



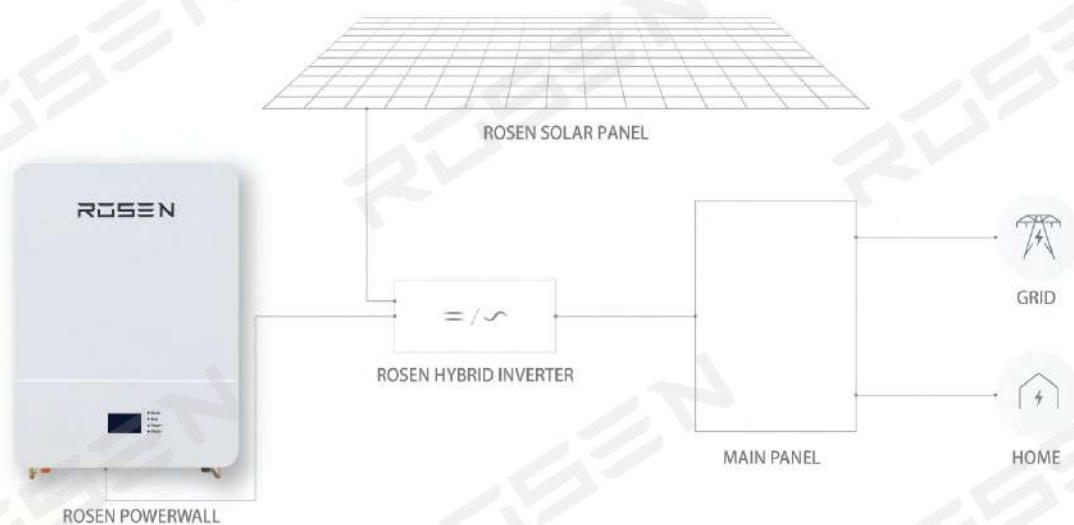
Rosen Solar Energy Co., Ltd.

Powerwall LiFePo4 Battery Specification

Model: LFP48V100AH

Modified Record

Revision	V.006	Draft	Chuanjun Bao
Date	2021-09-23	Checked	Chuanqiang Yao
File No.	LF48100-210901	Approved	Jack Tian





1. General Information

This specification is suitable for the 48v 100ah battery pack, and describes its dimensions, characteristics, technical requirements and precautions for use.

2. Battery Specification (@ 25±5℃)

NO	Items		Characteristics
System specification			
2.1	Battery Cell		3.2V 50AH, Prismatic, LiFePo4
2.2	Nominal capacity		100AH
2.3	Total energy		4.8KWh
2.4	Nominal voltage		48Vdc
2.5	Cell compose method		15S2P
2.6	End of discharge voltage		40.5V
2.7	Charging voltage		52.5~54.75V
2.8	Max. charging current		100Adc
2.9	Max. discharging current		100Adc
2.10	Max. power		4800W
2.11	Pulse discharge current		150A@1S
2.12	Display method and language		LCD, English
2.13	Communication interface		CAN and RS485
2.14	BMS parallel supports		Yes, Max. 14units
2.15	BMS series support		Not support
2.16	Cooling method		Natural cooling
2.17	Dimension		W 495±5mm
			H 190±5mm
			L 680±5 mm
2.18	IP rating		IP21
2.19	Net Weight		About 67 Kg
2.20	Cycle life (80% DOD, 25℃)		≥6000 times
2.21	Life time(25℃)		10 years
2.22	Protection		Over voltage, Low voltage, Over current, Over temperature, Low temperature, Short circuit.
2.23	Operation Humidity		0~95% RH (No condensing)
2.24	Operation temperature	Charge	0~50℃
		Discharge	-15~55℃
2.25	Self-discharge rate	Residual capacity	≤3%/Month; ≤15%/ Year
		Recover capacity	≤1.5%/Month; ≤8%/ year



3. Electrical Characteristics & Test Condition

Testing Conditions: Environment Temperature: $25\pm 5^{\circ}\text{C}$; Humidity: 45%~75%.

Normal charge: Charge battery under CC(0.5C)/CV(54V) mode until over charge protection or the charge current reduce to 0.05C, and then rest for 1h.

