



## BATTERY PACK-LFP-HC48100



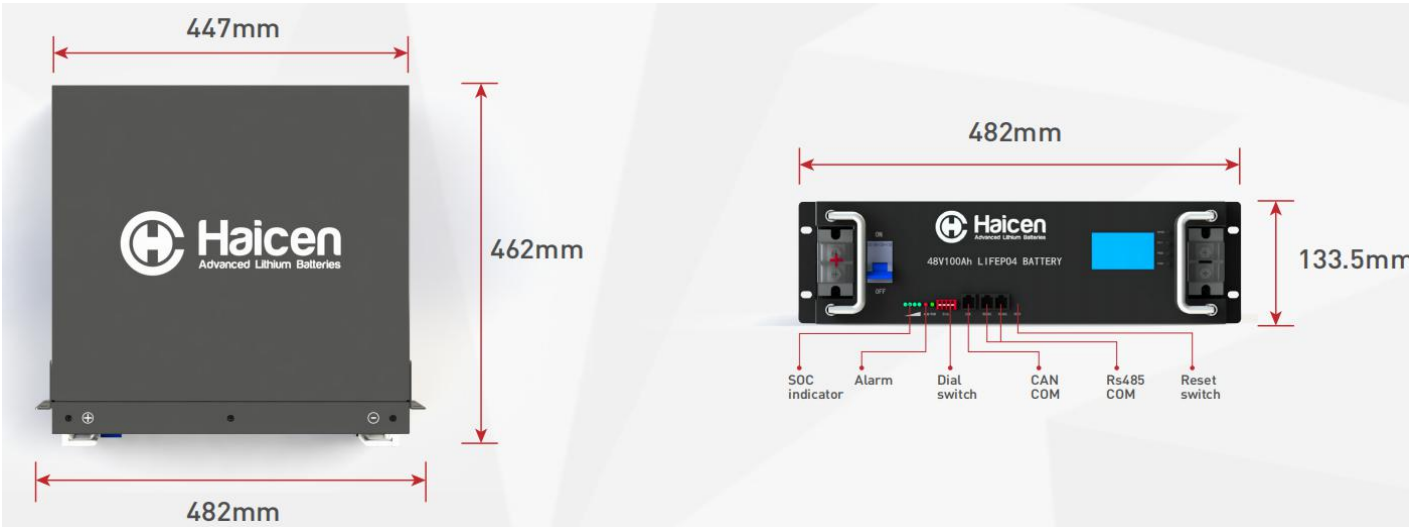
Thank you so much for buying lithium batteries from HAICEN  
Be sure to finish reading before installation / use; So you can use the lithium pack properly. After reading it, please keep it safe!  
If there is any ambiguity about this specification, or if you need to discuss technical issues, please contact our company!



# 1. General Information

This specification defines the performance of rechargeable LiFePO4 battery pack **HC48100** manufactured by **HAICEN**. describes the type, performance, technical characteristics, installation, warning and caution of the battery pack.

# 2. Dimensions



# 3.Battery Specification (@ 25±5℃)

NO	Items		Characteristics
3.1	Normal capacity		100Ah
3.2	Nominal energy		5.12KWh
3.3	Nominal voltage		51.2V (16Serial-cell)
3.4	Internal resistance		≤30mΩ
3.5	Normal charge voltage		57.6±0.3V
3.6	Allowed MAX charge current		50A
3.7	Recommended charge current		≤20A
3.8	Allowed MAX discharge current		100A
3.9	End of discharge voltage		40V
3.10	Dimension		Length 482±1 mm
			Height 133.5±1 mm
			Depth 462±2 mm
3.11	Weight		Approx. 44kg±0.5kg
3.12	Self-discharge rate		≤3%/Month; ≤15%/ year
3.13	Operation ntemperature	Charge	0~45℃
		Discharge	-20~60℃
3.14	Storage	≤3month	-20~+35℃、45~75%RH

	environment	Recommend environment	15~30℃、45~75%RH
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## 4. Battery Performance

Testing Conditions: Ambient Temperature: 25±5℃; Humidity:45%~85%.

