Green Energy

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$LiFePO_4$ battery User Manual

Model:LAR200

LAR200（12.8V 200Ah LiFePO4 battery）User manual

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Part 1: product overview

- This manual introduces features, use, precautions, safety warnings, and maintenance of the LAR200 product.
- LiFePO4 battery has a stable and high output voltage platform, which can effectively guarantee its output power.
- LiFePO4 battery has higher thermal stability and chemical stability, which can better guarantee its safety.
- LiFePO4 battery has a long life and low overall cost of maintenance and use.

M8 terminal(+) M8 terminal (-)

- ✓ The product can widely be used in boats, vehicles and the energy storage industry, to replace 12V lead acid battery/AGM or Gel battery.

Part 2 : Product features

★Long life, cycle times>8000 times;

★Large current, continuous discharge current up to **250A**;

★No maintenance, service life >3 years;

★High security, advanced BMS protection;

★Allowable for series and parallel connection;

★Low self-discharge rate;

★Wide operating temperature range;

★Environmentally friendly & Green energy source;

★Light weight, Easier to transport and Simple operation;

★Built-in Bluetooth, can monitor the battery status instantly through the mobile APP.

support both IPhone and Android smart phone.

Part 3: Safety characters

The product is equipped with an advanced battery management system (BMS), which can effectively ensure the life and safety of the battery, including:

★Short circuit protection

★Over-current protection

★Over temperature protection

★Over-charge/over-discharge protection

★ABS case reaches V0 flame retardant level, which can better prevent fire accidents

Part 4: Safety warning 

Lithium-ion batteries and battery packs exposed to extreme conditions may heat up, catch fire or explode, and cause serious injury. Be sure to follow the safety warnings listed below:

▲It is forbidden to short-circuit the positive and negative electrodes of the battery [such as directly connecting the positive (+) and negative (-) terminals with wires or other metal objects], otherwise the high current and high temperature may cause personal injury or fire;

▲Use qualified and matched $LiFePO_4$ battery charger;

▲It is forbidden to pierce the battery with nails or other sharp objects. It is forbidden to hit the battery with a hammer and step on the battery. It is forbidden to hit and throw the battery or otherwise subject the battery to strong physical impact;

▲It is forbidden to immerse the battery in water for long period. When it is not in storage, it should be placed in a cool and dry environment;

▲It is forbidden to use in series, parallel or series and parallel with any other types of batteries;

▲Do not connect to alternators or non-smart charging systems;

▲Keep the battery away from children;

▲It is forbidden to use or store the battery near heat and high temperature sources, such as fires, heaters, etc.;

▲It is forbidden to put batteries on microwave ovens, high-pressure containers or induction cookers;

▲It is forbidden to use or store the battery under high temperature (such as in direct sunlight or in a very hot car), otherwise it may cause performance loss, shortened service life and function failure, and even cause the battery to overheat, catch fire or explode;

▲It is forbidden to disassemble or modify the battery in any way. The battery contains safety and protection devices. If damaged, it may cause the battery to generate heat, catch fire or explode;

▲High-quality and suitable specifications of wire and cable should be used for connection;

▲If the battery emits peculiar smell, heat, discoloration or deformation, or any abnormal phenomenon during use, charging or storage, stop using it immediately;

▲Check whether the battery is damaged, cracked, or corroded before use. If you find any damage to the battery, stop using it immediately;

▲If the battery leaks and the electrolyte gets into your eyes, please don't rub your eyes and rinse your eyes with clean water. If necessary, please go to the hospital for treatment immediately, otherwise it will hurt your eyes.

Part 5: User manual

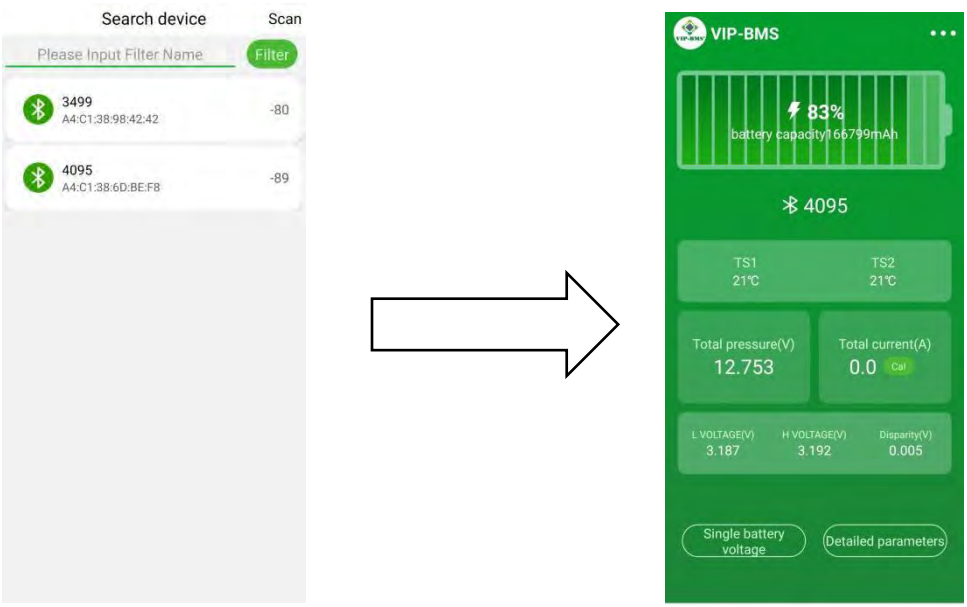
1. Bluetooth

After receiving the product, use the mobile phone according to its operating system, select the corresponding QR code to download and install the Bluetooth APP. client.

