

Product Specification

名称/ Name: _____

型号/ Model: KH-60D10000D 1.2V NiMH Battery

编制/ Author: _____

审核/ Review: _____

核准/ Approval: _____

日期/ Date: 2015-03-02

1、 APPLICATION/描述

This specification governs the performance of the following Nickel-Hydrate Cylindrical stack-up battery.

Model: KH-60D10000D

Cell Size: $\phi 32.5_{-1.0}^{+0} \times 60.0_{-2.0}^{+0}$

2、 RATINGS/额定性能

| Description/项目 | Unit/单位 | Specification/指标 | Conditions/条件 |
|--|---------|---------------------------------|---|
| Nominal Voltage/额定电压 | V/ Cell | 1.2V | |
| Nominal Capacity/额定容量 | mAh | 10000 | Standard Charge/Discharge /标准充放 |
| Standard Charge/标准充电 | mA | 1000(0.1C) | Ambient Temperature/环境温度: T _a = 20±5°C |
| | Hour | 16 | |
| Quick Charge/快充 | mA | 2000(0.2C) | Ambient Temperature/环境温度: T _a =10~40°C |
| | hour | 6.5 | |
| Fast Charge/急充 | mA | 5000(0.5C) | -ΔV=5mV/cell |
| | hour | 2.4 | |
| Trickle Charge/涓充 | mA | (0.02C)~(0.05C) | T _a = 0~70°C |
| Standard discharge/标准放电 | mA | 5000(0.2C) | Ambient Temperature/环境温度: T _a = 20±5°C Humidity/湿度: 50±15% |
| Max. Discharging Current (continuous)/最大持续放电电流 | A | 30 (3C) | T _a = 0~50°C |
| Discharge Cut-off Voltage/放电截止电压 | V/ Cell | 1.0 | Less than 1.0C discharge/ 少于 1.0C 放电 |
| | | 0.9 | 1.0C ~2.0C discharge/ 1.0C ~2.0C 放电 |
| Storage Temperature 贮存温度 | °C | -20~20°C/Within 1 year 一年 | Charged state of 30%. Humidity Max.:85% 充电 30%状态下, 最高环境湿度 85% See note(3) |
| | | -20~30°C/Within 6 months 六个月 | |
| | | -20~40°C/Within 3 months 三个月 | |
| Typical Weight/单体电池重量 | Gram | Approx.175 | Unit cell |

3、 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, 测试须在发货后一个月内在下述条件下进行:

Ambient Temperature/环境温度, T_a: 20±5°C

Relative Humidity/相对湿度: 50±15%

| Test/测试项目 | Unit/单位 | Specification/指标 | Other Condition/其它条件 | Remarks/备注 |
|-------------|---------|------------------|--------------------------------|--|
| Capacity/容量 | mAh | ≥10000 | Standard charge discharge/标准充放 | up to 3 cycles are allowed/允许 最多三次充放 |

