



Haicen
Advanced Lithium Batteries

BATTERY PACK-LFP-HC12V225



LiFePO4
Battery Specification

Preface

Thank you so much for buying lithium batteries from HAICEN
Be sure to finish reading before installation / use; So you can use the
lithium pack properly. After reading it, please keep it safe!

If there is any ambiguity about this specification, or if you need to
discuss technical issues, please contact our company!



1. General Information

This specification defines the performance of rechargeable LiFePO4 battery pack **HC12V225** manufactured by **HAICEN**. describes the type, performance, technical characteristics, installation, warning and caution of the battery pack.

2. Battery Specification (@ 25±5°C)

NO	Items	Characteristics
2.1	Normal capacity	225Ah
2.2	Nominal energy	2.88KWh
2.3	Nominal voltage	12.8V (4Serial-cell)
2.4	Internal resistance	≤8mΩ @1kHz AC
2.5	Normal charge voltage	14.6±0.1V
2.6	Float charge voltage(for Standby use)	13.8±0.1V
2.7	Allowed MAX charge current	200A
2.8	Recommended charge current	≤100A
2.9	Allowed MAX discharge current	200A
2.10	End of discharge voltage	10V
2.11	Over current protection	600±50A
2.12	Dimension	Length 519±2 mm
		Height 219±2 mm
		Width 233±2 mm
2.13	Weight	Approx. 26kg
2.14	Self-discharge rate	≤3%/Month; ≤15%/ year
2.15	Operationtemperature	Charging -20~45°C (charging current less than 5A) 0~45°C (charging current over 5A)
		Discharging -20~60°C
2.16	Storage environment	≤1month -20~+35°C、45~75%RH
		Recommend environment 15~30°C、45~75%RH

3. Battery Performance

Testing Conditions: Ambient Temperature: $25\pm 5^{\circ}\text{C}$; Humidity: 45%~85%.

Normal charge: Charge battery under CC(0.2C)/CV(14.6V) mode until over charge protection or the charge current reduce to 0.02C, and then rest for 0.5h.

NO	Items	Criterion		Condition
3.1	Cycle life @DOD100%	≥ 2000 cycles		After Normal charge, discharge @0.2C current to the end of discharge voltage. Repeat above process until discharge capacity reduce to 80% of initial value.
	Cycle life @DOD70%	≥ 7500 cycles		Charge the battery to 3.45V@0.2C current and hold for 0.5h, then discharge @0.2C current to 3.1V. Repeat above process until discharge capacity reduce to 80% of initial value.
3.2	Discharge temperature characteristic@ 0.33C	-20 $^{\circ}\text{C}$	$\geq 70\%$	<u>Capacity @specified temperature</u> Capacity @ 25 $^{\circ}\text{C}$
		-0 $^{\circ}\text{C}$	$\geq 80\%$	
		25 $^{\circ}\text{C}$	$\geq 100\%$	
		55 $^{\circ}\text{C}$	$\geq 95\%$	
3.2	Capacity retention rate	remain capacity $\geq 90\%$		After normal charge, store the battery @ $25\pm 5^{\circ}\text{C}$ for two months., then discharge capacity @0.2C, the retention capacity accord with criterion.

4. BMS function

This battery pack has a battery management system (BMS), which can monitor the operation status of the system through Bluetooth, providing over discharge, over charge, over current, short circuit, over temperature and low temperature protection.

4.1 BMS parameters

No	Item	Content	Criterion
4.1	Over charge	Over-charge protection for each cell	$3.75\pm 0.05V$
		Over-charge release for each cell	$3.55\pm 0.1V$
		Over-charge release method	Under the release voltage
4.2	Over discharge	Over-discharge protection each cell	$2.20\pm 0.1V$
		Over-discharge release for each cell	$2.70\pm 0.10V$
		Discharge over discharge release	Charge or Cut load
4.3	Over current	Discharge over current warning	$600\pm 50A$
		Discharge over current delay	$\leq 1000ms$
		Discharge over current release	Auto release or Cut load
4.4	Short circuit	Short circuit protection value	$800A(< 800\mu s)$
4.5	Internal resistance		$< 5m\Omega$
4.6	Cell balancing	Cell Balance Threshold	$\geq 3600mV$
		Cell Balance Current	$50\pm 20mA$

4.2 Bluetooth function interface

Mobile APP

Bluetooth 4.0



Lithium-ion/LiFePO4 Battery Packs

Bluetooth Technology for Lithium-ion/LiFePO4 batteries



Features:

- Pack voltage
- Single cell voltage
- Current
- State of charge (SOC)
- Charge or discharge (State)
- Cycles
- Temperature
- Remaining capacity (RMC)
- Design capacity (DCAP)
- Full charge capacity (FCC)
- SerialNumber (SN)
- Manufacturer Name
- Communication frequency
- Manufacture date

