging time for safety
- 具有电池反接、短路保护功能，确保充电器及电池在误操作（接反）的情况下不会损坏充电器及电池；注意请不要长时间反接电池充电。Battery reverse protection and short circuit protection to make sure that battery or charger will not be damaged under the condition of reverse. Please don't charge battery in the condition of reverse for a long time.
- 电池状态采用 LCD 显示充电状态及电池电量，显示直观。LCD display.

2. 电气性能 Electrical Specification

2.1. 输入特性 Input Characteristics

2.1.1. 输入电压 Input Voltage

DC 输入电压范围: Input DC voltage:
12V

2.1.2. 输入电流 Input Current

DC 额定工作电流:DC rated current:
 $\leq 1A$

2.2. 输出特性 Output characteristics

2.2.1. 充电电压范围 Range of Charge Voltage

充电电压范围 Range of charge voltage
0.2-4.25V （最大可充电电压范围）(Maximum chargeable voltage range).
NI-MH: 9V.

2.2.2. 充电方式 Charging Method

镍氢、镍镉电池-----采用恒流脉冲充电方式
NI-MH, NI-Cd battery----- Constant current pulse charging method
锂电池、磷酸铁锂电池-----采用恒流恒压充电方式
Li-ion, LiFePO4 battery-----Constant current and voltage charging method.
9V 7 节镍氢电池-----采用恒流充电方式

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9V (7 series)NI-MH battery-----Constant current charging method.

2.2.3. 输出空载电压: No-load Output Voltage

输出空载电压 No-load Output Voltage: $5 \pm 0.5V$

2.2.4. 额定充电电流: (正常充电条件下) Rated charging current : (Under normal charging condition)

锂电池、磷酸铁锂电池: 放置 ≤ 2 pcs 电池-----充电电流: $0.8A \pm 0.08A$

放置 > 2 pcs 电池-----充电电流: $0.4A \pm 0.04A$

Li-ion, LiFePO4 battery: less than or equal to 2pcs battery-----charge current: $0.8A \pm 0.08A$

More than 2pcs battery-----charge current: $0.4A \pm 0.04A$

镍氢电池: AA\C\D 充电电流: $1A \pm 0.1A$

AAA 充电电流: $0.5A \pm 0.05A$

NI-MH battery: AA\C\D charge current: $1A \pm 0.1A$

AAA charge current: $0.5A \pm 0.05A$

9V 7 节镍氢电池: 50mA

9V (7series)NI-MH battery: 50mA

2.2.5. 涓流电流(正常充电条件下) Trickle current(Under normal charging condition)

AA\C\D 镍氢、镍镉电池-----涓流电流: $100mA \pm 20\%$

AA\C\D NI-MH, NI-Cd battery-----trickle current: $100mA \pm 20\%$

AAA 镍氢、镍镉电池-----涓流电流: $50mA \pm 20\%$

AAA NI-MH, NI-Cd battery-----trickle current: $50mA \pm 20\%$

锂电池、磷酸铁锂电池-----涓流电流: 无

Li-ion, LiFePO4 battery-----trickle current: None

2.2.6. 输出短路电流 Output short circuit current

当输出端短路时, 电流 Output short circuit current $\leq 5mA$ 。

2.2.7. 反灌电流 Reverse current

充电器反灌电流: Reverse current $\leq 500\mu A$, (当无市电输入时) (when no AC input)

2.2.8. 反接保护电流 Reverse protect current

充电器具有反接保护功能: 当电池接反时, 充电器自动保护, 不会损坏充电器。

注意: 不要将电池长时间反接充电。

This charge has reverse protection: when battery is reversely placed in, the charger has auto protection so that not to be damaged.

Caution: do not charge battery in reverse direction for a long time.

2.2.9. 电池充满的条件 Condition of full-charged

AA/C/D 镍氢、镍镉电池, 电池电压出现 $-\Delta V$, 并且 $-\Delta V$ 为 $12mV$ 时, LCD 指示电池充满

AA/C/D NI-MH, NI-Cd battery. When $-\Delta V$ has been detected, $-\Delta V$ equal to $12mV$, the LCD indicates full-charged status.

AAA 镍氢、镍镉电池, 电池电压出现 $-\Delta V$, 并且 $-\Delta V$ 为 $8mV$ 时, LCD 指示电池充满

AAA NI-MH, NI-Cd battery. When $-\Delta V$ has been detected, $-\Delta V$ equal to $8mV$, the LCD indicates full-charged status.

锂电池, 电池电压为 $4.16V-4.22V$ 时, LCD 指示电池充满

Li-ion battery. When battery's voltage is $4.16V-4.22V$, the LCD indicates full-charged status.

磷酸铁锂电池, 电池电压为 $3.45V-3.55V$ 时, LCD 指示电池充满

LiFePO4 battery. When battery's voltage is $3.45V-3.55V$, the LCD indicates full-charged status.

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当安全充电时间 ≥ 14 小时，LCD 指示电池充满
 Charge time ≥ 14 hours, the LCD indicates full-charged status.

