



ENGLISH

## Datasheet

# High Temperature Rechargeable Nickel-Metal Hydride Cylindrical Battery Pack, 3 cell, 4000mAh



### SPECIFICATIONS:

RS Article: 917-5920		HT18670x3
Nominal Voltage		3.6V
Capacity	Typical	4000 mAh/0.2 CmA
	Minimum	3800 mAh/0.2 CmA
Charge	Standard	0.1 CmA for 16 hrs.
	Rapid	1C for 1.2 hrs.(approx.) (With- $\Delta$ V, Temp., Time charging control)
	Trickle	0.03CmA (1 month)
Maximum Discharge Current		1CmA
Discharge Cut-off Voltage		3.0V
Cycle Life		500 cycles (condition as para 4-3)
Applicable Temperature	Standard Charge	0°C ~+45°C
	Rapid Charge	0°C ~+40°C
	Discharge	-10°C ~+60°C
Storage	Within one year	-20°C ~+25°C
	Within 3 months	-20°C ~+30°C
	Within 1 month	-20°C ~+35°C
Relative Humidity Range		65% $\pm$ 20%
Weight		Approx. 195

## 1. Scope of Application

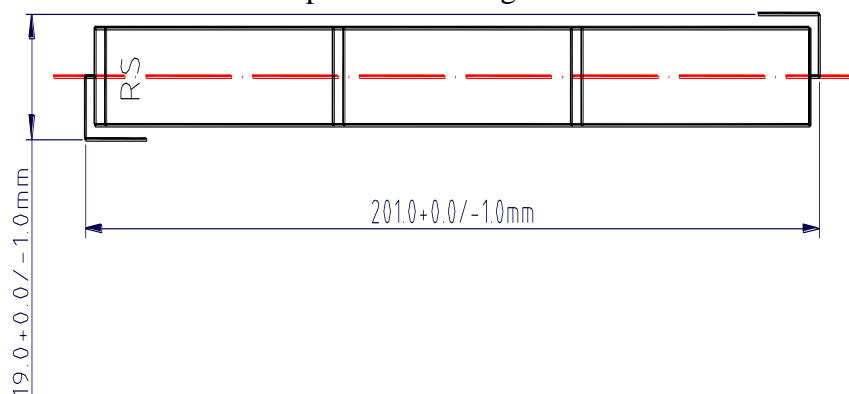
This specification is applied to RS Nickel-Metal Hydride Rechargeable battery pack, HT1870x3.

## 2. General

- |   |  |
|---|--|
| (1) Type                                | : HT18670×3  |
| (2) Nominal Voltage                     | : 3.6 V  |
| (3) Typical Capacity                    | : 4000mAh (0.1CmA for 16hrs/0.2CmA discharge)  |
| (4) Minimum Capacity                    | : 3800 mAh (0.1CmA for 16hrs/0.2CmA discharge)   |
| (5) Standard Charge                     | : 0.1C mA x 16 hrs.  |
| (6) Rapid Charge                        | : 1.0 CmA 1.2 hrs.(Maximum)<br>: (with- $\Delta V$ charging control, - $\Delta V=5\sim 10\text{mV/cell}$ ) |
| (7) Trickle Charge                      | : 0.03 CmA(1 month)  |
| (8) Cycles Life                         | : 500 cycles per Para. 4.3   |
| (9) Maximum Discharge Current           | : 1.0 CmA  |
| (10) Discharge Cut-off Voltage          | : 3.0 V  |
| (11) Applicable Temp. Range             |  |
| Standard Charge                         | : 0°C ~+45°C   |
| Rapid Charge                            | : 0°C ~+40°C   |
| Discharge                               | : -10°C ~+60°C   |
| (12) Storage                            |  |
| Within one year                         | : -20°C ~+25°C   |
| Within 3 months                         | : -20°C ~+30°C   |
| Within 1 month                          | : -20°C ~+35°C   |
| (13) Applicable Relative Humidity Range | : 65%±20%  |
| (14) Weight                             | : approx. 195g   |

## 3. Construction and Design

The battery is consisted of three (3) RS Ni-MH HT18670 cells. The design, construction, and physical dimensions are shown in the product drawing.



