

# Product specification

## Li-MnO<sub>2</sub> Battery

Battery model: CR14250H

Date of effective: 2020.12.26

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Customer's confirmation	
Company name	
Confirmed by	
Date	

## Revise records

Marks	Revise date	Version No.	Revise page	Revise content
/	2020.12.26	A/0	/	First issue

## 1. Scope

The document applies to CR14250H battery supplied by WUHAN FANSO TECHNOLOGY CO.,LTD. Specify quality, test method, performance, quality assurance and matters need attention.

## 2. Battery type

Lithium Manganese Dioxide battery

No.	Item	Characteristic	Remarks
3.1	Model	CR14250H	
3.2	Nominal voltage	3.0V	
3.3	Standard discharge current	0.5mA	
3.4	Nominal Capacity	950mAh	23±3℃ , 0.5mA constant discharge to 2.0V cut-off.
3.5	Max constant current	7mA	23±3℃ , max current value with 50% normal capacity discharged to 2.0V cut-off
3.6	Max pulse current	70mA	23±3℃ 下, at 0.5mA with discharge depth of 50% normal capacity, at 70mA for 15 seconds, yield battery voltage of no less than 2.0V
3.7	Operating temperature	-40~+75℃	
3.8	Recommend storage	Temperature: 0~30℃ Humidity: <70% RH	
3.9	External dimension	MaxΦ14.5*H25.2	Please refer to enclosed
3.10	Standard weight	Around 11.5g	
3.11	Annual self-discharge rate	≤2%	At 23±3℃ and humidity level <70% RH

## 4.Appearance and structure

### 4.1 Appearance

Cell appearance, no scratch, swelling, deformation, corrosion, electrolyte leakage and other defects.

### 4.2 Structure

CR14250H is the bobbin type

**5. Electrical performance typical value**

Item	Test condition and others	Standard Value
Open Circuit Voltage	23±3°C	≥3.10V
Load Voltage	23±3°C, at the final stage of 1 second with 270Ω	≥2.95V
Slow discharge capacity	23±3°C, 0.5mA, 2.0V cut-off	≥950mAh
Rapid discharge capacity	23±3°C, 2.0mA, 2.0V cut-off	≥800mAh

**6.Safety and environmental performance**

**6.1 Environmental performance**

**6.1.1 Heating cycle test**

Batteries are placed in a test chamber and subjected to the following cycles:

- a= 30min raise to 70±3°C, maintaining 4h.
- b= 30min release to 20±3°C, maintaining 2h.
- c= 30min release to -40±3°C, maintaining 4h.
- d= 30min raise to 20±3°C.
- e=Repeating the sequence for a 9cycles.
- f= after 10 cycles, battery be static placed for 7 days.

Pass/Fail criteria: the samples shall not explode or catch fire. In addition, the samples shall no leakage.

**6.1.2 Altitude Simulation**

Sample batteries are to be stored for 6h at an absolute pressure of 11.6KPa(1.68psi) and a temperature of 20±3°C (68±5°F)

Pass/Fail criteria: The batteries shall be no explosion or catch fire after the test. In addition the samples shall be no vent or leakage.

**6.1.3 Fall test**

Cell drop from 1.9m height onto cement ground (total 10 times).

Pass/Fail criteria: The battery samples shall be no explosion or catch fire. In addition, the samples shall no vent or leakage.

#### 6.1.4 Vibration test

Battery vibration frequency is to be varied at the rate of 1 hertz per minute between 10 and 55 hertz and last for 90 to 100 minutes, test in three mutually perpendicular directions.

Pass/Fail criteria: The battery samples shall be no explosion or catch fire. In addition, the samples shall no vent or leakage.

### 6.2 Safety test

#### 6.2.1 heating

Battery is heated in a gravity convection or circulating air oven. The temperature of the oven is to be raised at a rate of  $5\pm 3^{\circ}\text{C}$  per minute to a temperature of  $130\pm 2^{\circ}\text{C}$  and remain for 10 minutes at that temperature before the test is discontinued.

Pass/Fail criteria: The battery samples shall be no explosion or catch fire.

#### 6.2.2 Impact

A test sample cell was placed on a flat surface. A 5/8 in. (15.8 mm) diameter steel bar was placed across the center of the sample. The length of the bar should be at least as long as the width of the sample. A 20 pound (9.1 kg) weight was dropped from a height of  $24 \pm 1$  in. ( $610 \pm 25$  mm) on to the sample.

Pass/Fail criteria: The samples shall not explode or catch fire.

#### 6.2.3 Crush test

A cell was crushed between two flat hard surfaces (i.e. steel). The crushing was continued until a force of 3000 pounds ( $13\text{kN}\pm 0.78\text{kN}$ ) was applied by hydraulic piston with a diameter of 32mm. Press continued until pressure reach up to 17.2Mpa. Once the maximum pressure was obtained, it was released.

Pass/Fail criteria: The battery samples shall be no explosion or catch fire.

