BUKNUWO

To better protect your rights,
please log into the Buknuwo website or download the Buknuwo app to register for warranty service as soon as possible!

www.buknuwo.com

gmail@buknuwo.com

BUKNUWO

# USER MANUAL

## 12V LiFePO4 Deep Cycle Battery SERIES

- 12V50Ah
- 12V100Ah 24Group
- 12V100Ah 24Group Smart
- 12V100Ah Pro
- 12V100Ah Pro Smart
- 12V100Ah
- 12V100Ah Smart
- 12V150Ah
- 12V150Ah Smart
- 12V200Ah Smart
- 12V200Ah
- 12V314Ah
- 12V314Ah Smart
- 12V628Ah
- 12V628Ah 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 buknuwo®. 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 "buknuwo" in the App Store or Google Play Store to download and install.

*This app only supports for smart batteries.



# CONTENTS


01 Key Features

02 Charge Discharge Curve

03 Product Specifications

09 Charging

10 Installation Guide

13 BMS Function

14 Application Examples

15 FAQs

16 Warranty and Returns

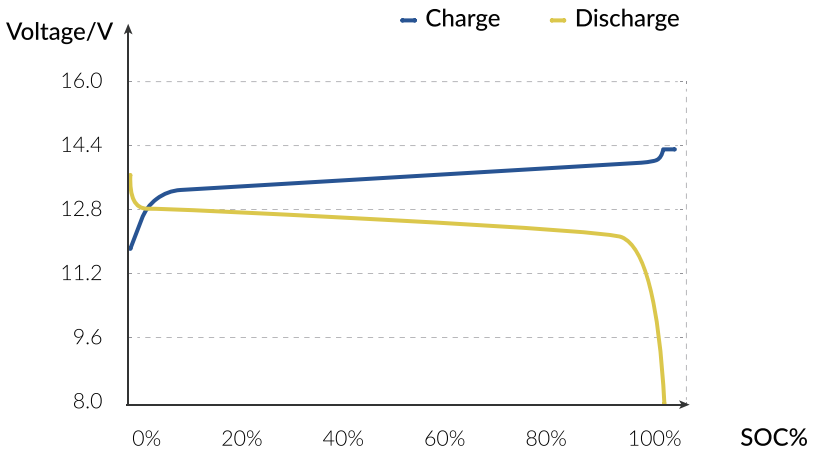
# Key Features

- 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



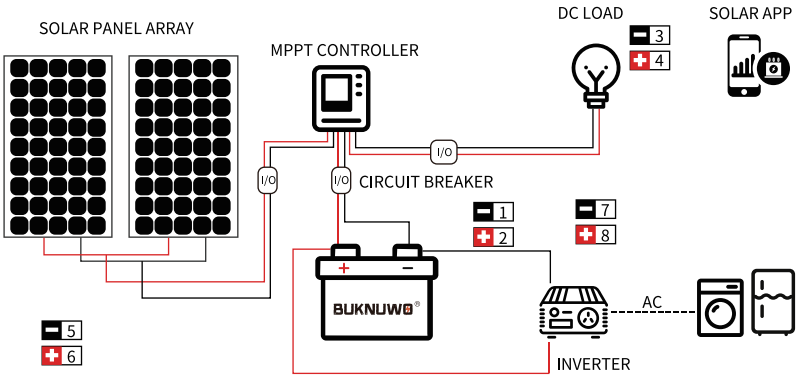
## Charge-Discharge Curve @ 77°F/25°C




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 24Group | 12.8V 100AH 24Group smart | 12.8V 100AH 12.8V 100AH Pro |
|---|---|---|---|
| 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 100AH Pro Smart | 12.8V 150AH | 12.8V 150AH 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 |

## Battery Management System(BMS) Warning and Protection

| 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 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 |

## 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)<br>483*170*240(mm) | 19.02*6.7*9.45(inch)<br>483*170*240(mm) |
| Balancing Method | 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)<br>195*130*170(mm) |
| Balancing Method | Passive Balancing |

## Battery Parameters

| Content | 12.8V 100AH 24Group<br>12.8V 100AH PRO<br>12.8V 100AH | 12.8V 100AH 24Group smart<br>12.8V 100AH PRO smart<br>12.8V 100AH smart | 12.8V 150AH |
|---|---|---|---|
| Rated Voltage | 12.8V | 12.8V | 12.8V |
| Energy | 1280W | 1280W | 1920W |
| Standard Charging Voltage | 14.4V±0.2V | 14.4V±0.2V | 14.4V±0.2V |
| Shipping Voltage | 13.2V | 13.2V | 13.2V |
| Charging High Temperature Protection | 65±5°C | 60±5°C | 70±5°C |
| Discharge HighTemperature Protection | 70±5°C | 65±5°C | 75±5°C |
| Charging LowTemperature Protection | 0±5°C | 0±5°C | 0±5°C |
| Discharge LowTemperature Protection | -20±5°C | -20±5°C | -20±5°C |
| Charging High Temperature Protection Release Value | 55±5°C | 55±5°C | 65±5°C |
| Discharging High Temperature Protection Release Value | 60±5°C | 60±5°C | 65±5°C |
| Charging Low Temperature Protection Release Value | 10±5°C | 5±5°C | 10±5°C |
| Discharging Low Temperature Protection Release Value | -10±5°C | -15±5°C | -10±5°C |
| Short CircuitCurrent Protection | ≈1700A | ≈1700A | ≈1700A |

