



**Affordable. Reliable. Home Improvement.**

## **24V LITHIUM BATTERY**

**MODEL:HD24100LY-24、 HD2450LY-12**

# VEVOR

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HD24100LY-24



HD2450LY-12

This is the original instruction, please read all manual instructions carefully before operating. VEVOR reserves a clear interpretation of our user manual. The appearance of the product shall be subject to the product you received. Please forgive us that we won't inform you again if there are any technology or software updates on our product.

	Warning-To reduce the risk of injury, user must read instructions manual carefully.
	This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:(1)This device may not cause harmful interference, and (2)this device must accept any interference received, including interference that may cause undesired operation.
	This product is subject to the provision of European Directive 2012/19/EC. The symbol showing a wheeled bin crossed through indicates that the product requires separate refuse collection in the European Union. This applies to the product and all accessories marked with this symbol. Products marked as such may not be discarded with normal domestic waste, but must be taken to a collection point for recycling electrical and electronic devices
	High voltage.Risk of shock.Do not touch uninsulated terminals or connectors
	Authorized personnel is allowed to operate only.Do not disassemble or incinerate. Follow product charging instructions.
	No sparks ! No flames ! No smoking!
	Keep out of the reach of children

## INSTRUCTIONS

### Disclaimer

Before using the product, please read the user manual of this product to ensure correct use after full understanding. After reading, please keep the user manual in a safe place for future reference. If you do not operate this product correctly, you may cause serious injury to yourself or others, or cause damage to the product and property. Once you use this product, you are deemed to have understood, recognized and accepted all the terms and contents of this document. Users promise to be responsible for their own actions and all consequences arising therefrom. Our company is not responsible for any losses caused by users not using the product in accordance with the User Manual.

Subject to complying with laws and regulations, our company has the final right to interpret this document and all related documents for this product. It is subject to update, revision or termination without prior notice.



### Warning

Batteries are potentially dangerous and proper precautions must be taken during operation and maintenance.

Improper use of the battery can lead to battery failure or other potential damage.

Improper configuration, installation, or use of related equipment in the battery system may damage the battery and other related equipment. Please wear proper personal protective equipment when working on the battery.

Battery installation and maintenance must be performed by trained and certified technicians.

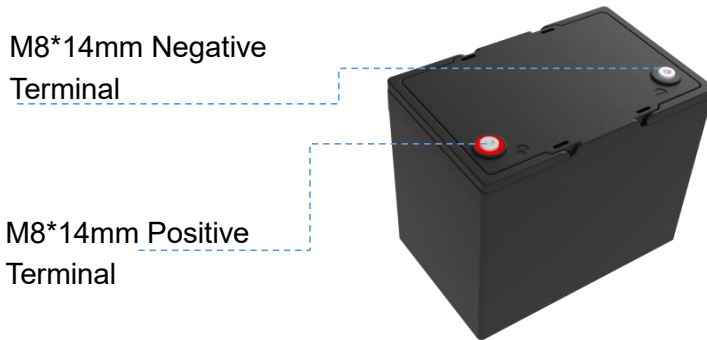
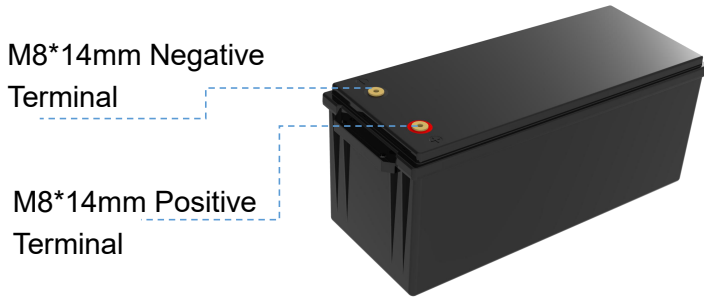
Failure to follow the warnings above can result in potential damage.

## PRODUCT OVERVIEW

Standard parameters		
Cell	24V Lithium Battery	
Model specifications	HD24100LY-24	HD2450LY-12
Nominal voltage	25.6V	
Nominal capacity	100Ah	50Ah
Standard charging voltage	29.2V	29.2V
Standard discharge cut-off voltage	20VDC	
Maximum charging current	50A	30A
Maximum continuous output power	2560Wh	1280Wh
Initial internal resistance	$\leq 30\text{m}\Omega$	$\leq 40\text{m}\Omega$
Shell material	ABS	

<b>Battery specifications</b>	
Battery Type	Lithium iron phosphate battery
Battery cycle life	After 4000 cycles, the remaining capacity is still more than 80%
protection function	BMS management system, with overcharge protection, charging over current protection, discharge over current protection, short circuit protection, discharge high temperature protection, discharge low temperature protection, charging high temperature protection, charging low temperature protection, FET high temperature protection
<b>Working environment temperature</b>	
working temperature	-20° C to 45° C, and humidity below 70 %
Storage environment temperature	-20 ° C to 60 ° C , humidity below 90%
Charging temperature	-5℃-55℃
Discharge temperature	-20-65℃

### Product appearance introduction



### ADDITIONAL COMPONENTS

#### M8(14MM)TERMINAL BOLTS\*2

The terminal bolts are used to secure multiple cable lugs to a single battery terminal. The bolts can be replaced with M8 bolts of other lengths based on actual needs.