NO	Items	Criterion		Condition
3.1	Normal Capacity	100AH		After Normal charge, discharge @0.33C current to the end of discharge voltage.
3.2	Internal Impedance	$\leq 22\text{m}\Omega$		@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	≥ 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	-15°C (6h)	$\geq 60\%$	$\frac{\text{Capacity @specified temperature}}{\text{Capacity @ } 25^{\circ}\text{C}}$ the percentage accord with criterion
		0°C (6h)	$\geq 80\%$	
		25°C (4h)	$\geq 100\%$	
		55°C (4h)	$\geq 95\%$	
3.6	Capacity retention rate	Remain capacity $\geq 96\%$		After normal charge, store the battery @ $25\pm 5^{\circ}\text{C}$ for 28days, then discharge capacity @0.2C, the retention capacity accord with criterion.

4. Circuit Protection

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

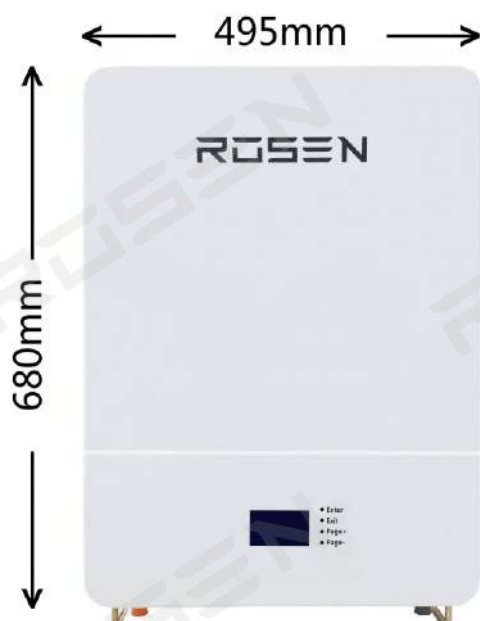
No	Item	Content	Criterion
4.1	Over charge	Over-charge protection Alarm for each cell	$3.5\pm 0.05\text{V}$
		Over-charge protection for each cell	$3.65\pm 0.05\text{V}$
		Over-charge protection delay time	0.5~1.5s
		Over-charge release for each cell	$3.4\pm 0.05\text{V}$
		Over-charge protection Alarm for system	$52.5\pm 0.5\text{V}$
		Over-charge protection for system	$54.75\pm 0.5\text{V}$
		Over-charge protection delay time	0.5~1.5s
		Over-charge release for system	$51\pm 0.5\text{V}$
		Over-charge release method	Under the release voltage than 60s
4.2	Over discharge	Over-discharge alarm for each cell	$2.90\pm 0.05\text{V}$
		Over-discharge protection each cell	$2.70\pm 0.05\text{V}$



		Over-discharge protection delay time	0.5~1.5s
		Over-discharge release for each cell	3.0±0.05V
		Over-discharge alarm for system	43.5±0.5V
		Over-discharge protection system	40.5±0.5V
		Over-discharge protection delay time	0.5~1.5s
		Over-discharge release for each cell	45±0.5V
		Over-discharge release method	Higher the release voltage than 60s
4.3	Over current	Charge over current protection alarm	100±5A
		Charge over current protection	120±5A
		Charge over current protection delay time	0.5~1.5s
		Charge over current release method	Auto release after 1min
		Discharge over current protection alarm	100±5A
		Discharge over current protection	120±5A
		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 download or exchange fuse
4.4	Temperature	Charge over temperature protection	Protect@55±3℃; Release@50±3℃;
		Charge under temperature protection	Protect@-10±3℃; Release@5±3℃
		Discharge over temperature protection	Protect@55±3℃; Release@50±3℃;
		Discharge under temperature protection	Protect@-15±3℃; Release@-0±3℃;

5. User guide

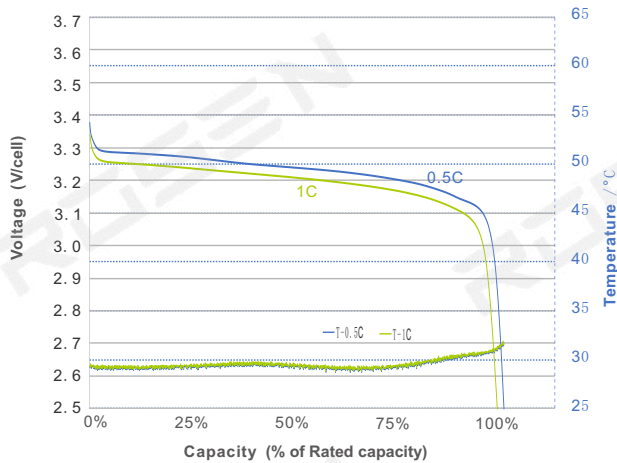
5.1 Product dimension(mm)



