SuntNeew

PRODUCT MANUAL

ESS-12.8V100AH-B-G31

12.8V 100Ah

01-Notice:

Please read this operating guide and product manual carefully before use.

1. After unpacking, wear insulating gloves for battery installation and wiring.
2. According to shipping-related regulations, this battery carries about 50%±5% capacity when shipped. Please fully charge the battery before starting to use it.
3. Install the battery upright with the post bolts facing up, do not mount it upside down.
4. Avoid directly contacting the positive and negative battery cable terminals which may cause a short circuit and damage the battery.
5. Wrap the cable terminals with insulating tape during wiring.
6. Ensure that the battery is properly wired to the device, do not reverse the positive and negative connections.
7. Do not connect batteries from different brands or with different specifications in series or parallel.
8. Before connecting the load, make sure the power supported by the battery can meet the power demand of the load.
9. Avoid using alligator clips to connect the charger or load to the battery, as the contact area is too small and may result in terminal melting and battery damage.
10. For long-term storage, it is advised to store the battery between -20°C to 60°C/-4°F to 140°F at a 50% charge level and ensure a recharge every six months.
11. Always keep the battery away from fire. Never soak the battery in water.

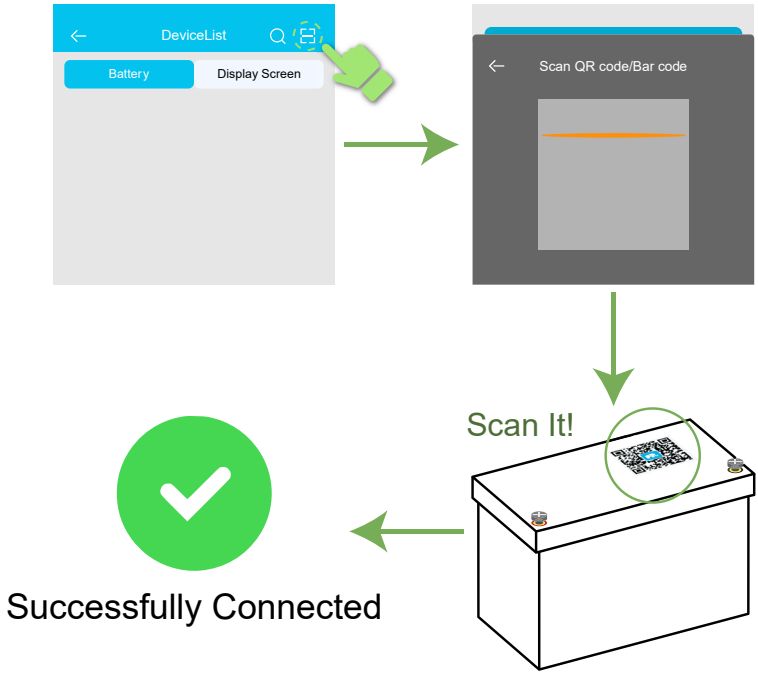
02-Bluetooth Installation Guide:

Step 1: Scan the QR code to download the App. Register and log in.

make sure to allow the App to access the following features

Step 2: **Connect and prepare to use**

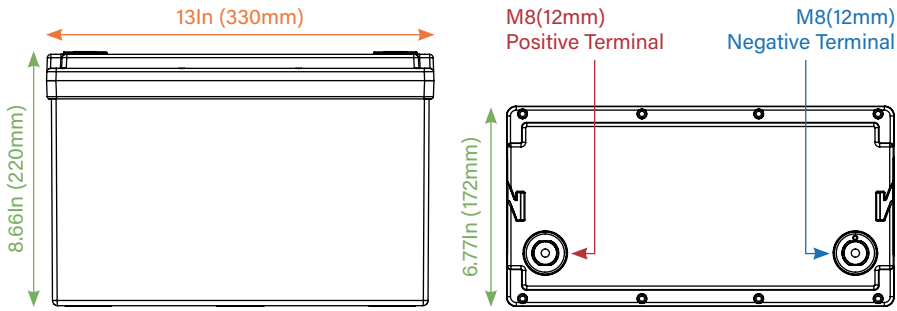
Use the App to scan the QR code on the top of the battery or enter the device list to find the Bluetooth address to connect to the battery, and you can start using it!



