AA Portable Power Corp.

1、 SCOPE

This specification governs the performance of the following Nickel-Metal hydride Cylindrical cell and its stack-up battery。

Model：MH- F13000

Cell Size：F Flat top($\phi 32.1^{\pm 0.2} \times 89.0^{\pm 0.5}$)

F Button Top($\phi 32.1^{\pm 0.2} \times 90.5^{\pm 0.5}$)

2 、DATA OF STACK UP BATTERIES

All data involves voltage and weight to stack-up battery are equal to the value of unit cell time the number of unit cell which consisted in the stack-up batteries

Example ： Stack-up batteries consisting three unit cells

Nominal voltage of unit cell=1.2V

Nominal voltage of stack-up batteries =1.2V×3=3.6V

3、 RATINGS

Description	Unit	Specification	Conditions
Nominal Voltage	V/Cell	1.2	Unit cell
Nominal Capacity	mAh	13000	Standard Charge/Discharge
Standard Charge	mA	1300(0.1C)	T_1=0~45℃(see Note1)
	Hour	14~16	
Quick Charge	mA	3900 (0.3C)	-ΔV=0~5mV/cell or Timer Cutoff=120% nominal capacity or Temp.Cutoff=55℃, T_1=10~45℃
	Hour	4.0approx (see Note 2)	
Trickle Charge	mA	(0.05C)~(0.1C)	T_1=0~45℃
Standard discharge	mA	2600 (0.2C)	T_1= -30~60℃ Humidity：Max.85%
Discharge Cut-off Voltage	V/cell	1.0	
Storage Temperature	℃	-30~65	Discharged state、Humidity、Max.85%
Typical Weight	Gram	238.14	Unit cell

4、 PERFORMANCE

Unless otherwise stated, tests should be done within one month of delivery under the following conditions：

Ambient Temperature ：20±5℃

Relative Humidity ： 65±20%

Notes： Standard Charge/Discharge Conditions：

Charge： 1300mA(0.1C)×14 hours

Discharge：2600 mA(0.2C) to 1.0V/cell

Test	Unit	Specification	Conditions	Remarks
Capacity	mAh	≥13000	Standard Charge Discharge	up to 3 cycles are allowed
Open Circuit Voltage(OCV)	V/cell	≥1.25	Within l hour after standard Charge	
Internal Impedance	mΩ/cell	≤6.5	Upon fully charge(lKHz)	
High Rate Discharge(1C)	minute	≥54	Standard Charge, l hour rest Before discharge by 13000mA (1C)to 1.0V/cell	up to 3 cycles are allowed
Overcharge	/	No leakage nor explosion	1300mA(0.1C)Charge 28 days	
Charge Retention	mAh	≥9100(70%)	Standard Charge, Storage：28 days, Standard Discharge	
IEC Cycle Life	Cycle	≥500	IEC285(1993)4.4.1	(see Note 3)
Accelerated Cycle Life	Cycle	≥400	Charge:3900mA(0.3C) Discharge: 6500mA(0.5C) To 1.0V/cell, End-of:80% nominal Capacity	Cycling charging cut-off condition：-△V=0~5mV/cell and Timer cut –off=110% Nominal capacity Input and Temp.cutoff=55℃
Leakage		No leakage nor deformation	Fully charged at :3900mA(0.3C) for 4.0 hrs Stand for 14 days	
Vibration Resistance		Change of voltage should be under 0.02V/cell,Change of impedance should be under 5 milli-ohm/cell	Charge the battery 0.1C 14hrs,then leave for 24hrs,check battery before/after vibration, amplitude 1.5mm Vibration 3000 CPM Any direction for 60mins.	
Impact Resistance		Change of voltage sho-uld be under 0.02V/cell Change of impedance should be under 5 milli-ohm/cell	Charge the battery 0.1C 14hrs Then leave for 24hrs,check bat-before/after dropped, Height 50cm Wooden board(thickness 30mm) Direction not specified,3 times.	

5、CONFIGURATION, DIMENSIONS AND MARKINGS

Please refer to the attached drawing.

6、EXTERNAL APPEARANCE

The cell/battery shall be free from cracks, scars, breakage, rust, discoloration, leakage nor deformation.

7、WARRANTY

Three months limited warranty against workmanship and material defects.

8、CAUTION

⑴Reverse charging is not acceptable.

⑵Charge before use. The cells/batteries are delivered in an uncharged state.

⑶Do not charge/discharge with more than our specified current.

⑷Do not short circuit the cell/battery Permanent damage to the cell/battery may result.

