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USER MANUAL

12V LiFePO4 Deep Cycle Battery SERIES

- 12V50Ah
- 12V100Ah Mini
- 12V100Ah Mini Smart
- 12V100Ah
- 12V100Ah Smart
- 12V160Ah
- 12V160Ah Smart
- 12V150AH
- 12V150AH Smart
- 12V200Ah Smart
- 12V200Ah
- 12V320Ah
- 12V320Ah Smart
- 12V314Ah
- 12V314Ah Smart
- 12V628Ah
- 12V628Ah Smart
- 12V640AH
- 12V640AH Smart

⚠ CAUTION

- Flammable/explosive hazard avoid mechanical impact.
- Do not short circuit.
- Do not crush.
- Do not disassemble.
- Do not incinerate.
- Battery temperature must be kept below 149°F/65°C.
- Do not exceed the charging voltage of 15V.
- Do not immerse the battery in water.
- Do not reverse the polarity of the battery and charger.
- Use the appropriate tools when handling the battery.
- When connecting batteries in series/parallel, do not use batteries from other brands/types (BMS may not be compatible).
- This battery should be charged using a lithium iron phosphate battery charger with a charging voltage of 14.6V±0.2V.
- Keep the battery away from fire, hazardous materials, or substances.

APP Introduction

This application is developed and designed by enlzh®. It specializes in monitoring lithium batteries, providing real-time status readings such as the voltage, charging and discharging current, alarm prompts, protection status, etc. This allows users to clearly understand the status of lithium batteries and ensure safe use.



Download on the App Store

GET IT ON Google Play

You can search "enlzh" in the App Store or Google Play Store to download and install.

*This app only supports for smart batteries.

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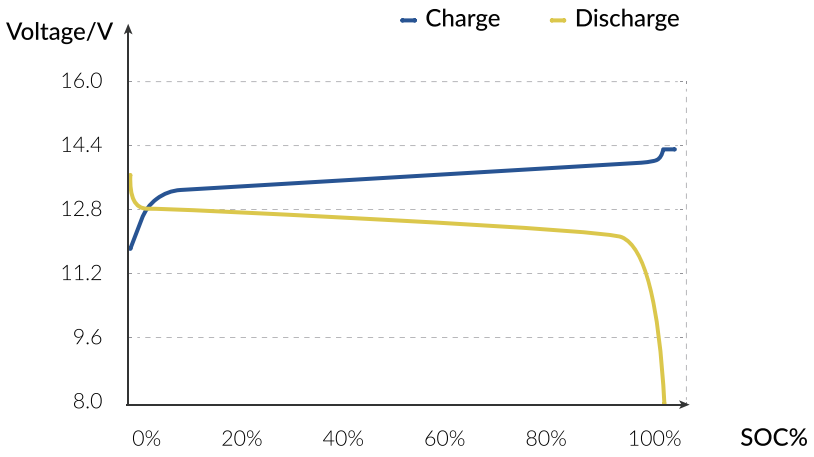
Key Features

- Lithium Iron Phosphate (LiFePO4) chemistry provides exceptional stability and consistent performance
- Advanced Battery Management System (BMS) ensures product safety and longlifespan
- Supports fast charging and discharging
- Constant voltage and full usable capacity at any state of charge
- Grade UL94 V-0 (Fireproof)

External Features



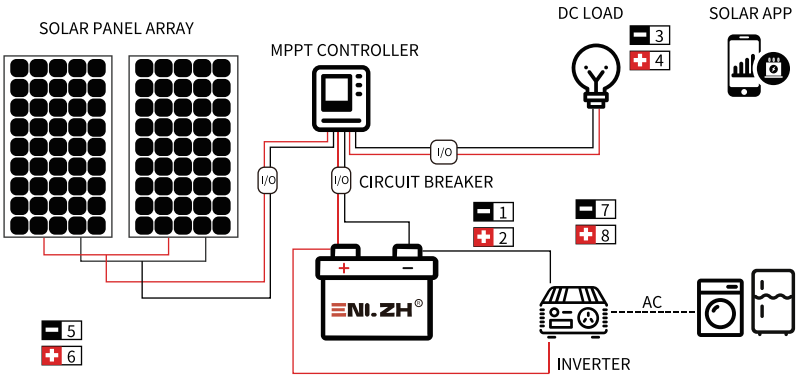
Charge-Discharge Curve @ 77°F/25°C



Sample: 12V50Ah battery

*Environmental conditions required for all tests: 77+9°F/25+5°C

Connection Diagram



Battery Management System(BMS) Warning and Protection

Content	12.8V 100AH mini	12.8V 100AH mini smart	12.8V 100AH
Standard/Maximum Continuous Charge	100A	100A	100A
Max Continuous Discharge Current	100A	100A	100A
Over-Current Charge Protection	250±50A	120±10A	250±50A
Dimensions	L259*W167*H212	L259*W167*H212	L332*W172*H218
Balancing Method	Passive Balancing	Passive Balancing	Passive Balancing