# **IMPORTANT**

## **SAFETY INSTRUCTION**

**!Please keep the battery away from heat sources, sparks, flames, and hazardous chemicals.**

**!Maintain Adequate Ventilation and Heat Dissipation**

Place the battery in a well-ventilated area with sufficient heat dissipation to prevent overheating and damage.

**!Size the Battery Cables and Connectors Appropriately**

Use high-stranded copper connectors and heavy gauge cables to handle possible battery loads. Make sure to keep identical cable lengths. Avoid accidents caused by unsuitable connectors or cables that make the connection a heat source during battery operation.

**!Please tighten all cable connections, as loose cable connection can cause terminal meltdown or fire.**

**!DO NOT puncture, drop, crush, burn, penetrate, shake, or strike the battery.**

The battery should be securely fastened during handling to prevent impact or dropping.

It should be safely secured to a solid plane and the cables safely tied to a suitable location to avoid arcing and sparking due to friction.

**!DO NOT press it by placing heavy stuff on top of it for long periods, which may damage it due to an internal short circuit.**

**!DO NOT immerse the battery in water whether the battery is in use or on standby.**

**!DO NOT open, dismantle, or modify the battery.**

**!DO NOT touch the exposed electrolyte or powder if the battery casing is damaged.**



**!Uncovered electrolyte or powder that has contacted the skin or eyes MUST be flushed out with plenty of clean water immediately. Seek medical attention afterward.**

### **!Avoid Short Circuit**

Please use circuit breakers, fuses, or disconnects that have been properly sized by certified electricians, licensed installers, or regional code authorities to protect all the electrical equipment in your system. The battery has a built-in battery management system (BMS) that protects the battery cells from over-charge, over-discharge, and over-current, however this alone will not protect your system from severe electrical conditions.

**!Trained and certified technicians are required for safe and reliable installation. This product manual can only serve as a guideline as it cannot cover all possible scenarios.**

### **!Verify Correct Polarity**

Please verify the polarity before connecting the wiring. Reverse polar it can and will destroy the battery and other electrical equipment. Use multi meter to determine proper polarity.

### **Avoid Exposed Metal Terminals or Connectors**

The terminals of this battery are always live. Avoid exposed metal terminals or connectors, DO NOT place tools on the terminals or touch them with bare hands: DO NOT short circuit or use outside of specified electrical ratings.

## **THINGS TO KNOW BEFORE USING**

**!When using the battery, please be careful to avoid metal or conductive objects touching the positive and negative poles of the battery at the same time, otherwise it may cause a short circuit.**

**!Tightly screw in the post bolts.** and it could not be mounted upside down.

**Tightly screw in the post bolts.** Having loose battery terminals will cause the terminals to build up heat resulting in damage to the battery. This battery is not intended to be used to start any devices, please **DO NOT use it as a starting battery.**

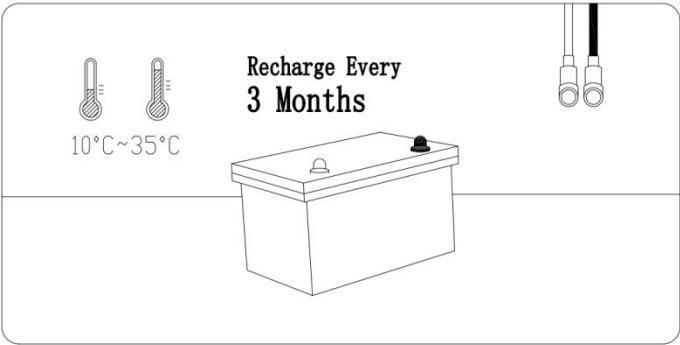
**!Suggestions for Long-term Storage:**

**Temperature**

The battery can be operated at a temperature of -20°C to 45°C/-4°F to 113°F. Store in a fireproof container and away from children

**Capacity**

For a longer-lasting product, it is best to store your battery at a 50% charge level and recharge every three months if it is not going to be used for a long time.



**CONTROLLER**

**Controller**

**★ Recommend Charging Current:**

25.6V 100AH	(0.2C)	The battery will be fully charged in around 5hrs to 100%
	(0.5C)	The battery will be fully charged in around 2hrs to around 97% capacity.

**★Recommend Charging Mode:25.6V(29.2V)L! (LiFePO4)**  
Controller Settings Refer to the below parameters if you need to manually set up your controller. As different types of batteries have different charging modes (refer to Page 04), it is recommended to set

only the following parameters for LiFePO4 batteries. The settings for other types of batteries do not apply to LiFePO4 batteries except for the following settings.

<b>CHARGING</b>	Charge /Bulk /Boost Voltage	29V/29.2V
	Absorption Voltage	29V/29.2V
	Over Voltage Disconnect	29.6V
	Over Voltage Reconnect	28.4V
<b>DIS-CHARGING</b>	Under Voltage Warning	23.2V
	Under Voltage Recover	21.6V
	Low Voltage Disconnect	19.6V
	Low Voltage Reconnect	24.8V

## BATTERY CHARGER

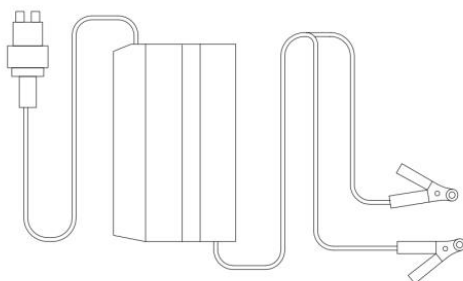
Use 29.2V lithium iron phosphate (LiFePO4) battery charger to maximize the capacity.

