RYDBATT® RYDELEC® 深圳市瑞鼎电子有限公司 SHENZHEN RYDER ELECTRONICS CO.,LTD

SPECIFICATION FOR APPROVAL

承 认 书

客戶 / CUSTOMER	:	
客戶型号 / CUSTOMER P/N	:	
产品名称 / ITEM	:	双通道5-10 节镍氢电池充电器/Two channels 5-10 series NI-MH battery charger
产品种类 / DESCRIPTION	:	线 充/wire type charger
本公司产品型号 / OUR MODEL NO.	:	CH-NI-02000-0120-1
标准 / STANDARD	:	
額定 / RATING	:	I/P:AC 100V~240V 50Hz/60Hz
		O/P :DC20V 1000mA
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 ISSUE	2017-9-13
A1	修改格式/CHANGE FORMAT	2019-1-28

瑞鼎电子/ Ryder Electronics	
	批准/Approved by
签名 Signature	衣绍鹏
日期/DATE	2019-1-28

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

目　　录 Content

1 产品特点 Product Characteristics

- 本产品是一款智能型镍氢电池包专用充电器，使用微电脑芯片控制 ，-△V 检测功能，确保充电的质量及安全。It is a smart charger special for NI-MH battery pack. It adopts intelligent single chip microcomputer control. With accurate detection of -△V, charger can control charging quality and safety.
- 适应 5 至 10 串镍氢电池包充电。The charger is suitable for 5-10series NI-MH battery pack.
- 1A 电流充电，适合 1Ah-4Ah 以下的镍氢电池充电。charge current 1A， suitable for 1Ah- 4Ah NI-MH battery.
- 恒电流充电，-△V 检测，确保电池快速充电及电池充电的饱和度≥80% 。Constant current charge. -△V detection to ensure quick charge and battery saturation ≥80%.
- 5 小时充电安全时间限制，确保使用安全。Limitation of 5 hours charging time for safety
- 具有电池自动识别功能，能识别电池及好坏，对电池以外的其它负载将自动停止充电。Auto-detection function that charger can detect bad battery and stop charging load except for battery.
- 具有唤醒功能，当电池电压低于正常电压值时，用 100mA 电流去唤醒电池。Wake-up function that charger will apply 100mA current to wake battery up when battery's voltage is lower than normal value.
- 充电时将充电器的两个输出端和电池包正、负极正确连接，接入 AC 电源即可，使用非常方便。It is convenient to correctly connect charger with battery pack's polarity and AC power supply.
- 具有电池反接保护功能，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 reversely connected protection function, to make sure that battery or charger will not be damaged under the condition of reverse.
- 硬件看门狗，确保软件失控，及硬件异常的情况下有效保护电池，防止电池过冲充出现以外事故。Hardware watchdog can protect battery effectively when software lost control or hardware abnormality occurs, and prevent overcharge.
- 蓝色 LCD 指示充电状态，电池电压，已充电容量，显示美观，内容直观。Blue LCD display charging status,battery voltage, charged power directly and Aesthetically.
- 双通道，可同时对两组电池组充电。Two channels, is can charges two pack of battery
- 宽电压 AC 输入，100-240V AC 50/60Hz 适应全球。Input: AC 100-240V 50/60Hz.
- 外置电池温度感应器（可选择），充电时请将温控传感器紧贴电池包，确保电池充电时的安全。External temperature sensor (optional). For safety, please set temperature sensor to battery pack closely.

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及电池包均指 5-10 串的镍氢电池组。

Caution: this spec and charger are only suitable for 5-10 series NI-MH battery pack.

2 电气性能 Electrical Specification

2.1 输入特性 Input characteristics

2.1.1输入电压 Input voltage

输入电压范围：Input voltage range

100-240VAC 50/60Hz

2.1.2输入电流 Input current

额定工作电流：Input rated current

≤1.0A

2.1.3浪涌电流：surge current

浪涌电流： surge current

60A MAX

2.1.4最大漏电流 Maximum leakage current

最大漏电流：maximum leakage current

≤0.25 mA

2.1.5启动延迟时间 Start-up delay time

接入市电时，启动延迟时间：AC input, start-up time

≤3S

2.2 输出特性 Output characteristics

2.2.1充电电压范围 Charge voltage range

充电电压范围 charge voltage range

5V-16V （最大可充电电压范围） (maximum chargeable voltage range)

2.2.2额定充电电流：(正常充电条件下) Rated charge current(normal condition)

额定充电电流 ：1000mA ±10% （1A 档）

Rated charge current: 1000mA±10% (1A level)

2.2.3 输出空载电压：Output no-load voltage

输出电压:output voltage

20±2V

2.2.4充电方式 Charge method

采用恒流充电方式 constant current charge method

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

涓流电流：1000mA 平均值（@1A 档位时），（占空比=10%）

Trickle current: 1000mA average value（@1A level），（duty circle=10%）

2.2.6输出短路电流 Output short circuit current

当输出端短路时，充电器将无电流输出，红色指示灯闪烁；

When output short circuit occurs, the output short circuit current <50mA and red LCD will flash in red.

