



36(38.4)V LiFePO4
 **150Ah**

Golf Cart Battery



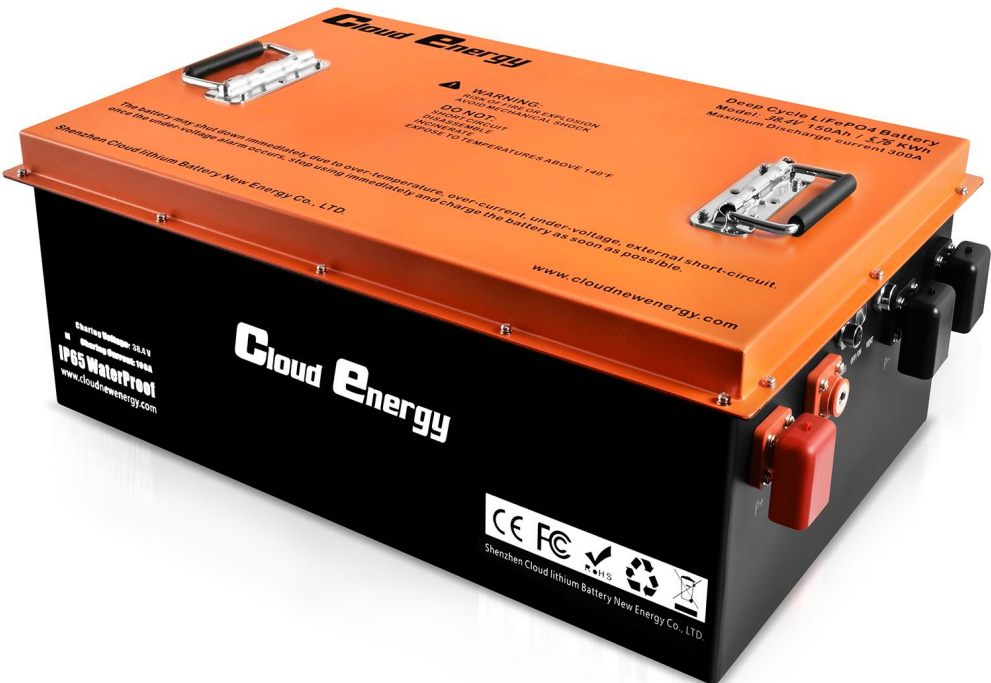
Please Read The Manual Carefully Before Using The Equipment.



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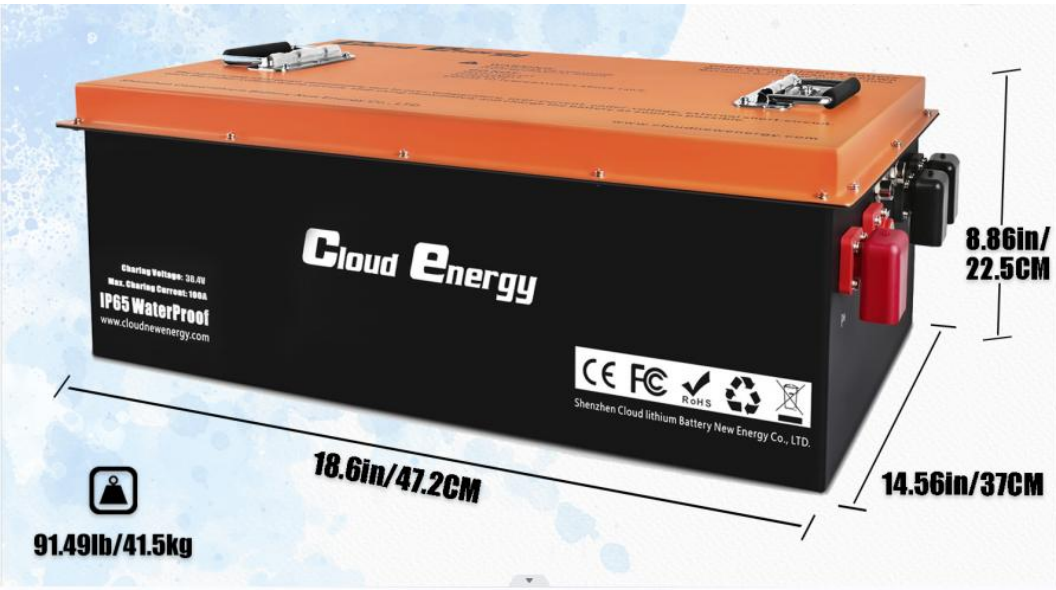
info@cloudnewenergy.com