★ Recommend Charging Voltage: Between 28.4V to 29.2V

<b>25.6V 100AH</b>	<b>(0.2C)</b>	<b>The battery will be fully charged in around 5hrs to 100%</b>
	<b>(0.5C)</b>	<b>The battery will be fully charged in around 2hrs to around 97% capacity.</b>

### Tips

- ① Connect the charger to the battery before connecting it to the grid power in case of spark.
- ② It's recommended to disconnect the charger from the battery after fully charging.



## SERIES / PARALLEL CONNECTION

### THE PREMISE OF CONNECTION

To connect in series or /and parallel, batteries should meet the below conditions:

- a. identical batteries with the same battery capacity (Ah) and BMS (A);
- b. from the same brand (as lithium battery from different brands has their special BMS);
- c. purchased in near time (within one month).

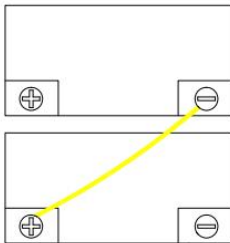
### LIMITATION FOR SERIES/PARALLEL CONNECTION

Support connecting up to 16 identical batteries for up to:

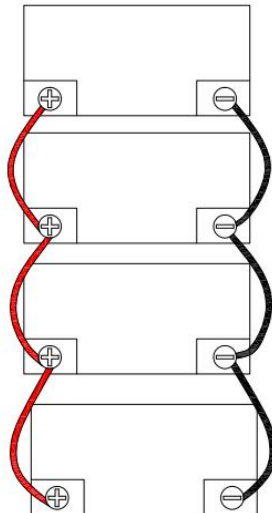
2 in series as 48V(51.2V)battery system/

Four battery packs in parallel, the system capacity can be expanded fourfold.

Series Connection  
48V(51.2V)100Ah



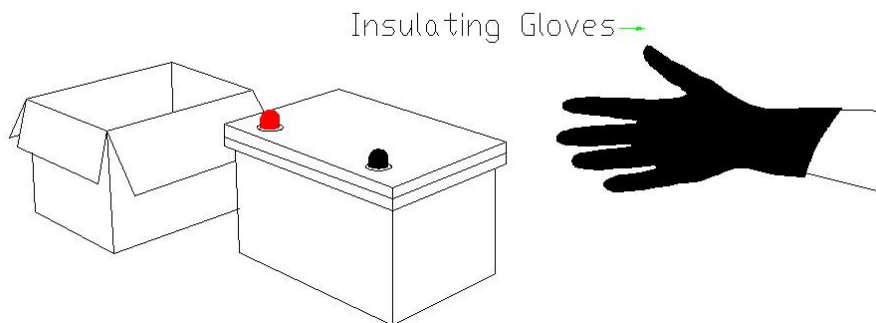
Parallel Connection  
24V(25.6V)400Ah



## HOW TO CONNECT BATTERIES

### Step1 Wear Insulating Gloves

Wear insulating gloves for protection before connecting. Please pay attention to operation safety in the process of connection.

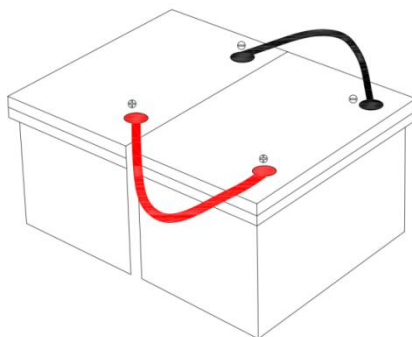


### Step2 Voltage Balancing Before Connection

Below two steps are necessary to reduce the voltage difference between batteries and let the battery system perform the best of it in series or/ and in parallel.

Step1 Fully charge the batteries separately.  
(voltage at rest: >26.6V)

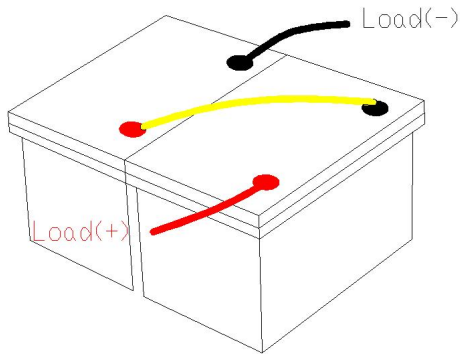
Step2 Connect all of the batteries in parallel, and leave them together for 12~24hrs



They're now ready for the connection.

### Step3 Battery-to-Battery Connection

#### #1 Connect Batteries in Series $\oplus$ to $\ominus$

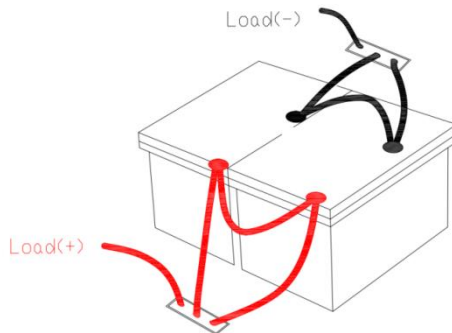


After series connection, the voltage of the battery system will be doubled according to the number of batteries you connect.

E.g. If two 24V(25.6V) 100Ah batteries are connected in series, the battery system will be 48V(51.2V)100Ah.