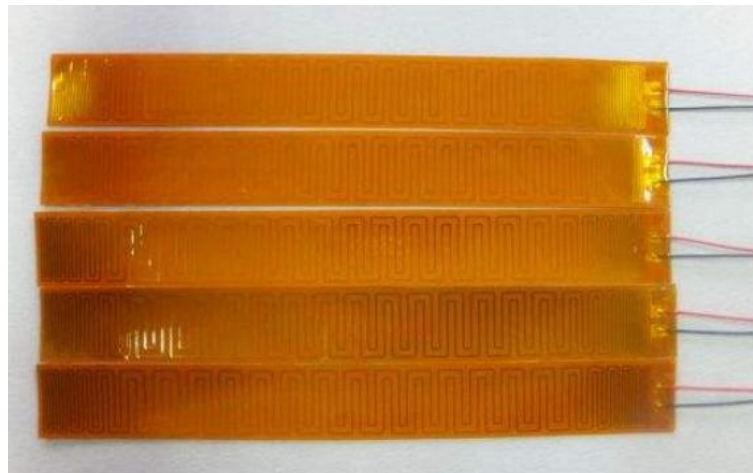
Note:

- * Mobile phone (tablet) hardware needs to support Bluetooth4.0 BLE (Bluetooth low energy) .
- * Measuring distance: ≤10M



5. Function description

5.1 Heating function

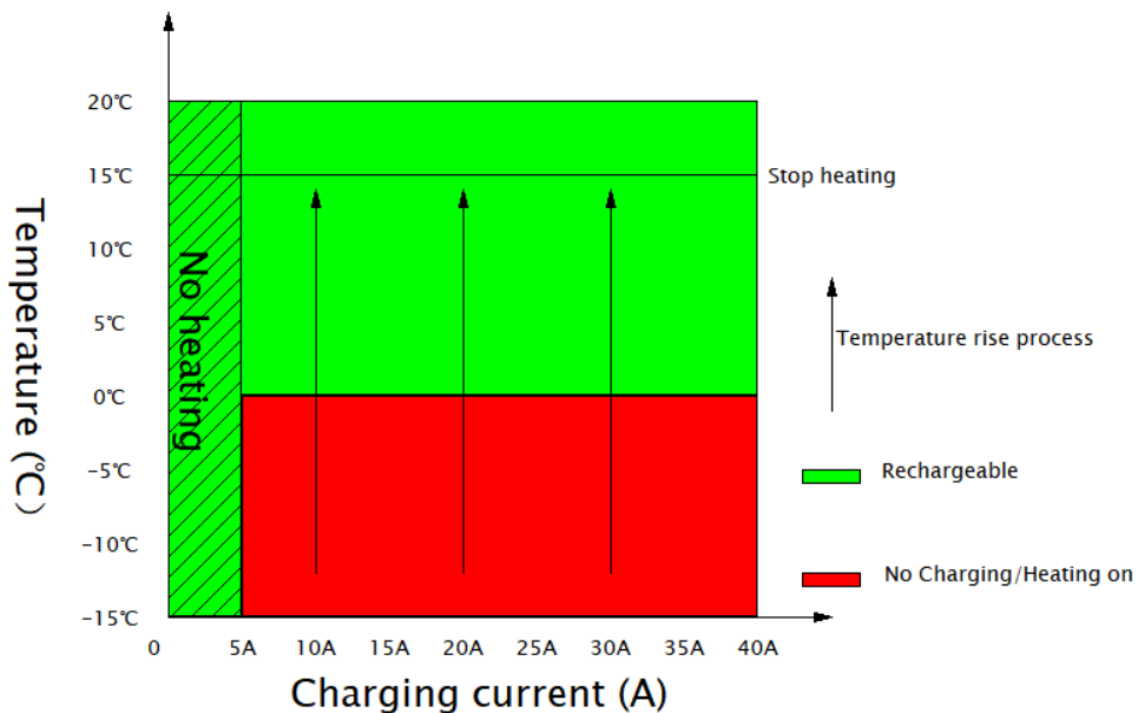


Heating film

A. The heating function adopts BMS to control the heating film, and the protection plate can start the heating mode by collecting the temperature and current;

B. Heating film : The main cross-sectional structure of the diaphragm includes polyimide film (0.08), heating element (0.05), and polyimide in order Membrane (0.08), double-sided tape (0.11) with a total thickness of 0.36 ± 0.1 MM, strong adhesion and no cracking after long-term use;

Working mode: Charging working mode: after the charging device is connected to the battery, the protection board performs current detection. If the current is less than 5A, the battery can be charged; if the current is more than 5A, the protection board needs to detect the temperature: a, when the temperature is less than 0 °C, turn on the heating film, the temperature When heated to above 0 °C, the battery can be recharged, continue to heat until the temperature ≥ 15 °C to stop heating. b. When the temperature is ≥ 0 °C, it can be charged without heating.



