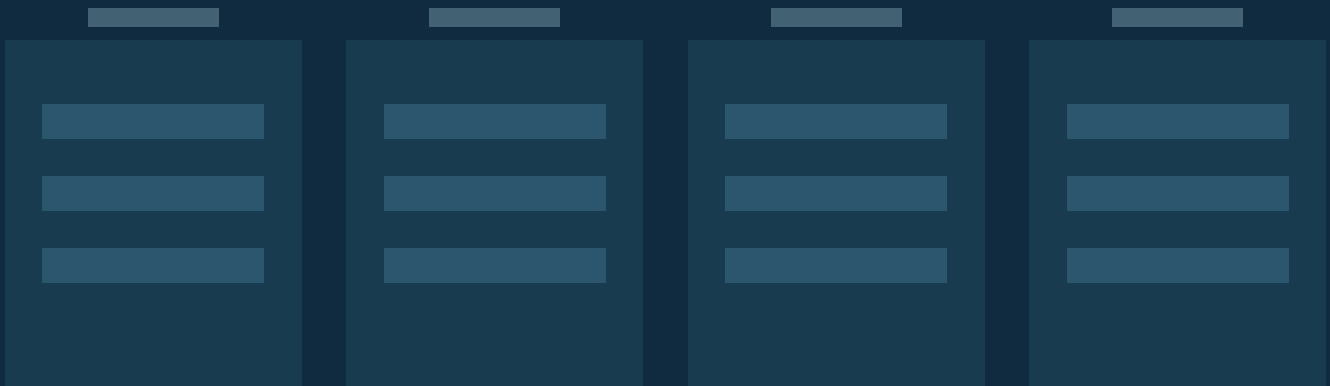


12V



Deep-cycle battery

LiFePO4 · Installation, charging and operation



READ BEFORE INSTALLATION

Keep this manual with your battery. Match every setting and connection to the exact model supplied.

USING THIS MANUAL

Find what you need

Safety essentials	03
Features & external connections	04
Charge curve & system diagram	05
Model specifications	06
Charging	12
Installation & battery banks	13
Battery management system	16
Applications	17
Care & support	18

Choose the exact model

This is a family manual. Capacity, current limits, dimensions, heating, monitoring and connection limits vary by model. Use the matching table column and the technical datasheet supplied with your product.

The technical pages retain the manufacturer's tables and diagrams. Product labels and interface screens may show the original equipment branding.

BEFORE YOU BEGIN

Safety essentials

Prevent short circuits and reverse polarity

Keep terminals protected. Never bridge the positive and negative terminals with tools, cables or other metal objects. Confirm polarity before connecting.

Handle and install with care

Do not crush, puncture, strike, dismantle, incinerate or immerse the battery. Keep it away from heat sources and flammable materials. Do not use a damaged or deformed battery.

Isolate before wiring

Switch off and disconnect equipment before installation. Use insulated tools and suitable protective equipment. Cables and circuit protection must suit the battery and installation. Qualified personnel must carry out the wiring.

Use the correct charger

The family manual specifies a LiFePO4 charger at 14.6V ± 0.2 V. Confirm the exact model's charging current and temperature limits before charging. Protection thresholds are not normal charger setpoints.

Match batteries before combining them

Use matching batteries of the same brand, chemistry, voltage and capacity. The source manual specifies a purchase-age difference of no more than three months. Fully charge each battery separately before assembling a permitted bank.

Stop if the battery behaves abnormally

Stop use if the battery becomes unusually hot, leaks, smells abnormal, swells or smokes. Keep people clear and seek appropriate assistance. Do not handle or move a hot or smoking battery.