### Step4 Battery-to-Battery Connection

#### #2 Connect Batteries in Parallel $\oplus$ to $\ominus$ $\ominus$ to $\ominus$



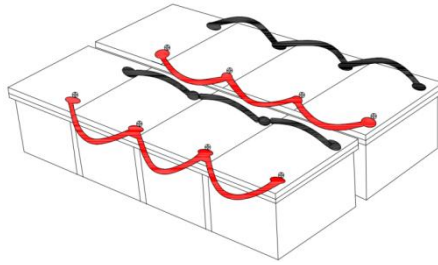
After parallel connection, the capacity of the battery system will be doubled according to the number of batteries you connect.

E. g. If two 24V(25.6V) 100Ah batteries are connected in parallel, the battery system will be 24V(25.6V)200Ah.

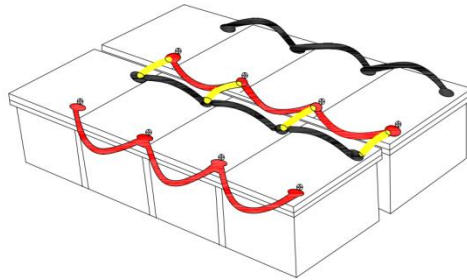
#### #3 Connect Batteries Both in Series & Parallel

Connect in parallel first, then series

### Step1 Connect the batteries in parallel



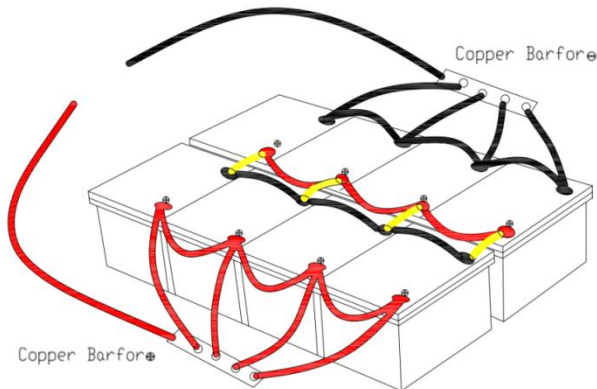
### Step2 Connect the paralleled battery systems in series



### Step3 Total input & Output Connection

Use two copper bars (instead of battery terminals) to connect all the positive and negative output input cables, ensuring that the input & output currents of each battery are balanced. (Not required when connecting batteries origin series.)

It is not recommended to use one terminal as the total positive or negative output input of the battery system as the connected terminals may heat up or even melt if the total output input current of the battery system is too high.

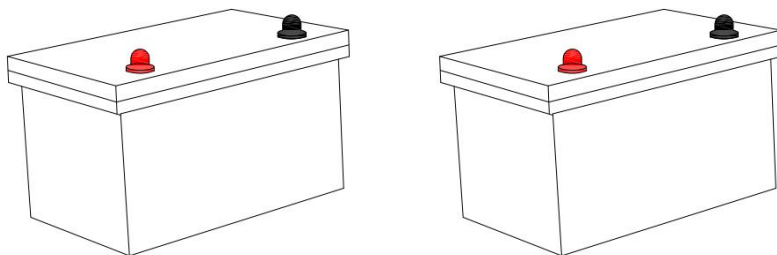


<b>Battery System</b>	<b>48V(51.2V)400Ah</b>
<b>Energy</b>	<b>20480Wh</b>
<b>Max.Continuous Charge /Discharge Current</b>	<b>400A</b>
<b>Max. Continuous Load Power</b>	<b>20480W</b>

①As **-** of ①/③/⑤/⑦ is connected in series with **+** of ②/④/⑥/⑧ please do not connect **-** of ①/③/⑤/⑦ with - of load or **-** of ②/④/⑥/⑧ with **+** of load, otherwise the battery system will fail to connect in series. ② Please do not connect in reverse order, which may affect the use of the batteries

### Step 5 Rebalancing Every 6 Months

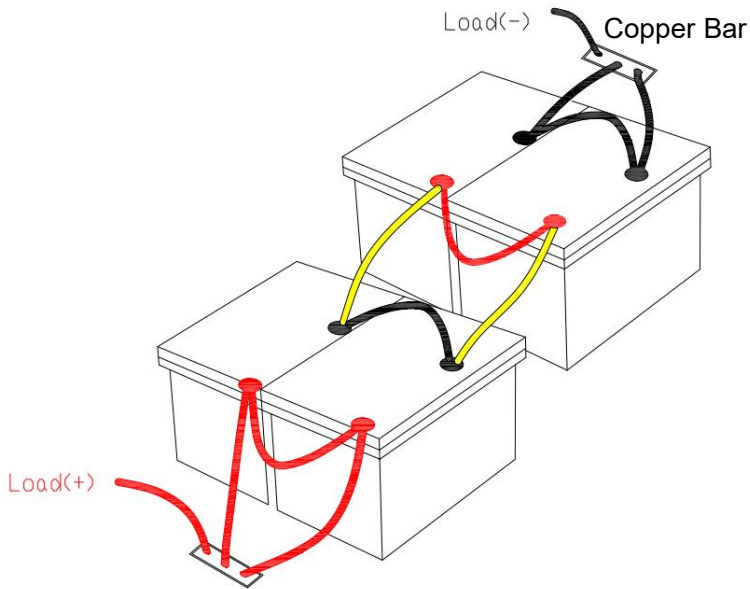
It is recommended to rebalance the battery voltage every six months following Step 2 on Page 13 if you're connecting multiple batteries as a battery system, as there might be voltage differences after six months of the battery system running.