Cloudenergy 36v 150Ah LiFePO4 Battery Deep Cycle Rechargeable Battery for Golf Cart



PRODUCT OVERVIEW

BATTERY



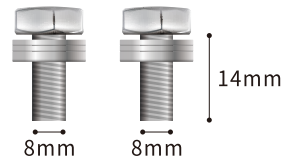
TERMINAL & POST BOLTS

Terminal Size:

M8 (1.25mm Metric Thread)

Post Bolts:

M8 (1.25mm Metric Thread * 14mm Bolt Length)



(The bolts can be replaced with M8 bolts of other lengths based on actual needs.)

GENERAL INFORMATION

Operating Voltage: 38.4V

Charging Voltage: 43.8V

Max Continuous Load Power: 5760W

Max Continuous Charge/ Discharge Current: 100A/150A

NOTICE BEFORE USING

Step

1

CONTACT US at info@cloudnewenergy.com to activate the FIVE-YEAR WARRANTY

Step

2

PULL OUT Packaging box.



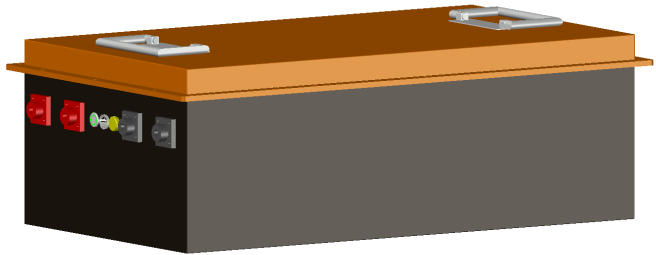
Step

3

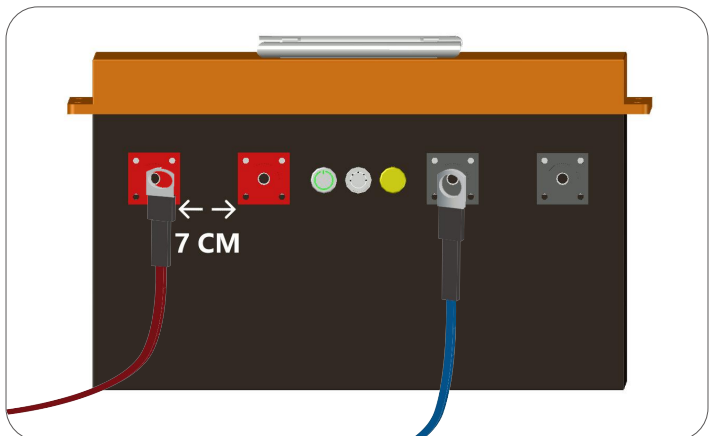
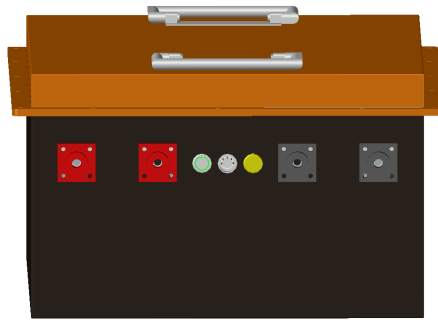
TEST The Battery Voltage with Multimeter