03-Product Overview:

ITEM	CONTENT	PARAMETER
Battery	Capacity	100AH
	Operating Voltage	12.8V
	Charging Voltage	14.4V ± 0.2V
	Recommended Charge Current	30A (0.3C)
	Max.Continuous Discharge Current	100A
	Max.Continuous Load Power:	1280W

ITEM	PARAMETER	EXPLANATION
Terminal Bolts	M8(12mm)	The bolts can be replaced with M8 bolts of other lengths.
Insulating Caps for Bolts		Protective terminals, bolts.
Integrated Bluetooth 5.0		Enables accurate and effortless real-time tracking and management of the battery status.
Product Manual		Product description and operation guide.



04-FCC Caution:

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.
- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: 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.

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance 20cm between the radiator and your body: Use only the supplied antenna.

05-SAFETY INSTRUCTION -1:

1. Please keep the battery away from heat sources, sparks, flames and hazardous chemicals.
2. Maintain Adequate Ventilation and Heat Dissipation: Place the battery in a well-ventilated area with sufficient heat dissipation to prevent overheating and damage.
3. 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.
4. Please tighten all cable connections, as loose cable connections can cause terminal meltdown or fire.
5. 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.
6. 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.
7. DO NOT immerse the battery in water whether the battery is in use or on standby.
8. DO NOT open, dismantle or modify the battery.
9. DO NOT touch the exposed electrolyte or powder if the battery casing is damaged.
10. 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.

05-SAFETY INSTRUCTION -2:

11. 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 alone will not protect your system from severe electrical conditions.
12. Trained and certified technicians are required for safe and reliable installation. This product manual can only serve as a guideline as it can not cover all possible scenarios.
13. Verify Correct Polarity
    Please verify the polarity before connecting the wiring. Reverse polarity can and will destroy the battery and other electrical equipment. Use a multimeter to determine proper polarity.
14. 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.
15. DO NOT dispose of the battery as household waste. Please use recycling channels by local, state, and federal regulations.
16. **Failure to observe the above warnings may result in potential damage.**

06-BATTERY PARAMETERS -1:

ITEM	PARAMETER
Product Name	LiFePO4 Battery 12.8V100AH-B-G31
Model	ESS-12.8V100AH-B-G31
Cell Type	LiFePO4
Nominal Voltage	12.8V
Rated Capacity	100Ah
Energy	1280Wh
Cycle Life	≥4000 times
Charge Method	CC/CV
Charge Voltage	14.4V ± 0.2V
Recommended Charge Current	30A(0.3C)
Max.Continuous Charge Current	100A
Max.Continuous Discharge Current	100A

06-BATTERY PARAMETERS -2:

ITEM	PARAMETER
Max.Continuous Output Power	1280W
Dimension	L13 * W6.77 * H8.66 inch
	L330 * W172 * H220 mm
Housing Material	ABS
Recommended Terminal Torque	106.2 to 123.9 inch·lbs/12 to 14 N.m
Protection Class	IP65
Temperature Range Charge	0°C to 55°C/32°F to 131°F
Discharge	-20°C to 60°C/-4°F to 140°F
Storage	-10°C to 50°C/14°F to 122°F
Low Temperature Charging Protection (LTCP)Functions	Yes
Resume Charging Temperature Under LTCP	5°C/41°F(Battery Temperature)
FCC ID	2BQK7-12100BG31

The 12V 100Ah battery supports Low-Temperature Charge Protection (LTCP), where the BMS stops battery charging when the battery Temperature falls below 0°C/32F and resumes charging when the temperature rises above 5°C/41°F.

07-User Manual -1:

1. 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.
2. Install the battery upright with the post bolt facing up, and it could not be mounted upside down.
3. Tightly screw in the post bolts. Having loose battery terminals will cause the terminals to build up heat resulting in damage to the battery.
4. This battery is not intended to be used to start any devices, please do not use it as a starting battery.
5. 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.
6. Store in a fireproof container and away from children.
7. For a longer-lasting product, it is best to store your battery at a 50% ± 5% charge level and recharge every six months if it is not going to be used for a long time.