### Wiring Diagrams

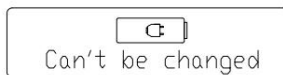
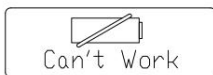
<b>2P2S</b>	<b>Battery System</b>	<b>48V(51.2V)200Ah</b>
	<b>Energy</b>	<b>10240Wh</b>
	<b>Max.Continuous Charge /Discharge Current</b>	<b>200A</b>
	<b>Max. Continuous Load Power</b>	<b>10240W</b>





## WHAT TO DO WHEN THE BATTERY STOP WORKING?

When the battery

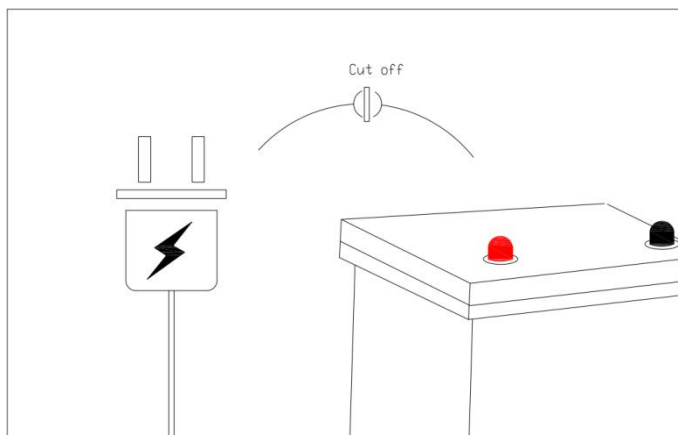


It has 85% chances that BMS has shut it off for protection, and you could try one of below ways to activate the battery.

## GENERAL STEPS

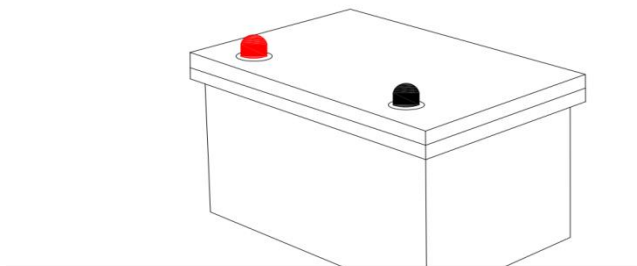
If the BMS has cut off the battery for protection, follow the below steps to activate it.

## Step1 Cut off all the connections from the battery



## Step2 Leave the battery aside for 30mins

Then the battery will automatically recover itself to normal voltage ( $>10V$ ) and can be used after fully charged.

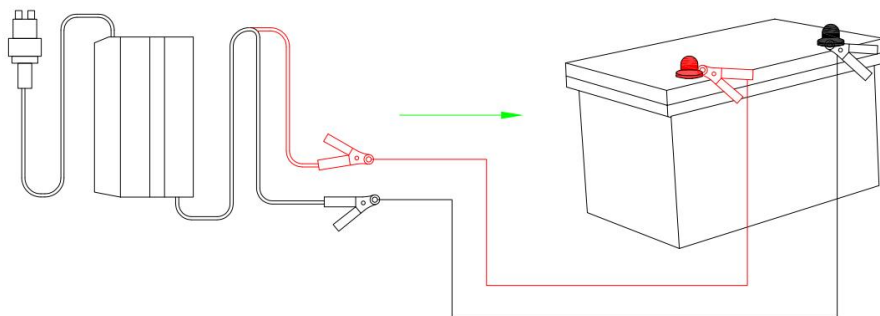


If the battery is unable to recover itself after the above steps. Please try activating by **ONE OF BELOW TWO METHODS.**

After activated (voltage  $> 10V$ ) and fully charged by the normal charging method, it can be used normally.

## Method (1)

Use a charger with a 0V charging function (1) to fully charge the battery.



(1) The charger can charge the battery starting from 0V.