Content	12.8V 100AH smart	12.8V 160AH	12.8V 160AH smart
Standard/Maximum Continuous Charge	100A	100A	100A
Max Continuous Discharge Current	100A	100A	100A
Over-Current Charge Protection	120±10A	240±30A	120±10A
Dimensions	L332*W172*H218	L256*W194*H254	L256*W194*H254
Balancing Method	Passive Balancing	Passive Balancing	Passive Balancing

Content	12.8V 50AH
Standard/Maximum Continuous Charge	10A/50A
Max Continuous Discharge Current	50A
Over-Current Charge Protection	70±10A
Dimensions	7.68*5.12*6.7(inch) 195*130*170(mm)
Balancing Method	Passive Balancing

Battery Management System(BMS) Warning and Protection

Content	12.8V 150AH	12.8V 150AH smart
Standard/Maximum Continuous Charge	100A	100A
Max Continuous Discharge Current	100A	100A
Over-Current Charge Protection	240±30A	120±10A
Dimensions	L256*W194*H254	L256*W194*H254
Balancing Method	Passive Balancing	Passive Balancing

Content	12.8V 314AH	12.8V 314AH smart
Standard/Maximum Continuous Charge	200A	200A
Max Continuous Discharge Current	200A	200A
Over-Current Charge Protection	400±50A	240±10A
Dimensions	L383*W193*H250	L383*W193*H250
Balancing Method	Passive Balancing	Passive Balancing

Content	12.8V 320AH	12.8V 320AH smart
Standard/Maximum Continuous Charge	200A	200A
Max Continuous Discharge Current	200A	200A
Over-Current Charge Protection	400±50A	240±10A
Dimensions	L383*W193*H250	L383*W193*H250
Balancing Method	Passive Balancing	Passive Balancing

Battery Management System(BMS) Warning and Protection

Content	12.8V 200AH	12V 200AH smart
Standard/Maximum Continuous Charge	40A/200A	40A/200A
Max Continuous Discharge Current	200A	200A
Over-Current Charge Protection	400±10A	210A±10A
Dimensions	19.02*6.7*9.45(inch) 483*170*240(mm)	19.02*6.7*9.45(inch) 483*170*240(mm)
Balancing Method	Passive Balancing	Passive Balancing

Content	12.8V 628AH	12.8V 628AH smart
Standard/Maximum Continuous Charge	250A	200A
Max Continuous Discharge Current	250A	200A
Over-Current Charge Protection	600±10A	240±10A
Dimensions	L635*W244*H220	L635*W244*H220
Balancing Method	Passive Balancing	Passive Balancing

Content	12.8V 640AH	12.8V 640AH smart
Standard/Maximum Continuous Charge	250A	200A
Max Continuous Discharge Current	250A	200A
Over-Current Charge Protection	600±10A	240±10A
Dimensions	L635*W244*H220	L635*W244*H220
Balancing Method	Passive Balancing	Passive Balancing

Battery Parameters

Content	12.8V 100AH mini 12.8V 100AH	12.8V 100AH mini smart 12.8V 100AH smart	12.8V 160AH 12.8V 150AH	12.8V 160 AH smart 12.8V 150AH smart
Rated Voltage	12.8V	12.8V	12.8V	12.8V
Energy	1280W	1280W	2048W	2048W
Standard Charging Voltage	14.4V±0.2V	14.4V±0.2V	14.4V±0.2V	14.4V±0.2V
Shipping Voltage	13.2V	13.2V	13.2V	13.2V
Charging High Temperature Protection	65±5°C	60±5°C	70±5°C	55±5°C
Discharge HighTemperature Protection	70±5°C	65±5°C	75±5°C	60±5°C
Charging LowTemperature Protection	0±5°C	0±5°C	0±5°C	0±5°C
Discharge LowTemperature Protection	-20±5°C	-20±5°C	-20±5°C	-20±5°C
Charging High Temperature Protection Release Value	55±5°C	55±5°C	65±5°C	55±5°C
Discharging High Temperature Protection Release Value	60±5°C	60±5°C	65±5°C	60±5°C
Charging Low Temperature Protection Release Value	10±5°C	5±5°C	10±5°C	5±5°C
Discharging Low Temperature Protection Release Value	-10±5°C	-15±5°C	-10±5°C	-15±5°C
Short CircuitCurrent Protection	≈1700A	≈1700A	≈1700A	≈1700A

