PARAGON ENERGY

EnergyWall
LiFePo4 Battery Specification & Testing Sheets

Model: LFP48200

Version: V:003
Dated:2022-01-25

1. General Information

This specification is designed for the 48V 200AH battery pack, and describes its dimensions, characteristics, technical requirements and precautions for use.

2. Battery Specifications（@ 25±5℃）

No.	Item		Characteristics
System specifications			
2.1	Battery cell		3.2V 50AH, Prismatic
2.2	Nominal capacity		200AH
2.3	Nominal energy		9.6KWh
2.4	Nominal pack voltage		48V
2.5	Voltage range		37.5V-54.75V
2.6	Internal resistance		≤22mΩ @1kHz AC
2.7	Cell wiring method		15 Series 4 Parallel
2.8	Normal charge voltage		54.75±1V
2.9	Float charge voltage		54.75±1V
2.10	Maximum charge current		120A
2.11	Recommended charge current		≤100A
2.12	Continuous discharge current		100Adc (optional: 160A)
2.13	Maximum discharge current		120Adc (optional: 200A)
2.14	Cut-off voltage		37.5±1V
2.15	Display method and language		LCD，English
2.16	Communication method		CAN and RS485
2.17	Cell cooling method		Natural cooling
2.18	BMS maximum connections		Maximum 14 units connected in parallel (134.4 KWh)
2.19	BMS cooling method		Natural cooling
2.20	Dimensions [Inches]		Width 19-1/2 [±1/4]
			Height 7-3/8 [±1/4]
			Length 26-5/8 [±1/4]
2.21	IP rating		IP21
2.22	Weight		~235 lbs [±15]
2.23	Operating temperature	Charge	0～50℃
		Discharge	-20～60℃
2.24	Self-discharge rate	Residual capacity	≤3%/Month; ≤15%/ year
		Recover capacity	≤1.5%/Month; ≤8%/ year
2.25	Storage environment	≤1month	-20～+65℃、5～75%RH

		≥3month	-10～+45℃、5～75%RH
		Recommend environment	15～35℃、5～75%RH

3. Electrical Characteristics & Test Conditions

Testing Conditions: Ambient Temperature: 25±5℃; Humidity: 45%~75%.

Normal charge: Charge battery under CC(0.5C)/CV(54.75V) mode until over charge protection or the charge current reduce to 0.05C, and then rest for 1h.

No.	Item	Value		Condition
3.1	Normal Capacity	200AH		After Normal charge, discharge @0.33C current to the end of discharge voltage.
3.2	Internal Impedance	≤22mΩ		@50% SOC @1kHz AC internal resistance test instrument.
3.3	Short circuit protection	Auto cut off load when short circuit		Connect the positive and negative of this battery pack through a lead with 0.1Ω resistance.
3.4	Cycle life @DOD100%	≥6000 cycles		After Normal charge，discharge @0.5C current to the end of discharge voltage. Repeat above process until discharge capacity reduce to 80% of initial value.
3.5	Discharge temperature characteristic @0.2C	-20℃(6h)	≥60%	$\frac{\text{Capacity @specified temperature}}{\text{Capacity @ 25℃}}$ equals percentage according to value
		0℃(6h)	≥80%	
		25℃(4h)	≥100%	
		55℃(4h)	≥95%	
3.6	Capacity retention rate	Remaining capacity ≥96%		After normal charge, store the battery @25±5℃ for 28 days, then discharge capacity @0.2C, retention capacity equals the given value

4. Circuit Protection (BMS Protection parameters)

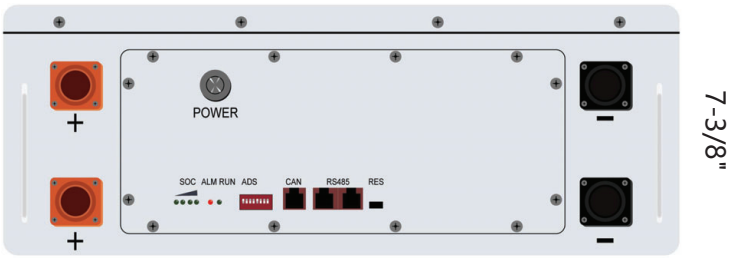
Battery units are supplied with a LiFePo4 Battery Management System (BMS) that can monitor and optimize each individual prismatic cell during charge & discharge, to protect the battery pack from overcharge, over discharge & short circuit. Overall, the BMS helps to ensure safe and accurate running.

No.	Item	Content	Value
4.1	Over charge	Over-charge protection Alarm for each cell	3.55±0.05V
		Over-charge protection for each cell	3.65±0.05V
		Over-charge protection delay time	0.5~1.5s
		Over-charge release for each cell	3.5±0.05V
		Over-charge protection Alarm for system	53.25±1V
		Over-charge protection for system	54.75±1V
		Over-charge protection delay time	0.5~1.5s

		Over-charge release for system	52.5±1V
		Over-charge release method	Under the release voltage, then 60s
4.2	Over discharge	Over-discharge alarm for each cell	2.80±0.05V
		Over-discharge protection each cell	2.50±0.05V
		Over-discharge protection delay time	0.5~1.5s
		Over-discharge release for each cell	3.00±0.05V
		Over-discharge alarm for system	42±1V
		Over-discharge protection system	37.5±1V
		Over-discharge protection delay time	0.5~1.5s
		Over-discharge release for each cell	45±1V
		Over-discharge release method	Higher the release voltage, then 60s
4.3	Over current	Charge over current protection alarm	110±10A
		Charge over current protection	120±10A
		Charge over current protection delay time	0.5~1.5s
		Charge over current release method	Auto release after 1min
		Discharge over current protection alarm	110±10A
		Discharge over current protection	120±10A
		Discharge over current protection delay time	0.5~1.5s
		Discharge over current release	Auto release after 1min
		Short circuit protection	Yes
		Short circuit protection release	Cut-off load or exchange fuse
4.4	Temperature	Charge over temperature protection	Protect@55±3℃; Release@50±3℃;
		Charge under temperature protection	Protect@0±3℃; Release@5±3℃
		Discharge over temperature protection	Protect@65±3℃; Release@60±3℃;
		Discharge under temperature protection	Protect@-20±3℃; Release@-15±3℃;