FEATURES & EXTERNAL CONNECTIONS

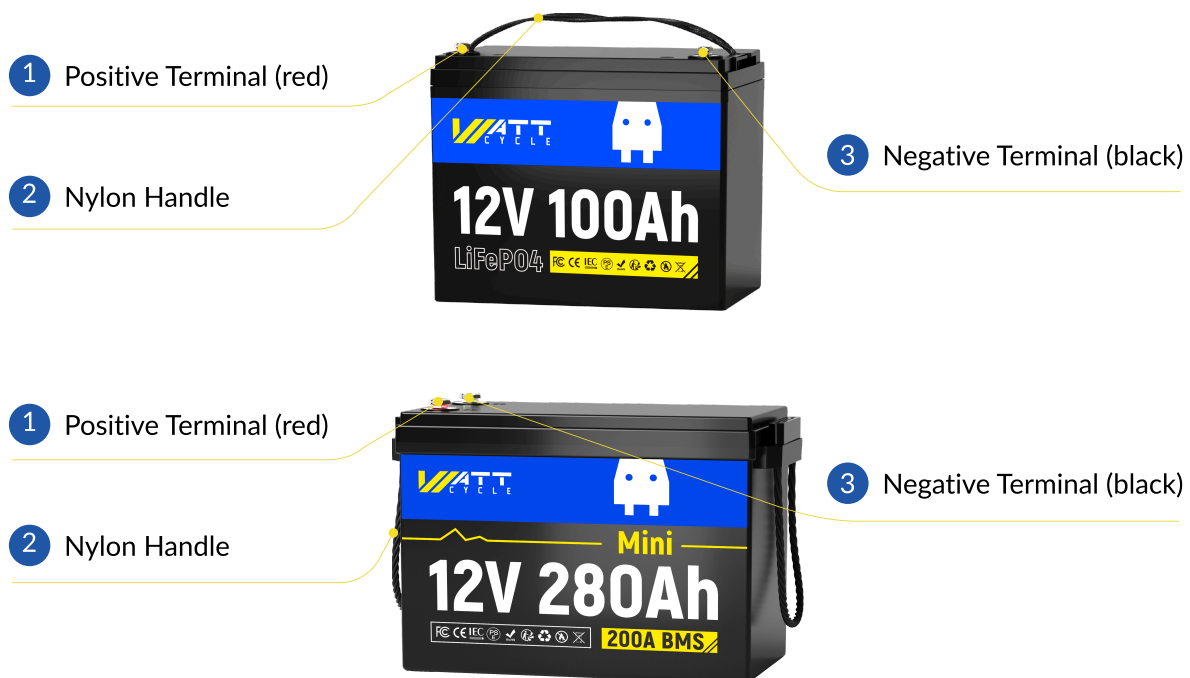


Key Features

- 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)



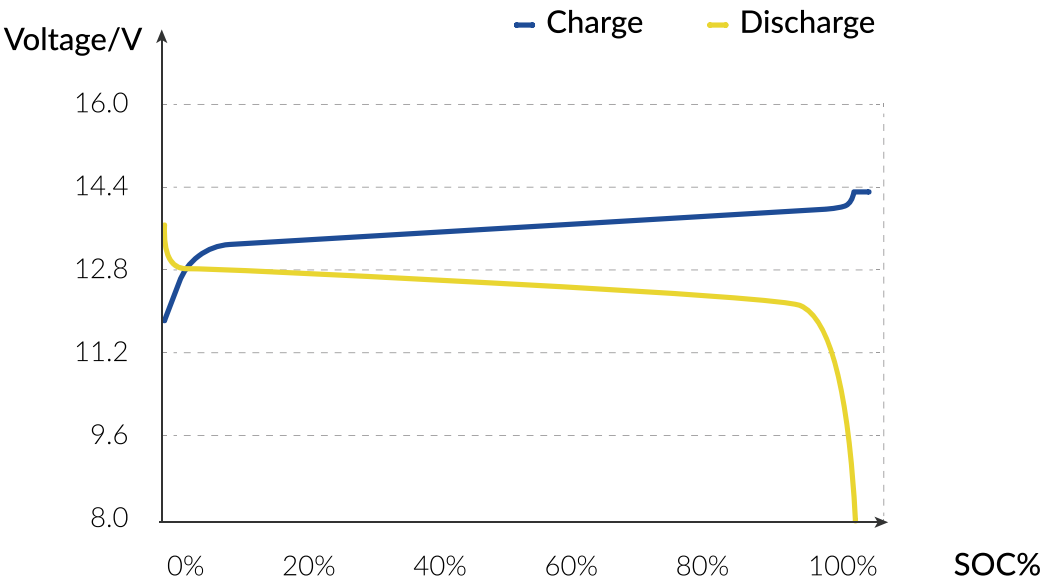
External Features



12V50Ah, 12V100Ah and 12V100Ah Mini are similar in appearance.
12V314Ah Mini and 12V280Ah Mini are similar in appearance.