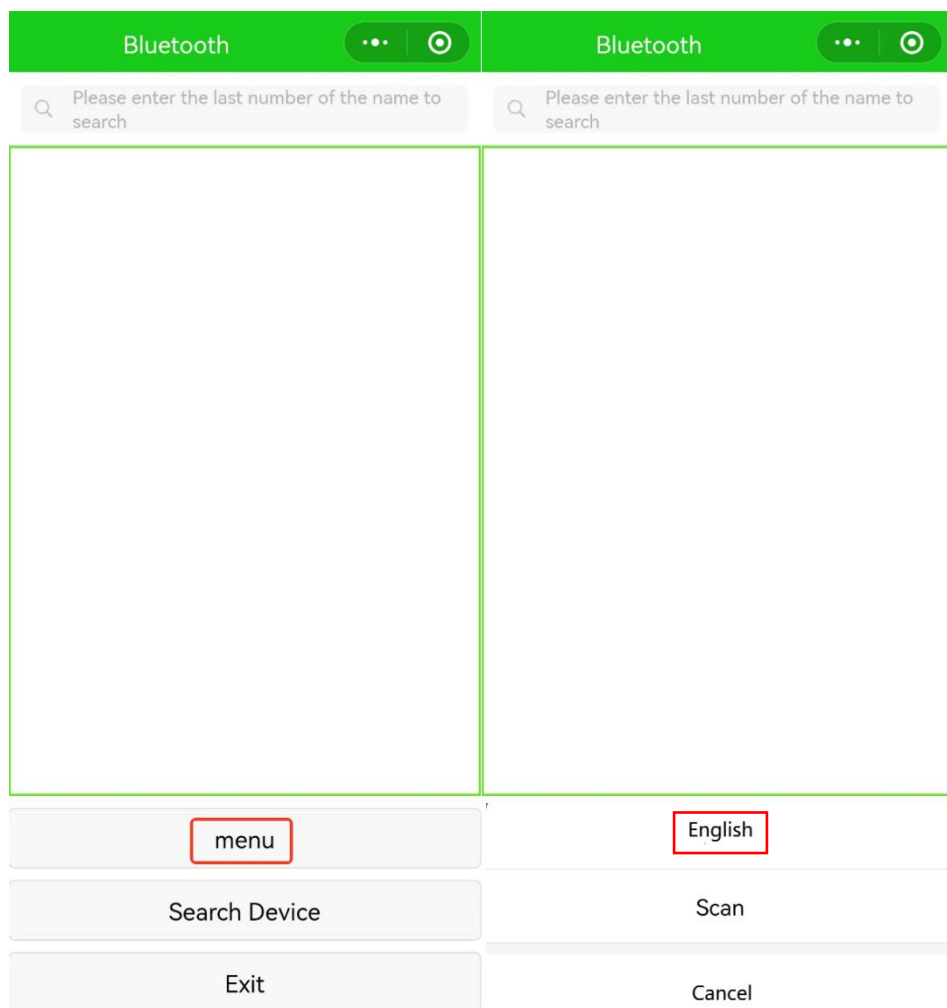
## CONNECT THE WECHAT APPLET TO THE BMS

1) Search for ThereeTeamBMS on WeChat, or scan the QR code below with WeChat

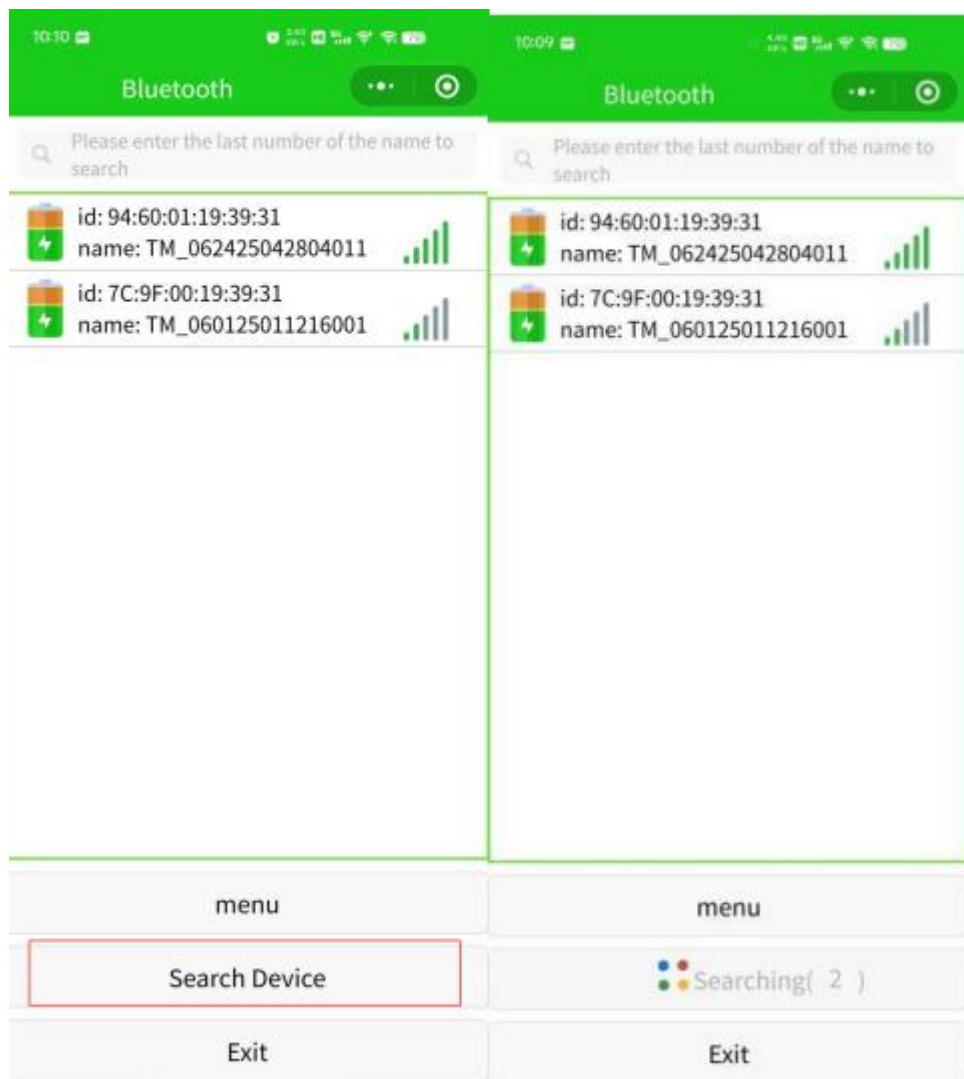


2) Turn on your phone's Bluetooth and location.

