

PRODUCT SPECIFICATION

Nickel-Metal Hydride Cylindrical Cell

Type Designation : HR6 (High capacity)

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RECORD OF REVISION

TYPE DESIGNATION: HR6

REV. No.	REASON	CONTENTS	DATE	PREPARE	REMARK
0	Initial Released		2011-10-18	Zheng X.	

1. Scope:

This specification is applicable to the performance of the following PAIRDEER Nickel-Metal Hydride Cylindrical Cell.

2. Law & Regulation Compliances:

This product complies with EU's battery directive (2006/66/EC).

Packaging materials comply with EU's directive on packaging materials and waste (94/62/EC)

3. General:

3.1 Type designation

PAIRDEER HR6 200/210/220/230/240/250/260/270
 GP 200/210/220/230/240/250/260/270 AAH

3.2 Chemical system: Ni /KOH-H₂O/ MH

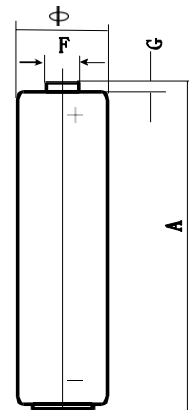
3.3 Nominal voltage: 1.2 V

3.4 Weight: (g)

Designation	HR6 200	HR6 210	HR6 220	HR6 230	HR6 240	HR6 250	HR6 260	HR6 270
Approximate	28	29	30	31	31	32	32	32

3.5 Dimension (mm)

/	min	max
Φ	13.5	14.5
A	49.5	50.5
F	4.2	5.5
G	1.0	/



3.6 Capacity: (mAh)

Designation	HR6 200	HR6 210	HR6 220	HR6 230	HR6 240	HR6 250	HR6 260	HR6 270
Approximate	2000	2100	2200	2300	2400	2500	2600	2700

Remark: Discharged at 0.2C₅, 24h/d, 20°C, e.v.= 1.0V

3.7 Storage Temperature: -20~35°C at discharge state.

4. Appearance

The battery visually inspected by unaided eye 30cm away from battery. The battery shall be free from dents, scratch, rust and extruded internal compounds, such as sealing compounds and etc, and serious displacement of artwork. Appearance defects shall not be observed that may adversely affect actual use or performance of batteries.

5. Electrical Characteristics

Unless otherwise stated, all measurements are to be performed at a **Standard Environment** of

20 ± 2°C
60 ± 15% RH.

All samples are normalized for 8 hours at least at the above environment prior to measurement. The digital voltmeter (DCM) is with the precision of 1mV (internal resistance not less than 1 Megohm).

Notes: Standard Charge/Discharge Condition:

Charge: 0.1C₅ mA × 16hrs Discharge: 0.2C₅ mA to 1.0V/cell
e.g. HR6 200: Charge: 200mA × 16hrs Discharge: 400mA to 1.0V/cell

5.1 Performance:

Test	Unit	Specification	Condition	Remarks
Open Circuit Voltage (OCV)	V	≥ 1.25	Within 1hr after standard charge	Unit cell

5.2 Service Performance

Test	Unit	Specification	Condition	Remarks
Internal impedance(Ri)	mΩ	≤ 50	Upon fully charge (1KHZ)	Unit cell
Standard Discharge (0.2C ₅)	minute	≥ 300	Standard Charge , 1hr rest before discharge	
High Rate Discharge (1C ₅)	minute	≥ 42	Standard Charge , 1hr rest before discharge	
Overcharge	N/A	No leakage nor explosion	0.1C ₅ mA charge for 1yr	
Charge Retention	mAh	≥ 60%C ₅ (e.g. HR6 200: 1200)	Standard charge Storage: 28 days at RT or 7 days at 45°C Standard discharge	
IEC Cycles Test	Cycle	> 500	IEC 61951-2 (2003)	(see note 3)
Accelerated Cycles Life	Cycle	≥ 300	Charge: 0.5C ₅ mA Discharge: 0.5C ₅ mA to 1.0V/cell End of life: 80% of nominal capacity	Cycling charging cut off condition: -ΔV = 0~5V/cell or time cut off = 105% of input capacity

6. Leakage Characteristics

6.1 Over charge leakage test

Samples: 10pcs

Test conditions: Fully charged at 1C₅ mA (e.g. HR6 200: fully charged at 2000mA), stand for 14 days

Requirement: No leakage or deformation.
Criterion: 0/10

7. Security Characteristics

7.1 Short-circuit explosion-proof characteristics

Samples: 10pcs

Test conditions: After standard charge. short circuit the cell at 20+/-2°C until the cell temperature returns to ambient temperature.(The resistance of the inter-connecting circuitry shall not exceed 0.1 ohm.)

Requirement: No fire and No explosion; Leakage/deformation is allowable.

Criterion: 0/10

8. Warranty:

1 year limited warranty against manufacture and material defects.

9. Configurations, Dimensions and Markings:

Please refer to the related drawing.

10. Caution:

1. Batteries should be charged prior to use
2. For charging methods please referred to our technical handbook
3. Use the correct charger for Ni-Cd or Ni-MH batteries
4. Do not reverse charge batteries
5. Do not subject batteries to adverse condition such as extreme temperature, deep cycling and excessive over charge/over discharge.
6. Avoid batteries being used in an airtight compartment. Ventilation should be provided inside the battery compartment, otherwise batteries may generate hydrogen gas, which could cause an explosion if exposed to an ignition source
7. Do not attempt to take batteries apart or subject them to pressure or impact. Heat may be generated or fire may result. The alkaline electrolyte is harmful to eyes and skin, and it may damage clothing upon contact.
8. Keep away from children. If swallowed, contact a physician at once.
9. Do not short circuit batteries, permanent damage to batteries may result
10. Do not incinerate or mutilates batteries, may burst or release toxic material.
11. Do not solder directly to cells or batteries.
12. Store batteries in a cool dry place.
13. If find any noise, excessive temperature or leakage from a battery, please stop its use.
14. When using a new battery for the first time or after long term storage, please fully charge the battery before use
15. When using a new battery in use with semi-used batteries, over-discharge may occur.
16. Do not mix new batteries in use with semi-used batteries, over-discharge may occur.
17. When connecting a battery pack to a charger, ensure correct polarity.
18. When the battery is hot, please do not touch it and handle it, until it has cooled down.
19. Do not remove the outer sleeve from a battery pack nor cut into its housing.
20. When find battery power down during use, please switch off the device to avoid over discharge.

21. Unplug a battery by holding the connector itself and not by pulling at its cord.
22. After use, if the battery is hot, before recharging it, cool it in a well-ventilated place out of direct sunlight.
23. Never put a battery into water or seawater

- Notes:
1. Ta: Ambient Temperature.
 2. Approximate charge time from discharged rate, for reference only.
 3. IEC61951-2(2003) Cycle Life Test:

Cycle No.	Charge	Rest	Discharge
1	0.1C ₅ ×16hrs	none	0.25 C ₅ ×2hrs20mins
2-48	0.25C ₅ ×3hrs10mins	none	0.25 C ₅ ×2hrs20mins
49	0.25C ₅ ×3hrs10mins	none	0.25 C ₅ to 1.0V/cell
50	0.1C ₅ ×16hrs	1-4hr(s)	0.2 C ₅ to 1.0V/cell
Cycle 1 to 50 shall be repeated until the discharges duration on any 50th cycle becomes less than 3hrs			