5.2. Display





SOC display



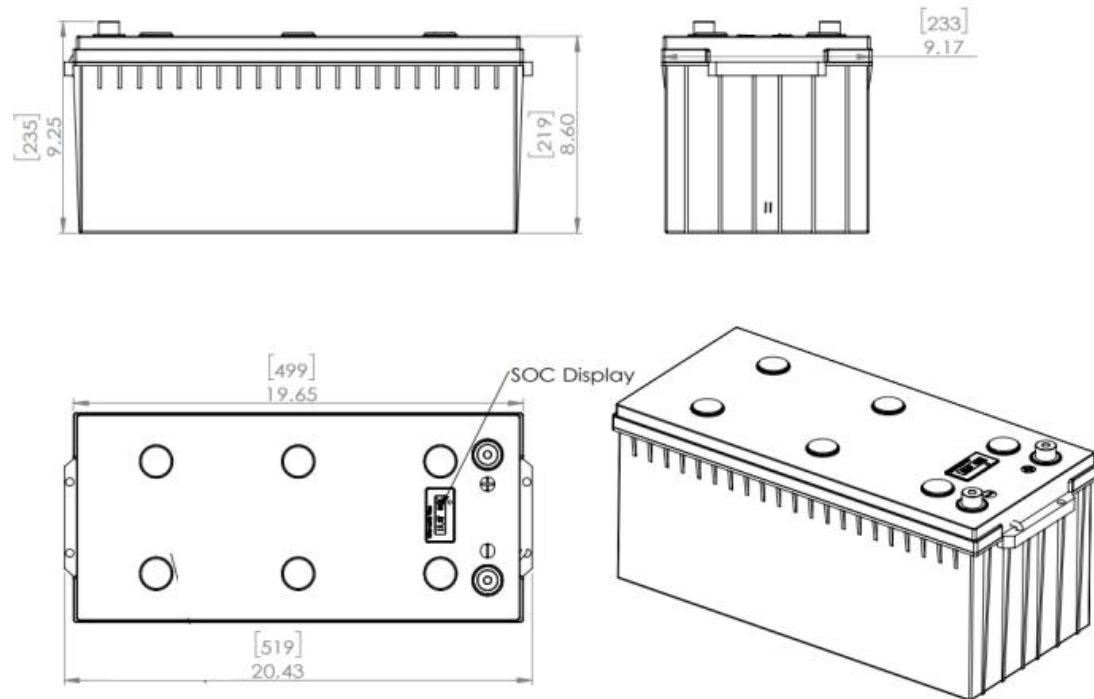
Toggle switch for voltage and temperature



Power switch

1. Press the button  to turn on/off the meter. In the off state, press any button to wake up the meter
2. Press the button  to switch the display between the voltage value and the temperature value when the power is on
3. The 7 symbols on the display interface from the right to the left of the battery symbol represent the battery power from low to high
4. The voltage value on the display interface is real-time measured voltage value 10-100V display
5. The percentage value on the display interface is the percentage value of the remaining battery power
6. When the battery is connected to the charger or the large current load is discharged, the display parameters will also fluctuate
7. When the battery capacity is low, the red lightning energy symbol on the display interface will flash as an alarm

6. Dimension



7. Transport & Store

- Lithium-ion batteries are hazardous goods. Therefore the following points must be observed when transporting the battery modules:
- Observe the general transport regulations based on the mode of transport as well as all legal regulations.
- No fall down, no pile up over 5 layers and keep face up.
- Check the battery immediately after transport the battery.
- If user finds shell deformation of the battery pack, don't use it and contact us.

Warning & Tips.

Please read and follow the handling instructions before use. Improper use may cause heat, fire, rupture, damage or capacity deterioration of the battery. **HAICEN**. Describes is not responsible for any accidents caused by the usage without following our handling instructions.

Warning

- Battery must be far away from heat source, high voltage, and no exposed in sunshine for long time.
- Never throw the battery into water or fire.
- Never reverse two electrodes when use the battery.
- Never connect the positive and negative of battery with metal.
- Never knock, throw or trample the battery.
- Never disassemble the battery without manufacturer's permission and guidance.
- Never use mixed with other type of battery.

Tips

- Keep the battery against high temperature. Otherwise it will cause battery heat, get into fire or lose some function and reduce the life.
- When battery run out of power, please charge your battery timely (≤ 15 day).
- Please use the matched or suggested charger for this battery.
- If battery emit peculiar smell, heating, distortion or appear any abnormality, please stop using.
- If the battery leaks and get into the eyes or skin, do not wipe, instead, rinse it with clean water and see doctor immediately.
- Please far away from children or pets.