Android

iOS

When the installation is finished, turn on the Bluetooth function of the mobile phone, open the APP., press "Search" and click the Bluetooth number corresponding to the bluetooth code on the product to enter its interface to view the battery status. The interface is as follows:



Note: the battery MUST get a fully charge and discharge cycle then you can get an accurate battery capacity

2. Check before use

When the customer receives the battery, first check whether the battery is damaged, cracked, or corroded; connect to Bluetooth, check whether the battery is in normal condition on the mobile phone APP., and ensure that there is no damage during transportation. If there is any abnormality, please stop installation and use immediately then notify us.

3. Installation

Before installation, make sure that the cables and terminals are kept clean to avoid any corrosion, dirt or deposits.

Please confirm whether the battery voltage matches the battery charger and load before installation.

Select wires, cables and terminals with appropriate specifications and sizes that meet the standard, and ensure that the positive and negative connections are correct; tighten the wires, cables and terminals to ensure that they are firmly fixed to reduce the resistance between the DC terminal and the cable connection.

If the batteries need to be used in series or parallel, please fully charge the batteries before installation. The maximum number of batteries in series is 4 groups, and the number of batteries in parallel is recommended to be no more than 10 groups. The allowable number in series and parallel is as follows:

When there is a necessary to connect the battery in series or parallel, please **Fully Charge** the batteries before installation. The maximum number of batteries in series is 4 groups, and

the number of batteries in parallel is recommended to be no more than 10 groups. The allowable number in series and parallel is as follows:

Series connection	Parallel connection	Series & Parallel connection	Battery pack parameter after connected in series or parallel			
			Rated voltage	Universal voltage	Rated capacity	Rated Power
2	/	/	25.6V	24V	200Ah	5120Wh
3	/	/	38.4V	36V	200Ah	7680Wh
4	/	/	51.2V	48V	200Ah	10240Wh
/	2	/	12.8V	12V	400Ah	5120Wh
/	3	/	12.8V	12V	600Ah	7680Wh
/	4	/	12.8V	12V	800Ah	10240Wh
/	5	/	12.8V	12V	1000Ah	12800Wh
/	6	/	12.8V	12V	1200Ah	15360Wh
/	7	/	12.8V	12V	1400Ah	17920Wh
/	8	/	12.8V	12V	1600Ah	20480Wh
/	9	/	12.8V	12V	1800Ah	23040Wh
/	10	/	12.8V	12V	2000Ah	25600Wh
/	/	2S2P	25.6V	24V	400Ah	10240Wh
/	/	3S2P	38.4V	36V	400Ah	15360Wh
/	/	4S2P	51.2V	48V	400Ah	20480Wh

Note:

a、Please full charge the battery before connecting in series and parallel;

b、Green energy don`t recommend the connection excess the table above;

c、Green energy don`t responsible for the connection excess the table above.

▲ Please install the battery in a dry, cool, non-high temperature, well-ventilated environment.

▲It is forbidden to reverse the positive and negative polarity. Although the battery has safety protection, it may be damaged.

▲It is forbidden to directly connect the positive terminal and negative terminal of the battery with any metal objects (such as wires).

Before using the battery for the first time, please fully charge the battery before using it.

Please use a charger suitable for charging lithium iron phosphate. If an inappropriate charger is used to charge the battery, a fire may occur.

4. Charge

Before charging, make sure that the battery is tightly connected with the wire and cable, and the charger, and follow the battery charger's operating instructions.

LiFePO4 battery charger parameters are as follows:

Item	Parameter
Charge protection voltage	（N×3.65）V
Charge cut-off current	0.01C（2A）
Suggest charge current	0.2C（40A）
Charge cut-off voltage	（N×3.65）V

Remarks：N= series connection number；C= battery capacity

If you use a power supply such as a transformer or solar power for charging, please check and make sure that the specifications of the charging power supply and the battery match

before connecting the charging. If it does not match, it may damage the charging power supply and the battery (for example, the voltage higher than the battery charging voltage may damage the BMS).

5. Transportation

Individual package and prevent short-circuit;

Do not stack more than 6 layers or upside down;

Maximum transportation temperature does not exceed 65℃;

UN3480 category 9 and must comply with its relevant regulations during transportation

6. Storage

Suggested State of charge(SOC): 30%~50%

Please disconnect the battery from the equipment load before storage to eliminate any potential load that may be discharged.

