

12V LiFePO4 Battery

Installation, charging and operating manual

Part code PVS-MAN-12V-LIFEPO4-BATTERY

Issued 2026-09-11

Read this manual completely before installing, charging or connecting the battery, and keep it with the installation for future reference.

Contents

- CYCLE BAT T ERY
- External Features
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- Recreational Vehicle
- After-Sales Service

CYCLE BATTERY

service@wattcycle.com To better protect your rights and interests, please log in to the WattCycle website or scan the QR code to register for the warranty promptly!

www.wattcycle.com 12V 50Ah 12V 100Ah Mini 12V 100Ah Mini Smart 12V 100Ah 12V 100Ah TMS Smart 12V 100Ah Mini Smart+Self-Heating 12V 100Ah H190 Smart 12V 100Ah H190 Smart+Self-Heating 12V 200Ah 12V 166Ah Smart 12V 314Ah Mini 12V 314Ah Mini Smart 12V 314Ah Mini Smart Super 12V 314Ah Mini Smart+Self-Heating 12V 314Ah Mini Smart Super+Self-Heating 12V 314Ah Ultra 12V 314Ah Ultra Smart 12V 314Ah H190 Smart+Self-Heating 12V 628Ah Ultra Smart 12V 348Ah Mini AB 12V 280Ah Mini 12V 300Ah Mini Smart 12V 100Ah Pro

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. This application is developed and designed by WattCycle®. 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.

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

- This app only supports for smart batteries.

App Store

CAUTION

Key Features 01

Charge-discharge Curve 02 Product Specifications 03 Charging 09 Installation Guide 10 BMS Function 13 Application Examples 14 FAQs 15 Warranty and Returns 16

External Features

Key Features

Key Features / 01

Lithium Iron Phosphate (LiFePO₄) chemistry provides exceptional stability and consistent performance. Advanced Battery Management System (BMS) ensures product safety and long lifespan. Supports fast charging and discharging. Constant voltage and full usable capacity at any state of charge. IP65 (Ingress Protection Rating). Grade UL94 V-0 (Fireproof). Positive Terminal (red) 1 Positive Terminal (red) 1 Nylon Handle 2 Nylon Handle 2 Negative Terminal (black) 3 Negative Terminal (black) 3 12V50Ah, 12V100Ah and 12V100Ah Mini are similar in appearance.

12V314Ah Mini and 12V280Ah Mini are similar in appearance.

Charge-Discharge Curve @ 77°F/25°C Connection Diagram *Environmental conditions required for all tests: 77°F/25°C Sample: 12V50Ah battery

Voltage/V

S O C%

Charge D ischarge 16.0 8.0 0% 20% 40% 60% 80% 100% 9.6 11.2 12.8 14.4

Balancing Method Passive BalancingPassive Balancing Passive Balancing Product Specifications / 03
Balancing Method Passive BalancingPassive Balancing Passive Balancing

Content

Standard/Maximum /gO /gOContinuous Charge Maximum Continuous/gO /gO D ischarge Current Over-Current/gO
/gO Charge Protection 12V50Ah 10A /50A 50A

170A ±30A

70A ±10A

195 x 130 x 170(mm)

12V100Ah Minimum /gO 20A /100A 100A

300A ±50A

130A ±30A

229 x 138 x 208(mm)

Content

Standard/Maximum /gO /gOContinuous Charge Maximum Continuous/gO /gO D ischarge Current Over-Current/gO
/gO D ischarge Protection Over-Current/gO /gO Charge Protection 12V100Ah Minimum Smart 20A /100A 100A

150A ±50A

120A ±20A

229 x 138 x 208(mm)

Weight Dimensions

11.46lbs±3% /5.2kg±3%

7.68 x 5.12 x 6.7(inch)

20.94lbs±3% /9.5kg±3%

9.02 x 5.43 x 8.19(inch)

20.94lbs±3% /9.5kg±3%

9.02 x 5.43 x 8.19(inch)

Weight Dimensions 12V100Ah 20A /100A 100A

300A ±50A

130A ±20A

23.15lbs±3% /10.5kg±3%

260 x 168 x 209(mm)

10.24 x 6.61 x 8.23(inch)

12V100Ah TMS Smart 20A /100A 120A

400A ±50A

120A ±20A

24.47lbs±3% /11.1kg±3%

260 x 168 x 209(m m)

10.24 x 6.61 x 8.23(inch)

Self-Heating Self-Heating / / / / Battery Management System (BMS) Warning and Protection 12V100Ah Mini /gOSmart+Self-Heating 20A /100A 200A

600A ±50A

210A ±10A

24.91lbs±3% /11.3kg±3%

354 x 176 x 187(m m)

13.94 x 6.93 x 7.36(inch)