8. **CHARGING METHODS**

A: Controller

Recommended Charging Current:

- 30A(0.3C) The battery will be fully charged in around 4hrs to 100% capacity.
- 50A(0.5C) The battery will be fully charged in around 2 hours to around 97% capacity.

Recommended Charging Mode:14.4 ± 0.2V(LiFePO4)

Controller Settings

Refer to the below parameters if you need to manually set up your controller.

07-User Manual -2:

ITEM	CONTENT	PARAMETER
CHARGING	Charge/Bulk	14.4±0.2V
	Over Voltage Disconnect	15V
	Over Voltage Reconnect	14.2V
	Tail Current	2A(0.02C)
DIS-CHARGING	Low Voltage Disconnect	10V
	Low Voltage Reconnect	10.4V

B: BATTERY CHARGER

Use 14.6V lithium iron phosphate(LiFePO4) battery charger to maximize the capacity.

Recommended Charging Voltage: Between 14.2V to 14.6V

Recommended Charging Current:

- 30A(0.3C)The battery will be fully charged in around 4hrs to 100% capacity.
- 50A(0.5C)The battery will be fully charged in around 2 hours to around 97% capacity.

Tips: it's recommended to disconnect the charger from the battery after fully charging.

C: ALTERNATOR/GENERATOR

The battery can be charged by an alternator or generator.

07-User Manual -3:

If the alternator/generator supports DC output, a DC-to-DC charger needs to be added between the battery and the generator;

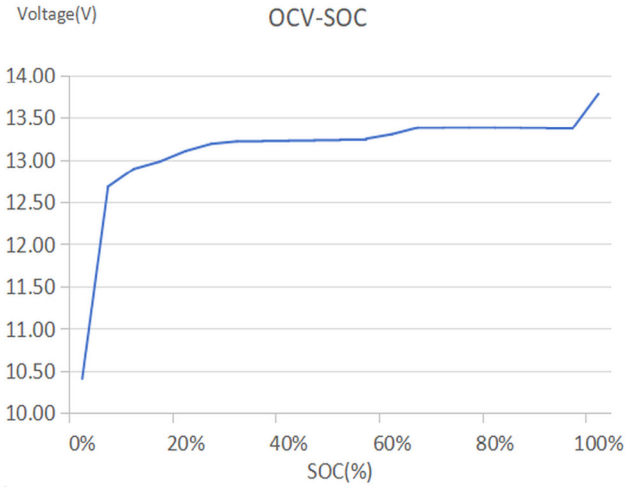
If the alternator/generator supports AC output, please add a suitable Battery charger between the battery and the generator.

Recommended Charging Voltage: Between 14.2V to 14.6V

Recommended Charging Current:

- 30A(0.3C)The battery will be fully charged in around 4hrs to 100% capacity.
- 50A(0.5C)The battery will be fully charged in around 2hrs to around 97% capacity.

9. STATE OF CHARGE(SOC)



SOC (%)	Voltage(V) (25°C/0.5C)
100%	13. 78
80%	13.38
60%	13.30
40%	13.22
20%	13.10
0%	10.41

a: Based on the characteristics of 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.

07-User Manual -4:

b: After this battery is protected from overcharge, the tested battery voltage (not the real voltage) will be lower than the real voltage. To calculate the SOC(%),add 0.5V to 0.7V to the tested battery voltage.

10. RECOMMENDED CABLE SIZING

Battery cables should be properly sized to handle the expected load.

Refer to the table below for amperage ratings for different sizes of copper cables.

PVC COPPER CABLE SIZE(AWG)	PVC COPPER CABLE SIZE(mm^2)	AMPACITY(A)
14	2.08	20
12	3.31	25
10	5.25	35
8	8.36	50
6	13.3	65
4	21.1	85
2	33.6	115
1	42.4	130
1/0	53.5	150
2/0	67.4	175
4/0	107	230

The above values are from NEC table 310.15(B)16 for copper cables rated at 167°F(75°C) operating at an ambient temperature not exceeding 86°F(30°C). Cables longer than 6 feet(1829 mm) or ambient temperature higher than 86°F(30°C)may require heavier gauges to avoid excessive voltage drops with undersized ones.

