



USER MANUAL

(12V 100AH GC LiFePO4 Battery Low-Temp Cut-off Version)

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We are living in a time of energy within reach, in which every step we take consumes energy. We keep striving to maintain a green life on the way to continuing to explore new energy. ENJOYBOT has been contributing to the green life with its 20 years of professional technology of battery. We firmly believe in "Green Leads Life".

We are mainly engaged in LiFeP04 and lithium-ion battery business, focusing on the research and development, manufacturing, sales, and marketing of new energy. The total area of our production site is 120,000 square meters. Our batteries are widely used in consumer electronics as well as in the fields of energy storage and electric vehicles.

ENJOYBOT factory is equipped with the most advanced R&D team and equipment and the products have obtained UL, CE, ROHS, WEEE, and PSE quality system certification. Our batteries and products can fully fulfill the requirements of the high-end OEM industry market. We have quality assurance and inspection systems to control and ensure that all batteries are of high quality, comply with international standards and have the best performance and safety.

ENJOYBOT team has been committed to providing the best products and services for all customers, in order to provide a better low-carbon life. With the leading technology, strong R&D ability, and perfect sales network, ENJOYBOT has become one of the famous battery manufacturers. We are also designated as an OEM business partner of a lot of famous brands and companies in the world.

ENJOYBOT possesses strong technical strength and high-quality employees. Our mission is to integrate and reform the resources gathered from customers, suppliers, investors, employees, and other sources so that we can continue to provide customers with better products and high-quality services and keep making contributions to the community. In the past decade of development and experience, we are not only a company that produces batteries, but also a platform for the next generation to cultivate their own business and realize their dreams.



Product Specification - 12V 100AH

		Weight	10.5 Kg/23 Lbs
		Dimensions	329 * 172 * 214 mm 12.95 * 6.77* 8.42 inch
		Terminal	M8*16mm (L)
		Cell Type	Grade A LiFePO4 Prismatic Cells
		Case Material	ABS Plastic
		Waterproof Rating	IP67
		Max. Batteries in Series	6S
		Max. Batteries in Parallel	10P
		Max. Configuration	6S4P
		Recommended Charge Current	20 A
		Max. Continuous Charging Current	50 A
		Max. Continuous Discharging Current	100 A
		Peak Discharge Current	350 A (3-5s)
		Charge Voltage	14.2 V - 14.6 V
		Charge Temperature	32 °F ~ 122 °F (0 °C ~ 50 °C)
		Discharge Temperature	-4 °F ~ 140 °F (-20 °C ~ 60 °C)
		Storage Temperature	14 °F ~ 122 °F (-10 °C ~ 50 °C)
		High Temp Cut-Off / Recovery	167 °F (75 °C) / 122°F (50 °C)
		Low Temp Cut-Off / Recovery	32 °F (0 °C) / 41°F (5 °C)
Nominal Voltage	12.8 V		
Rated Capacity	100 Ah, 1280 Wh		
Cycle Life	4000+ cycles at 100% DOD, 6000 cycles at 80% DOD		
BMS	100 A		
Max. Output Power	1280 W		
Smart Bluetooth	/		
Low-Temp Charging Cut-Off	Yes		
Self-Heating	/		
Warranty	10 Years		

About High/Low-Temp Cut-Off Protection

Low-Temperature Charging Protection:

When the ambient temperature is lower than 32°F (0°C), the charging function will be turned off, and charging will not be possible at this time. When the temperature returns to >41°F (5°C), it can be charged normally.

Low-Temperature Discharge Protection:

When the ambient temperature is lower than -4°F (-20°C), the discharge function will be turned off, and discharge cannot be performed at this time. When the ambient temperature returns to 5°F (-15°C), the battery can resume discharging.

High-Temperature Charging Protection:

When the ambient temperature is higher than 167°F (75°C), the charging function will be turned off, and charging will not be possible at this time. When the temperature returns to <122°F (50°C), it can be charged normally.

High-Temperature Discharge Protection:

When the ambient temperature is higher than 140°F (60°C), the discharge function will be turned off, and discharge cannot be performed at this time. When the ambient temperature returns to 131°F (55°C), the battery can resume discharging.