>48v To step 4

<48V Contact us at info@cloudnewenergy.com to help solve the problem



FULLY CHARGE The Battery Separately





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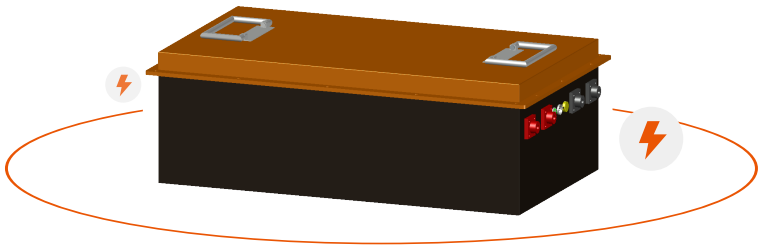
BATTERY-PACK MAIN PARAMETERS

Cell	Prismatic LiFePO4 Battery
Nominal Capacity	150Ah
Usable Capacity	150Ah
Nominal Voltage	38.4V
Energy	5760Wh
Charge Method	CC / CV
Charge Voltage	43.8V±0.75V
Max. Charge Current	100A (0.68C)

Battery Management System (BMS) Board	300A
Max. Continuous Charge / Discharge Current ^①	100A/150A
Max. Discharge Current 5 Seconds	300A
Max. Continuous Load Power ^②	5760W

- ① The maximum continuous current that the battery can withstand.
② The maximum continuous output power that the battery can support.

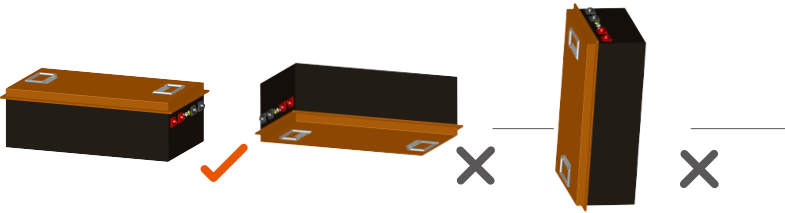
Internal Impedance	≤40mΩ
Battery Pack Case	Steel Plate Cold Common (SPCC)
Dimension	L18.6*W14.56*H8.86 inch
	L472*W370*H225 mm
Temperature Range	Charge: 0°C to 50°C / 32°F to 122°F
	Discharge: -20°C to 60°C / -4°F to 140°F
	Storage: -10°C to 50°C / 14°F to 122°F



THINGS TO KNOW BEFORE USING

Please take care to avoid metal or conductive objects touching the positive and negative terminals of the battery at the same time during your operation, otherwise it is likely to cause a short circuit.

DO NOT install the battery with the top or the post bolt facing down. If you are not sure about the installation direction, please contact to confirm the direction.



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.

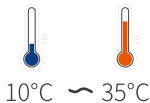
Suggestions for **Long-term Storage**:

○ Temperature

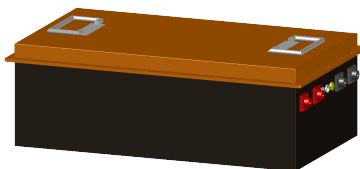
The battery can be operated at a temperature of -20°C to 60°C / -4°F to 140°F , and a temperature between 10°C to 35°C / 50°F to 95°F is ideal for long-term storage. Store in a fireproof container and away from children.

○ 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.