#### 6.2.4 Forced discharge

A completely discharged cell is to be force-discharged by connecting it in series with fully charged cells of the same kind. The number of fully charged cells to be connected in series with the discharged cell is to equal the maximum number less one of the cells to be covered for series use, the circuit load resistance less than  $0.1\Omega$ . The sample is to discharge until a fire or explosion is obtained, or until it has reached a completely discharge state of less than 0.2V and battery case temperature has returned to  $\pm 10^{\circ}\text{C}$  ( $+18^{\circ}\text{F}$ ) of ambient temperature.

Pass/Fail criteria: The samples shall be no explosion or catch fire.

#### 6.2.5 External Short-circuit

Connect the battery positive and negative terminal with Cu wire(internal resistance  $< 0.1$  ohm), battery was discharged until a fire or explosion was obtained, or until it had reached a completely discharged and the cell case temperature had returned to room temperature.

Pass/Fail criteria: The battery samples shall be no explosion or catch fire.

#### 6.2.6 forced recharging

Tested battery is subjected to a charging current of three times of the current specified by the manufacturer by connecting to DC-power. The specified charging current is to be obtained by connecting a resistor of specified size and value.

The test time is calculated from the formula below:

$$T_c = 2.5 * C / (3 * I_c)$$

In which

$T_c$ ——charge time, hour,  $T_c \geq 7$ Hour;

$C$ ——Nominal capacity, Ah;

$I_c$ ——Max. charging current specified by manufacturer.(A)

Pass/Fail criteria: The samples shall be no explosion or catch fire.

### 7.Delivery inspection

FANSO will 100% inspect the open circuit voltage and load voltage of the delivered batteries, and test capacity, appearance and dimensions on a sampling basis for each delivery before shipped out.

**Inspection items, order, sampling method**

No.	Item	Sampling (GB2828.1.2012)	
		QC level	AQL
7.1	Open voltage	II	0.065
7.2	Load voltage	II	0.065
7.3	Appearance	II	1.0
7.4	Dimension	S-1	1.0
7.5	Capacity	As destructive testing, the customer can determine on the basis of the actual situation	

**8.Storage**

Battery should be placed in cool ,dry and clean environment, and the recommended surrounding temperature is 0~30℃ with humidity level of less than 70% RH, far away from the fire and heat source and not contact with corrosive substance.

**9. Usage safety**

9.1 Important Notes

- 9.1.1 Before use, do not remove the battery from the original packaging.
- 9.1.2 Do not scattered placed the battery together in order to avoid accidental short circuit.
- 9.1.3 Do not heat the battery above 80℃ or incinerated.
- 9.1.4 Do not charge or short the battery.
- 9.1.5 Do not mixed with different brand, model or type batteries.
- 9.1.6 Do not mix the new and used batteries.
- 9.1.7 Do not disassembly or open battery.
- 9.1.8 Do not reversely contact the positive and negative terminals.
- 9.1.9 Do not solder directly on the battery surface.
- 9.1.10 Do not test environment and safety under extrusion without any protection.
- 9.1.11 Do not throw the battery to water.

**10.Transportation**

10.1 Batteries should be protected against sunlight, fire, rain, immersion, and corrosive substances in transportation.

## **11. Important Notice**

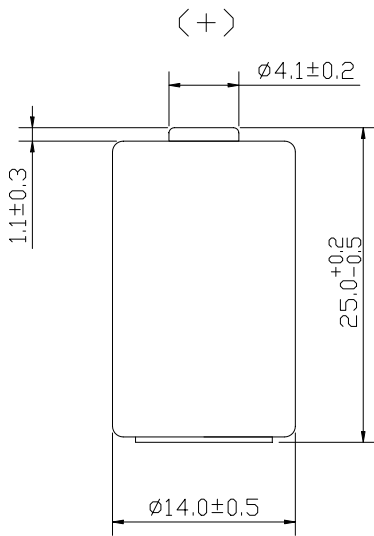
- 11.1 Any complaint should be responded to FANSO within one year from delivery time. If battery found defective within this date, FANSO will offer qualified cells to all FANSO customers during this quality guarantee period.
- 11.2 In practical applications, customer should be responsible for the compatibility and reliability of the battery and the device.
- 11.3 In any of the following circumstances, FANSO will not take any responsibility: the client's fails of appropriate treatment, operation, installation, testing, maintenance and inspection of the battery, or do not follow the instructions provided in the specification, notes, terms, and other FANSO instructions.
- 11.4 This specification is effective after 6 months if not received further questions or response from customer within six months from the date of receipt this datasheet.

## **12 Statement**

Before use FANSO batteries, please operate or use the battery strictly according to the battery datasheet, any misuse may result in safety problem and cause body hurt or property loss. FANSO will not be responsible for any unexpected accident due to misuse or not use according to the specific requirements or important notes written in this specification.



### 13 Product picture



Unit:mm