NOTE:

1. Charging Temperature: 32 °F (0°C) ~ 122°F (50°C).
2. Discharge Temperature: -4°F (-20°C) ~ 140° F (60°C).

How To Charge The Battery

Method 1: Use a lithium iron phosphate charger to charge the battery.

1. Recommended charger voltage

Battery Voltage	12V	24V	36V	48V	60V	72V
Charger Voltage	14.2V-14.6V	28.4V-29.2V	42.6V-43.8V	56.8V-58.4V	71V-73V	85.2V-87.6V

2. **Note:** Connect the charger to the battery before connecting the power source to prevent sparks. Do not use lead-acid chargers.

Method 2: Use solar panels to charge the battery through MPPT solar charge controller.

1. Recommended power for the solar panel

Battery Capacity	1280Wh	2560Wh	3840Wh	5120Wh
Solar Panel Power	$\geq 300W$	$\geq 600W$	$\geq 900W$	$\geq 1200W$

2. **Note:** Place your solar panel in a place with as much direct sunlight as possible. Using the recommended solar panel, the battery can be fully charged by the solar panel in one day (effective sunlight 4.5 hours/day). Since light time, light intensity, and whether a solar charge controller is used are important factors affecting charging efficiency, it may take more than a day to fully charge the battery.

Method 3: Use an inverter to charge the battery.

Note: The inverter requires built-in AC-DC charging function.

Method 4: Use a generator to charge the battery.

Note: Additional DC-DC charging converter needs to be added.

MPPT Parameter Settings

Recommended parameter settings for the MPPT:

12V LiFePO4 Battery	Charge	Discharge
	Charging Limit Voltage: 14.2V	Low Voltage Disconnect Voltage: 11.6V
	Over Voltage Disconnect Voltage: 14.6V	Low Voltage Reconnect Voltage: 12.4V
	Over Voltage Reconnect Voltage: 13.8V	Under Voltage Warning Voltage: 12.8V
	Float Charging Voltage: 13.8V	

24V LiFePO4 Battery	Charge	Discharge
	Charging Limit Voltage: 28.4V	Low Voltage Disconnect Voltage: 23.2V
	Over Voltage Disconnect Voltage: 29.2V	Low Voltage Reconnect Voltage: 24.8V
	Over Voltage Reconnect Voltage: 27.6V	Under Voltage Warning Voltage: 25.6V
	Float Charging Voltage: 27.6V	

36V LiFePO4 Battery	Charge	Discharge
	Charging Limit Voltage: 42.6V	Low Voltage Disconnect Voltage: 34.8V
	Over Voltage Disconnect Voltage: 43.8V	Low Voltage Reconnect Voltage: 37.2V
	Over Voltage Reconnect Voltage: 41.4V	Under Voltage Warning Voltage: 38.4V
	Float Charging Voltage: 41.4V	

48V LiFePO4 Battery	Charge	Discharge
	Charging Limit Voltage: 56.8V	Low Voltage Disconnect Voltage: 46.4V
	Over Voltage Disconnect Voltage: 58.4V	Low Voltage Reconnect Voltage: 49.6V
	Over Voltage Reconnect Voltage: 55.2V	Under Voltage Warning Voltage: 51.2V
	Float Charging Voltage: 55.2V	

60V LiFePO4 Battery	Charge	Discharge
	Charging Limit Voltage: 71V	Low Voltage Disconnect Voltage: 58V
	Over Voltage Disconnect Voltage: 73V	Low Voltage Reconnect Voltage: 62V
	Over Voltage Reconnect Voltage: 70V	Under Voltage Warning Voltage: 64V
	Float Charging Voltage: 69V	

72V LiFePO4 Battery	Charge	Discharge
	Charging Limit Voltage: 85.2V	Low Voltage Disconnect Voltage: 69.6V
	Over Voltage Disconnect Voltage: 87.6V	Low Voltage Reconnect Voltage: 74.4V
	Over Voltage Reconnect Voltage: 84V	Under Voltage Warning Voltage: 76.8V
	Float Charging Voltage: 82.8V	

Estimate Your Battery Capacity

Voltage Detection Method:

1. Lithium Iron Phosphate (LiFePO₄) batteries exhibit a characteristic where the voltage measured during charging/discharging may not represent the true voltage of the battery. Once the battery is disconnected from the power source, it gradually stabilizes to its true voltage. To accurately test the battery's true voltage, it is recommended to disconnect all connections and loads for over 120 minutes before proceeding with the voltage test.
2. When measuring the battery voltage using a voltmeter or multimeter, ensure the red probe is positioned on the positive terminal of the battery and the black probe on the negative terminal. Take care not to touch the metal parts of the probes with your hands during the measurement process.
3. The battery capacity can be roughly estimated by its static voltage. Due to slight differences in voltage among each battery, the following parameters are for reference only.