The battery should be stored in a cool, dry, ventilated and clean environment, its temperature should be (-20~65)℃, and its humidity should be (65±20)%

The battery is charged at least once every 3 months to prevent over-discharge.

When removing the battery before using it, please charge the battery fully.

Do not expose the battery to extreme temperatures above 65°C.

7. Maintenance

Cables and terminals are kept clean and free from any corrosion, dirt or deposits. It can be wiped clean with a dry cloth.

When conditions permit, please store the battery in an environment with a temperature of (25±5)℃ and a humidity of (60±15)%.

The battery is stored at (30~50)% SOC.

The battery is charged and discharged according to product specifications.

8. Troubleshooting

If there are any problems during battery operation, please refer to the following instructions or contact us for help:

◆When the battery voltage is too low to provide reliable and stable power to the load, please charge the battery as soon as possible.

◆When the battery temperature is too high or too low, disconnect all connections, and let the battery rest until the battery cools or warms to room temperature.

◆When excessive current flows through the battery and causes battery failure, disconnect the load until the battery resumes normal operation.

◆If the battery fails due to a short circuit, please eliminate the short circuit immediately and the battery will resume normal operation.

◆When the battery voltage drops to 0V, please use an external charging source with lithium-ion battery activation function to activate the battery.

The following table lists common battery failures and their solutions.

Problem	Solution
Can`t charge or discharge	Check the cable connection
	Check voltage
	Check the connection between battery
	Disconnect the connection or load then connect again
The product heats up during the operation	Current is too high
	Battery and loader isn`t connected firmly

Part 6: Spec. of Product

Item	Description	Spec.
1、Cell parameter		
1.1	Cell type and material	$LiFePO_4$
1.2	Rated voltage	3.2V
1.3	Rated capacity	100Ah
1.4	Single cell voltage range	（2.5～3.65）V
2、Battery parameter		
2.1	Rated voltage	12.8V
2.2	Rated capacity	200Ah
2.3	Rated power	2560Wh
2.4	Configuration	2P4S
2.5	Expected cycle life	>8000cycle，(25±3)℃, 0.2C rate，80%DOD
2.6	Voltage range	（10.0～14.6）V
2.7	Charge voltage	14.6V
2.8	Work temp.	Charge ： （0 ~ 45）℃; Discharge： （-20 ~ 60）℃
2.9	Standard charge current	0.2C（40A）
2.10	Max. charge current	250A(cc-cv)
2.11	Standard discharge current	0.5C（100A）
2.12	Max. continuous discharge current	250A
2.13	Net. Weight	Approx. 22kg

2.14	Battery dimension	（450*170*243）mm
2.15	Self discharge rate	≤3.5%/month
2.16	Storage	Temp.: (-20±60)℃, Humidity: (65±25)%RH Suggest to charge every three month
3、BMS parameter		
3.1	Over-charge protection voltage	（3.75±0.05）V/cell
3.2	Over-discharge protection voltage	（2.20±0.05）V/cell
3.3	Charge over-temp. protection	60℃
3.4	Discharge over-temp. protection	75℃
3.5	Charge low temp. protection	-5℃
3.6	Max. charge current	250A
3.7	Max. continuously discharge current	250A
3.8	Max. discharge current (3 sec.)	500A
3.9	Work temp. range	（-20~80）℃
3.10	Short circuit protection	Yes
3.11	Over-load protection	Yes
3.12	Over-current protection	Yes
3.13	Equipped with Bluetooth	Yes

Part 7: Maintenance

1. Disclaimer

GREEN ENERGY / mipv.pro are not liable for any damage caused by the below reasons:

Force majeure includes fire, typhoon, flood, earthquake, war and terrorism.

Intentional or accidental misuse, abuse, neglect or improper maintenance, and use under abnormal conditions.

Improper installation of peripheral equipment, improper operation, etc. cause malfunction.

Disassemble or modify the product without GREEN Energy's express or written consent.

2. Warranty

GREEN ENERGY / mipv.pro promises that this battery will have no quality problems within 3 years of use according to the product manual.

Within its normal service life, if the battery fails or has quality problems, GREEN ENERGY / mipv.pro will carry out a warranty.

Causes caused by poor battery maintenance, incorrect charging, reverse polarity, improper installation, improper storage and overheating, physical damage, fire, frostbite, water damage, disassemble, modification, or terminal damage are not covered by the warranty.

3. Warranty Card

Warranty card

Product	LAR200		
Product code		Warranty period	year month
Distributor			
Add.:			
Customer name		Purchase date	
Customer add.			
Contact No.			

Warranty terms:

1. Within three months from the date the product is sold, if there is a performance failure, the product itself and the outer packaging must be intact, and the product of the same model can be replaced, except for man-made damage.

2. The product is guaranteed for three years from the date of sale, and the accessories are not covered by the warranty.

3. The warranty service is only valid under normal use.

4. All human-made damage, self-disassemble or modification, improper use and appearance damage, etc. are not covered by the warranty.

5. The product warranty card is required during the warranty period. If this card is not provided or the card is altered privately, the company has the right to refuse the warranty.

FCC statement

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

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.

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

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