5. User guide

5.1 Product dimension



5.2 Transportation & Storage

If the battery is to be stored for longer than three months, it should be stored in a dry and cool place. The pack's storage voltage should be between 48.0V-49.0V at a temperature of 25±2℃ and a humidity of 45%-75%. If batteries are to be stored for longer that 3 months, a cycle and recharge will be required. Ensure that the battery voltage is within the above range.

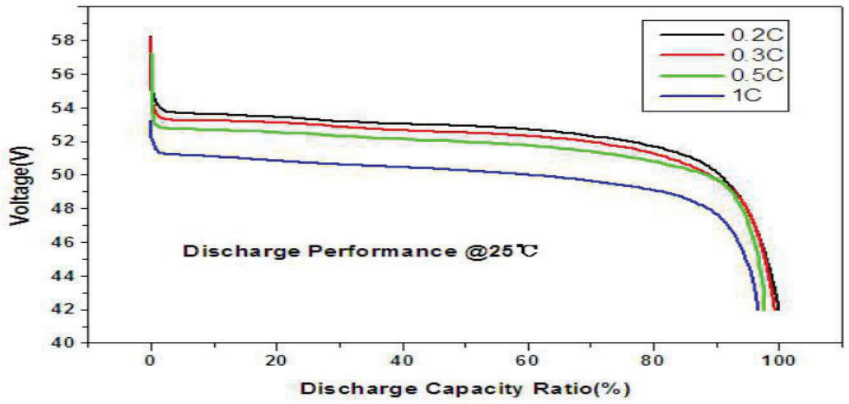
DO NOT DROP BATTERY, DO NOT STACK MORE THAN 6 HIGH, STORE FACE UP.

5.3 Warning & Tips.

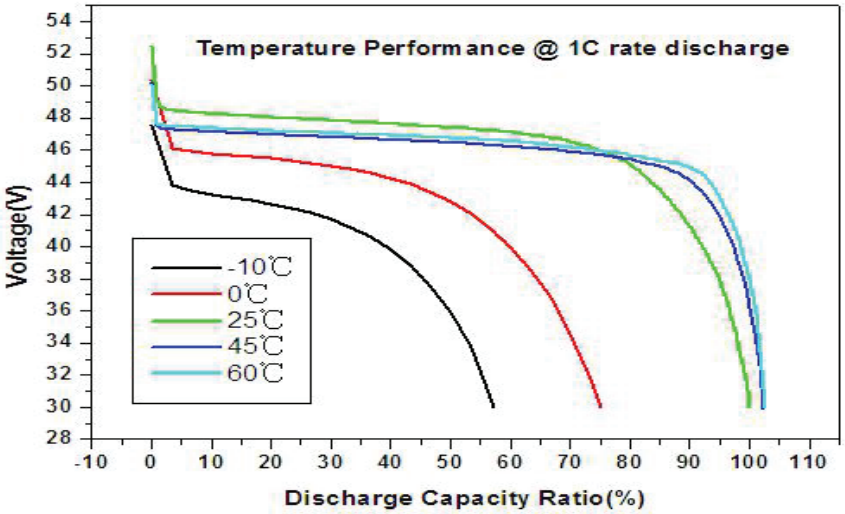
Please read the specifications and warning signs on the surface of the battery box carefully before using the battery. Improper use of the battery may cause overheating and damage of the battery. Rosen Solar Energy Co., Ltd. will not bear any responsibility for any accident caused by the operation not in accordance with the specifications. In order to ensure the safe use and handling of the battery, please read the operation instructions carefully before using

6. Testing Report Curve

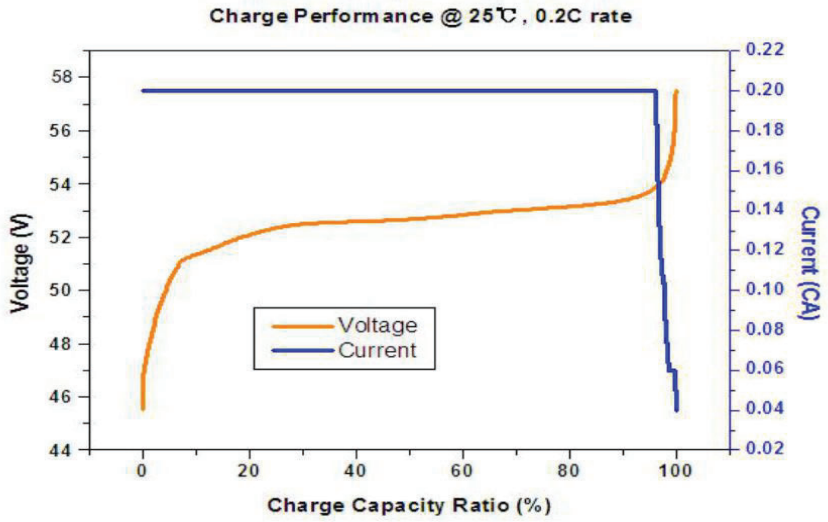
6.1 Discharge Curve-C rate



6.2 Discharge Curve-1C



6.3 Charge Curve-0.2 C



6.4 Cycle life over 6000 times –0.5 C standard