SOC During Charge:

<div>SOC</div> <div>Battery</div>	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
12.8V Battery	11.68V	12.88V	13.09V	13.21V	13.22V	13.23V	13.25V	13.36V	13.37V	13.37V	13.38V
25.6V Battery	23.37V	25.77V	26.18V	26.42V	26.44V	26.46V	26.50V	26.73V	26.74V	26.74V	26.76V
38.4V Battery	35.05V	38.65V	39.26V	39.62V	39.66V	39.70V	39.76V	40.09V	40.11V	40.12V	40.14V
51.2V Battery	46.74V	51.54V	52.35V	52.83V	52.88V	52.93V	53.01V	53.46V	53.48V	53.49V	53.52V
64V Battery	58.42V	64.42V	65.44V	66.04V	66.10V	66.16V	66.26V	66.82V	66.85V	66.87V	66.90V
76.8V Battery	70.10V	77.30V	78.53V	79.25V	79.32V	79.39V	79.51V	80.18V	80.22V	80.24V	80.28V

SOC During Discharge:

SOC Battery	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%
12.8V Battery	13.40V	13.32V	13.32V	13.31V	13.18V	13.16V	13.15V	13.08V	12.96V	12.81V	11.17V
25.6V Battery	26.80V	26.65V	26.63V	26.62V	26.35V	26.32V	26.30V	26.17V	25.91V	25.62V	22.34V
38.4V Battery	40.20V	39.97V	39.95V	39.92V	39.53V	39.48V	39.46V	39.25V	38.87V	38.44V	33.52V
51.2V Battery	53.60V	53.30V	53.26V	53.23V	52.70V	52.64V	52.61V	52.34V	51.82V	51.25V	44.69V
64V Battery	67.00V	66.62V	66.58V	66.54V	65.88V	65.80V	65.76V	65.42V	64.78V	64.06V	55.86V
76.8V Battery	80.40V	79.94V	79.90V	79.85V	79.06V	78.96V	78.91V	78.50V	77.74V	76.87V	67.03V

NOTE:

Battery storing at 50% SOC level will last a longer service life. It is commended to charge the battery every three month for long-term storage.

Series & Parallel Connection

Series & Parallel Connection Instruction

Enjoybot LiFeP04 batteries can be connected in series or parallel to obtain larger capacity and higher voltage. The maximum configuration is 6 series and 4 parallel to form a 72V 400Ah battery system.

When connecting batteries in series or parallel, three conditions must be met:

- a. They must have the same voltage, capacity, and identical protection board parameters.
- b. They must be from the same brand (different brands of lithium batteries have their own specific BMS).
- c. They must have been purchased recently (within the last three months).

How to Connect in Series and Parallel?

Step1. Protective Preparation

Please take off your watches and metal jewelry before connecting, and wear insulating gloves for protection.

Step2. Voltage Balancing Before Connection

By following these steps, you can optimize the performance and lifespan of your Enjoybot Battery packs.

- (1) Full charge each battery separately using a compatible charger.
- (2) Connect all batteries in parallel one by one and leave them for more than 12 hours.
- (3) Untie the parallel connection, and use a multimeter to measure the voltage of each battery pack individually. Check the voltage difference between each battery pack. If the difference is $\leq 40\text{mV}$, this indicates that the battery pack has reached a voltage balance.
- (4) They can be connected in series or parallel.