Battery Parameters

Content	12.8V 200AH smart	12.8V 200AH	12.8V 314AH 12.8V 320AH 12.8V 628AH 12.8V 640AH	12.8V 314AH smart 12.8V 320AH smart 12.8V 628AH smart 12.8V 640AH smart
Rated Voltage	12.8V	12.8V	12.8V	12.8V
Energy	2560W	2560W	314AH: 4019W 320AH:4096W 628AH: 8038W	314AH: 4019W 320AH:4096W 628AH: 8038W
Standard Charging Voltage	14.4V±0.2V	14.4V±0.2V	14.4V±0.2V	14.4V±0.2V
Shipping Voltage	13.2V	13.2V	13.2V	13.2V
Charging High Temperature Protection	60±5°C	65±5°C	65±5°C	60±5°C
Discharge HighTemperature Protection	65±5°C	70±5°C	70±5°C	65±5°C
Charging LowTemperature Protection	0±5°C	0±5°C	0±5°C	0±5°C
Discharge LowTemperature Protection	-20±5°C	-20±5°C	-20±5°C	-20±5°C
Charging High Temperature Protection Release Value	65±5°C	55±5°C	55±5°C	65±5°C
Discharging High Temperature Protection Release Value	65±5°C	60±5°C	60±5°C	65±5°C
Charging Low Temperature Protection Release Value	5±5°C	10±5°C	10±5°C	5±5°C
Discharging Low Temperature Protection Release Value	-15±5°C	-10±5°C	-10±5°C	-15±5°C
Short CircuitCurrent Protection	≈2800A	≈2800A	≈2800A	≈2800A

Battery Parameters

Content	12.8V50AH, 12.8V100AH mini, 12.8V100mini smart, 12.8V100AH, 12.8V100AH smart, 12.8V150AH, 12.8V150AH smart, 12.8V160AH, 12.8V160AH smart, 12.8V200AH, 12.8V200AH smart, 12.8V314AH , 12.8V314AH smart, 12.8V628AH, 12.8V628AH smart 12.8V640AH, 12.8V640AH smart
Release Condition	Cut load.
Shipping Capacity	40%
Cycle Life	≥4000cycle DOD80%
Self Discharge Rate	Monthly<3%
Series & Parallel Connections	Maximum 4S4P
Case Material	ABS
Battery Pack Certifications	CE/UN38.3/Level 9 /IEC62133/RoHS
Cell Certifications	UL1642/UL2580/UN38.3
Storage Temperature	-10~45°
Terminal Bolt Size	M8 100MINI: M6
Ingress Protection Rating	IP65

Charging with AC-DC Battery Charger

Check the AC-DC battery charger you intend to use has a dedicated lithium charge setting that meets the below charging requirements. A lot of battery chargers are designed for charging lead-acid batteries only and may not have a suitable charge setting for $LiFePO_4$ battery.

Charging Tips:

- Use a 14.6V $LiFePO_4$ battery charger
- Recommended Charging Voltage: 14.6V±0.2V
- The recommended charging current is the battery capacity divided by 5 hours.

  (For example, the recommended charging current for 12V314Ah Mini battery is 314Ah/5h=62.8A, so 12V 60A charger would be perfect for a 12V314Ah Mini battery.)

Time at charging currents of 20A and 50A is shown in the following table:

Battery Model / Charging Current	12.8V100AH 12.8V 100AH smart 12.8V 100mini 12.8v100mini smart	12.8v 314ah 12.8v 314 ah smart 12.8V 320ah 12.8V 320ah smart	12.8v 628ah 12.8v 628ah smart
20A	≈5H	≈15.5H	≈31H
50A	≈2H	≈6.3H	≈12.5H

*Comparison of charging time for 12V series batteries

Installation Environment

The battery should be installed in a clean, cool, and dry place, away from water, oil, and dirt. The accumulation of these substances on the battery may cause leakage, resulting in self-discharge and possible short circuits. Adequate ventilation must be maintained to prevent the battery from overheating, and temperature fluctuations between the batteries should be minimized as much as possible.