Normal charge: Charge battery under CC(0.2C)/CV(57.6V) mode until over charge protection or the charge current reduce to 0.02C, and then rest for 0.5h.

NO	Items	Criterion		Condition
4.1	Cycle life @DOD100%	≥3000cycles		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 @DOD80%	≥6000cycles		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.
4.2	Discharge temperature characteristic@ 0.33C	-20℃	≥70%	<u>Capacity @specified temperature</u>  Capacity @ 25℃
		-0℃	≥80%	
		25℃	≥100%	
		55℃	≥95%	
4.3	Capacity retention rate	remain capacity ≥90%		After normal charge, store the battery @25±5℃ for two months., then discharge capacity @0.2C, the retention capacity accord with criterion.

## 5. BMS function

This battery pack have Battery Management System (BMS), which can monitor the system operation state, provide over discharge, overcharge, over current, short circuit, over temperature, low temperature protection. And the BMS support communication between battery packs, and connect to external equipment.

### System alarm and protection parameter

No	Item	Content	Criterion
5.1.	Over charge	Over-charge warning for each cell	3.50±0.03V
		Over-charge protection for each cell	3.75±0.03V
		Over-charge release for each cell	3.50±0.05V

		Over-charge release method	Under the release voltage
5.2	Over discharge	Over-discharge warning for each cell	2.90±0.05V
		Over-discharge protection each cell	2.50±0.05V
		Over-discharge release for each cell	2.80±0.10V
5.3	Over current	Charge over current warning	105±3A
		Charge over current protection	110A±3A, delay time 5s
		Charge over current release	Discharge or auto release
		Discharge over current warning	105±3A
		Discharge over current protection	110A±3A, delay time 5s
		Discharge over current release	Charge or auto release
		Short circuit protection	Available
5.4	Temperature	Charge over temperature protection	Alarm@50±3℃
			Protect@65±3℃
			Release@60±3℃;
		Charge under temperature protection	Alarm@0±3℃
			Protect@-5±3℃
			Release@0±3℃
		Discharge over temperature protection	Alarm@52±3℃
			Protect@65±3℃
			Release@60±3℃;
		Discharge under temperature protection	Alarm@-15±3℃
			Protect@-20±3℃;
			Release@-15±3℃;

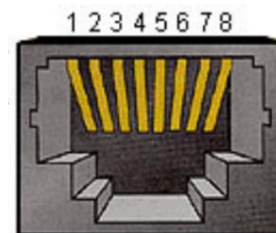
## 5.5 Communication Function

### RS485 Communication

Battery modules mutually communicate through this RJ45

Pin Number	Pin definition
3、6	GND
2、7	RS485-A
1、8	RS485-B
4、5	NC

connector.

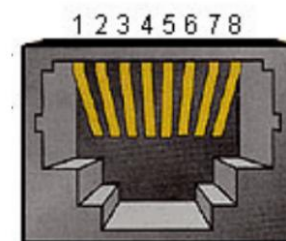


### CAN Communication

Battery modules mutually communicate through this RJ45

Pin Number	Pin definition
4	CANH
5	CANL
8	GND

connector.



## 5.6 LED INSTRUCTION

### 5.61 LED Sequence

SOC				ALARM	RUN

### 5.62 Capacity indication

State		Charge				Discharge			
Capacity indicator		L4●	L3●	L2●	L1●	L4●	L3●	L2●	L1●
	0~25%	OFF	OFF	OFF	Flashing	OFF	OFF	OFF	ON
	25~50%	OFF	OFF	Flashing	ON	OFF	OFF	ON	ON
	50~75%	OFF	Flashing	ON	ON	OFF	ON	ON	ON
	≥75%	Flashing	ON	ON	ON	ON	ON	ON	ON
Running lights ●		ON				Flashing			

