

SPECIFICATION FOR APPROVAL

承 认 书

客户 / CUSTOMER : _____

客户型号 / CUSTOMER P/N : _____

产品名称 / ITEM : 四槽LED多功能充电器/4 slots LED multi-function charger

产品种类 / DESCRIPTION : 槽 充/slot type charger

本公司产品型号 / OUR MODEL NO. : CH-RMU001-01

标准 / STANDARD : _____

额定 / RATING : I/P:AC 100V~240V 50HZ/60HZ
DC 12V
O/P:DC 1.2V/3.6V/4.2V—0.85A


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	2013-09-23
A1	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 MCU. It suitable for Li-ion, LiFePO4, NI-MH, NI-Cd and adopts

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- 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, to ensure quick charge and battery saturation 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.
- 10 小时充电安全时间限制，确保使用安全。Limitation of 10 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 connection 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 LED 灯组动态显示充电状态及电池电量，显示直观。LED indication.
- 宽电压 AC 输入，100-240VAC 50/60Hz 或 DC12V 适应全球。
 Input: 100-240VAC 50/60Hz or DC12V

2. 电气性能 Electrical Specification

2.1. 输入特性 Input Characteristics

2.1.1. 输入电压 Input Voltage

AC 输入电压范围 AC voltage input range: 100-240VAC 50/60Hz
 DC 输入电压范围 DC voltage input range: 12V

2.1.2. 输入电流 Input current

AC 额定工作电流 rated AC current: $\leq 0.3A$
 DC 额定工作电流 rated DC current: $\leq 1A$

2.1.3. 浪涌电流 Surge current

浪涌电流 surge current: 30A MAX

2.1.4. 最大漏电流 Maximum leakage current

最大漏电流 maximum leakage current: $\leq 0.25\text{ mA}$

2.1.5. 启动延迟时间 Star-up delay time

接入市电时，启动延迟时间: $\leq 3S$
 When AC input, start-up delay time $\leq 3s$.

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
 0.8-4.25V （最大可充电电压范围）(Maximum chargeable voltage range)

2.2.2. 充电方式 Charge Method

镍氢、镍镉电池-----采用恒流充电方式
 NI-MH, NI-Cd battery----- Constant pulse current charge 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 charge method.

2.2.3. 输出空载电压 No-load output voltage

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

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2.2.4. 额定充电电流: (正常充电条件下) **Rated charge current**

1、3 电池槽: 放置 1pcs 电池-----充电电流: 0.85A \pm 0.08A
放置 2pcs 电池-----充电电流: 0.85A \pm 0.08A (充电占空比 50%)
No.1,No.3 battery slot: placing 1pcs battery --- charge current: 0.85A \pm 0.08A
placing 2pcs battery --- charge current: 0.85A \pm 0.08A (duty circle:50%)
2、4 电池槽: 放置 1pcs 电池-----充电电流: 0.85A \pm 0.08A
放置 2pcs 电池-----充电电流: 0.85A \pm 0.08A (充电占空比 50%)
No.2,No.4 battery slot: placing 1pcs battery --- charge current: 0.85A \pm 0.08A
placing 2pcs battery --- charge current: 0.85A \pm 0.08A (duty circle: 50%)

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

镍氢、镍镉电池-----涓流电流: 50mA \pm 20%
NIOMH, 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 \leq 1 mA, 对应电池槽的 3 个 LED 灯闪烁
Short circuit output current \leq 1 mA. The three LEDs will flash corresponding to short circuit slot.

2.2.7. 反灌电流 **Reverse current**

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

2.2.8. 反接保护电流 **Reverse protect current**

充电器反向保护电流: \leq 10mA, 对应通道的 3 个 LED 灯闪烁
Battery reversely connection protection current \leq 10mA. The corresponding three LEDs will flash.
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 charger has reverse connection 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 status**

镍氢、镍镉电池, 电池电压出现 $-\Delta V$, 并且 $-\Delta V$ 为 2-5mV 时, 电池充满转灯
NI-MH, NI-Cd battery. When $-\Delta V$ has been detected and $-\Delta V$ is range from 2mV to 5mV, the LED indicates full-charged status.
锂电池, 电池电压为 4.15V-4.25 时, 电池充满转灯
Li-ion battery. When battery's voltage is 4.15V-4.25V, LED indicates full-charged status.
磷酸铁锂电池, 电池电压为 3.55V-4.65 时, 电池充满转灯
LiFePO4 battery. When battery's voltage is 3.55V-4.65V, the LED indicates full-charged status.
当安全充电时间 \geq 10 小时, 电池充满转灯
Charge time \geq 10 hours, the LED indicates full-charged status

2.3. 适用电池 **Suitable Battery**

镍氢、镍镉电池 NI-MH NI-CD battery: AA:1800mAh、2000mAh、2200mAh、2500mAh、

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2800mAh

AAA:700mAh、800mAh、900mAh、1000mAh

锂电池 Li-ion battery: 18650、14500

磷酸铁锂电池 LiFePO4 battery: 14430、RCR123A 3.2V

3. 充电器 LED 指示状态 LED Indication

3.1. LED 指示 LED indication

空载状态: 灯灭
充电状态: 3 个 LED 指示电量, 动态显示充电状态
充饱状态: 3 个 LED 常亮
输出短路: 3 个 LED 闪烁
输出反接: 3 个 LED 闪烁

No-load: light off
Charging: three LED dynamically indicate power of battery
Full-charged: three LED keep light
Output short circuit: three LED flash
Battery reverse connection: three LED flash

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。

Switch the toggle to choose charge Li-ion or LiFePO4 battery. NI-MH and NI-CD battery can be charged directly.