Recharge Every
3 Months

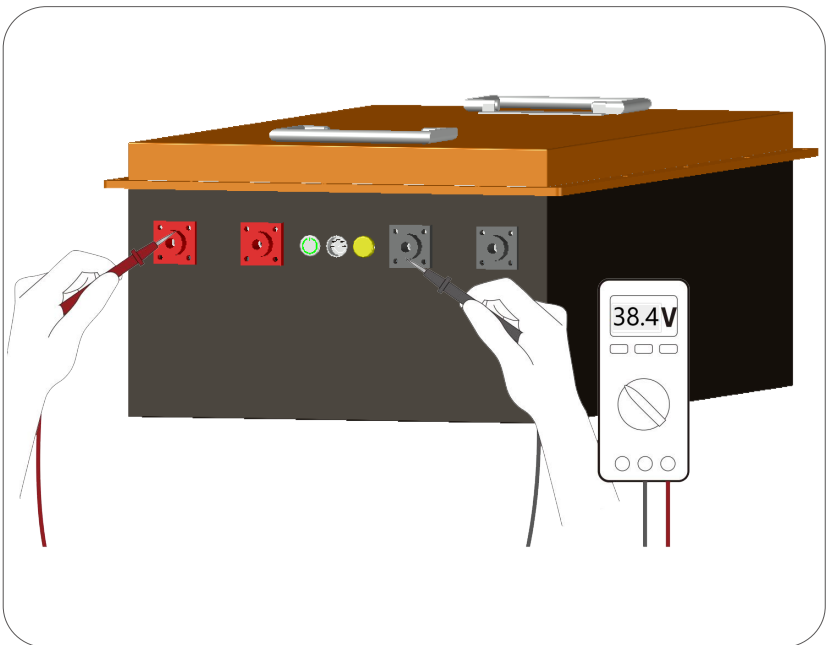


CHARGING METHODS

THE VOLTAGE WHEN CHARGING & DISCHARGING

Based on the characteristics of Lithium Iron Phosphate (LiFePO₄) batteries, the voltage measured by all LiFePO₄ batteries during charging/discharging is not the real voltage of the battery. Therefore, after charging/discharging and disconnecting the battery from the power source, the voltage of the battery will gradually drop/increase to its real voltage.

If you need to test the real voltage of the battery, please disconnect all the connections to the battery and test its voltage after putting it aside for over 30 mins.



■ Tips When Testing The Battery Voltage by A Multimeter

- ① Put the red probe (+) tightly on the tightly screwed positive post bolt, and the black probe (-) on the tightly screwed negative post bolt.
- ② Do not touch the metal part of the probes with your hands during use.

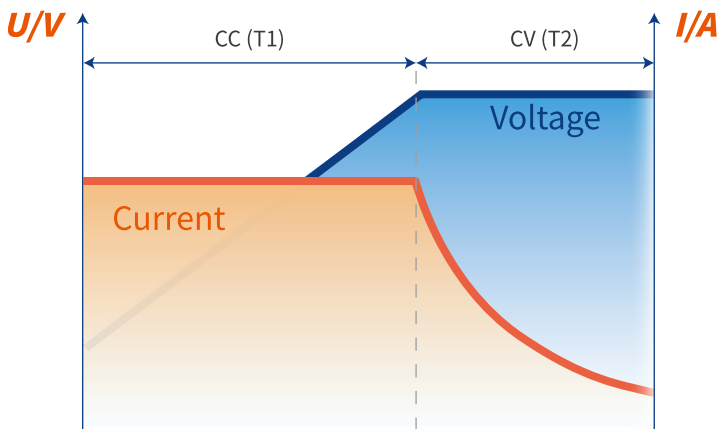
BATTERY CHARGING LOGIC

The material characteristics of the LiFePO₄ battery determine that its charging curve is obviously different from that of a lead-acid battery.

Compared with a lead-acid battery, the LiFePO₄ battery has a simpler charging process and mode. Therefore, it is recommended to select LiFePO₄ for your charging mode.

If LiFePO₄ mode is not available, please refer to the recommended parameters on Page 07~08 for setting.

LiFePO₄ Battery Charging Mode



LiFePO₄ Battery Charging Curve

○ CC (Constant Current) Phase (T1)