短路排除，充电器自动进入充电状态.

Charger turns into charging state when cause of short circuit was removed.

2.2.7反灌电流 Reverse current

充电器反灌电流：Reverse current

≤1mA，（当无市电输入时）(no AC input)

2.2.8 反向保护电流 Battery reverse connection protection 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：不要将充电器长时间反接充电。

Charger has reverse protection function: charger has self-protection when battery was placed reversely. Caution: don't charge battery in reverse direction for a long time.

充电器反向保护电流：≤100mA

Reverse protection current ≤100mA

2.2.9 停止充电的条件 Condition of stop charging

当电池充饱时出现-△V，当-△V 为 10-30mV 时，停止充电。

Charger will stop charging when there is a -△V(10-30mV).

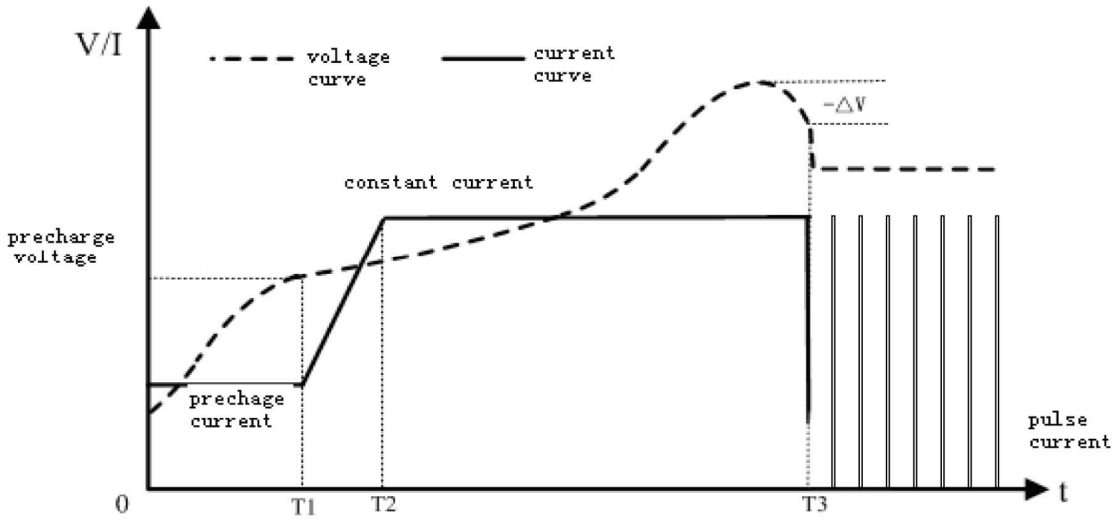
当安全充电时间≥5 小时，停止充电。

Charger will stop charging when charge time ≥5 hours

当电池温度感器检测温度＞60℃时停止充电(温控线属可选项)。

Charger will stop charging when temperature sensor detects the temperature ＞60℃

2.2.10 充电输出特性图 Output curve



T0-T1: 唤醒阶段，当电池包的电压≤5V 时，充电器将会用 100mA 电流去唤醒电池。

T1-T2: 电流上升阶段，当电池包的电压≥5V 时，充电器将会从唤醒状态转换为电流上升状态。在此阶段，电流上升到恒流充电电流；1000mA ±10% （1A 档）。

T2-T3: 恒流充电阶段,在此阶段，检测电池的-△V，当检测到-△V 为 10-30mV 时，就会转入充饱阶段； LCD 指示充饱状态,显示电池电压，NTC 温度。

T3-T4; 充饱阶段，LCD 指示充饱状态，显示电池电压。充电器转入涓流电流：1A 档位时 1000 mA 平均值,（占空比=10%）。

T0-T1: Wake-up period. Charger will apply 100mA current to wake battery up when battery's voltage ≤5V.

