

LIFE P04 HIGH EFFICIENCY BATTERY



AVAILABLE MODELS 12-24-48V

1. Scope

This specification only applies to the reference battery in this specification and manufactured by

SHENZHEN CERROPOWER CO., LTD.

2. Rating

Item	Rating	Note	
Cell	Type	LiFePO4 Battery	
	Cell Model	LF26700-4.0AH	
	Nominal Capacity	4Ah	Discharge : 0.2C Cut-off Voltage: 2.25V
	Minimum Capacity	4.0 Ah	Discharge : 0.2C Cut-off Voltage: 2.25V
	Nominal voltage	3.2V	
	Internal Impedance	60 mΩ	
	Dimension	Dia 26x70mm	
	Weight	95g	
Battery pack	Pack Method	8S9P	
	Nominal Capacity	36.25 Ah	Discharge : 0.2C Cut-off Voltage:20V
	Minmium Capacity	36.00 Ah	Discharge : 0.2C Cut-off Voltage: 20V
	Nominal Voltage	25.6V	
	Energy	921.60Wh	
	Charge Voltage	29.20V	
	Discharge cut-off voltage	20.00V	
	Charge Method	CC/CV	
	Standard Charge Current	7.2A	
	Max. Charge Current	36.0A	
	Standard Discharge Current	7.2 A	0.2C
	Max. Discharge current	80 A	< 10s
	Cycle Life	2000 Cycles	
	Internal Impedance	100mΩ	
	Dimension	L260.0XW168.50X H 209.0mm	(adjustable)
Output Wire		Red/Black	
Output Connector	M5		

	Weight	Approx.6.85 kgs	Without Case weight
	Working Temperature Range	Charge: 0 °C--45 °C Discharge: -20 °C--60 °C	
	Storage Temperature	-10 °C—45 °C	

3. Protection Circuit

3.1 BMS Parameter

No.	Item	Standard	
1	Charge Current	36A	
2	Discharge Current	80A	
3	Balance Voltage	3.65V±0.05V	
4	Balance Current		
5	Overcharge	Over-Charge Detect Voltage	3.65±0.05V
		Over-Charge Delay Time	1-3S
		Over-Charge Reset Voltage	3.55±0.05V
6	Over-discharge	Over-Discharge Detect Voltage	2.5±0.1V
		Over-Discharge Delay Time	1-3S
		Over-Discharge Reset Voltage	2.7±0.01V
7	Over-current	Over-Current Detect Current	108A
		Over-Current Delay Time	500ms
		Reset	Release load
8	Short Circuit	Detect Status	External Short Circuit
		Delay Time	100us
		Reset	Release load
9	Standby Current	25uA type, max.32uA	
10	Resistance	≤15mΩ	

4. Appearance

It shall be free from any defects such as remarkable scratches, breaks, cracks, discoloration, leakage, or deformation, and it shall be clean and have equality and product value.

5. Performance

5.1 Standard Test Condition

The battery shall be evaluated within 1 month from the arrival date.

Unless otherwise stated in these specifications, the following test shall be carried out in an ambient temperature of $20\pm 5^{\circ}\text{C}$, relative humidity of $65\pm 20\%$

Discharge capacity when the battery is discharged at 0.2C to 19.25V after being standard charged. Five cycles are permitted for this test. The test shall be terminated at the end of the first cycle which meets the requirement.

5.2 Testing Instrument or Apparatus

5.2.1 Dimension Measuring Instrument

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.01mm specified.

5.2.2 Voltmeter and Ammeter

Voltmeters and ammeters shall be equal or more precision instruments of $10\text{K}\Omega/\text{V}$ and 0.01Ω .

5.2.3 Impedance Meter

Impedance shall be measured by a sinusoidal alternating current method (1kHz LCR meter)

5.3 Standard Charge

Standard charge means charging for 6hours using 29.20V/5A charger

5.4 Standard Discharge

Standard discharge means discharging at 0.2C down to 20.00V

5.5 Electrical Performance

Item	Condition	Specification
Open-Circuit Voltage	The open-circuit voltage shall be measured within 24hours after standard charge	$\geq 27.20\text{V}$
Internal Impedance	The impedance shall be measure in an alternating current method (1kHz LCR meter) after standard charge at $20\pm 5^{\circ}\text{C}$	$\leq 100\text{m}\Omega$
Battery Capacity 1	The discharge time at 0.2C shall be measured after standard charge at $20\pm 5^{\circ}\text{C}$ and rest 25mins	$\geq 250\text{min}$
Battery Capacity 2	The discharge time at 36A shall be measured after standard charge at $20\pm 5^{\circ}\text{C}$ and rest 25mins	$\geq 48\text{min}$
Cycle Life	The discharge time on standard discharge shall be measured after 500 cycles of standard charge and discharge at $20\pm 5^{\circ}\text{C}$	$\geq 240\text{min}$
Charge(capacity) retention	The discharge time at 0.2C shall be measured after standard charge and then storage at $20\pm 5^{\circ}\text{C}$ for 28days	$\geq 240\text{min}$
Temperature Characteristic1	After standard charging at $20\pm 5^{\circ}\text{C}$, laying the battery at 55°C for 4hour, then discharge at 0.2C to 20V, record the discharge time	$\geq 240\text{min}$
Temperature Characteristic2	After standard charging at $20\pm 5^{\circ}\text{C}$, laying the battery at -10°C for 4hour, then discharge at 0.2C to 20V, record the discharge time	$\geq 210\text{min}$