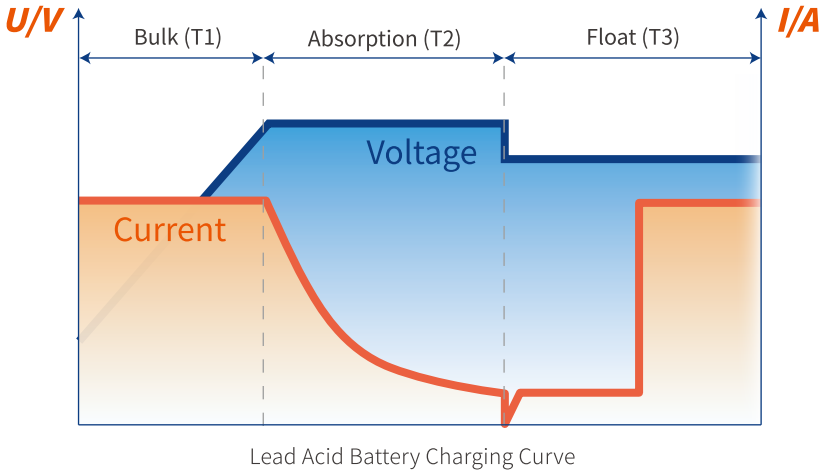
In the beginning, a discharged battery will be charged with a constant current and voltage will be climbing steadily until reaching the constant voltage setpoint which varies for different charging methods.

○ CV (Constant Voltage) Phase (T2)

The battery maintains a constant voltage during this phase while the current gradually decreases to **3A** (0.02C) which is also known as tail current^①. At this point, the charging is cut off and the battery is fully charged.

① Tail Current (A) = Battery Capacity * 0.02C. E.g., 100Ah*0.02C= 2A tail current.

Lead Acid Battery Charging Mode



○ Bulk / Boost Phase (T1)

In the beginning, a discharged battery will be charged with maximum current and voltage will be climbing steadily until reaching the absorption voltage setpoint.

(This phase is basically equivalent to the CC phase of LiFePO₄ battery charging.)

○ Absorption Phase (T2)

The battery reaches the absorption voltage setpoint and holds the voltage constant while the current gradually decreases until the battery is becoming full (within 10-20%). Generally, absorption will not exceed 3 hours to prevent overcharging.

(This phase is basically equivalent to the CV phase of LiFePO₄ battery charging.)

○ Float Phase (T3)

After the absorption stage, the voltage of the battery will reduce to the float voltage setpoint and the current will also reduce to a low maintenance mode to prevent the battery from discharging and offsetting any self-discharge. Heavier battery discharge may set the controller back to Bulk/Boost or Absorption to replenish energy lost while energy is available.

(LiFePO₄ battery does not have this charging phase.)

SOLAR PANEL(S) & CONTROLLER

Solar Panel

☆ Recommend Power: $\geq 1500\text{W}$

- The battery can be fully charged in one day (with effective sunshine 4.5hrs/day) by 1500W solar panels.
- It may take more than one day to fully charge the battery by 1500W solar panels since the duration and intensity of light would be a great factor for their charging efficiency.

Controller

☆ Recommend Charging Current:

20A (0.15C)	The battery will be fully charged in around 8 hrs to 100% capacity.
50A (0.35C)	The battery will be fully charged in around 3 hrs to around 97% capacity.

☆ Recommend Charging Mode: **36V (38.4V) 20Ah (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 05-06), **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

CHARGING	Charge /Bulk /Boost Voltage	43.6V/ 43.8V
	Absorption Voltage	43.6V/ 43.8V
	Over Voltage Disconnect	44.6V
	Over Voltage Reconnect	40.2V
	Tail Current	2A (0.02C)
DIS-CHARGING	Under Voltage Warning	32.6V
	Under Voltage Recover	33.75V
	Low Voltage Disconnect	32.6V
	Low Voltage Reconnect	34.5V

BATTERY CHARGER

Use 54.75V lithium iron phosphate (LiFePO₄) battery charger to maximize the capacity.

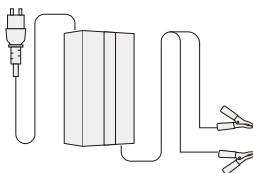
☆ Recommend Charging Voltage: Between **43.6V** to **43.8V**

☆ Recommend Charging Current:

20A (0.15C)	The battery will be fully charged in around 8hrs to 100% capacity.
50A (0.35C)	The battery will be fully charged in around 3hrs to around 97% capacity.