| | | | | |
|---|------------------|--|--|--|
| Open Circuit Voltage(OCV)/ 开路电压 | V/Cell | ≥ 1.25 | Within 2 weeks after standard Charge/在标准充电后 2 周内测量 | |
| Internal Impedance/ 交流内阻 | m Ω /Cell | ≤ 8 | Upon fully charge(1KHz)/ 充满电后(1KHZ 的交流频率) | |
| High Rate Discharge(0.5C)/ 0.5C 放电时间 | minute | ≥ 106 | Standard charge, 1 hour rest before discharge by 0.5C to 1.0 V/cell 标准充电后搁置 1 小时, 0.5C 放电至 1.0V/只 | up to 3 cycles are allowed/允许最多三次充放 |
| Overcharge/过充 | | No leakage nor deformation/ 无漏液或变形 | 0.1C Charge 48 hrs/ 0.1C 充电 48 小时 | |
| Charge Retention/ 荷电保持能力 | mAh | ≥ 8000 (80%) | Standard Charge, Storage for 7days at 45°C ambient temperature, standard discharge/标准充电后 45°C 环境温度中存放 7 天, 标准制度放电 | |
| IEC Cycle Life/ IEC 循环寿命 | Cycle | ≥ 1000 | IEC61951-2(2003) 7.4.1.1 | (See Note 4)/ (参见 Note 4) |
| Leakage Test/ 泄漏测试 | | No leakage nor deformation/无漏液或变形 | Fully charged at 0.5C for 2.5hours and storage for 14days / 0.5C 充电 2.5 小时, 存放 14 天后检查 | |
| Vibration Resistance /抗振动 | | $\Delta V < 0.02V/cell$, ΔRi (Internal Impedance) < 5m Ω /cell 电压变化 < 0.02V/只, 内阻变化 < 5m Ω /只 | Charge at 0.1C for 16 hrs, and then leave for 24hrs, check battery before / after vibration. Amplitude: 1.5mm. Vibration: 3000CPM (any direction for 60mins).将电池用 0.1C 电流充电 16 小时, 然后开路 24 小时, 检查振动前后电池状况。振动幅度 1.5mm, 振动 3000 次。(任意方向振动 60 分钟)。 | Ambient Temperature/ 环境温度: $T_a = 20 \pm 5^\circ C$ |
| Impact Resistance /抗撞击 | | $\Delta V < 0.02V/cell$, ΔRi (Internal Impedance) < 5m Ω /cell 电压变化 < 0.02V/只, 内阻变化 < 5m Ω /只 | Charge at 0.1C for 16 hrs, and then leave for 24hrs, check battery before /after drop. Height: 50cm. Thickness of wooden board: 30mm. Direction is not specified. Test for 3 times 将电池用 0.1C 电流充 16 小时, 开路 1~4 小时, 检查掉落前后电池状况。落体高度 50cm。木板厚度 30mm。任意方向测试 3 次。 | Ambient Temperature/ 环境温度: $T_a = 20 \pm 5^\circ C$ |
| External Short Circuit /短路测试 | | No explosion, but leakage or deformation is allowed /无破裂或爆炸, 但允许漏液或变形 | After charge at 0.1C for 16hrs, short circuit the cell for 1hrs. (The resistance of the inter-connecting circuitry shall not exceed 0.1 Ω .)/将电池 0.1C 充电 16 小时。用 $\leq 0.1\Omega$ 的电阻短路 1 小时。 | Ambient Temperature/ 环境温度: $T = 20 \pm 5^\circ C$ |
| Security Test/安全测试 | | No break nor blast, but allow leakage or deformation /无破裂或爆炸, 但允许漏液或变形 | Discharge the group 0.2C to 0V, and then advance current to 1C. Discharge the group 1C 30 minutes /将电池 0.2C 放电到 0V。然后将电流提高到 1C, 放电 30 分钟。 | Surroundings Temperature/ 环境温度: $T_a = 20 \pm 5^\circ C$ |

4、 CONFIGURATION,DIMENSIONS AND PACKINGS/电池结构、尺寸、包装物

Please refer to the attached drawing. /参见附图

5、 EXTERNAL APPEARANCE/外观

The battery shall be free from cracks, scars, breakage, rust, discoloration, leakage nor deformation. /无裂缝、疤痕、破裂、锈蚀、脏污、漏液、变形。

6、 CAUTION/使用注意事项

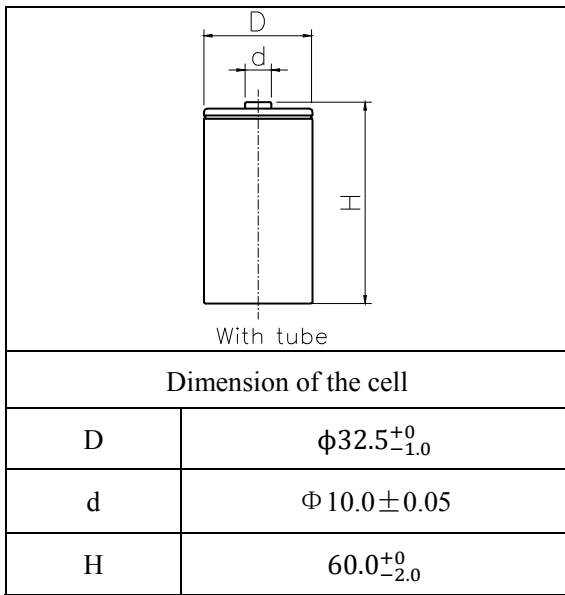
- (1) Reverse charging is not acceptable. / 勿将电池反极充电。
- (2) Charge before use. The batteries are delivered in an uncharged state. / 电池为未充电态，初次使用前先充电。
- (3) Do not charge/discharge with more than our specified current. / 避免以高于指定的电流充放电。
- (4) Do not short circuit the battery Permanent damage to the battery may result. / 防止电池短路，以免造成可能的损坏。
- (5) Do not incinerate or mutilate the battery. / 勿拆解或焚烧电池。
- (6) Do not solder directly to the battery. / 勿在电池上直接焊接。
- (7) The life expectancy may be reduced if the battery is subjected adverse conditions like: extreme temperature, deep cycling, excessive overcharge/ over-discharge. / 如超高温、深度循环、过量的过充、过放电，电池的使用寿命可能会下降。
- (8) Store the battery uncharged in a cool dry place. Always discharge batteries before bulk storage or shipment. / 电池应贮放干爽阴凉处；组合电池或装定前应将电池放电。