07-User Manual -5:

11. SERIES/PARALLEL 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);

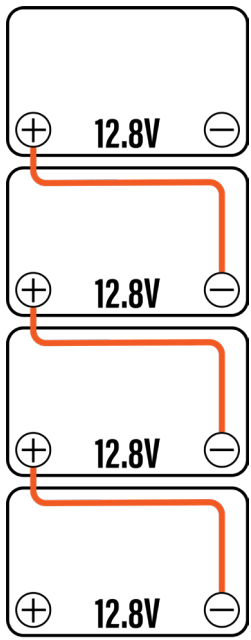
b. from the same brand(as lithium battery from different brands have their Special BMS);

c. purchased in near time(within one month).

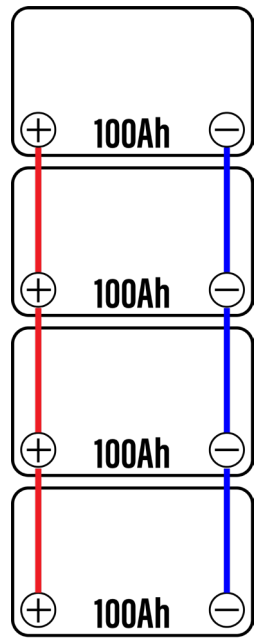
LIMITATION FOR SERIES/PARALLEL CONNECTION

Support connecting up to 16 identical batteries for up to: 4 in series as 51.2V 100Ah battery system or 4 in parallel as 12.8V 400Ah battery system.

Series Connection
48V(51.2V) 100Ah



Parallel Connection
12V(12.8V)400Ah

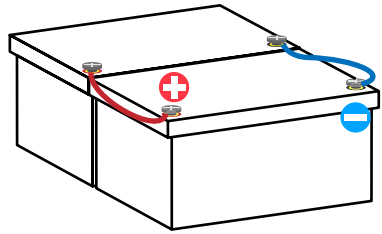


07-User Manual -6:

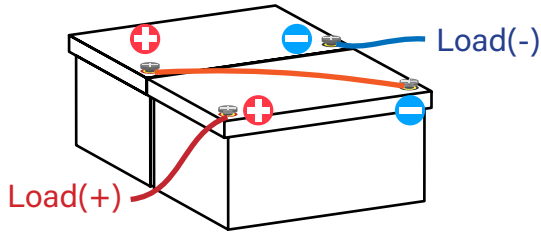
CONNECT BATTERIES

Step1: Wear insulating gloves for protection before connecting. Please pay attention to operation safety in the process of connection.

Step2: Voltage Balancing:
Reduce the voltage difference between batteries and let the battery system perform the best of it in parallel.
a: Fully charge the batteries separately. (voltage at rest: ⩾ 13.6V).
b: Connect all the batteries in parallel, and leave them together for 12-24hrs.

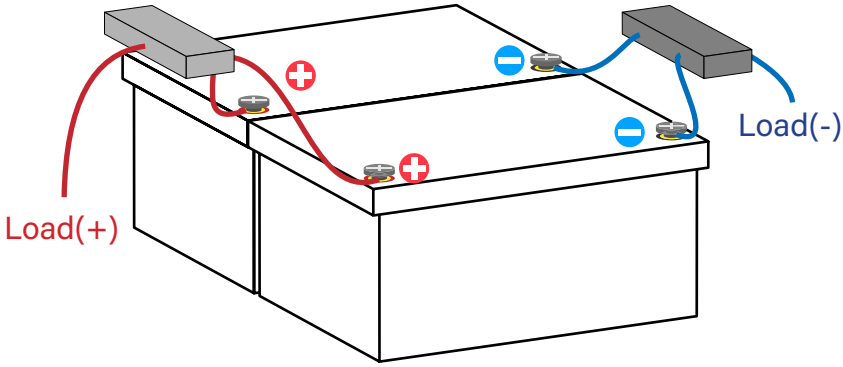


Step3: Battery-to-Battery Connection:
a: Connect Batteries in Series + to -
The voltage of the battery system will be doubled according to the number of batteries you connect.
For two 12.8V 100Ah batteries are connected in series, the battery system will be 25.6V 100Ah.