## Battery Parameters

| Content | 12.8V 150 AH smart | 12.8V 314AH<br>12.8V 628AH<br>12.8V 200AH | 12.8V 314AH smart<br>12.8V 628AH smart<br>12.8V 200AH smart |
|---|---|---|---|
| Rated Voltage | 12.8V | 12.8V | 12.8V |
| Standard Charging Voltage | 14.4V±0.2V | 14.4V±0.2V | 14.4V±0.2V |
| Energy | 1920W | 200AH: 2560W<br>314AH: 4019W<br>628AH: 8038W | 200AH: 2560W<br>314AH: 4019W<br>628AH: 8038W |
| Shipping Voltage | 13.2V | 13.2V | 13.2V |
| Charging High Temperature Protection | 55±5°C | 65±5°C | 60±5°C |
| Discharge HighTemperature Protection | 60±5°C | 70±5°C | 65±5°C |
| Charging LowTemperature Protection | 0±5°C | 0±5°C | 0±5°C |
| Discharge LowTemperature Protection | -20±5°C | -20±5°C | -20±5°C |
| Charging High Temperature Protection Release Value | 55±5°C | 55±5°C | 65±5°C |
| Discharging High Temperature Protection Release Value | 60±5°C | 60±5°C | 65±5°C |
| Charging Low Temperature Protection Release Value | 5±5°C | 10±5°C | 5±5°C |
| Discharging Low Temperature Protection Release Value | -15±5°C | -10±5°C | -15±5°C |
| Short CircuitCurrent Protection | ≈1700A | ≈2800A | ≈2800A |

## Battery Parameters

| Content | 12.8V50AH, 12.8V100AH 24Group, 12.8V100 24Group smart, 12.8V100AH Pro, 12.8V100AH Pro smart,12.8V100AH, 12.8V100AH smart,12.8V150AH, 12.8V150AH smart, 12.8V200AH, 12.8V200AH smart, 12.8V314AH , 12.8V314AH smart, 12.8V628AH, 12.8V628AH 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 |
| 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<br>12.8V 100AH smart<br>12.8V100AH Pro<br>12.8V 100AH Pro smart<br>12.8V 100 24Group<br>12.8v100 24Group smart | 12.8v 314AH<br>12.8v 314AH smart | 12.8v 628AH<br>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

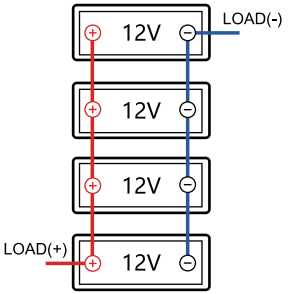
1. Same brand.
   (Do not connect any $LiFePO_4$ battery of other brands due to differences in the BMS)
2. Same battery type($LiFePO_4$).
   (Do not connect any other battery type with this battery - such as Li-ion, SLA etc)
3. Same voltage.
   (It is recommended to use the fully charged battery)
4.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

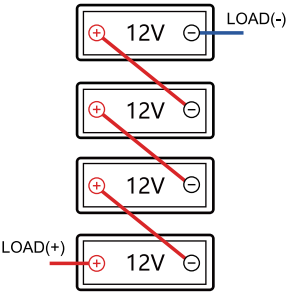
**Parallel Connection**

12V 200Ah

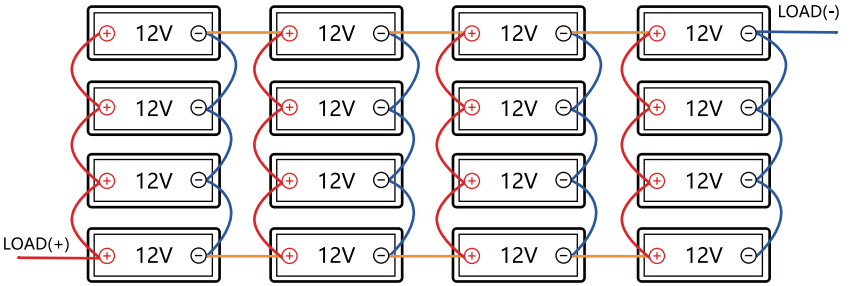



**Series Connection**

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: gmail@buknuwo.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 gmail@buknuwo.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.buknuwo.com

## Warranty

Please visit our official website to register your warranty: www.buknuwo.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
gmail@buknuwo.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.

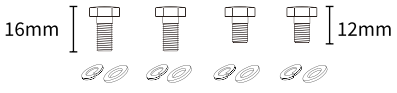
We strongly encourage our customers to recycle used batteries.

## • Packing List

Battery x 1




Screw x 4




User Manual x 1




Plastic Insulation Cap x 2



BUKNUWO

## Dear Valued Customer,

We extend our deepest gratitude for the trust you have placed in Buknuwo 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 Buknuwo Team