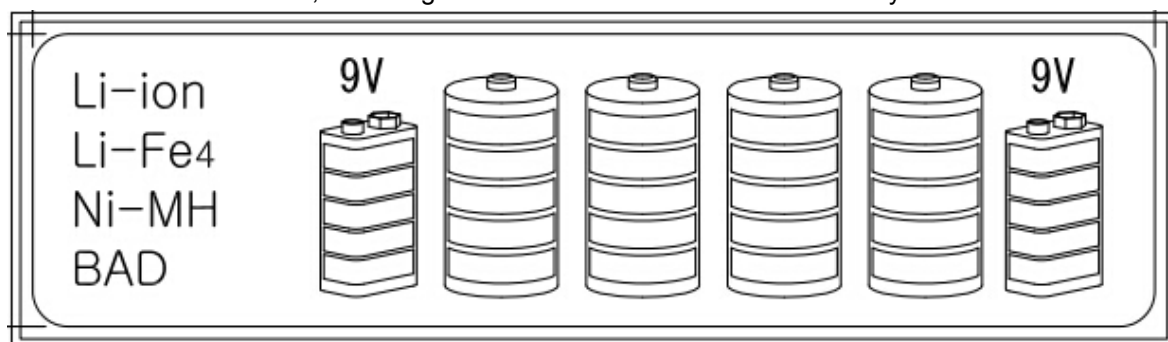
2.3 适用电池 Suitable Battery

镍氢、镍镉电池 NI-MH, NI-Cd battery : AA, AAA, C Cell, D Cell, 9V Ni-MH / NI-Cd
 磷酸铁锂/锂电池 LiFePO₄/Li-ion battery: 18650, 26650, 22650, 18490, 18350, 17670, 17500, 17335, 16340, 14500, 10440

3. 充电器 LCD 指示状态 LCD Indication

3.1. LCD 显示 LCD Indication

LCD 显示电池当前的电量状态，充满状态和错误状态。
 LCD indicates the volume, full-charged status and error status of the battery.



3.2. 功能设置 Function setting

拨动开关选择锂电池或是磷酸铁锂电池，镍氢镍镉电池无需选择，直接放置充电。
 Toggle switch to choose Li-ion or LiFePO₄ battery. NI-MH, NI-Cd battery can be charged directly.

4. 适用环境 Applicable Environment

4.1. 工作温度 Working temperature:

0~+35℃

4.2. 工作湿度 Working humidity

$\leq 90\%$ （不结露 No condensation）

4.3. 贮存温度 Storage temperature

-20~+80℃

4.4. 存储湿度 Storage humidity

$\leq 85\%$

4.5. 大气压力 Atmospheric pressure

70~106KPa

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5. 安全要求 Safety Requirements

5.1. 抗电强度 Electrical Resistance

初次级抗电强度 $\geq 3000\text{V AC } 50\text{HZ}/60\text{HZ}$ 正弦波有效值一分钟无击穿、飞弧现象, 漏电流 $\leq 10\text{ mA}$
Primary electrical resistance $\geq 3000\text{V AC } 50\text{HZ}/60\text{HZ sin wave RMS}$. No breakdown or arcing phenomenon in 1minute. Drain current $\leq 10\text{ mA}$.

5.2. 绝缘电阻 Insulation resistance

绝缘电阻 $\geq 10\text{M}\Omega$ (在 $\text{DC}500\text{V}$ 条件下)
Insulation resistance $\geq 10\text{M}\Omega$ (under the condition of $\text{DC } 500\text{V}$)

6. 机械 Mechanics

6.1. 外观图 Appearance:

外壳颜色: 实际外观颜色或印字内容按客户订制
The appearance and print can be customized



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6.2. 铭牌标贴 Label

具体内容按客户要求订制

Charger label can be customized

7. 可靠性能 Reliable Performance

- 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；成品电性能正常；LCD 指示功能正常。

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

- 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；成品电性能正常；LCD 指示功能正常。

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 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

- 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；成品电性能正常；LCD 指示功能正常。

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

- 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；成品电性能正常；LCD 指示功能正常。

Vibration test: 10~55HZ, amplitude 0.35mm, Sweep cycles in each direction 10 times. Then

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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

- 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，外观应无机械破损，外露金属部分不应有锈蚀；绝缘测试无击穿、飞弧现象；成品电性能正常；LCD 指示功能正常；成品内部应无异响。
 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. The product has no abnormal sounds

8. 外观要求 Appearance Requirement

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 no rust.

9. 体积与重量 Volume And Weight

9.1. 体积 Volume

165*143.1*61.5mm

9.2. 重量 Weight

338g

10. 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. Also can be based on the customer requirement

11. 包装 Packing

产品配套白盒/彩盒包装，具体包装方式可按客户要求订制

White box and colorful box packaging. Packing can be customized

12. 使用注意事项 Caution

1. 不可以拿本充电器充适应范围以外的电池。
 Only suitable for Li-ion, LiFePO4, NI-MH, NI-Cd, 9V(7 series) NI-MH battery.
2. 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。

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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.

3. 充电时请远离热源和火源。

Far away from heat and fire

4. 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

5. 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

6. 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

7. 不得让小孩单独使用本充电器。

Do not let children use the charger alone

8. 给锂电池或磷酸铁锂电池充电时，请正确选择其电池类型；镍氢、镍镉电池无需选择，直接放置即可。

Choosing correct type of battery when charge Li-ion or LiFePO4 battery. NI-MH, NI-Cd battery can be charged directly.

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