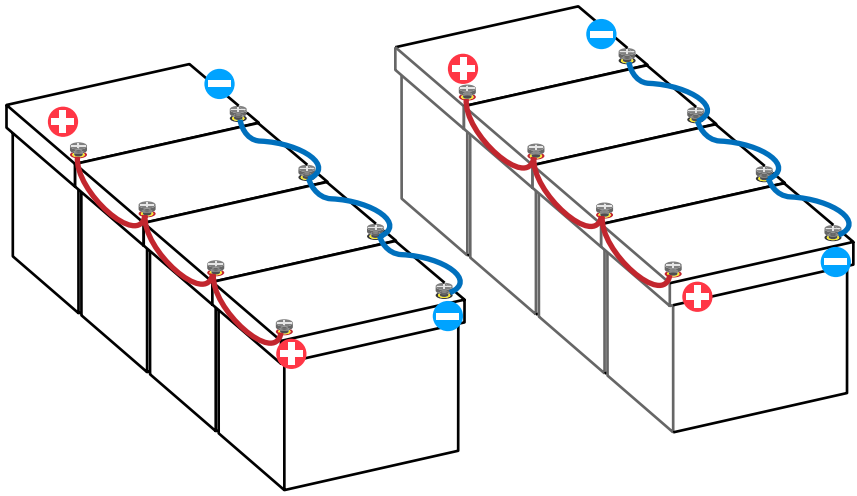


07-User Manual -7:

b: Connect Batteries in Parallel + to +
After a parallel connection, the capacity of the battery system will be doubled according to the number of batteries you connect.
For two 12.8V 100Ah batteries are connected in parallel, the battery system will be 12.8V 200Ah.

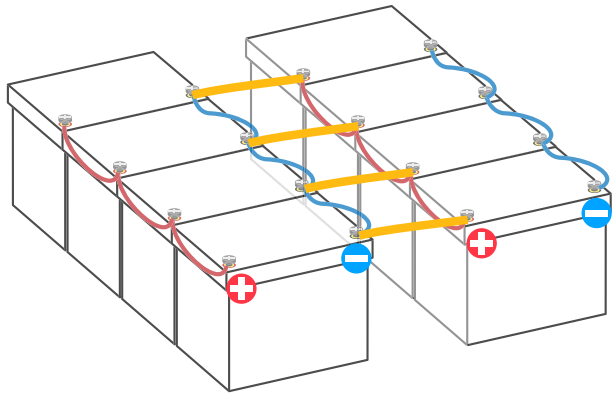


c: Connect Batteries Both in Series&Parallel
Connect the batteries in parallel.

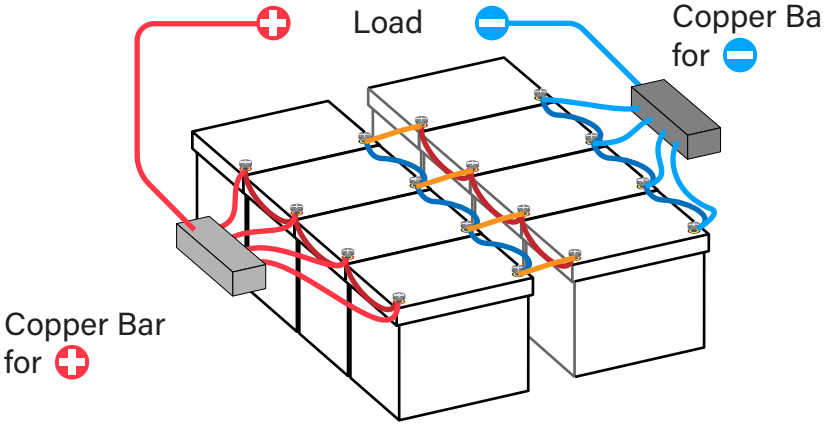


07-User Manual -8:

Connect the paralleled battery systems in series.



d: 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 only in 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.



