

## 1. General Information

This specification is suitable for the 48v 200ah battery pack, and describes its dimensions, characteristics, technical requirements and precautions for use.

## 2. Battery Specification (@ 25±5°C)

NO	Items	Characteristics
<b>System specification</b>		
2.1	Battery Cell	3.2V 50AH, Prismatic, LiFePo4
2.2	Nominal capacity	200AH
2.3	Total energy	9.6KWh
2.4	Nominal voltage	48Vdc
2.5	Cell compose method	15S4P
2.6	End of discharge voltage	40.5V
2.7	Charging voltage	52.5~54.75V
2.8	Max. charging current	100A <sub>dc</sub>
2.9	Max. discharging current	150A <sub>dc</sub>
2.10	Max. power	9600W
2.11	Pulse discharge current	200A@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±5mm
2.18	IP rating		IP21
2.19	Net Weight		About 96 Kg
2.20	Cycle life (80% DOD, 25°C)		≥6000 times
2.21	Life time( 25°C)		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°C
		Discharge	-15~55°C
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: Ambient Temperature:  $25\pm 5^{\circ}\text{C}$ ; 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	Items	Criterion	Condition
3.1	Normal Capacity	200AH	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 $0.1\Omega$ resistance.
3.4	Cycle life	$\geq 6000$ 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 $^{\circ}\text{C}$ (6h)	$\geq 60\%$
		0 $^{\circ}\text{C}$ (6h)	$\geq 80\%$
		25 $^{\circ}\text{C}$ (4h)	$\geq 100\%$
		55 $^{\circ}\text{C}$ (4h)	$\geq 95\%$
		$\frac{\text{Capacity @specified temperature}}{\text{Capacity @ } 25^{\circ}\text{C}}$ the percentage accord with criterion	
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(BMS Protect parameter)

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	$3.5 \pm 0.05V$
		Over-charge protection for each cell	$3.65 \pm 0.05V$
		Over-charge protection delay time	0.5~1.5s
		Over-charge release for each cell	$3.4 \pm 0.05V$
		Over-charge protection Alarm for system	$52.5 \pm 0.5V$
		Over-charge protection for system	$54.75 \pm 0.5V$
		Over-charge protection delay time	0.5~1.5s
		Over-charge release for system	$51 \pm 0.5V$
		Over-charge release method	Under the release voltage than 60s

4.2	Over discharge	Over-discharge alarm for each cell	$2.90 \pm 0.05V$
		Over-discharge protection each cell	$2.70 \pm 0.05V$
		Over-discharge protection delay time	0.5~1.5s
		Over-discharge release for each cell	$3.0 \pm 0.05V$
		Over-discharge alarm for system	$43.5 \pm 0.5V$
		Over-discharge protection system	$40.5 \pm 0.5V$
		Over-discharge protection delay time	0.5~1.5s
		Over-discharge release for each cell	$45 \pm 0.5V$
		Over-discharge release method	Higher the release voltage than 60s
4.3	Over current	Charge over current protection alarm	$100 \pm 5A$
		Charge over current protection	$120 \pm 5A$
		Charge over current protection delay time	0.5~1.5s
		Charge over current release method	Auto release after 1min
		Discharge over current protection alarm	$150 \pm 5A$
		Discharge over current protection	$160 \pm 5A$
		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@ $55 \pm 3^{\circ}C$ ; Release@ $50 \pm 3^{\circ}C$ ;
		Charge under temperature protection	Protect@ $-10 \pm 3^{\circ}C$ ; Release@ $5 \pm 3^{\circ}C$
		Discharge over temperature protection	Protect@ $55 \pm 3^{\circ}C$ ; Release@ $50 \pm 3^{\circ}C$ ;
		Discharge under temperature protection	Protect@ $-15 \pm 3^{\circ}C$ ; Release@ $-0 \pm 3^{\circ}C$ ;