Notes:

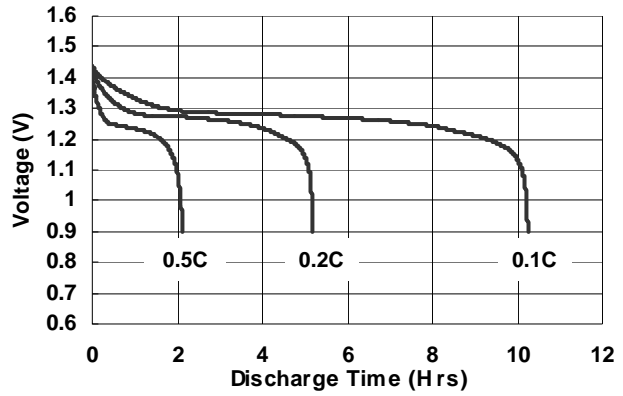
- (1) Ta: Ambient Temperature / 环境温度
- (2) Approximate charge time from discharged state is for reference only. / 以放电态为基准的大致充电时间仅供参考
- (3) If the battery or battery packs are subjected to storage for such a long term more than 3 months ,it is recommended to recharge the battery or battery packs periodically e.g. every 3 months or before the open circuit voltage (OCV) of the battery comes down to 1.1 volts in order to obtain reasonably good capacity recovery and prevent battery performance degradation / 当电池或电池组贮存时间达到3个月，应对其进行周期性的充电，也就是说，每3个月或电池开路电压降到1.1V/只以前，为了得到合理的容量以防止电池性能的下降，应对其进行充电。
- (4) IEC61951-2(2003) 7.4.1.1 Cycle Life:/ 循环寿命

| Cycle No. /循环周次 | Charge/充电 | Rest/搁置 | Discharge/放电 |
|-----------------|---------------|---------|---------------|
| 1 | 0.1C×16h | None | 0.25C×2h20min |
| 2-48 | 0.25C×3h10min | None | 0.25C×2h20min |
| 49 | 0.25C×3h10min | None | 0.25C to 1.0V |
| 50 | 0.1C×16h | 1-4h | 0.2C to 1.0V |

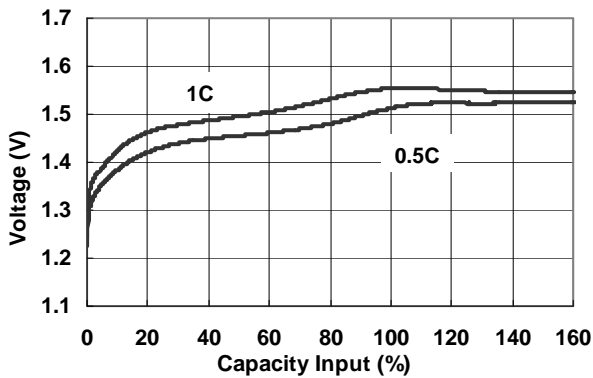
Cycles 1 to 50 shall be repeated until the discharge duration on any 50th cycle becomes less than 3 h



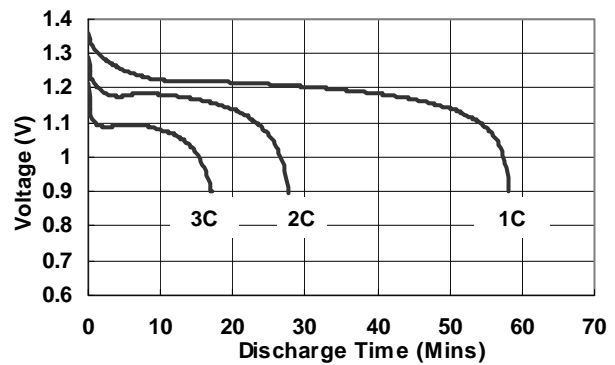
Low Rate Discharge



Fast Charge (Charge Control Required)



High Rate Discharge



1. The information (subject to change without prior notice) contained in this document is for reference only and should not be used as a basis for product guarantee or warranty. For applications other than those described here, please consult supplier.
2. Manufacturer reserves the right to after or amend the design, model and specification without prior notice.

Modification Record Table/变更记录表

| No. | Date/日期 | Modification description/修改描述 | Modification Manager/修改者 |
|-----|------------|-------------------------------|--------------------------|
| 1.0 | 2015.03.02 | New issue. /新文件。 | Li Lun/李伦 |
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