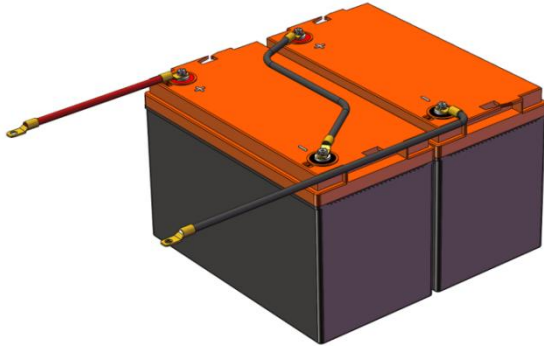
Step3. Charge Effectively

Once connected, charge the entire battery pack with a charger of the appropriate volts. (For example, if you connect four 12V batteries in series to form a 48V battery pack, then please use a 58.4V charger to charge the entire battery pack in order to maintain the voltage difference between each battery.)

NOTE: To ensure the optimal performance of the battery, we highly recommend rebalancing the voltage of each battery every six months.

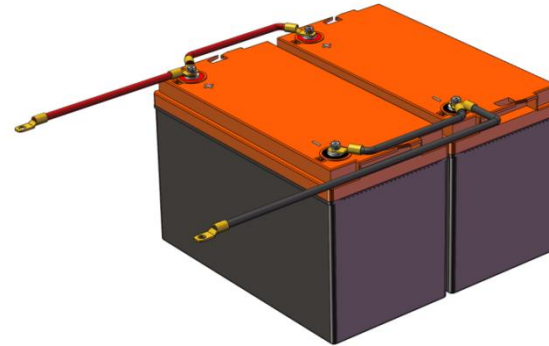
Series Connection

Attach the positive terminal of each battery to the negative terminal of the next one to superimpose voltages while maintaining unchanged rated capacities.



Parallel Connection

Connect the positive terminal of one battery to the positive terminal and the negative terminal to the negative terminal of another battery to keep voltage constant and superimpose the rated capacities.



Series & Parallel Connection

First connect the batteries in parallel to expand capacity, and then connect the batteries in series to increase the voltage. This effectively equalizes the voltage difference between batteries. Pay attention to the position of the positive and negative output terminals to ensure accurate installation.



Advantages & Applications

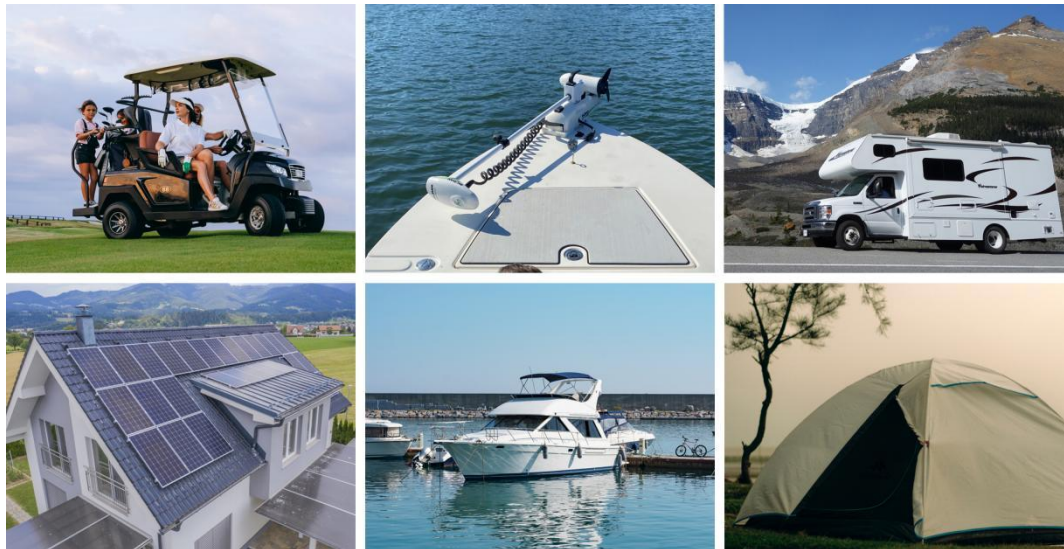
Advantages

Considered the best alternative to traditional lead-acid and AGM batteries, Enjoybot LiFePO4 batteries offer superior performance and convenience.