## 5.63 Flashing description

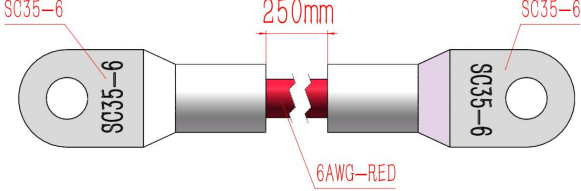
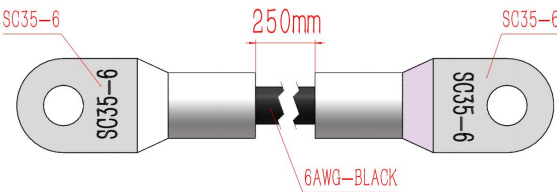
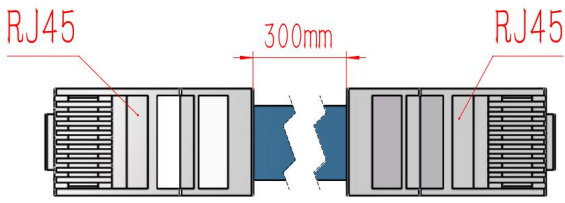
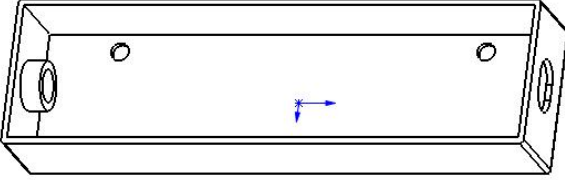
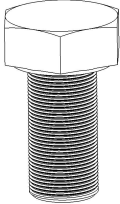
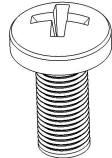
Flashing mode	ON	OFF
Flashing 1	0.25s	3.75s
Flashing 2	0.5s	0.5s
Flashing 3	0.5s	1.5s

## 5.64 LED Display Function

system state	operating state	RUN	ALM	SOC				State
								
Shut down	Dormancy	Off	Off	Off	Off	Off	Off	Total blackout
Standby	Normality	ON	Off	According to the quantity indicator				Stand by
Charge	Normality	ON	Off	According to the quantity indicator				
	Over current Alarm	ON	Flashing2	According to the quantity indicator				
	over voltage protection	Flashing1	Off	Off	Off	Off	Off	
	Temperature over current protection	Flashing1	Off	Off	Off	Off	Off	
Discharge	Normality	Flashing3	Off	According to the quantity indicator				
	warn	Flashing3	Flashing3					
	Temperature over current and short circuit protection	Off	ON	Off	Off	Off	Off	When the mains is offline, no action is taken for 48 hours before the discharge is stopped
	Low-voltage protection	Off	Off	Off	Off	Off	Off	

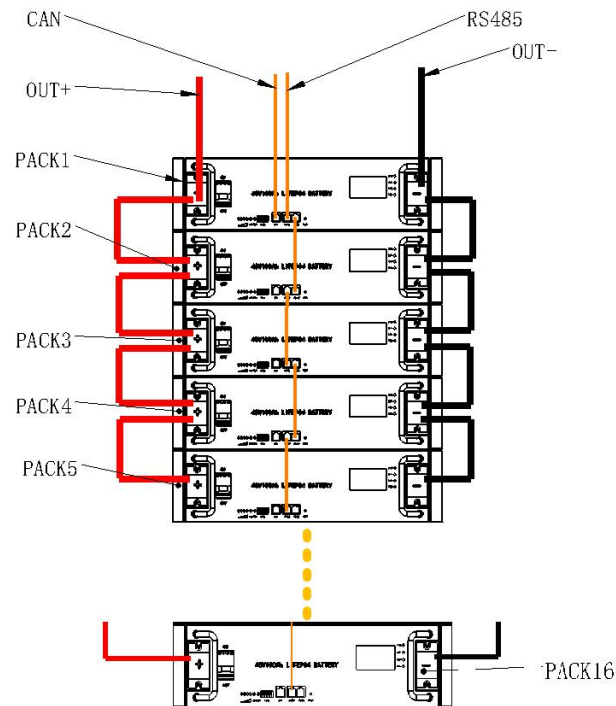
## 6.User guide

## 6.1 Packing list, rack set (optional)

Serial number	Application Description	Drawing	QUANTITY
1	Multiple+		1PCS
2	Multiple-		1PCS
3	Parallel communication		1PCS
4	Supporting structure		4PCS
5	M8*12mm screw		4PCS
6	M4*8mm screw		16PCS