Support Over-Current/gO /gO Discharge Protection

Content

Standard/Maximum /gO /gO Continuous Charge Maximum Continuous/gO /gO Discharge Current Over-Current/gO /gO Discharge Protection Over-Current/gO /gO Charge Protection

Content

Standard/Maximum /gO /gO Continuous Charge Maximum Continuous/gO /gO Discharge Current Over-Current/gO /gO Discharge Protection Over-Current/gO /gO Charge Protection

04 / Product Specifications

Weight Weight Dimensions Dimensions Self-Heating Self-Heating 20A /100A 100A

150A ±50A

110A ±10A

24.9lbs±3% /11.29kg±3%

354 x 176 x 187(m m)

12V100Ah H 190 Smart

13.94 x 6.93 x 7.36(inch)

/ Battery Management System (BMS) Warning and Protection 12V166Ah Smart 33.2A /200A 200A

300A ±10A

300A ±10A

34.55lbs±3% /15.67kg±3%

331.4 x 172.4 x 219.5(m m)

13.05 x 6.79 x 8.64(inch)

/ 12V200Ah 40A /200A 200A

600A ±50A

210A ±10A

18.69kg ±3% /41.21lb ±3%

483 x 170 x 240(m m)

19.02 x 6.7 x 9.45(inch)

/ Balancing Method Passive BalancingPassive Balancing Passive BalancingBalancing Method 56A /200A 200A

600A ±50A

210A ±10A

59.52lbs±3% /27kg±3%

12V280Ah Mini

384 x 194 x 248(m m)

15.12 x 7.64 x 9.76(inch)

/ Passive BalancingPassive Balancing 12V100Ah Pro 20A /110A 110A

300A ±50A

130A ±20A

26lbs±3% /11.79kg±3%

332 x 172 x 218(m m)

13.07 x 6.77 x 8.58(inch)

/ 20A /100A 100A

110A ±10A

110A ±10A

25.02lbs±3% /11.35kg±3%

354 x 176 x 187(m m)

12V100Ah High Power Smart /gO+Self-Heating

13.94 x 6.93 x 7.36(inch)

Support

Passive Balancing

Self-Heating Product Specifications / 05

Content

Standard/Maximum /gO /gOContinuous Charge Max Continuous/gO /gO Discharge Current Over-current/gO /gO Discharge Protection Over-current/gO /gO Charge Protection Weight Dimensions Balancing Method Battery Management System (BMS) Warning and Protection 62.8A /200A 200A

210A ±10A

210A ±10A

59.52lbs±3% /27kg±3%

384 x 194 x 248(m m)

12V314Ah M ini S m art

15.12 x 7.64 x 9.76(inch)

Passive Balancing

Content

S tandard/M axim um /gO /gOContinuous Charge M ax Continuous/gO /gO D ischarge Current O ver-current/gO /gO D ischarge Protection O ver-current/gO /gO Charge Protection W eight D im ensions S elf-H eating Balancing M ethod

Passive Balancing

/ 12V314Ah M ini 62.8A /200A 200A

210A ±10A

210A ±10A

59.52lbs±3% /27kg±3%

384 x 194 x 248(m m)

15.12 x 7.64 x 9.76(inch)

A ctive Balancing 62.8A /200A 200A

220A ±10A

220A ±10A

27.23kg ±3% / 60.03 lb ±3%

386.5 x 206.3 x 272.8(m m)

12V314Ah M ini /gOS m art S uper

15.22 x 8.12 x 10.74(inch)

Passive Balancing

/ 60A /200A 200A

210A ±10A

210A ±10A

59.52lbs±3% /27kg±3%

12V300A h M ini S m art

15.12 x 7.64 x 9.76(inch)

384 x 194 x 248(m m)

S upport 62.8A /200A 200A

210A ±10A

210A ±10A

61.62lbs±3% /27.95kg±3%

15.07 x 7.61 x 9.82(inch)

12V314Ah Mini Smart+Self-Charging Passive Balancing Active Balancing 62.8A /200A 200A

220A ±10A

220A ±10A

62.83lbs±3% /28.5kg±3%

386.5 x 206.3 x 272.8(mm)

12V314Ah Mini /gOSmart Super /gO+Self-Charging

15.22 x 8.12 x 10.74(inch)

Support

382.7 x 193.3 x 249.5(mm)

06 / Product Specifications

Battery Management System (BMS) Warning and Protection Standard/Maximum /gO /gOContinuous Charge
Maximum Continuous/gO /gO Discharge Current Over-current/gO /gO Discharge Protection Over-current/gO /gO
Charge Protection Weight Dimensions Self-Charging 125.6A /300A 300A

310A ±10A

310A ±10A

59.81kg ±3% /131.85 lb ±3%

480 x 362 x 242(mm)

12V628Ah Ultra Smart

18.9 x 14.25 x 9.53(inch)

/ Balancing Method Passive Balancing Standard/Maximum /gO /gOContinuous Charge 62.8A /250A 250A