- **Weight Advantage:** Enjoybot LiFePO4 batteries are half the weight of traditional lead-acid batteries.
- **Capacity:** Enjoybot LiFePO4 batteries offer 2X the capacity compared to lead-acid batteries.
- **Service Life:** With a 4X longer service life, Enjoybot LiFePO4 batteries are a durable and reliable choice.
- **Fast Charging:** These batteries enable 5X faster charging than lead-acid counterparts.
- **Ease of Use:** Enjoybot LiFePO4 batteries eliminate the need for complicated wiring, watering, or maintenance.
- **Eco-Friendly:** They represent a green energy option, eliminating harmful liquids.

Application

Enjoybot 12V 100Ah LiFePO4 Battery is best suited for various applications such as Golf Carts, Trolling Motor, RV&Campers, Marine, Solar Storage, Home Backup, Off-grid Systems, and Camping needs.



First Use Instructions

1. Upon receiving the product, please read the user manual carefully before installing and using the product, and use the battery correctly under the instructions in the manual.
2. When using the battery for the first time, please ensure to use a dedicated LiFePO₄ battery charger and fully charge the battery separately.
3. Please securely tighten the battery terminals and use the appropriate wire size. Loose battery bolts can lead to bolt heating, while improper wiring can cause wire heating, potentially damaging the battery.
4. Be sure to install an insulating cover on the battery bolt to prevent simultaneous contact of metal or conductive objects with the positive and negative poles of the battery, which could result in a short circuit.
5. Install the battery vertically with the bolts facing upward; do not install it upside down. If you need to install the battery on its side, please contact our customer service team to confirm the installation orientation.
6. This battery is not to be used for starting any equipment; please do not use it as a starting battery.
7. The battery should be stored within the temperature range specified in the product specifications. If stored for more than 3 months, it is recommended to charge the lithium iron phosphate (LiFePO₄) battery.

Precautions

1. Do not directly weld the battery or strike it with any sharp-edged items, such as nickel strips, large needles, or pins.
1. Do not drop, place heavy objects on, or subject the battery to strong impacts.
2. Do not transport or store the battery together with metal items like necklaces, keys, and other metallic objects.
3. Do not immerse the battery in water, seawater, or any other liquid.
4. Do not use or place the battery near a fire or heater.
5. Do not use the battery in areas with strong static electricity or strong magnetic fields, as this can damage the battery's safety protection mechanism.
6. Do not connect the battery to a power outlet.
7. Do not throw the battery into the fire or heat it.
8. Do not cover the device with towels, clothes, or other items.
9. Disassembly, dismantling, or reassembly of the battery is prohibited.
10. Strictly avoid reversing the positive and negative terminals.
11. Please dispose of waste products by regulations, and do not treat built-in batteries as household waste to avoid explosion and pollution.

Troubleshooting

If the Enjoybot LiFePO₄ battery fails to work, please follow these steps:

1. Check the battery voltage and estimate the remaining power.

If the remaining power is less than 20%, please recharge the battery.

2. Check if the battery has triggered BMS protection.

You can try the following methods to activate the battery:

- a. Disconnect all the connections of the battery, and leave the battery aside for 30 minutes. The battery will automatically recover itself to normal voltage and can be used after fully charged.
- b. Measure the battery temperature and determine whether the low-temperature charging protection has been triggered. If the temperature is below 0°C / 32°F, you need to place the battery indoors and wait until the temperature is higher than 0°C - 5°C / 32°F - 42°F. The battery will automatically recover itself to normal voltage and can be used after fully charged.
- c. Measure the battery voltage and determine whether the low-voltage protection or over-discharge protection has been triggered. If the voltage is lower than 10V ± 0.5V, it means triggered BMS protection, you need to activate the battery.

Activation method:

- Use a charger with Lithium battery activation function to charge and activate the battery.
 - Use a solar panel to charge the battery and activate it for 30 minutes in sunny daytime.
 - Use a battery with equivalent voltage and full power, parallel the battery pack and leave them for more than 30 minutes.
- d. Check the technical specifications of your device to determine whether the over-current protection has been triggered. All batteries have their own maximum output power, maximum output current, and capacity. You need to check your device and ensure it will work with Enjoybot LiFePO₄ battery.

