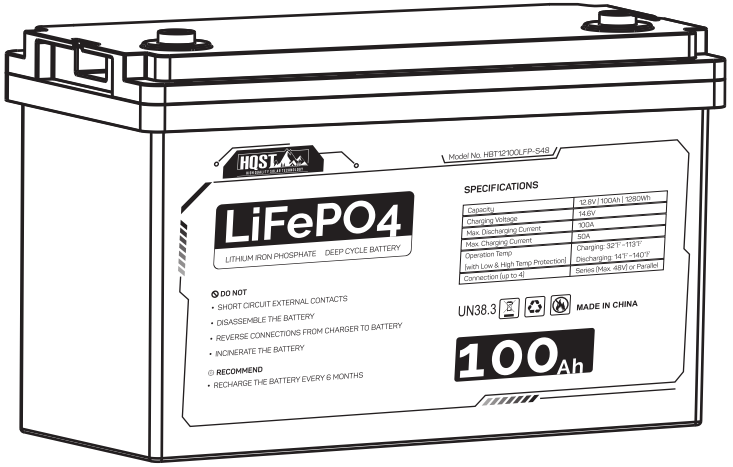
12V 100Ah Lithium Iron Phosphate (LiFePO4) Battery

Model: HBT12100LFP-S48



This user manual offers a brief walkthrough of the unit's features. Please keep the user manual in hand for future reference.

Still need help? Feel free to send us an email at **sales@myhqsolar.com**

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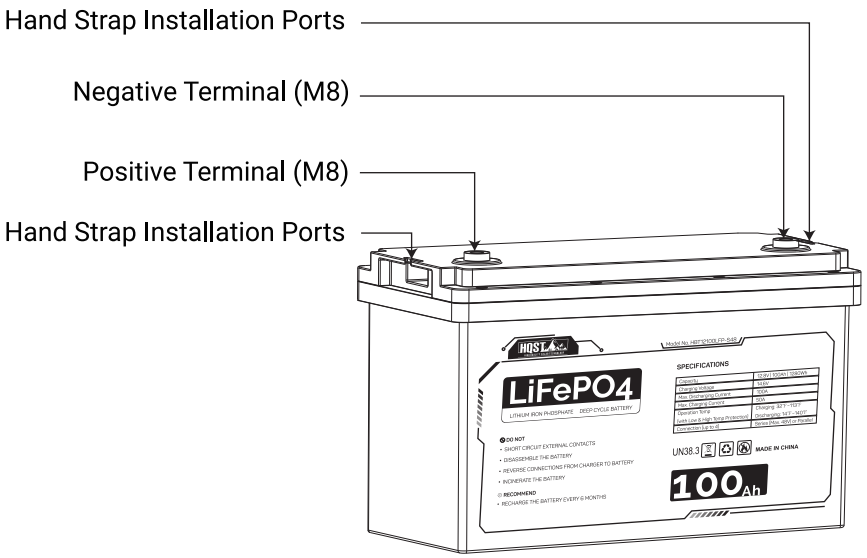
PRODUCT OVERVIEW

Built to last, the HQST 12V 100Ah lithium battery delivers reliable power for your next adventure. Ideal for RVs, vehicles, off-grid setups, and backup energy systems.



PACKAGE LIST

- 1 x 12V 100Ah Lithium Iron Phosphate (LiFePO4) Battery
- 1 x User Manual
- 2 x M8 Bolts

SPECIFICATIONS

General	
Rated capaity	100Ah (1,280Wh)
Rated voltage	12.8V
Max. charge voltage	14.6V
Max. continuous discharge current	100A
Charging current	Optimal: 20A; Maximum: 50A
Discharge cut-off voltage	10V
Over-discharge recovery voltage	11V
Cycle lifespan	3,000 cycles at 80% DOD
Protection rating	IP65
Terminal bolt size	M8 x 14 mm
Dimensions (L x H x W)	13.07 x 8.66 x 6.77 in/332 x 220 x 172 mm Compatible with Group 31 battery box
Net weight	22 lbs / 10 kg
Operation Temperature Parameters	
Charge temperature range	32 °F~113 °F / 0 °C~45 °C
Discharge temperature range	14 °F~140 °F / -10 °C~60 °C
Low temperature protection	Charging: 23 °F~41 °F/-5 °C~5 °C Discharging: -13 °F~5 °F/ -25 °C~-15 °C
High temperature protection	Charging: 140 °F~158 °F/ 70 °C~60 °C Discharging:158 °F~176 °F/ 80 °C~70 °C
Storage temperature range	-4 °F~113 °F/ -20 °C~45 °C (1-3 months storage) -4 °F~68 °F/ -20 °C~20 °C (1 year and above storage)