T1-T2: Current ascend period, when battery pack's voltage≥5V, charger will turn into current ascend period. In this period, charger applies constant current charging method, current: 1000mA ±10％(1A level).

T2-T3: Constant current charging period, when -△V was detected in the range of 10-30mV, the charger will turn into full-charged period.

T3-T4: Full-charged period, Charger then turns into trickle current period: 1000mA average value（@1A level)，（duty circle=10%）

2.2.11 适用电池 Suitable battery

本充电器适用于 5 至 10 串 镍氢电池组充电。

The charge is suitable for 5-10 series NI-MH battery pack.

3 电池放置及 LCD 指示状态 Battery placing and LCD indication

3.1 电池放置 Battery placing

将 5 至 10 串联镍氢电池正负极与充电器对接，充电器自动识别有电池接入后，并开始充电。

Connect 5-10 series NI-MH battery pack to charger, the charger will start work automatically.

3.2 LCD 指示 LCD indication

充电器上电	背光 LED 亮 3 秒，后熄灭
Charger turns on	LED back light crush out after 3 seconds
不接电池	背光 LED 熄灭
Without battery in	LED back light crush out
充电状态	动态显示充电状态，电池电压，电池温度，
Charging status	LCD displays charging status, battery voltage, battery temperature dynamically
充饱状态	背光 LED 熄灭，LCD 显示电池电压，显示充滿狀態
Maximal charging status	LCD back light crush out,LCD displays battery voltage, full of power status
输出短路或反接	LCD 动态显示 ERR
Out put short or inverse	LCD displays ERR dynamically

4 适用环境 Applicable environment

4.1 工作温度：Working temperature

0~+40℃

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

≤85%

4.5 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

5.2 绝缘电阻 **Insulation resistance**

绝缘电阻≥10MΩ(在 DC500V 条件下)

Insulation resistance≥10MΩ (under the condition of DC 500V)

6 机械 Mechanics

6.1 外观图 Appearance

具体外形及印字按实际样品而定
The appearance and print can be customized

6.2 输人插头及 AC 线材要求 Input cable and AC plug standard

具体 AC 插头标准及线材标准按客户要求订制
AC plug and cable can be customized.

6.3 输出线材及 DC 插头要求 Output cable and DC plug requirements

具体 DC 插头标准及线材标准按客户要求订制
DC plug and cable can be customized.

6.4 铭牌标贴 Label

具体规格及标准按客户要求订制
Label can be customized.

7 可靠性能 Reliable Characteristics

1 高温试验：实验温度为 65℃ ±2℃，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℃ ±2℃，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. LCD indicator and electrical specification works normally.

2 低温试验：实验温度为 －20℃ ±3℃，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℃ ±3℃，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. LCD indicator and electrical specification works normally.

3 恒定湿热试验：实验温度为 40℃ ±2℃，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℃ ±2℃，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. LCD indicator and electrical specification 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. LCD indicator and electrical specification 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. Electrical specification should meet the requirements. The appearance no damage, no abnormal noise inside.

8 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 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

9.2 重量 Weight

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’s requirement.

11 包装 Packing

具体包装方式可按客户要求订制。
Packing can be customized.

12 使用注意事项 Caution

- 不可以拿本充电器充适应范围以外的电池及电池包。
  The charger is only suitable for 5-10 series NI-MH battery pack.

- 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.
- 为了安全，建议使用 TENERGY 公司的 5-10 节串联的镍氢镍镉电池包。
  For safety, 5-10 series NI-MH battery pack made by TENERGY Co.ltd is recommended to use.
- 充电时远离热源和火源。
  Far away from heat and fire.
- 不得在酸、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.
- 不得让充电器进水或淋雨，以免引起安全问题。
  Do not place the charger into rain or water, or may cause problems.
- 不得拆解充电器和电池，以免引起危险。
  Do not disassemble charger and battery , to avoid danger.
- 不得让小孩单独使用本充电器；请勿将充电器放置于小孩可接触到的地方，以免发生危险。
  Do not let children use the charger alone. Please place the charger out of reach of children.
- 当电池长时间放置不用后再次使用时，可能会出现假象-△V 现象，导致充电器误判而停止充电，出现此情况后，请对电池反复充电、放电几次后即可修复或部分修复。When the battery is not in use for a long time, there may be false -△V phenomenon, resulting in wrong detection and stop charging. In this case, please repeatedly charge and discharge the battery for a few times.