⑸Do not incinerate or mutilate the cell/battery.

⑹Do not solder directly to the cell/battery.

⑺the life expectancy may be reduced if the cell/battery is subjected adverse conditions like: extreme temperature, deep cycling, excessive overcharge/ over-discharge.

⑻store the cell/battery uncharged in a cool dry place. Always discharge batteries before bulk storage or shipment.

Notes：

⑴ T_1: Ambient Temperature.

⑵ Approximate charge time from discharged state, for reference only.

⑶ IEC285(1993)4.4.1 Cycle Life:

Cycle No.	Charge	Rest	Discharge
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/cell
50	0.1C×16h	1-4h	0.2C to 1.0V/cell
Cycles l to so shall be repeated until the discharge duration on any 50th Cycle becomes less than 3 h.			

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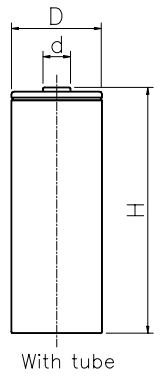
MODEL No: MH-F13000 **Description:**13000mAh F SIZE NI-MH



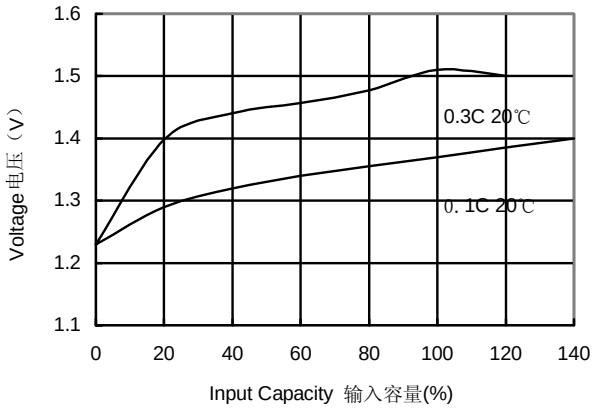
Dimension of the cell

D	Φ32.1±0.2
d	Φ10.0±0.05
H	90.5±0.5

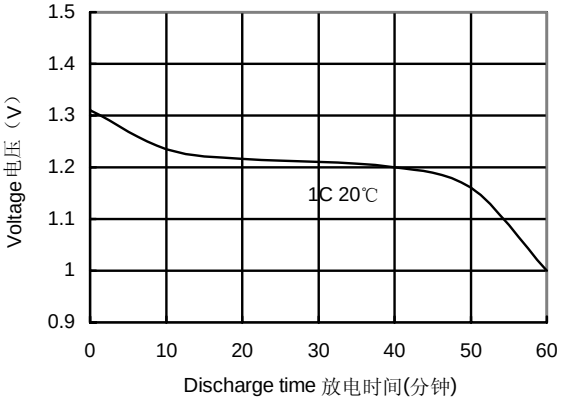
Specification

Nominal Capacity 额定容量		13000 mAh
Nominal Voltage 额定电压		1.2 V
Charge current 充电电流	Standard 标准	1300mA
	Quick 快充	3900 mA
Charge time 充电时间	Standard 标准	14~16 Hrs
	Quick 快充	4.0 Hrs
Ambient Temperature 使用温度	Charge 充电 Standard 标准	0℃~45℃
	Charge 充电 Quick 快充	10℃~45℃
	Discharge 放电	-30℃~60℃
	Storage 储存	-30℃~65℃
Internal Impedance(mΩ) (After Charge)充电后内阻		Max≤6.5
Weight 重量		255g

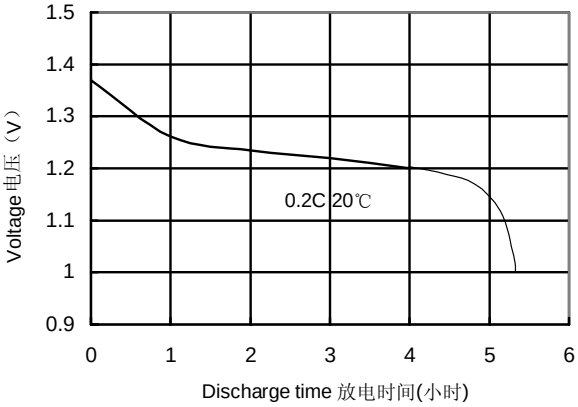
Charge(充 电)



Discharge at high rate(高倍率放电)



Discharge at low rate(低倍率放电)



Charge Retention(荷电保持能力)