## 6.2 Module parallel connection

### 6.21 Dimensions



## 6.22 Operating steps ( Let's take three parallel ones )

- 1.Connect the battery packs through a bracket and use M8 screws



- 2.Parallel connection



### 3.Communication line parallel connection (RS485)



### 4.Open the reset button respectively



### 5.Turn on the switch separately

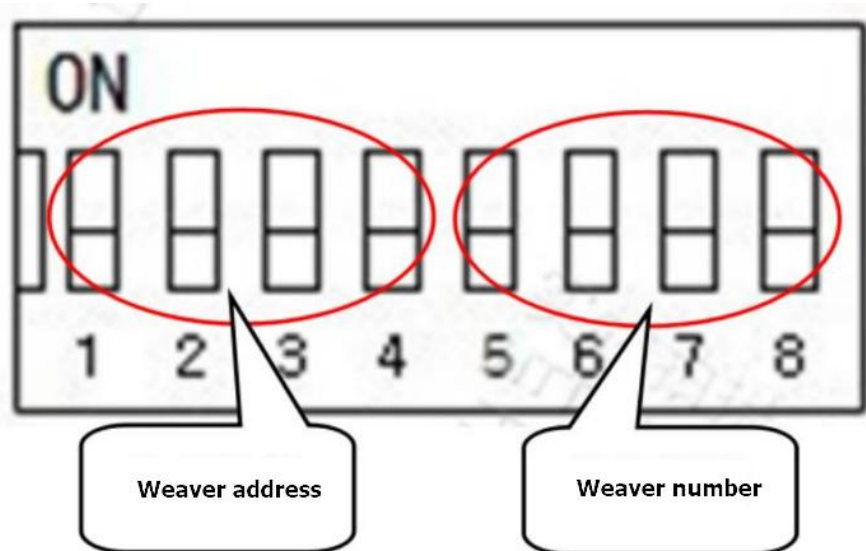


## 6.23 Dialing address selection

Definition of parallel dial switch: When the batteries are connected in parallel, the dialing switch is used to distinguish different pack addresses. The hardware address can be set through the dialing switch on the board.

Single machine address setting: 0000 0000

Address setting for parallel operation: the definition of dial switch is shown in the table below