CHARGE CURVE & SYSTEM DIAGRAM

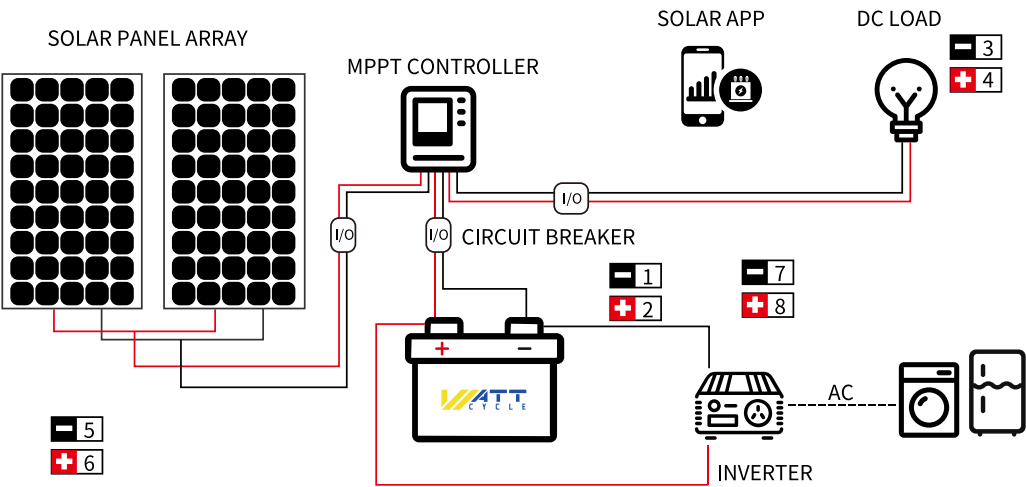
Charge-Discharge Curve @ 77°F/25°C



Sample: 12V50Ah battery

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

Connection Diagram



MODEL SPECIFICATIONS

 Battery Management System(BMS) Warning and Protection

Content	12V50Ah	12V100Ah Mini	12V100Ah Mini Smart
Standard/Maximum Continuous Charge	10A/50A	20A/100A	20A/100A
Max Continuous Discharge Current	50A	100A	100A
Over-Current Discharge Protection	170A±30A	300A±50A	150A±50A
Over-Current Charge Protection	70A±10A	130A±30A	120A±20A
Weight	11.46lbs±3%/5.2kg±3%	20.94lbs±3%/9.5kg±3%	20.94lbs±3%/9.5kg±3%
Dimensions	7.68 x 5.12 x 6.7(inch) 195 x 130 x 170(mm)	9.02 x 5.43 x 8.19(inch) 229 x 138 x 208(mm)	9.02 x 5.43 x 8.19(inch) 229 x 138 x 208(mm)
Self-Heating	/	/	/
Balancing Method	Passive Balancing	Passive Balancing	Passive Balancing

Content	12V100Ah	12V100Ah TM Smart	12V100Ah Mini Smart+Self-Heating
Standard/Maximum Continuous Charge	20A/100A	20A/100A	20A/100A
Max Continuous Discharge Current	100A	120A	200A
Over-Current Discharge Protection	300A±50A	400A±50A	600A±50A
Over-Current Charge Protection	130A±20A	120A±20A	210A±10A
Weight	23.15lbs±3%/10.5kg±3%	24.47lbs±3%/11.1kg±3%	24.91lbs±3%/11.3kg±3%
Dimensions	10.24 x 6.61 x 8.23(inch) 260 x 168 x 209(mm)	10.24 x 6.61 x 8.23(inch) 260 x 168 x 209(mm)	13.94 x 6.93 x 7.36(inch) 354 x 176 x 187(mm)
Self-Heating	/	/	Support
Balancing Method	Passive Balancing	Passive Balancing	Passive Balancing

MODEL SPECIFICATIONS

 Battery Management System(BMS) Warning and Protection

Content	12V100Ah Pro	12V100Ah H190 Smart	12V100Ah H190 Smart +Self-Heating
Standard/Maximum Continuous Charge	20A/110A	20A/100A	20A/100A
Max Continuous Discharge Current	110A	100A	100A
Over-Current Discharge Protection	300A±50A	150A±50A	110A±10A
Over-Current Charge Protection	130A±20A	110A±10A	110A±10A
Weight	26lbs±3%/11.79kg±3%	24.9lbs±3%/11.29kg±3%	25.02lbs±3%/11.35kg±3%
Dimensions	13.07 x 6.77 x 8.58(inch) 332 x 172 x 218(mm)	13.94 x 6.93 x 7.36(inch) 354 x 176 x 187(mm)	13.94 x 6.93 x 7.36(inch) 354 x 176 x 187(mm)
Self-Heating	/	/	Support
Balancing Method	Passive Balancing	Passive Balancing	Passive Balancing