Connection Method	
In parallel	Up to 4 batteries
In series	Up to 4 batteries
In parallel and series	Up to 16 batteries
Controller Setting (for reference)	
System voltage	12V (x N*)
Boost charge voltage	14.2V (x N*)
Over-discharge voltage	11.1V (x N*)
Over-discharge recover voltage	12.6V (x N*)
(x N*): 'N' represents the number of batteries connected in series. The voltage setting should be multiplied by the number of series-connected batteries. For example: For a 24V battery system, N is 2. For a 36V battery system, N is 3. For a 48V battery system, N is 4.	

HOW TO CONNECT BATTERIES

When wiring batteries in parallel or series, it's highly recommended to follow these guidelines to avoid potential battery damage and ensure optimal performance:

1. Battery Matching:

- Ensure all batteries have the same voltage (12.8V).
- Ensure all batteries have the same capacity (Ah).
- Use the same battery type: lithium iron phosphate (LiFePO4).
- Use the same brand: Battery Management Systems (BMS) vary between brands, so it's advisable to use batteries from the same brand.

2. Fully Charge Preparation:

- Fully charge each battery individually with a compatible lithium iron phosphate (LiFePO4) battery charger.

3. Voltage Matching:

- Use a voltmeter to measure the voltage of each battery.
- Ensure the voltage difference between each battery is less than 0.1V.

4. Cable Consistency:

- Use battery interconnect cables of the same wire gauge (AWG) and length, and from the same brand. Inconsistent impedance can lead to unbalanced charge and discharge performance.

5. Connection Method:

- Connect batteries one by one in series (up to 4 batteries) or in parallel (up to 4 batteries).

6. Secure Connections:

- Ensure all cable connections between the cable lugs and battery terminals are secure.

Note: When connecting batteries in series, avoid using ones that are more than six months old. Batteries degrade over time, which can affect their performance, reliability, and safety.

HOW TO SIZE CONNECTION CABLES

When determining the cable size (AWG) for your system, consider the following factors:

1. Electrical Load: Determine the size of the electrical load you want to power.

2. Distance: Measure the distance between the electrical load and your batteries.

Here are the two reference charts:

— Cables for Controller to Battery

Solar Input Current	5A	10A	20A	30A	40A	60A
Wire Cross Section Area (mm²)	1.5	2.5	5	8	10	12
Wire AWG	15	13	10	8	7	6

— Cables for Battery to Inverter

Cable Gauge Size	Copper Conductor Diameter (inches)	Maximum Amperage
6 AWG	0.20	115
4 AWG	0.23	150
2 AWG	0.30	205
1/0 AWG	0.37	285
2/0 AWG	0.43	325
4/0 AWG	0.56	440

HOW TO CHARGE A BATTERY

The battery may arrive with a partial state of charge (SOC) depending on the time between manufacturing and shipping. It is highly recommended to fully charge the battery before its initial use.

1. Use a Compatible Charger:

(1) Our lithium iron phosphate (LiFePO4) batteries support multiple charging methods, including solar charge controllers, LiFePO4-compatible AC chargers, and DC-DC chargers.

(2) When using a solar charge controller, set the battery type to “Li” first. If your controller doesn’t have a “Li” option, configure the parameters as follows: Boost, Absorption, and Float to 14.4V (± 0.2V) × N (N = number of batteries in series), and the over-discharge parameter to 11.1V × N.