Preparation

Before installing and handling the battery, it is recommended that the following equipment or tools be available:

- Proper insulation protection equipment and tools
- Multimeter, battery cables
- Battery Charger/Charge Controller

Inspection

Check for visible damage, including cracks, dents, deformations, and other visible anomalies. The top of the battery and terminal connections should be clean, dry and free of dirt and corrosion. Should any issue be detected with the battery, feel free to get in touch with us for prompt assistance.

1. Do not connect the positive and negative poles of the battery together, as doing so may cause a current burst leading to irreversible damage to the system and battery.

2. Please check the polarity before wiring. Polarity reversal will damage the battery.

3. Protect all electrical equipment with circuit breakers, fuses, or appropriately sized circuit breakers as specified by a qualified electrician, licensed installer or regional regulatory authority.

Cable Size

Cable size should be selected based on the expected load.

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

Cable Specification and Capacity(AWG / MM2)	Current Capacity(A)
14(2.08)	9.37
12(3.33)	14.89
10(5.26)	23.68
8(8.37)	37.66
6(13.30)	59.85
4(21.15)	95.19
2(33.62)	151.33
1/0(53.49)	240.74
2/0(67.43)	303.50
4/0(107.22)	482.57

Best Practice Guidelines

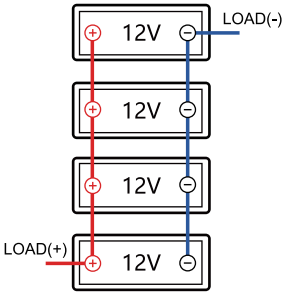
1. Same brand.
   (Do not connect any $LiFePO_4$ battery of other brands due to differences in the BMS)
2. Same battery type($LiFePO_4$).
   (Do not connect any other battery type with this battery - such as Li-ion, SLA etc)
3. Same voltage.
   (It is recommended to use the fully charged battery)
4. Same capacity.
   (Do not connect any other battery type with this battery - such as Li-ion, SLA etc)
5. The time difference between battery purchases should not exceed 3 months.

Connection Steps

STEP1. Fully charge the battery separately.
STEP2. Wait for 15mins and then test the voltage. It should be above 13V.
STEP3. Connect your batteries in series, parallel, or a combination of both.
(Taking a 12V50Ah battery as an example)

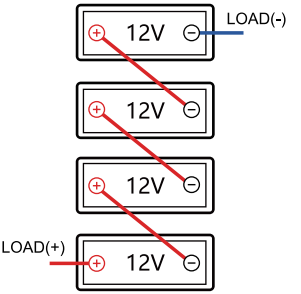
Parallel Connection

12V 200Ah

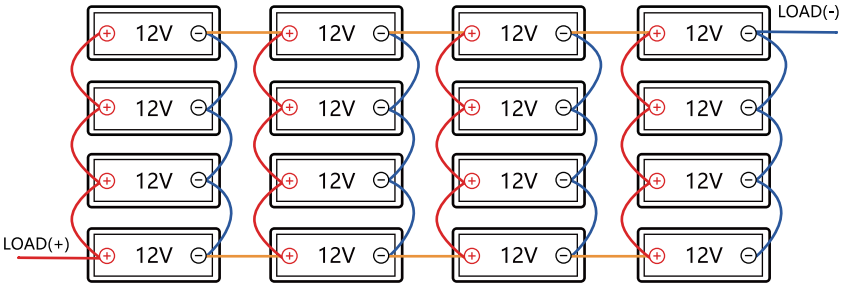


Series Connection

48V 50Ah



Max. Connection in Series & Parallel(4S4P)



Taking a 12V 50Ah battery as an example, first, four such batteries in parallel form a 12V 200Ah pack. Then, four of these packs in series produce a 48V 200Ah battery pack.

BMS Function

Over-Charge Protection Voltage(>14.4V)

If an individual cell voltage exceeds a prescribed threshold during charging, the BMS will stop the charging.

Over-Discharge Protection Voltage(<10V)

If an individual cell falls below the prescribed threshold during discharge, the BMS will prevent further discharge. When the battery voltage reaches over 10.8V, the battery will automatically reconnect after 15 seconds.

Charging High Temperature Protection

The BMS will not allow a charging current, if the internal temperature of the battery has reached 131°F/55°C.

Discharging High Temperature Protection

The BMS will not allow a discharging current, if the internal temperature of the battery has reached 140°F/60°C.

Low Temperature Charging/Discharging

The BMS will not allow a charging current under 32°F/0°C,
but will continue to discharge down to -4°F/-20°C.

