



**Haicen**  
Advanced Lithium Batteries

## BATTERY PACK-LFP-HC12V105



**LiFePO4**  
**Battery Specification**

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# 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!

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## 1.General Information

This specification defines the performance of rechargeable LiFePO4 battery pack **HC12V105** manufactured by **HAICEN**. describes the type, performance, technical characteristics, installation, warning and caution of the battery pack.

## 2.Battery Specification (@ 25±5℃)

NO	Items	Characteristics
2.1	Normal capacity	105Ah
2.2	Nominal energy	1.34KWh
2.3	Nominal voltage	12.8V (4Serial-cell)
2.4	Internal resistance	≤25mΩ @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	52.5A
2.8	Recommended charge current	≤21A
2.9	Allowed MAX discharge current	150A
2.10	End of discharge voltage	10V
2.11	Over current protection	700±50A
2.12	Dimensions	Length 355±2 mm
		Height 175±2 mm
		width 188±2 mm
2.13	Weight	11±0.5kg
2.14	Self-discharge rate	≤3%/Month; ≤15%/ year
2.15	Operation temperature	Charging -20~45℃(charging current less than 5A) 0~45℃(charging current over 5A)
		Discharging -20~60℃
2.16	Storage environment	≤1month -20~+35℃、45~75%RH
		Recommend environment 15~30℃、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(14.4V) 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%	$\geq 2000$ 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%	$\geq 7500$ 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.

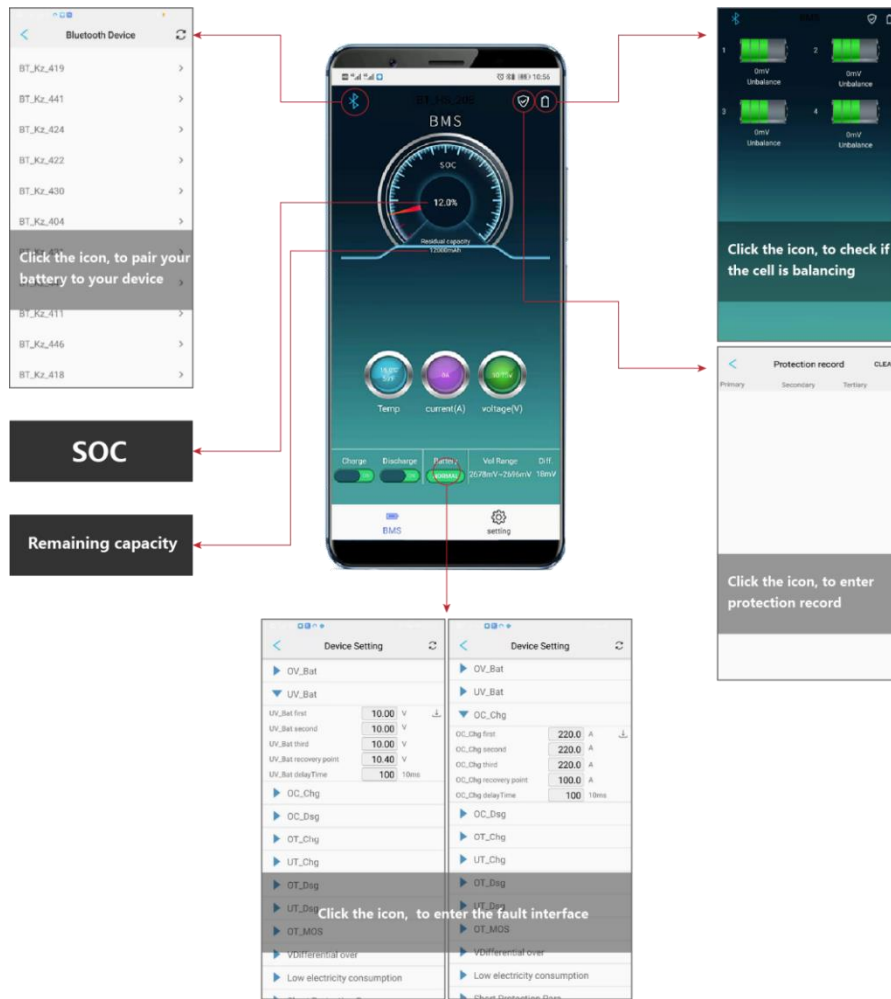
### 4. BMS function

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 , display , heating,CAN communication.