Content	12V166Ah Smart	12V200Ah	12V280Ah Mini
Standard/Maximum Continuous Charge	33.2A/200A	40A/200A	56A/200A
Max Continuous Discharge Current	200A	200A	200A
Over-Current Discharge Protection	300A±10A	600A±50A	600A±50A
Over-Current Charge Protection	300A±10A	210A±10A	210A±10A
Weight	34.55lbs±3%/15.67kg±3%	18.69kg ±3%/41.21lb ±3%	59.52lbs±3%/27kg±3%
Dimensions	13.05 x 6.79 x 8.64(inch) 331.4 x 172.4 x 219.5(mm)	19.02 x 6.7 x 9.45(inch) 483 x 170 x 240(mm)	15.12 x 7.64 x 9.76(inch) 384 x 194 x 248(mm)
Self-Heating	/	/	/
Balancing Method	Passive Balancing	Passive Balancing	Passive Balancing

MODEL SPECIFICATIONS

 Battery Management System(BMS) Warning and Protection

Content	12V300Ah Mini Smart	12V314Ah Mini	12V314Ah Mini Smart
Standard/Maximum Continuous Charge	60A/200A	62.8A/200A	62.8A/200A
Max Continuous Discharge Current	200A	200A	200A
Over-current Discharge Protection	210A±10A	210A±10A	210A±10A
Over-current Charge Protection	210A±10A	210A±10A	210A±10A
Weight	59.52lbs±3%/27kg±3%	59.52lbs±3%/27kg±3%	59.52lbs±3%/27kg±3%
Dimensions	15.12 x 7.64 x 9.76(inch) 384 x 194 x 248(mm)	15.12 x 7.64 x 9.76(inch) 384 x 194 x 248(mm)	15.12 x 7.64 x 9.76(inch) 384 x 194 x 248(mm)
Self-Heating	/	/	/
Balancing Method	Passive Balancing	Passive Balancing	Passive Balancing

Content	12V314Ah Mini Smart Super	12V314Ah Mini Smart Super +Self-Heating	12V314Ah Mini Smart+Self-Heating
Standard/Maximum Continuous Charge	62.8A/200A	62.8A/200A	62.8A/200A
Max Continuous Discharge Current	200A	200A	200A
Over-current Discharge Protection	220A±10A	220A±10A	210A±10A
Over-current Charge Protection	220A±10A	220A±10A	210A±10A
Weight	27.23kg ±3%/ 60.03 lb ±3%	62.83lbs±3%/28.5kg±3%	61.62lbs±3%/27.95kg±3%
Dimensions	15.22 x 8.12 x 10.74(inch) 386.5 x 206.3 x 272.8(mm)	15.22 x 8.12 x 10.74(inch) 386.5 x 206.3 x 272.8(mm)	15.07 x 7.61 x 9.82(inch) 382.7 x 193.3 x 249.5(mm)
Self-Heating	/	Support	Support
Balancing Method	Active Balancing	Active Balancing	Passive Balancing

MODEL SPECIFICATIONS

 Battery Management System(BMS) Warning and Protection

Content	12V314Ah Ultra	12V314Ah Ultra Smart	12V314Ah H190 Smart+Self-Heating
Standard/Maximum Continuous Charge	62.8A/300A	62.8A/300A	62.8A/250A
Max Continuous Discharge Current	300A	300A	250A
Over-current Discharge Protection	310A±10A	310A±10A	260A±40A
Over-current Charge Protection	310A±10A	310A±10A	260A±40A
Weight	61.72lbs±3%/28kg±3%	61.72lbs±3%/28kg±3%	67.79lbs±3%/30.75kg±3%
Dimensions	20.63 x 9.65 x 8.66(inch) 524 x 245 x 220(mm)	20.63 x 9.65 x 8.66(inch) 524 x 245 x 220(mm)	12.60 x 11.42 x 7.48(inch) 320 x 290 x 190(mm)
Self-Heating	/	/	Support
Balancing Method	Passive Balancing	Passive Balancing	Passive Balancing