Tips

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



ALTERNATOR / GENERATOR

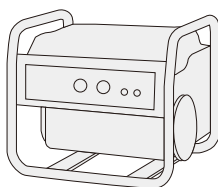
LiTime battery can be charged by an alternator or generator.

If the alternator/generator supports DC output, a DC-to-DC charger needs to be added between the battery and the generator; if the alternator/generator supports AC output, please refer to the recommendations in "Battery Charger" above to add a suitable battery charger between the battery and the generator.

☆ Recommend Charging Voltage: Between **43.6V** to **43.8V**

☆ Recommend Charging Current:

20A (0.15C)	The battery will be fully charged in around 8hrs to 100% capacity.
50A (0.35C)	The battery will be fully charged in around 3hrs to around 97% capacity.



HOW TO ESTIMATE THE BATTERY CAPACITY

STATE OF CHARGE (SOC)

The battery capacity could be roughly estimated by its rest voltage (not charging/discharging voltage). As there are subtle differences in the voltage of each battery, the below parameters are for reference only.

Rest Voltage:The voltage needs to be tested at rest (with zero current) after 30 mins of disconnecting from the charger & loads.

CAPACITY	CHARGE VOLTAGE
100%	40.3V
99%	39.7V
90%	39.4V
70%	39V
40%	37.5V
30%	36.7V
20%	36V
10%	33.8V
1%	☆ 32.3V (recommend low voltage disconnect voltage)
0%	31.5V

PARALLEL CONNECTION

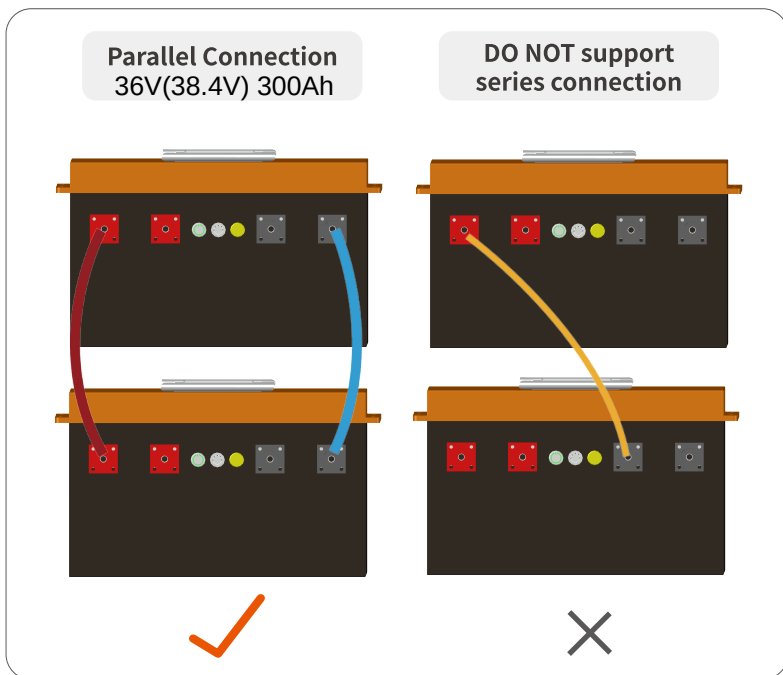
THE PREMISE OF CONNECTION

To connect in 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 in parallel for up to: 36V 2400Ah battery system.