## 4. Electrical Characteristics

### 4-1. Terminal Voltage

Open circuit voltage (O.C.V.) shall be 3.75 V (minimum) within two weeks at room temperature after full charge.

### 4-2. Capacity

The battery deliver 4000mAh capacity at 0.1CmA charge rate for 16 hrs, then 0.2CmA discharge rate to 3.0 V. And the capacity of the battery is over 3800mAh at 0.2CmA discharge. The actual capacity depends on the operating temperature and the cycling conditions.

### 4-3. Cycle-life

The battery pack is capable of 500 cycles under the following conditions:

Cycle number	Charge	Rest	Discharge
1	0.10CmA for 16 hrs	0.5hr	0.25CmA for 2 hrs 20 min
2~48	0.25CmA for 3 hrs 10 min	0.5hr	0.25CmA for 2 hrs 20 min
49	0.25CmA for 3 hrs 10 min	0.5hr	0.25CmA to 1.0V/cell
50	0.10CmA for 16 hrs	1.0hr	0.20CmA to 1.0V/cell

50 cycles test as per above table is repeated. The discharge time of the 100th, 200th, 300th, 400th, 500th should be more than 3 hours respectively. After 500 cycles, the capacity is still over 80% of rated capacity. The actual cycle life depends on the operating temperature and cycling conditions.

### 4-4. Overcharge

- (1) The battery is charged at 0.5 CmA for 3 hours. After charging, the battery shows no change in the cell appearance, no leakage, and no fire or explosion.
- (2) The battery is charged at less than 0.03 CmA for a long term (over one month). After charging, the battery shows no change in the cell appearance, no leakage, and no fire or explosion.

### 4-5. Short Test

The battery is fully charged, then shorted by connecting the positive to the negative terminals. The battery discharging is cut off by the fuse. The battery has no leakage observed, no change in the battery appearance, and no fire or explosion.

### 4-6. Self Discharge

- (1) After one-month storage of a fully charged battery at room temperature (25°C), the capacity of battery has 70% of rated capacity, 0.2 CmA discharge to 3.0 V.
- (2) After one-week storage of a fully charged battery at 45°C, the capacity of battery has 70% of rated capacity, 0.2 CmA discharge to 3.0 V.

Welding strength of nickel terminals is tested in perpendicular direction. The welding strengths are over 1 kgf.

#### **4-8. Vibration Test**

Cells are tested as follows:

- |                        |   |
|------------------------|---|
| (1) Amplitude          | : 3.6mm peak to peak  |
| (2) Frequency          | : 1000cpm   |
| (3) Direction and time | : Arbitrary direction continuously for 1 hour.              |
| (4) Performance        | : The cell shall be normality in appearance and no leakage. |

#### **4-9. Shock Test**

Cells are tested as follows:

- |                       |   |
|-----------------------|---|
| (1) Dropping Distance | : 0.45m (spontaneous dropping)                              |
| (2) Shock board       | : Made of hard wood (Thickness is over 10mm)                |
| (3) Dropping Time     | : Arbitrary direction for 3 times.                          |
| (4) Performance       | : The cell shall be normality in appearance and no leakage. |

### **5. Safety Requirement for User**

Please keep in mind the following points when operating, designing, or manufacturing your equipment.

1. Avoid short-circuiting of the battery. Do not connect the positive and the negative terminals with a wire or other metal items, as this will cause a large flow of current through the battery. It may damage the cells in the pack.
2. Do not attempt to take battery apart or subject to pressure or impact. The parts of the battery will be damaged, when the cells in the battery have ruptured, heat may be generated or fire may result. The alkaline electrolyte may harm the skin or eyes or damage clothing upon contact.
3. Do not heat or incinerate the battery. The battery may swell or rupture and it may explode or release alkaline electrolyte.
4. Do not solder directly to the battery. It may damage the battery cell.
5. If any abnormally or problem is found while using the battery, stop its use, and bring it to your local dealer. Please do not attempt to fix or take the battery apart. It may cause dangerous to you.
6. Charge the battery only with a charger specified by RS Battery or with a charger that meets our specified conditions. Charging under other conditions can cause overcharging and loss of charging control, and can cause the battery to leak, overheat, burst, or catch fire.
7. Do not use the battery in a sealed contained. It may cause hazard.