Content	12V348Ah Mini AB	12V628Ah Ultra Smart
Standard/Maximum Continuous Charge	62.8A/250A	125.6A/300A
Max Continuous Discharge Current	250A	300A
Over-current Discharge Protection	260A±40A	310A±10A
Over-current Charge Protection	260A±40A	310A±10A
Weight	67.79lbs±3%/30.75kg±3%	59.81kg ±3%/131.85 lb ±3%
Dimensions	12.60 x 11.42 x 7.48(inch) 320 x 290 x 190(mm)	18.9 x 14.25 x 9.53(inch) 480 x 362 x 242(mm)
Self-Heating	Support	/
Balancing Method	Passive Balancing	Passive Balancing

MODEL SPECIFICATIONS



Battery Parameters

Content	12V50Ah, 12V100Ah Mini, 12V100Ah Mini Smart, 12V100Ah, 12V100Ah TM 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
Rated Voltage	12.8V
Standard Charging Voltage	14.4V±0.2V
Shipping Voltage	12.8V~13.5V
Charging High Temperature Protection	122~140°F / 50~60°C
Discharge High Temperature Protection	131~149°F / 55~65°C
Charging Low Temperature Protection	23~41°F / -5~5°C
Discharge Low Temperature Protection	-13~5°F / -25~-15°C
Charging High-Temperature Protection Release Value	113~131°F / 45~55°C
Discharging High-Temperature Protection Release Value	122~140°F / 50~60°C
Charging Low-Temperature Protection Release Value	26.6~44.6°F / -3~7°C
Discharging Low-Temperature Protection Release Value	-4~14°F / -20~-10°C
Short Circuit Current Protection	Support

MODEL SPECIFICATIONS



Battery Parameters

Content	12V50Ah, 12V100Ah Mini, 12V100Ah Mini Smart, 12V100Ah, 12V100Ah TM 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
Release Condition	Cut Load
Shipping Capacity	60%
Cycle Life	6000@DOD80%
Self Discharge Rate	≤3%/Month
Series & Parallel Connections	4 Series(Max) 4 Parallel(Max)
Case Material	ABS+PC/UL94 V-0
Ingress Protection Rating	IP65
Battery Pack Certifications	IEC/CE/FCC/UN38.3
Cell Certifications	UL1642/UL2580/UN38.3
Storage Temperature	32°F~140°F/0°C~60°C
Terminal Bolt Size	M8(M6 for 12V50Ah)

CHARGING

 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 LiFePO₄ battery.

Charging Tips:

- Use a 14.6V LiFePO₄ 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	12V50Ah	12V100Ah	12V166Ah	12V200Ah	12V314Ah
20A	2.5h	5h	8.3h	10h	15.7h
50A	1h	2h	3.5h	4h	6.5h

*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.

INSTALLATION & BATTERY BANKS

 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 LiFePO4 battery of other brands due to differences in the BMS)
2. Same battery type(LiFePO4).
(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.