HOW TO CONNECT

Step1 Wear Insulating Gloves

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

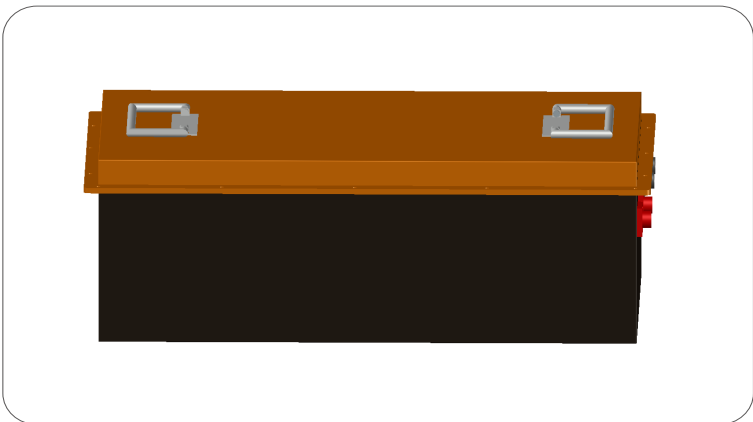


Step2 Voltage Balancing Before Connection

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

Step
1

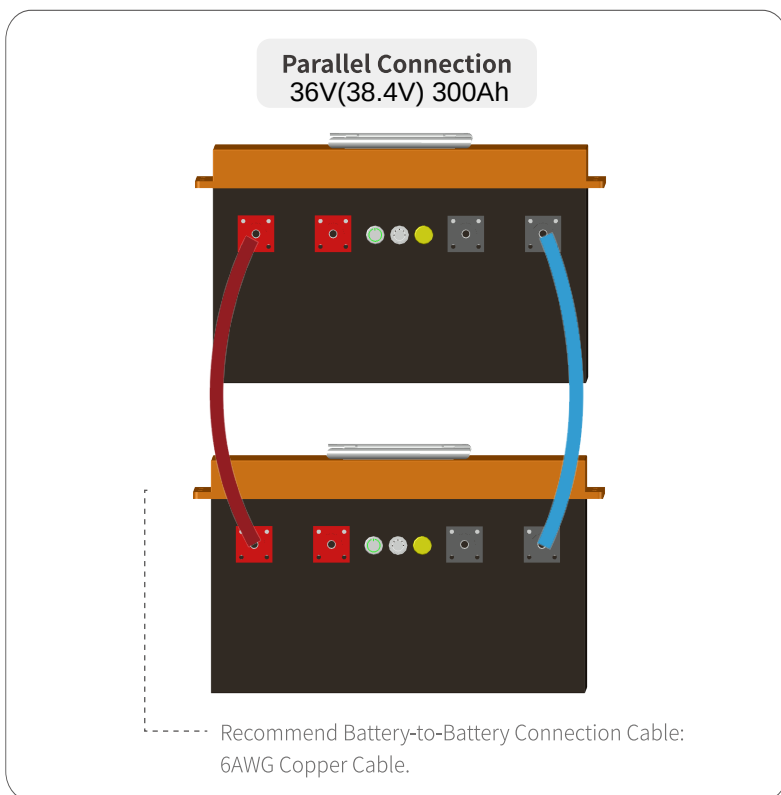
Fully charge the batteries separately.
(voltage at rest: $\geq 40.3V$)



Step
2

Connect the batteries one by one in parallel, and leave them together for 12~24hrs. After the battery voltages have been balanced, the paralleled battery system can be connected to the load referring to Step 3 on Page 13.

Connect Batteries in Parallel **+** to **+** **-** to **-**



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

E.g. If two **36V 150Ah** batteries are connected in parallel, the battery system will be **36V 300Ah**.

How to Connect the Battery Power Indicator

Step

1

Connect battery and display screen through RS485 cable



Step

2

Switch on



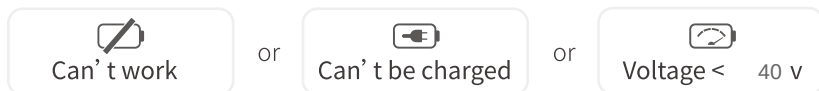
Step
3

The battery information can be switched by touch screen



WHAT TO DO WHEN THE BATTERY STOPS WORKING?