2. Charge Voltage:

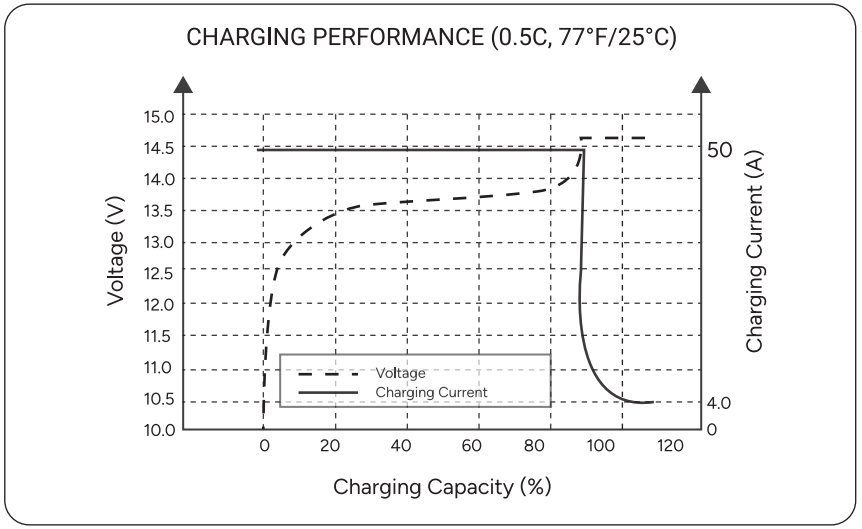
Set the charge voltage, boost voltage, or bulk voltage to 14.4V (± 0.2V).

3. 20A Optimal Charging Current:

The ideal charging current for a single LiFePO4 battery is around 20A, with a maximum of 50A. The charging current is determined by your battery charger.

4. Optimal Operating Temperature:

The recommended charging temperature range is 32°F to 131°F (0°C to 55°C). Charging outside this range may trigger low or high temperature cut-off protection.



IMPORTANT NOTES

1. Avoid Immediate High Current Charging:

If the battery is fully discharged at a continuous 100A, do not immediately recharge it at 50A. This can trigger high temperature charging protection.

2. Check Charger Compatibility:

Ensure your charger is compatible with lithium iron phosphate (LiFePO4) batteries. Using an incompatible charger can damage the batteries.

3. Do Not Exceed Maximum Charge Current:

Do not exceed the maximum continuous charge current of 50A.

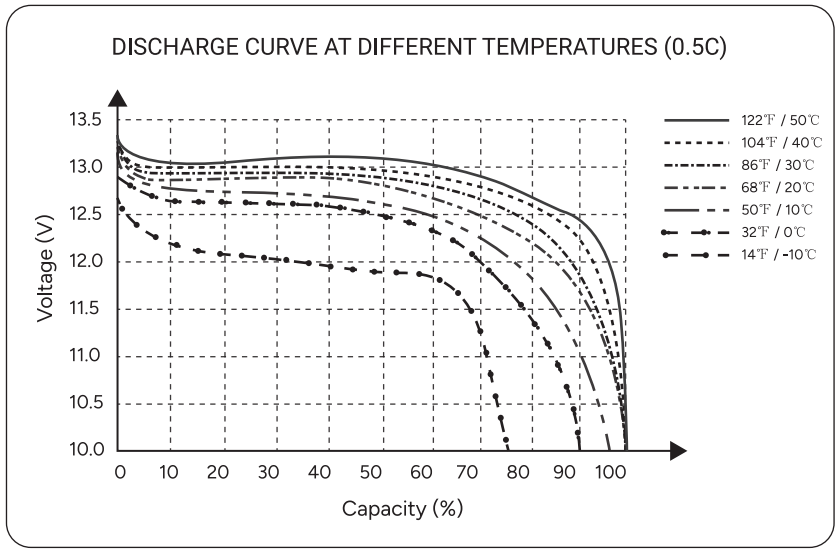
HOW TO DISCHARGE A BATTERY

1. Standard Discharging:

The battery can discharge at a maximum continuous current of 100A until the voltage drops to 10V.

2. Optimal Discharging Temperature:

The recommended discharging temperature range is 14°F to 140°F (-10°C to 60°C). Discharging outside this range may trigger low or high temperature cut-off protection.



3. Connecting to an Inverter:

When connecting the battery to an inverter for powering home appliances, it's important to understand the rated power of the battery bank system, inverter, and appliances.

1) Single Battery Power: The maximum rated power of a single battery is 1,280W.