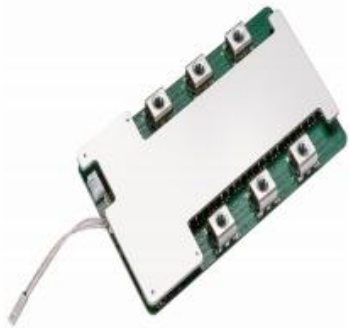
Product Feature

Grade-A LiFePO4 Prismatic Cells

Enjoybot lithium-ion battery is made from lithium iron phosphate material, which offers several advantages such as high energy density, high average output voltage, low self-discharge rate, and no memory effect. It also boasts excellent cycle life (up to 6000 cycles at 80% DOD), fast charging (5X faster than lead-acid batteries), 100% charge/discharge efficiency, high power output, and a 10-year lifespan. These characteristics make it the best alternative to lead-acid batteries. It requires no maintenance, contains no toxic substances, is environmentally friendly, and is known as a green battery.

Smart Battery Management System (BMS) Protection

Enjoybot LiFePO4 lithium battery features a unique built-in Battery Management System (BMS) that protects the battery from damage caused by overcharging, over-discharging, overloading, overheating, and short circuits. It also includes a self-balancing function that helps maintain the battery performance consistently and stably. When the overcharge voltage exceeds 15V or If the over-discharge voltage is lower than 10V, the battery will automatically disconnect.



Warranty Terms

We provide warranty service, please check the warranty clause in the Product Description. Deep cycle LiFeP04 battery has smaller size, lighter weight, superior performance and longer service life, which can greatly reduce Lead Acid Battery replacement . The cell of ENJOYBOT LiFeP04 battery pack has obtained CE, RoHs, PSE, WEEE certification.

We provide 10 Years conditional warranty.

Within 90 days from the date of purchase, if our products have quality problems and cannot work normally, we can provide refund or replacement services.

More than 90 days from the date of purchase, and within 10 years, if our products have quality problems and cannot work normally, we can provide replacement services.

If you encounter any problems when using the product, please feel free to contact us via customer service email (**Official store:** service@enjoybot.com, **Amazon:** ENJOYBOTbattery_service@hotmail.com), attach your order number and detailed instructions (including pictures or videos), and we will assist you within 24 hours.

Warranty Conditions:

1. This warranty extends only to the original Purchaser. If gifted or resold the customer must go through the original Purchaser to claim a warranty. Original order information is needed to claim the warranty.
2. Please read the product manual carefully before installing and using the product. If the consumer fails to install, use and maintain the product correctly in accordance with the requirements of the instruction manual, which causes serious quality problems in the product, it is not covered by the warranty.
1. We must ascertain whether the product has gone faulty due to defects in materials/workmanship or misuse/neglect.

Failures caused by (1) incorrect storage; (2) improper use (3) failure to follow the product instructions or to perform any preventive maintenance; (4) modifications; (5) unauthorized repair; (6) normal abrasion; (7) damage caused by negligence, including using the battery for a long time with high power but not timely charging; (8) not following the scope of application of the product; or (9) external causes such as accidents, abuse, actions or events beyond our reasonable control, or any other issue not caused by defects in materials and workmanship is not covered under the warranty.

Warranty Card

Thank you very much for purchasing our products, We will provide you with free warranty service.
Please read the product manual and warranty terms carefully before using the product.

Product Model:		Product Name:	
Purchase Store:		Purchase Date:	
Order Number:		Customer Name:	
Customer E-mail:			

Note: When you fill in the warranty card and send us your order number through the customer service email, your warranty service has taken effect (**Official Site: service@enjoybot.com; Amazon: ENJOYBOTbattery_service@hotmail.com**). You can also log in to our Official Website (enjoybot.com) and find the [**Register Warranty**] page in the [**SUPPORT**] menu to register.

If you are satisfied with our service, please share your shopping experience on our product listing page, which can help other customers, making it easier for them to find the products and services they need.

Customers first, service first, we have been committed to providing customers with a good shopping experience and high-quality products.

We will send 5% discount codes to every customer from time to time. You can present these discount codes with your friends and families and they will enjoy the same preferential service.

Please remember the brand from China: ENJOYBOT, it will provide you with high-quality after-sales service and let you re-recognize MADE IN CHINA.