6. Mechanical Performance

Item	Condition	Specification
Crush Test	A battery is to be crushed between two flat surfaces. The force for the crushing is to be applied by a hydraulic ram with a 32mm diameter piston. The crushing is to be continued until a pressure reading of 17.2mmPa is reached on the hydraulic ram, applied force of 13kN. Once the maximum pressure has been obtained it is to be released.	No fire, No explosion
Drop Test	The battery has only two axes of symmetry in which case only two directions shall be tested. The battery is to be dropped from a height of 1 meter twice onto concrete ground.	No explosion, No fire, No smoke
Vibration	A full-charged battery is to be subjected to simple harmonic motion with an amplitude of 1.6mm total maximum excursion. The frequency is to be varied at the rate of 1 hertz per minute between 10 and 55 hertz. The cell shall be vibrated for 25 minutes per axis o XYZ axes.	No leakage, No Fire, No explosion

7. Safety Performance

Item	Condition	Specification
Over charge	At $20\pm 5^{\circ}\text{C}$, charging battery with constant current 1C to voltage 35V, then with constant voltage 35V till current decline to 0.	No explosion, No fire
Over discharge	At $20\pm 5^{\circ}\text{C}$, the cell are fully charged with standard charging method and standby at least 1hour. The cell should be discharged at a current of 1C for 2.5h.	No explosion, No fire
Short-circuit	At $20\pm 5^{\circ}\text{C}$, The cells are fully charged with standard charging method and standby at least 1hour. Positive and negative terminal connect with wire (maximum load of 50m Ω) to cause short circuit until its voltage is lower than 0.1V or cell temperature on the surface is back to room temperature $\pm 10^{\circ}\text{C}$.	No explosion, No fire The temperature of the surface of the cell are lower than 150°C
Heating	Battery is heated in a circulating air oven at a rate of $5\pm 2^{\circ}\text{C}$ per mins to 125°C , an then placed 25 mins at 125°C	No explosion, no fire

8. Delivery Conditon

Approx. 50%-30% charged

10. Period of Warranty

The period of warranty is one year from the date of shipment. CERROPOWER guarantees to give a replacement in case of battery with defects proven due to manufacturing process instead of the customer abuse and misuse.

11. Warnings

To prevent the possibility of the battery from leaking, heating, fire, Please READ this specification carefully before usage and observe the following precautions:

- Ⓞ When recharging, use the lithium battery charger specifically for that purpose
- Ⓞ Do not strike battery with any sharp edge parts, such as Ni-tabs, pins and needles
- Ⓞ Do not immerse the battery in water and seawater
- Ⓞ Do not use and leave the battery near a heat source as fire or heater
- Ⓞ Do not reverse the position and negative terminals
- Ⓞ Do not connect the battery to an electrical outlet
- Ⓞ Do not discard the battery in fire or heat it
- Ⓞ The battery tabs are not so stubborn especially for aluminum tab. Do not bend tab.
- Ⓞ Do not short-circuit the battery by directly connecting the positive and negative terminal with metal object.
- Ⓞ Do not transport and store the battery together with metal objects such as necklaces, hairpins etc.
- Ⓞ Do not directly solder the battery and pierce the battery with a nail or other sharp object.

12. Battery operation instruction

12.1 Charging

Charging current: Do not surpass the biggest charging current which in this specification.

Charging voltage: Do not surpass the highest voltage which in this specification.

Charge temperature: The charge temperature is in according to this specification.

12.2 Discharging

Discharge current: Do not surpass the biggest discharge current which in this specification.

Discharge voltage: Do not be less than the lowest voltage which is in this specification.

Discharge temperature: The discharge temperature is in according to this specification,

12.3 Over-discharges

After the short time excessively discharges charges immediately cannot affect the use, but the long time excessively discharges can cause the battery the performance, battery function losing. The battery long-term has not used, has the possibility to be able to be at because of its automatic flashover characteristic certain excessively discharges the condition, for prevented excessively discharges the occurrence, the battery should maintain the certain electric quantity.

12.4 Storing the Batteries

The battery should store in the product specification book stipulation temperature range. If has surpasses above for six months the long time storage, suggested you should carry on additional charge to the battery.

12.5 Please do not continuously charge the battery over 8hours.

13. Others

- ©The customer is requested to contact CERRO POWR in advance, if and when the customer needs other applications or operating conditions than those described in this document. Additional experimentation may be required to verify performance and safety under such conditions.
- ©CERRO POWER will take no responsibility for any accident when the battery is used under other conditions than those described in this Document.
- ©CERRO POWER will inform, in a written form, the customer of improvement(s) regarding proper use and handing of the battery, if it is deemed necessary.