## 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	$2.3 \pm 0.1V$
		Over-discharge release for each cell	$2.4 \pm 0.10V$
		Discharge over discharge release	Charge or Cut load
4.3	Over current	Discharge over current warning	$700 \pm 50A$
		Discharge over current delay	$\leq 100ms$
		Discharge over current release	Auto release or Cut load
4.4	Short circuit	Short circuit protection value	$900A (< 100us)$
4.5	Internal resistance		$< 5m \Omega$
4.6	Cell balancing	Cell Balance Threshold	$\geq 3400mV$
		Cell Balance Current	$50 \pm 20mA$

## 4.2 Bluetooth function interface



## 5. function description

### 5.1 Heating function description

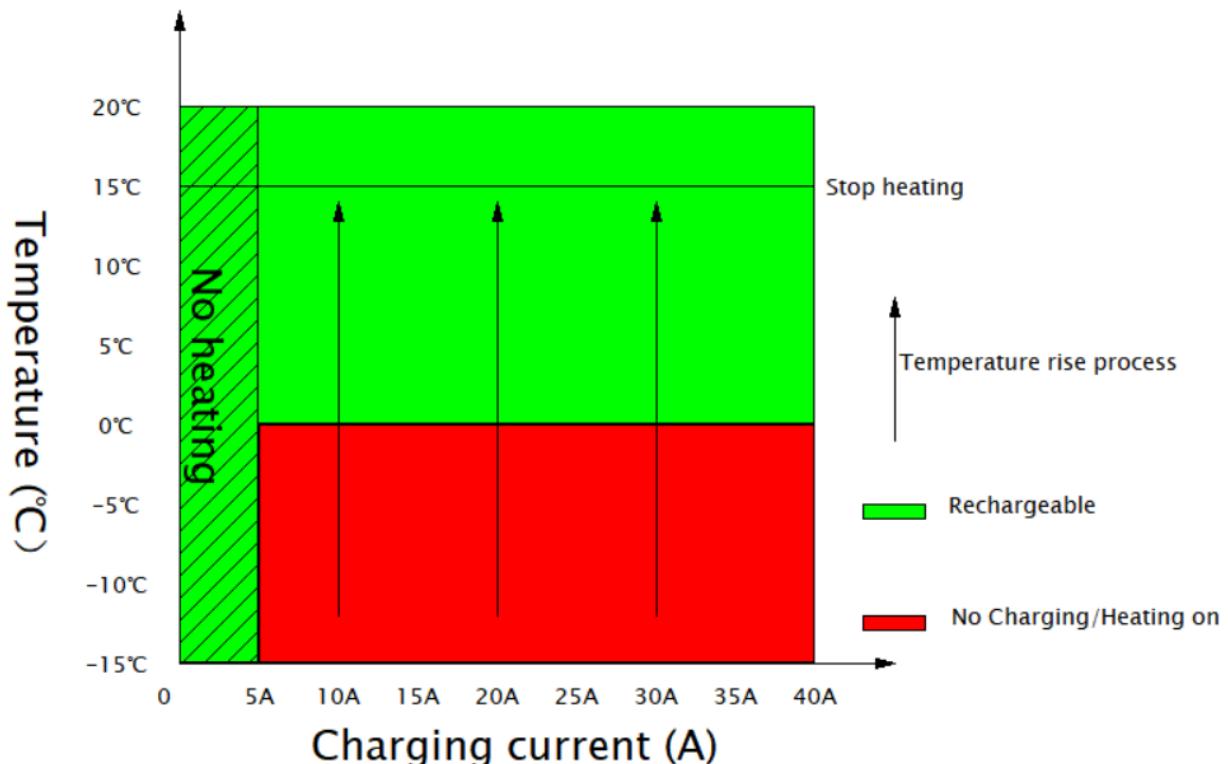