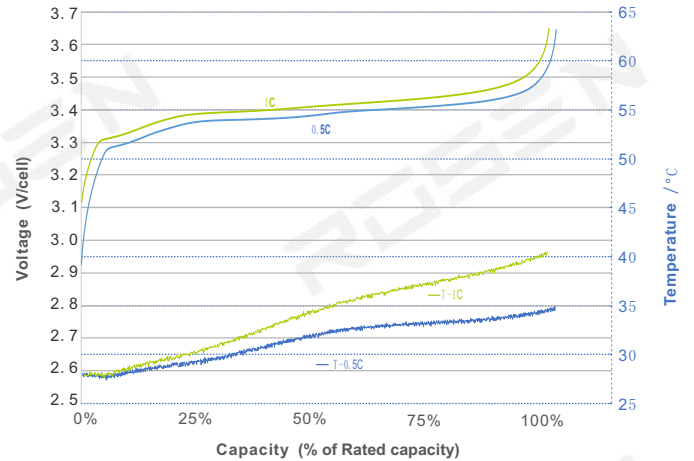


48V POWERWALL LITHIUM BATTERY

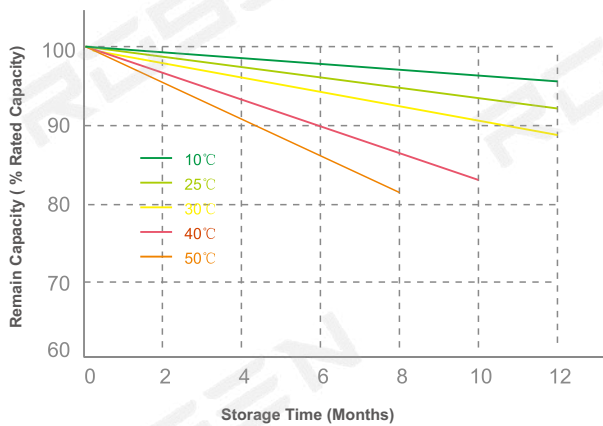
Different Discharge Rate and Temperature Characteristic



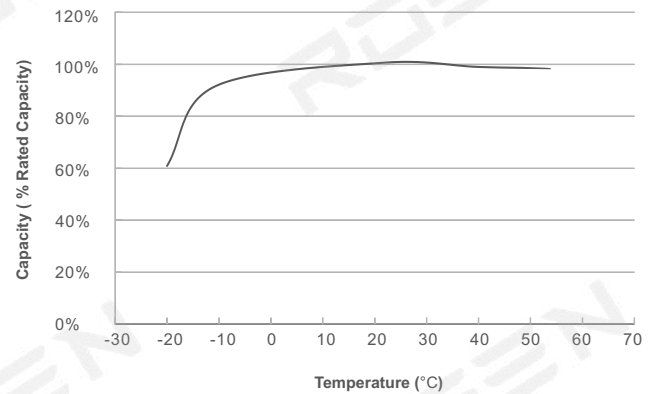
Different Charge Rate and Temperature Characteristic



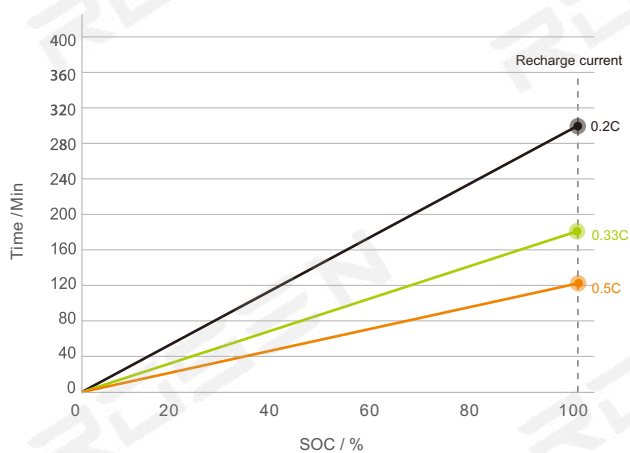
Different Temperature Self Discharge Curve



Capacity with Different Temperature



Typical Recharge Time



Typical Cycle Life