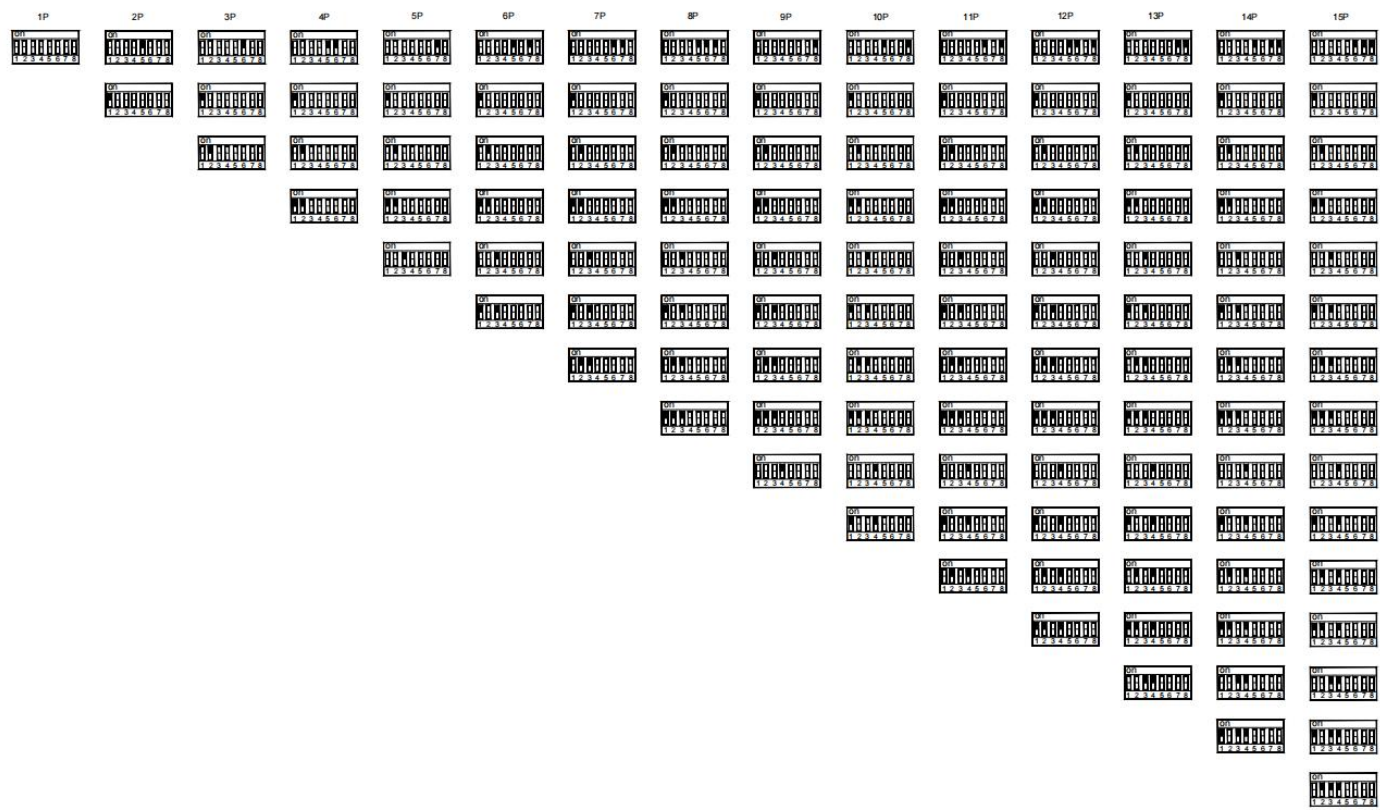
### Slave address

Add.	Position of dial switch				Instruction
	#1	#2	#3	#4	
1	ON	OFF	OFF	OFF	Pack1
2	OFF	ON	OFF	OFF	Pack2
3	ON	ON	OFF	OFF	Pack3
4	OFF	OFF	ON	OFF	Pack4
5	ON	OFF	ON	OFF	Pack5
6	OFF	ON	ON	OFF	Pack6
7	ON	ON	ON	OFF	Pack7
8	OFF	OFF	OFF	ON	Pack8
9	ON	OFF	OFF	ON	Pack9
10	OFF	ON	OFF	ON	Pack10
11	ON	ON	OFF	ON	Pack11
12	OFF	OFF	ON	ON	Pack12
13	ON	OFF	ON	ON	Pack13
14	OFF	ON	ON	ON	Pack14
15	ON	ON	ON	ON	Pack15

Host address

Number of parallel machines	Position of dial switch				Instruction
	#5	#6	#7	#8	
2	ON	OFF	OFF	OFF	2
3	OFF	ON	OFF	OFF	3
4	ON	ON	OFF	OFF	4
5	OFF	OFF	ON	OFF	5
6	ON	OFF	ON	OFF	6
7	OFF	ON	ON	OFF	7
8	ON	ON	ON	OFF	8
9	OFF	OFF	OFF	ON	9
10	ON	OFF	OFF	ON	10
11	OFF	ON	OFF	ON	11
12	ON	ON	OFF	ON	12
13	OFF	OFF	ON	ON	13
14	ON	OFF	ON	ON	14
15	OFF	ON	ON	ON	15

6.24 Dimensions



6.3 System operation

## **Wake up**

System will go to Sleep mode without load or charger for 48h. The following operations can be used to wake up:

- a. Automatically wakeup when connecting a charger;
- b. Press on the “reset” key for 3s;

## **System standby and sleep**

Sleep mode: System will immediately go to Standby mode without load or charger, and RUN LED will flash (1s ON, 1s OFF).

After 24h later, the system will automatically go to sleep mode. And then all LEDs in panel will turnoff.

System will go to sleep mode through press the reset key for 3s.

## **6.4 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.
- I If user finds shell deformation of the battery pack, don't use it and contact us.

## **6.5 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. . 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.
- I 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.