## Heating film

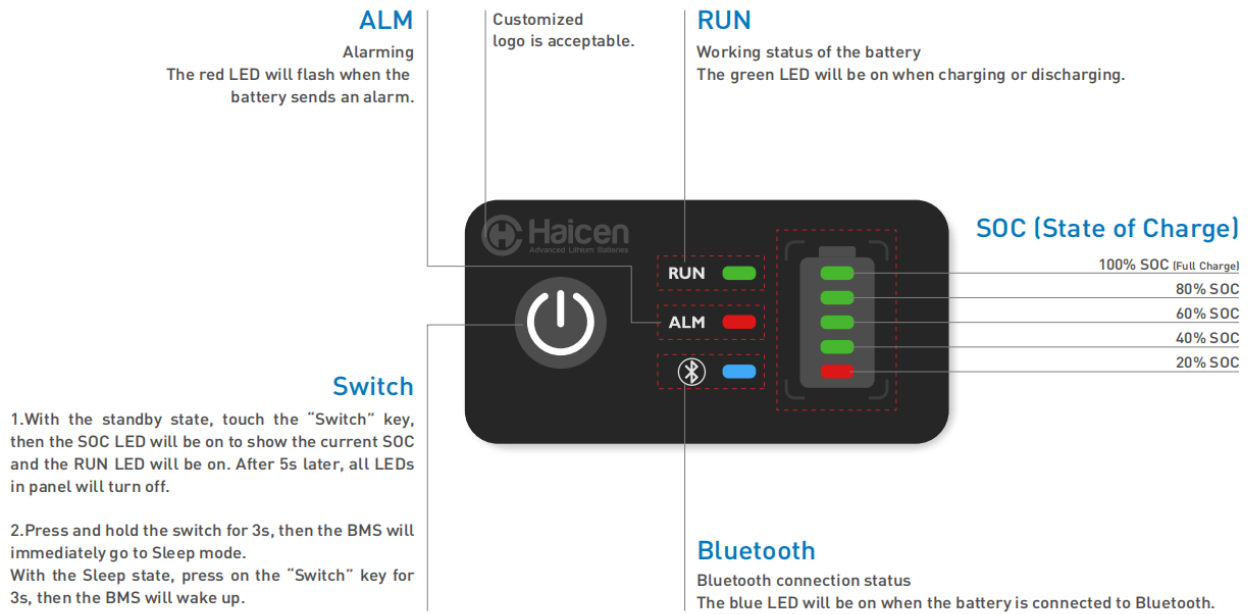
A. The heating function adopts BMS to control the heating film, and the protection plate can start the heating mode by collecting the temperature and current;

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  $0.36 \pm 0.1\text{MM}$ , 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  $0^\circ\text{C}$ , turn on the heating film, the temperature When heated to above  $0^\circ\text{C}$ , the battery can be recharged, continue to heat until the temperature  $\geq 15^\circ\text{C}$  to stop heating. b. When the temperature is  $\geq 0^\circ\text{C}$ , it can be charged without heating.