When the battery



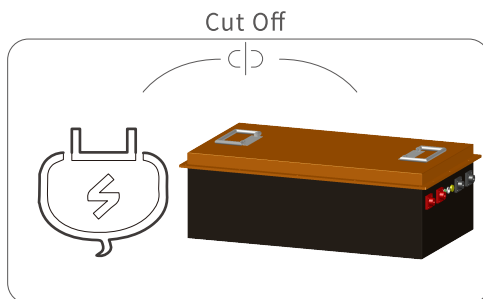
It has 85% chances that BMS has shut it off for protection, and you could try one of below ways to activate the battery.

GENERAL STEPS

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

Step
1

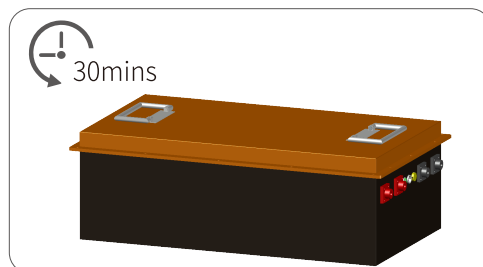
Cut off all the connections from the battery



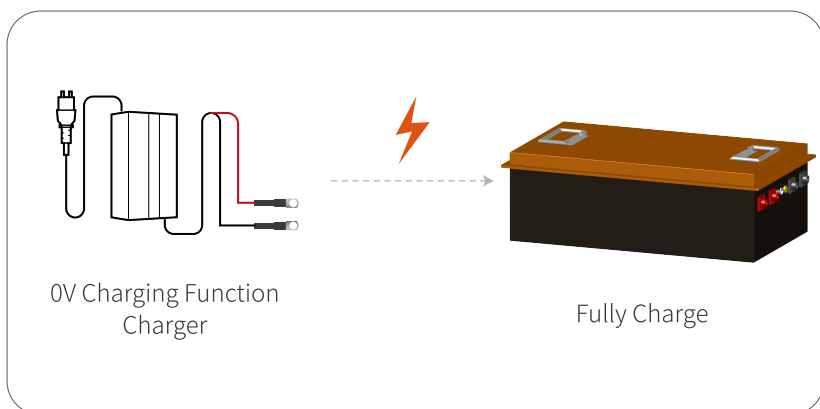
Step
2

Leave the battery aside for 30mins

Then the battery will automatically recover itself to normal voltage (> 30 V) and can be used after fully charged.



If the battery is unable to recover itself after the above steps, please try activating by **USING A CHARGER WITH A 0V CHARGING FUNCTION** ^①
TO FULLY CHARGE THE BATTERY.



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

After activated (voltage >28.5V) and fully charged by the normal charging method, it can be used normally.

ATTENTION

Caution: Risk of Fire, Explosion or Burns

DO NOT Short circuit

DO NOT Reverse connections from the charger to the battery

DO NOT Disassemble

DO NOT Throw into fire or incinerate

DO NOT Heat above 70°C / 158°F

WARNING

BATTERY DISPOSAL

The electrodes of the waste battery should be wrapped with insulating paper to prevent fire and explosion.

PROHIBITION OF DISASSEMBLY

Never disassemble the cells.

The disassembling may generate an internal short circuit in the cell, which may cause gassing, firing, explosion, or other problems.

The electrolyte is harmful.

Li-Fe battery should not have liquid from electrolyte flowing, but in case the electrolyte comes into contact with the skin, or eyes, physicians shall slush the electrolyte immediately with fresh water and medical advice is to be sought.

PROHIBITION OF DUMPING OF CELLS INTO WATER

Do not soak the battery in which the liquid, like water, seawater and non-alcoholic drinks, fruit juice, coffee or other drinks.

PROHIBITION OF DISASSEMBLY

If any abnormal features of the cells are found such as damages in a plastic envelope of the cell, deformation of the cell package, smelling of an electrolyte, an electrolyte leakage and others, the cells shall never be used anymore.

The cells with a smell of the electrolyte or a leakage shall be placed away from the fire to avoid firing or explosion.

PROHIBITION OF USING IN BELOW PLACES

Do not use the battery in a place with strong static electricity and a strong magnetic field, otherwise, it is easy to damage the battery safety protection device and bring hidden danger.



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