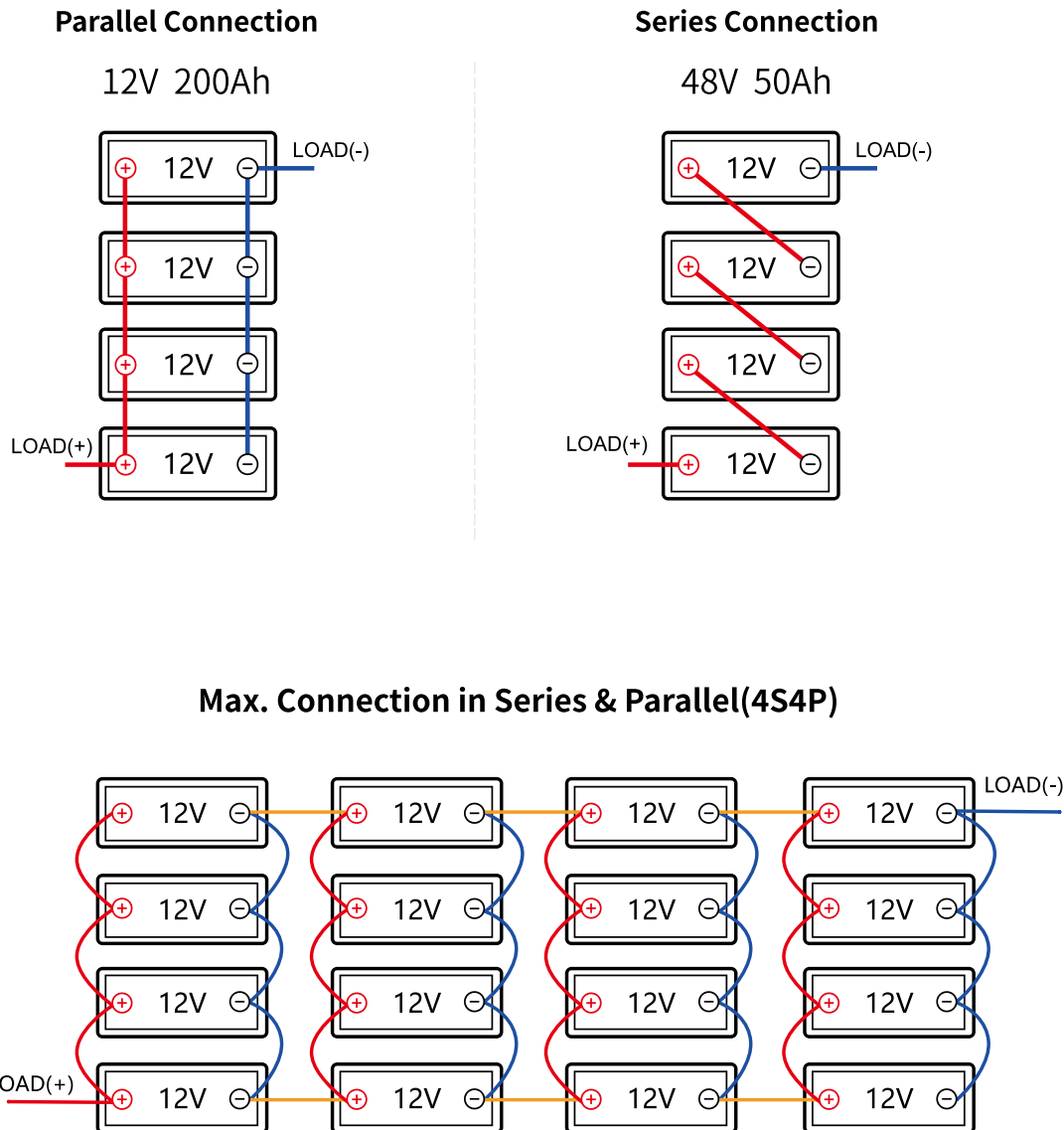
INSTALLATION & BATTERY BANKS

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)



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.

BATTERY MANAGEMENT SYSTEM



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: pvshop.store.

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 06](#) .

APPLICATIONS



Wide Application

Trolling Motor

Boat Electronics

Recreational Vehicle

Fit for Replacing 12V Lead-acid Batteries

Solar Energy System

Industrial Storage System

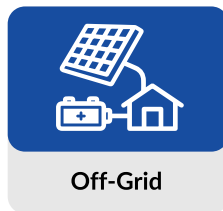
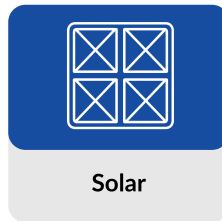
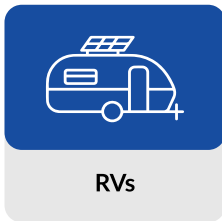
Home Storage & Power Wall

Off-Grid System

Note: Not suitable for starting gasoline engines.

WIDELY USED

INCLUDING BUT NOT LIMITED



Keep your battery ready

Storage

For the 12V and 24V families, the source manual recommends approximately 50% state of charge before storage. Disconnect loads. Check the battery periodically and avoid leaving it uncharged for a year. Self-discharge rises in extreme conditions.

Inspection

Keep the casing and terminals clean and dry. Look for loose connections, corrosion, damaged insulation or signs of impact before use. Resolve faults before reconnecting the system.

If the battery shows 0V

A 0V reading can indicate BMS protection. Disconnect the load and check the relevant protection section. Do not bypass the BMS or repeatedly reconnect a faulted circuit. Contact support if the cause is unclear or protection does not clear.

Smart features

Bluetooth, heating, active balancing and communication interfaces are model-dependent. Use only the app, cable and protocol specified for your exact battery. A connector alone does not establish inverter compatibility.

Support and warranty

Keep the order number, model, serial number and a description of the fault. Contact PVShop through your order confirmation or pvshop.store for assistance. Warranty and return terms are those provided with your purchase; this manual does not create additional warranty coverage.

End of service

Arrange battery recycling in accordance with local requirements. Protect the terminals during handling and follow the collection provider's instructions.