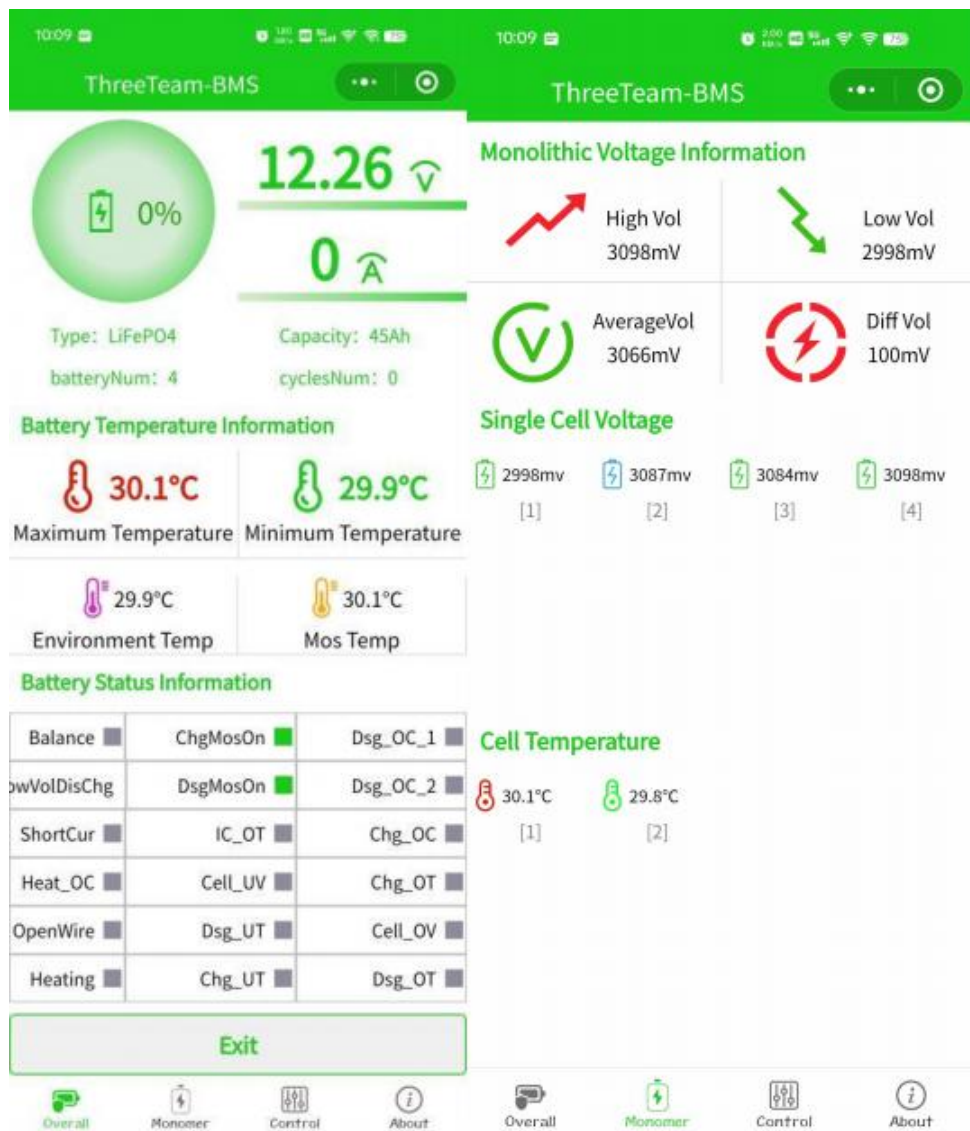
3) After opening the Mini Program, open the "menu" bar and click "English" to switch between Chinese and English.



4) Click Device Search, search for the battery icon shown in the figure below, and select Connect.

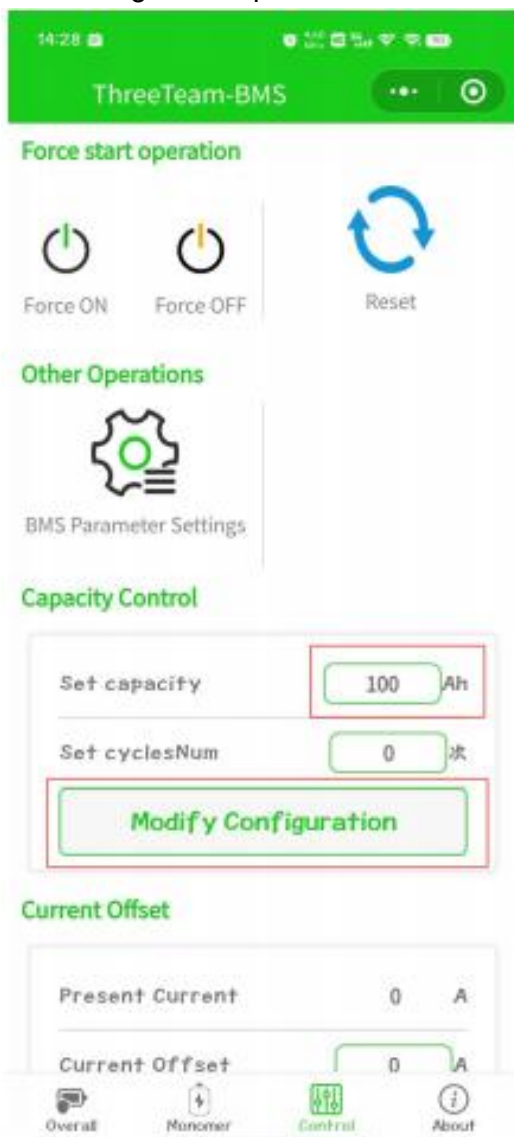


5) Once connected to Bluetooth, the battery information can be read



## 2. Set the battery capacity Connect.

As shown in the figure below, when the default capacity set by the BMS is inconsistent with the actual battery capacity, set the battery capacity in the set capacity input box on the command control page, and then select the following modification configuration, password ZXK.2012.