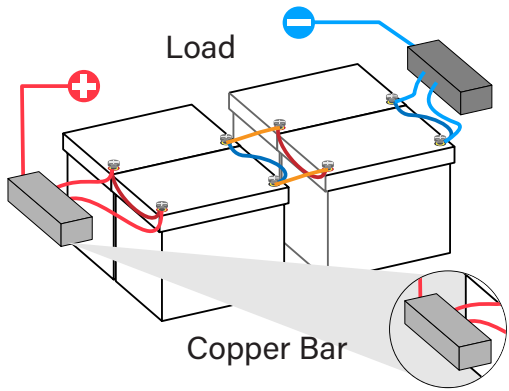
07-User Manual -9:

4 parallel 2 series	Battery System	25.6V 400Ah
	Energy	10240Wh
	Max.Continuous Charge/Discharge Current	400A
	Max.Continuous Load Power	10240Wh

Step4: Rebalancing Every 6 Months

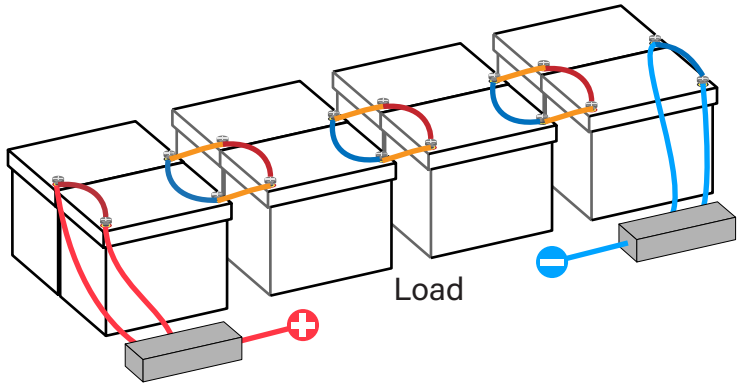
if you're connecting multiple batteries as a battery system, there might be voltage differences after six months of the battery system running. Rebalance the battery voltage following **Step2**.

12. Wiring Diagram Reference



2 parallel 2 series	Battery System	25.6V 200Ah
	Energy	5120Wh
	Max.Continuous Charge/Discharge Current	200A
	Max.Continuous Load Power	5120Wh

07-User Manual -10:



2 parallel 4 series	Battery System	51.2V 200Ah
	Energy	10240Wh
	Max.Continuous Charge/Discharge Current	200A
	Max.Continuous Load Power	10240Wh

13. BATTERY STOPS WORKING

When the battery Can't work or is charged or the Voltage<10v, BMS has shut it off for protection, and you could try one of the below ways to activate the battery.

Step1: Cut off all the connections from the battery.

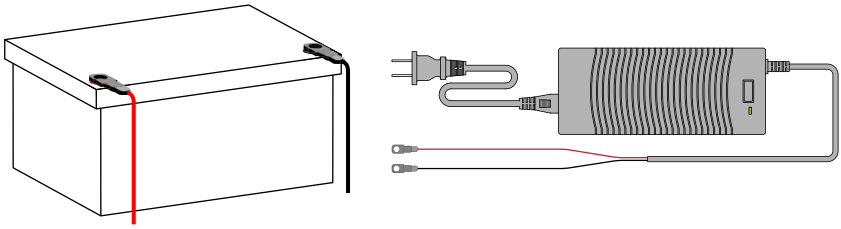
Step2: Leave the battery aside for 30mins

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

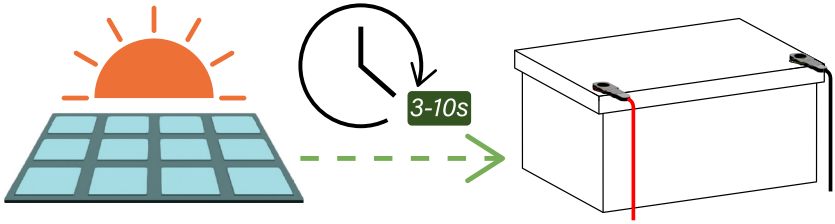
07-User Manual -11:

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

Method 1: use a charger with lithium battery activation function to fully charge the battery.



Method 2: Connect a controller that supports 12.8V LiFePO4 battery charging to charge the battery for 3-10s in sunny daytime.



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