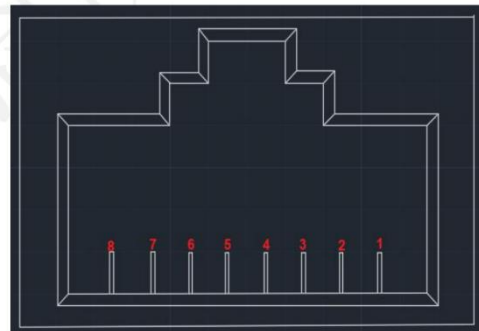


## 5.2. Display



## 5.3. CAN

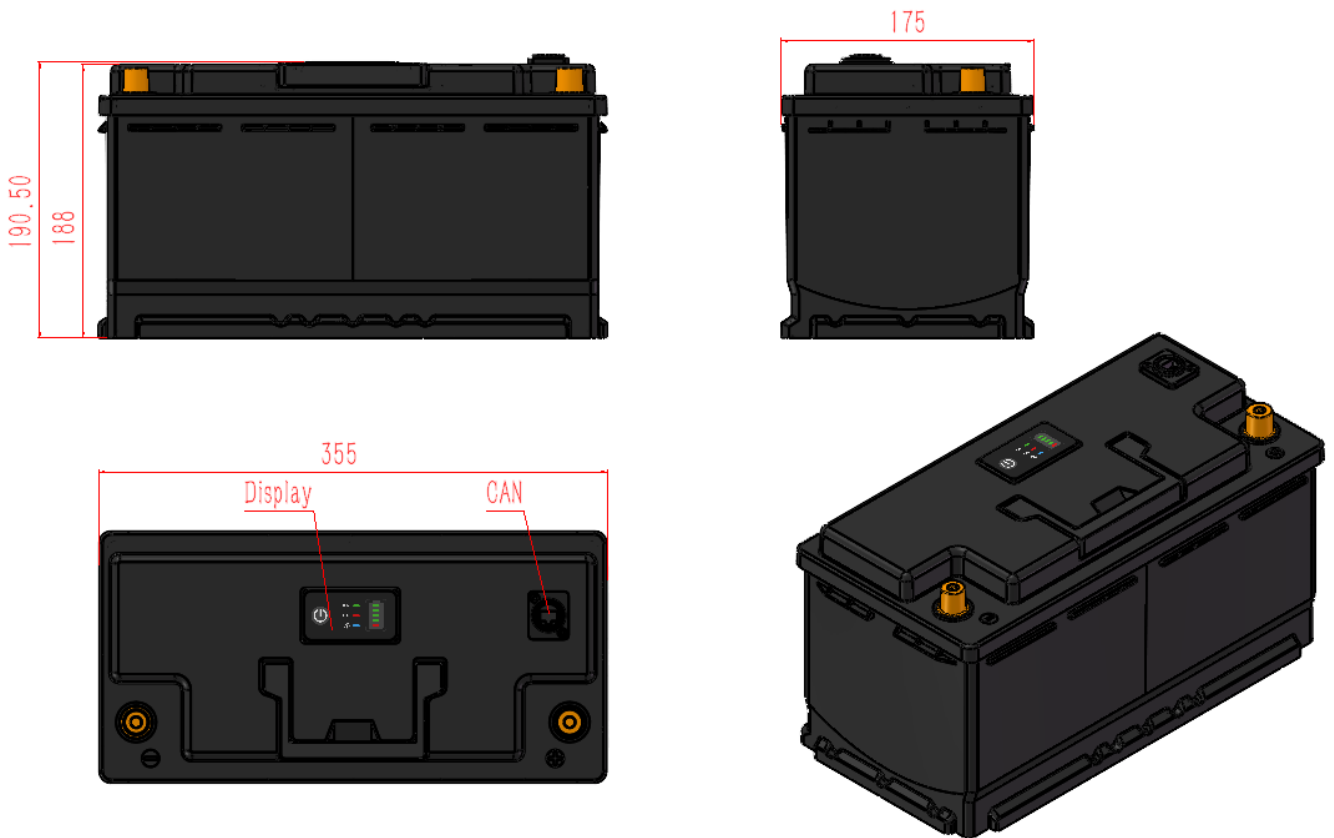
The BMS has the function of battery pack upload to CAN communication, 500K baud rate CAN communication interface adopts 8 P8C network interface. You can communicate with the Victron Cerbo GX box.



PIN	Definitions
1、2、7、8	NC (suspended)
4	CAN-H
5	CAN-L
3、6	GND

## 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 ( $\leq 15$ 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.