260A ±40A

260A ±40A

67.79lbs±3% /30.75kg±3%

320 x 290 x 190(mm)

12V314Ah H190 /gOSmart+Self-Charging

12.60 x 11.42 x 7.48(inch)

Support

Passive Balancing

62.8A /250A 250A

260A ±40A

260A ±40A

67.79lbs±3% /30.75kg±3%

320 x 290 x 190(mm)

12V348Ah Mini A B

12.60 x 11.42 x 7.48(inch)

Support

Passive Balancing

Max Continuous/gO /gO Discharge Current Over-current/gO /gO Discharge Protection Over-current/gO /gO Charge Protection Weight Dimensions Self-Heating Balancing Method

524 x 245 x 220(m m)

62.8A /300A 300A

310A ±10A

310A ±10A

61.72lbs±3% /28kg±3%

12V314A h U ltra

20.63 x 9.65 x 8.66(inch)

Passive Balancing

Content

Content

62.8A /300A 300A

310A ±10A

310A ±10A

61.72lbs±3% /28kg±3%

524 x 245 x 220(m m)

12V314A h U ltra S m art

20.63 x 9.65 x 8.66(inch)

Passive Balancing

Short Circuit/ /gOC urrent t Protection C hargin g H igh/ /gOTem perature Protection D ischarge H igh/ /gOTem perature Protection C hargin g Low / /gOTem perature Protection D ischarge Low / /gOTem perature Protection C hargin g H igh-Tem perature /g0Protection Release Value C hargin g Low -Tem perature /g0Protection Release Value D ischargin g H igh-Tem perature /g0Protection Release Value D ischargin g Low -Tem perature /g0Protection Release Value Support

122~140°F / 50~60■

131~149°F / 55~65■

23~41°F / -5~5■

-13~5°F / -25~-15■

113~131°F / 45~55■

-4~14°F / -20~-10■

122~140°F / 50~60■

26.6~44.6°F / -3~7■

Rated Voltage 12.8V

Standard Charging

/ Voltage 14.4V±0.2V

Shipping Voltage 12.8V~13.5V 12V50Ah, 12V100Ah Mini, 12V100Ah Mini Smart, 12V100Ah, 12V100Ah TMS Smart, 12V 100Ah Mini Smart+Self-Heating, 12V100Ah Pro, 12V100Ah H190 Smart, 12V100Ah H190 Smart+Self-Heating, 12V 166Ah Smart, 12V200Ah, 12V280Ah Mini, 12V300Ah Mini Smart, 12V314Ah Mini, 12V314Ah Mini Smart, 12V314Ah Mini Smart Super, 12V314Ah Mini Smart+Self-Heating, 12V314Ah Ultra, 12V314Ah Ultra Smart, 12V314Ah H190 Smart+Self-Heating, 12V628Ah Ultra Smart

Storage Temperature 32°F~140°F/0°C~60°C Terminal Bolt Size M8(M6 for 12V50Ah) Self Discharge Rate ≤3%/Month Series & Parallel Connection 4 Series(Max) 4 Parallel(Max) Case Material ABS +PC /UL94 V-0 Ingress Protection Rating IP65

Battery Pack

Certifications IEC /CE/FC /UN38.3 Cell Certifications UL1642/UL2580/UN38.3

08 / Product Specifications

Shipping Capacity 60% Cycle Life 6000@ DOD 80% Content Battery Parameters Release Condition Cut Load 12V50Ah, 12V100Ah Mini, 12V100Ah Mini Smart, 12V100Ah, 12V100Ah TMS Smart, 12V 100Ah Mini Smart+Self-Heating, 12V100Ah Pro, 12V100Ah H190 Smart, 12V100Ah H190 Smart+Self-Heating, 12V 166Ah Smart, 12V200Ah, 12V280Ah Mini, 12V300Ah Mini Smart, 12V314Ah Mini, 12V314Ah Mini Smart, 12V314Ah Mini Smart Super, 12V314Ah Mini Smart Super+Self-Heating, 12V314Ah Mini Smart+Self-Heating, 12V314Ah Ultra, 12V314Ah Ultra Smart, 12V314Ah H190 Smart+Self-Heating, 12V628Ah Ultra Smart

Check the A-C-D 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 LiFePO4 battery.

Charging / 09

Use a 14.6V LiFePO4 battery charger /gO/gORecomm ended Charging Voltage: 14.6V±0.2V /gO/gOT he recomm ended charging current is the battery capacity divided by 5 hours.

Time at charging currents of 20A and 50A is shown in the following table (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.) 12V166Ah 12V200Ah12V50Ah 15.7h10h8.3h5h2.5h20A 6.5h4h3.5h2h1h50A 12V100Ah 12V314Ah *Comparison of charging time for 12V series batteries Charging with A-C-D Battery Charger Charging Tips:

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.