Over-Current/Short-Circuit Discharge Protection

If the over-current/short-circuit protection is tripped, the BMS will shut the battery down and will remain disconnected until you remove the battery cables. While the battery cables are disconnected, we suggest taking the battery voltage with the use of a voltmeter. If it reads above 10.8V, reconnect the battery cables. If you are unsuccessful at obtaining a voltage reading above 10.8V, please contact our technical support team: service@enlzh.com

Cell Balancing

The BMS activates a passive balancing process at the end of each charge cycle. This ensures that all the cells remain at the same state of charge, which helps pack performance.

The above data can be viewed on Page 03.

Wide Application

- Trolling Motor
- Boat Electronics
- Recreational Vehicle
- Fit for Replacing 12V Lead-acid Batteries
- Solar Energy System
- Industrial Storage System
- Home Storage & Power Wall
- Off-Grid System

Note: Not suitable for starting gasoline engines.

WIDELY USED

INCLUDING BUT NOT LIMITED



FAQs

What should I do if the battery is 0 V?

Don't worry, if the battery is showing 0V, this is potentially due to BMS protection. Please disconnect the battery cable from the load, test the battery voltage. If the voltage is more than 14.6V, reconnect the battery cable. If the voltage is lower than 12.8V, please contact our technical team service@enlzh.com

Is it necessary to charge the battery out of the box?

Yes, you need to fully charge the battery. NOTE: Please also fully charge the battery if you want to connect the batteries in series or parallel.

How can I check the battery voltage?

If you don't have a battery monitor, you can use a multimeter to monitor the voltage.

Can the battery be mounted in any position?

You can mount our battery in any position. Please make sure to secure and protect the terminals when mounting.

FOR MORE FAQs PLEASE VISIT:

www.enlzh.com

Warranty

Please visit our official website to register your warranty: www.enlzh.com

Not Covered by Warranty:

- Damage caused by insufficient or improper fastening.
- Improper installation, use, maintenance, or service.
- Loose battery terminal connections.
- Series connection of more than 4 batteries (48V above) or parallel connection of more than 4 batteries.
- Reverse polarity connection.
- Improper storage conditions defined in the battery user manual.
- Any short circuit caused by accidentally, intentionally, or unintentionally connecting the positive and negative terminals.
- Damage caused by impact, accidents, collisions, or drops.
- Insufficient/overcharging of the battery as defined in the battery user manual.
- Use in conjunction with other third-party products.
- High resistance caused by terminal corrosion, poor crimping, or undersized cables.
- Battery failure caused by electrical system malfunctions. Modification of the product without the explicit written consent of the manufacturer.
- Use of the battery for applications beyond its design and intended use, including repeated engine starting or consuming more amperes than the battery's rated continuous discharge to meet their respective specifications.
- Batteries left uncharged for more than 1 year (batteries should be charged regularly).
- Batteries used in commercial applications that cycle to a discharge depth of 80% or more within 24 hours.
- Force majeure, including fires, typhoons, floods, or earthquakes.
- Buyers are responsible for any damage caused by improper operation or misuse of our products and/or failure to follow safety guidelines.

After-Sales Service

If you need any after-sales service for the product, please contact service@enlzh.com
We will provide you with the necessary assistance.

How to Store the Battery?

We recommend bringing the batteries to a 50% state of charge. Then, disconnect the batteries from any loads by removing the negative cable from one of the batteries. On average, the batteries lose ≤ 3% capacity per month at 77°F/25°C.
This is subject to an increase in capacity loss if stored in extreme environmental conditions.

• Disposal and Recycling

Ensure that the battery is properly disposed of in accordance with the laws and regulations in your area.

This product contains lithium-ion batteries and other recyclable materials.

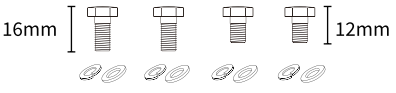
We strongly encourage our customers to recycle used batteries.

• Packing List

Battery x 1



Screw x 4



User Manual x 1



Plastic Insulation Cap x 2



ENLZH®

Dear Valued Customer,

We extend our deepest gratitude for the trust you have placed in enlzh Batteries. Your unwavering support serves as a constant inspiration, driving our team to pursue innovation and deliver state-of-the-art battery solutions, all while maintaining an uncompromising commitment to service excellence.

It is through your invaluable feedback and the relentless dedication of our team that we are able to provide superior products at competitive prices, ensuring your complete satisfaction. Your confidence in our brand fuels our passion to continually raise the standard in energy solutions.

We take immense pride in the engineering and craftsmanship of our products and sincerely hope they exceed your expectations. Should you require any assistance, our dedicated team remains readily available to support you.

With sincere appreciation,
The enlzh Team