4. 适用环境 Suitable environments

4.1. 工作温度: Working temperature

0~+40℃

4.2. 工作湿度 Working humidity

工作湿度 working humidity: ≤90% (不结露 no condensation)

4.3. 贮存温度 Storage temperature

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

大气压力 atmospheric pressure: 70~106KPa

5. 安全要求 Safety requirements

5.1. 抗电强度 Electrical Resistance

初次级抗电强度≥3000VAC 50HZ/60HZ 正弦波有效值一分钟无击穿、飞弧现象, 漏电流≤10 mA

Primary electrical resistance ≥3000V AC 50HZ/60HZ sin wave RMS. No breakdown or arcing phenomenon in 1minute. Drain current ≤10 mA.

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5.2. 绝缘电阻 Insulation resistance

绝缘电阻 $\geq 10\text{M}\Omega$ (在 DC500V 条件下)

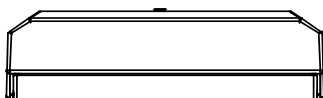
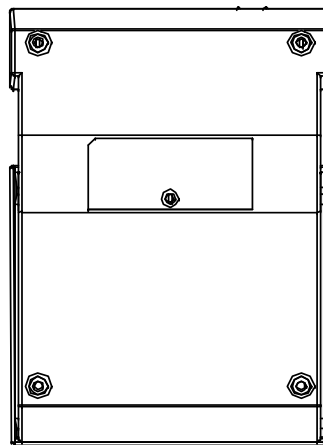
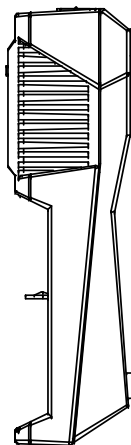
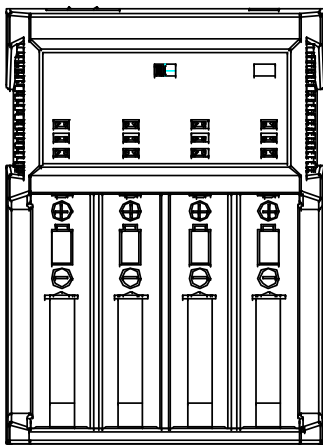
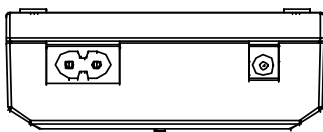
Insulation resistance $\geq 10\text{M}\Omega$ (under the condition of DC 500V)

6. 机械 Mechanics

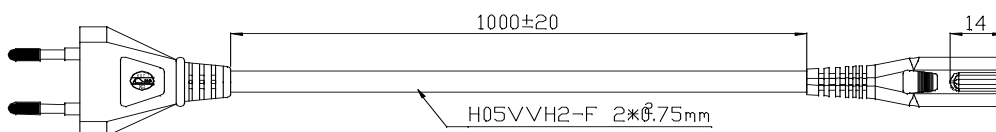
6.1. 外观图: Appearance

外壳颜色: 实际外观颜色或印字内容按客户订制

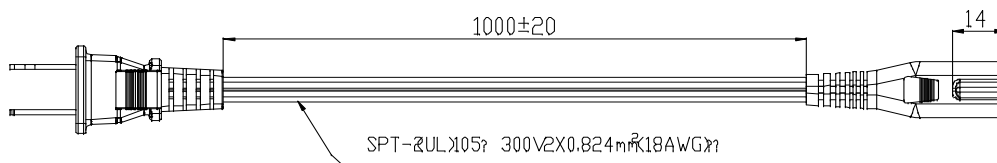
The appearance and print can be customized



6.2. 输入线材与 AC 头标准 Input cable and AC plug standard



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6.3. 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；LED 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, LED 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 .LED 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；LED 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, LED 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. LED 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；LED 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, LED and electrical specification.

The appearance should have no scratches, burrs and other mechanical damage, metal parts

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rust should have no corrosion. Insulation test has no breakdown or arcing phenomenon. LED 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；LED 指示功能正常。

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

L 136 W 96 H 40 mm³

9.2. 重量 Weight

net: 180g

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. Standard also can be based on the customer's requirements.

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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。
Charger is only suitable for Li-ion, LiFePO4, NI-MH, NI-Cd battery mentioned by this spec.
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。
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 safety 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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