10 / Installation Guide

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.

//gOPlease check the polarity before wiring. Polarity reversal will damage the battery.

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

/g0Proper insulation protection equipment and tools / /g0M ultimeter, battery cables / /g0Battery Charger/Charge Controller

(Do not connect any LiFePO4 battery of other brands due to differences in the BMS) (Do not connect any other battery type with this battery - such as Li-ion, SLA etc) (It is recommended to use the fully charged battery) (Do not connect any other battery type with this battery - such as Li-ion, SLA etc) Installation Guide / 11 /g0Same brand.

/g0/g0Same battery type(LiFePO4). /g0/g0Same voltage. /g0/g0Same capacity. /g0/g0The time difference between battery purchases should not exceed 3 months.

14(2.08) /g012(3.33)/g0 /g010(5.26)/g0 /g08(8.37)/g0 /g06(13.30) /g04(21.15)/g0 /g02(33.62) /g01/0(53.49)/g0 /g02/0(67.43)/g0 /g04/0(107.22) 9.37 /g014.89 /g023.68 /g037.66 /g059.85 /g095.19 /g0151.33 /g0240.74 /g0303.50 /g0482.57

STEP1. Fully charge the battery separately. /g0STEP2. Wait for 15mins and then test the voltage. It should be above 13V.

/g0STEP3. Connect your batteries in series, parallel, or a combination of both. / (Taking a 12V50Ah battery as an example) Taking a 12V 50Ah battery as an example, first, four such batteries in parallel form a 12V 200Ah pack.

/g0Then, four of these packs in series produce a 48V 200Ah battery pack. Max. Connection in Series & Parallel(4S 4P)

12 / Installation Guide

Connection Steps

The above data can be viewed on Page 03. Low Temperature Charging/Discharging The BMS will not allow a charging current under 32°F/0°C, /g0but will continue to discharge down to -4°F/-20°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.

Charging High Temperature Protection The BMS will not allow a charging current, if the internal temperature of the /g0battery has reached 131°F/55■.

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.

Over-Charge Protection Voltage(>14.4V) If an individual cell voltage exceeds a prescribed threshold during charging, the BMS will stop the charging.

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.

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@wattcycle.com.

BMS Function / 13 BMS Function

14 / Application Examples

WIDELY USED

INCLUDING BUT NOT LIMITED TO RVs Marine Solar Home Storage Golf Cart Trolling Motor Off-Grid Wide Application Solar Energy System Industrial Storage System Home Storage & Power Wall Off-Grid S

ystem Trolling Motor

Boat Electronics

Recreational Vehicle

Fit for Replacing 12V Lead-acid

Batteries

Note: Not suitable for starting gasoline engines.

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@PVShop.com.

What should I do if the battery is 0 V? You can mount our battery in any position. Please make sure to secure and protect the terminals when mounting.

Can the battery be mounted in any position? If you don't have a battery monitor, you can use a multimeter to monitor the voltage.

How can I check the battery voltage? 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.

Is it necessary to charge the battery out of the box? FAQs / 15 FAQs FOR MORE FAQs PLEASE VISIT:

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.

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.

16 / Warranty and Returns

Please Scan the QR Code to Register for the 5-Year Warranty. Warranty Not Covered by Warranty:

Warranty and Returns / 17 Battery x 1 User Manual x 1 Screw x 4 Plastic Insulation Cap x 2 16mm 12mm

After-Sales Service

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 $\leq 3\%$ capacity per month at 77°F/25°C. This is subject to an increase in capacity loss if stored in extreme environmental conditions.

How to Store the Battery? Disposal and Recycling Packing List

Dear Valued Customer, Thank you for choosing WattCycle lithium batteries! We sincerely appreciate your support and warmly welcome your feedback.

At WattCycle, we are dedicated to a user-centric and innovative approach, providing high-performance and eco-friendly lithium battery solutions to meet energy needs across various applications.

We offer unique competitive advantages in materials, craftsmanship, technology, design, safety, after-sales service, warranty periods, and pricing. Your choice is our greatest support and encouragement.

With infinite energy and a commitment to sustainability, WattCycle is committed to creating a cleaner, bluer sky. We hope we can work together to contribute to a greener planet in the future.

Thank you once again for your trust in WattCycle. We always welcome you to share your experiences or any feedback with us.

Wishing you a pleasant experience! / The WattCycle Team

Warranty and contact

This manual is issued by PVShop for the battery supplied with it, and reproduces the manufacturer's installation and operating instructions for this battery family. Keep your order number for any warranty enquiry. For support, reply to your order confirmation or use the contact details on the shop's help page.

Before you install: confirm the model's maximum continuous and peak current limits, its charge voltage and the permitted series/parallel configuration on its technical datasheet, and size cables, fuses and the charger accordingly.