### 3. Calibrate the current.

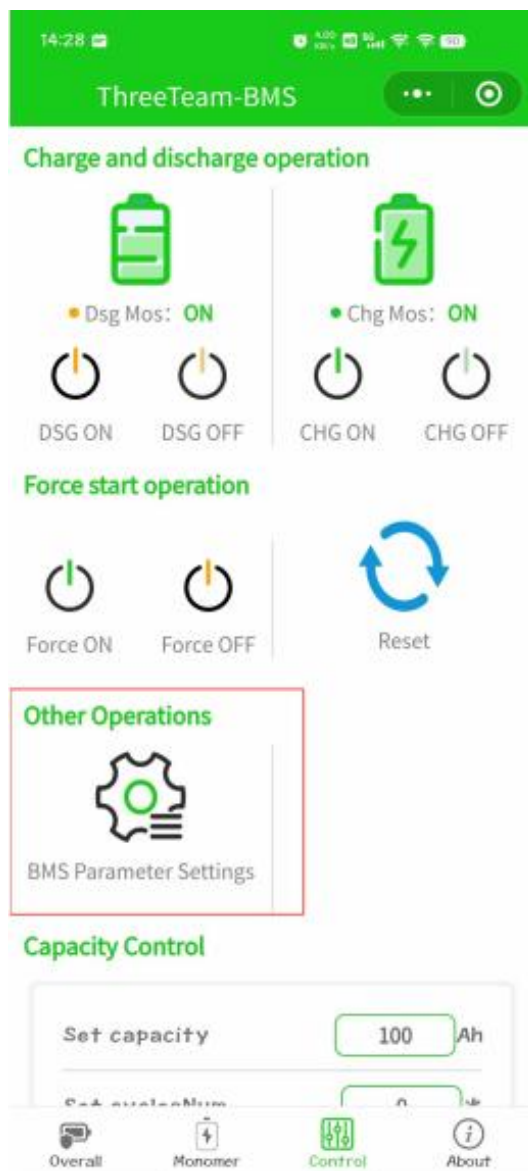
When there is a deviation between the current and the actual current of the applet, you can do current calibration, first the output of the battery pack is connected to the electronic load, and then the electronic load sets a current, and the actual discharge current is entered in the current calibration input box on the command control page, and then select the following modification configuration, password ZXK.2012.





4. BMS parameters are modified.

1) On the Command Control page, click BMS Parameter Settings to enter the parameter modification page.



2) After modifying the parameters, select Modify Configuration, password

The screenshot displays the 'Setting' screen of a BMS application. The interface is organized into several sections, each with a title in green text. Each section contains a list of parameters with their current values and units, and a small arrow icon to the right of each value, indicating it can be edited.

**System Set**

- Batteries: 36
- Mosfet Enable: OFF
- Mosfet Enable Recovery: On
- DSG TC Prohibit: OFF

**Voltage Protection**

- CHG Over Volt: 3365 mV
- Over Volt Delay: 2 s
- Over Volt Release: 3520 mV
- Balance Start Volt: 3380 mV
- Balance Dis Off Volt: 30 mV
- Balance Off Off Volt: 10 mV
- Balance Enter Delay: 0 s
- DSG Under Volt: 2500 mV
- Under Volt Release: 2700 mV
- Under Volt Delay: 3 s
- LQV Threshold: 1500 mV

**Current Protection**

- DSG Over Cur L1: 300 A
- Over Cur L1 Delay: 30 s
- Over Cur L1 Recover Delay: 5 s
- DSG Over Cur L2: 300 A
- Over Cur L2 Delay: 2000 mV
- Over Cur L2 Recover Delay: 5 s
- Short Cur Vol: 200 mV
- SC Protect Delay: 400 s
- SC Recover Delay: 0 s
- CHG Over Cur: 180 A
- CHG Over Cur Delay: 8 s
- CHG Over Cur Recover Delay: 90 s

**Temperature Protection**

- CHG Temp Delay: 2 s
- CHSOT: 60 °C
- CHSOT ResTemp: 55 °C
- CHSUT: -10 °C
- CHSUT ResTemp: -4 °C
- DSGOT: 70 °C
- DSGOT ResTemp: 65 °C
- DSGUT: -20 °C
- DSGUT ResTemp: -15 °C

At the bottom of the screen, there are four large green buttons with white text:

- Modify Configuration
- One-click Li-Ion
- One-click LFP
- One-click Na-Ion

**Manufacturer:** Shanghaimuxinmuyeyouxiangongsi

**Address:** Shuangchenglu 803nong11hao1602A-1609shi, baoshanqu, shanghai 200000 CN.

**Imported to AUS:** SIHAO PTY LTD. 1 ROKEVA STREETEASTWOOD NSW 2122 Australia

**Imported to USA:** Sanven Technology Ltd. Suite 250, 9166 Anaheim Place, Rancho Cucamonga, CA 91730

UK	REP
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YH CONSULTING LIMITED. C/O YH Consulting Limited Office 147, Centurion House, London Road, Staines-upon-Thames, Surrey, TW18 4AX

EC	REP
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E-CrossStu GmbH  
Mainzer Landstr.69,  
60329 Frankfurt am Main.

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RF Exposure Information

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

NOTE 2: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

