

Pro Power 12V Lithium Ion LiFePo4 Battery Specification

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Battery Pack / Cell specification

		50AH	100AH	150AH	200AH	
PACK	Combination method	3P4S	6P4S	9P4S	12P4S	
	Capacity (0.5C)	51000mah	102000mah	153000mah	204000mah	
	Nominal voltage	12.8V	12.8V	12.8V	12.8V	
	Max. charge voltage	14.6V	14.6V	14.6V	14.6V	
	Discharge cut-off voltage	10V	10V	10V	10V	
	Max Charge current	25A	50A	75A	100A	
	Max Working current	100A	200A	300A	400A	
	Pack Impedance standard	1S≤55mΩ	1S≤55mΩ	1S≤55mΩ	1S≤55mΩ	
	Weight (Approx.)	6.80 kg	12.75kg	22.20 kg	33.75 kg	
	Max. dimension (LxWxH) (mm)	197*165*168	350*170*180	485*170*245	530*240*220	
	Operating temperature	Charge temperature	0°C~45°C	0°C~45°C	0°C~45°C	0°C~45°C
		Discharge temperature	-15°C~60°C	-15°C~60°C	-15°C~60°C	-15°C~60°C
	Single cell over-charge cut-off voltage		3.85V	3.85V	3.85V	3.85V
	Warranty		3 Years	3 Years	3 Years	3 Years

CELL	Model	3.2V17AH
	Capacity (0.5C)	17000mah
	rated voltage (V)	3.2V
	Typical Impedance (mΩ)	≤55mΩ
	Battery material	LiFePO4
	over-charge release voltage	3.65V
	Single cell under-discharge cut-off voltage	2.5V
	Discharge release voltage	2.5V
	Over-discharge cut-off current	120a
	Over-discharge cut-off current delay	1.5S
	Short-circuit protection	Yes
	Short-circuit protection delay	500uS
	Condition for the recovery of over-current and Short-circuit	remove load, auto recover
	Balance current	45mA
	Balance Condition	3.65V

Test Conditions

Standard Test Conditions

Test should be conducted with new batteries within one week after shipment from our factory and the cell shall not be cycled more than five times before the test. Unless otherwise specified, test and measurement shall be done under temperature of $20\pm 5^{\circ}\text{C}$ and relative humidity of 45~48%.if

it is judged that the test results are not affected by such conditions, the tests may be conducted at temperature 15~30°C and humidity 25-85%R.H.

- Measuring Instrument or Apparatus
 - Dimension Measuring Instrument

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

Voltmeter

Standard class specified in the national standard or more sensitive class having inner impedance more than $10\text{k}\Omega/\text{V}$.

- Ammeter

Standard class specified in the national standard or more sensitive class. Total external resistance including ammeter and wire is less than 0.01Ω .

- Impedance Meter

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

- Standard Charge/Discharge
 - Standard charge: Test procedure and its criteria are referred as follows:
0.2C5A= Charging shall consist of charging at a 0.5 C5A constant current rate until the cell reaches 14.6V. The cell shall then be charged at constant voltage of 14.6 volts while tapering the charge current. Charging shall be terminated when the charging current has tapered to 0.02 C5A. Charge time: Approx. 6.0h, The cell shall demonstrate no permanent degradation when charged between 0°C and 45°C .
 - Standard Discharge: 0.2 C5A= Cells shall be discharged at a constant current of 0.2 C5A to 10.0 volts @ $20^{\circ}\text{C}\pm 5^{\circ}\text{C}$.
 - If no otherwise specified, the rest time between Charge and Discharge amount to 30min.

Appearance, Initial Performance Test

Initial Performance Test

Item	Test Method and Condition	Requirements
Open-Circuit Voltage	The open-circuit voltage shall be measured within 24 hours after standard charge.	$\geq 14.6V$
Internal impedance	Internal resistance measured at AC 1KHz after 50% charge.	$1S \leq 55m\Omega$
Minimal Rated Capacity	The capacity on 0.2C5A discharge till the voltage tapered to 10.0V shall be measured after rested for 30min then finish standard charge.	Discharge Capacity $\geq 49950mAh$

Cycle Life and Leakage-Proof

No.	Item	Criteria	Test Conditions
1	Cycle Life (0.5 C5A)	Higher than 70% of the Initial Capacities of the Cells	Carry out 1500 cycle Charging/Discharging in the below condition. <ul style="list-style-type: none"> • Charge: Standard Charge • Discharge:0.5 C5A to 10.0V • Rest Time between charge/discharge:30min. • Temperayure:20±5°C
2	Leakage-Proof	No leakage (visual inspection)	After full charge with standard charge, store at 60±3°C,60±10%RH for 1 month.

Mechanical characteristics and Safety Test
 (Mechanical characteristics)

No.	Item	Test Method and Condition	Criteria
1	Vibration Test	After standard charging, fixed the cell to vibration table and subjection cycling that the frequency is to be varied at the rate of 1Hz per minute between 10Hz an 55Hz,the excursion of the vibration is 1.6mm.The cell shall be vibrated for 30minutes per axis of XYZ axes.	No leakage No fire
2	Drop Test	The cell is to be dropped from a height of 1 meter twice to concrete ground.	No explosion, No fire, no leakage.

Item	Battery Condition	Test Method	Requirements
Crush	Fresh, Fully charged	Crush between two flat plates. Applied force is about 13kN(1.72Mpa) for 30min.	No explosion, No fire
Short Circuit	Fresh, Fully charged	Each test sample battery, in turn, is to be short-circuited by connecting the (+)and (−) terminals of the battery with a Cu wire having a maximum resistance load of 0.1Ω. Test are to be conducted at room temperature (20°C±2°C).	No explosion, No fire.The Temperature of the surface of the Cells are lower than 150°C
Short Circuit	Fresh,Fully charged	Each test sample battery, in turn,is to be short-circuited by connecting the (+)and (−)	No explosion, No fire. The

		terminals of the battery with a Cu wire having a maximum resistance load of 0.1Ω. Test are to be conducted at temperature (60°C±2°C).	Temperature of the surface of the Cells are lower than 150°C
Impact	Fresh, Fully charged	A 56mm diameter bar is inlaid into the bottom of a 10Kg weight. And the weight is to be dropped from a height of 1m onto a sample battery and then the bar will be across the center of the sample.	No explosion, No fire
Forced Discharge	Fresh, Fully charged	Discharge at a current of 1 C5A for 2. 5h.	No explosion, No fire
Nail Pricking 3mm	Fresh, Fully charged	Prick through the sample battery with a nail having a diameter of 3mm and remain 2h.	No explosion, No fire