2) Parallel or Series Connection: When connecting two batteries in parallel or series, the power capacity increases accordingly.

Connection method	Battery quantity	Battery bank voltage	Rated power
In parallel	2	12V (12.8V)	2,560Wh
	3	12V (12.8V)	3,840Wh
	4	12V (12.8V)	5,120Wh
In series	2	24V (25.6V)	2,560Wh
	3	36V (38.4V)	3,840Wh
	4	48V (51.2V)	5,120Wh

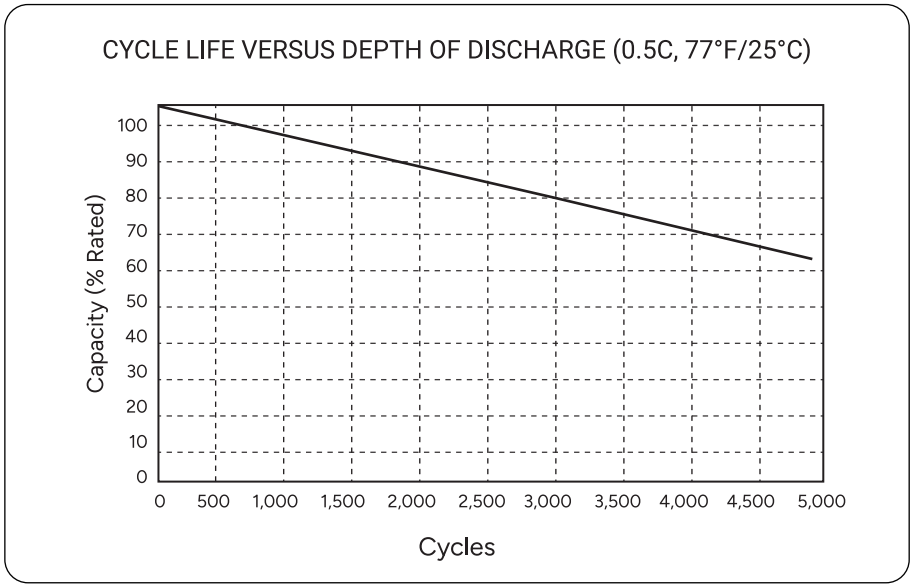
(3) **Inverter Capacity:** Home appliances draw power from the inverter. For instance, if you have a 2,560Wh battery bank and an appliance with a peak power consumption exceeding 2,000W, the appliance won't function with a 2,000W inverter. It is highly recommended to use an inverter with 1.5 to 2 times the power capacity of your highest-demand appliance. Additionally, ensure that your battery bank system can handle the required power.

(4) **AC Motor Appliances:** The peak power requirement for AC motor appliances, such as air conditioners or water pumps, is typically double their rated power. For example, a 1,500W AC air conditioner would need at least 3,000W (2 x 1,500W) from the battery bank and inverter to operate normally (actual power required refers to the specs/manual of your appliance).

(5) **High Peak Power Appliances:** Some appliances have peak power requirements that are three times their rated power. Always check the manual and specifications of the appliance, or consult the manufacturer for the exact peak power data.

IMPORTANT NOTES

- Avoid connecting large loads to the battery when it's running low.
- Do not exceed the battery's maximum continuous discharge current of 100A.



MAINTENANCE AND STORAGE

Cleaning

- Disconnect the battery from the system.
- Clear any leaves and debris from the battery.
- Clean the battery with a soft, lint-free cloth. If the battery is extremely dirty, dampen the cloth with water or a mild soap solution.
- Dry the battery with a soft, lint-free cloth.
- Keep the area around the battery clean.
- Reconnect the battery to the system.

Storage

Follow these tips to ensure your battery remains in good condition during storage:

- Charge the battery to at least 50% State of Charge (SOC). Ideally, fully charge it to 100%.
- Disconnect the battery from the system.
- Store the battery in a well-ventilated, dry, and clean area with temperatures between 32°F (0°C) and 113°F (45°C).
- Do not expose the battery to direct sunlight, moisture, or rain.
- Handle the battery carefully to avoid sharp impacts or extreme pressure on the housing.
- Charge the battery at least once every 3 to 6 months to prevent over discharge.
- Fully charge the battery before using it after storage.

TROUBLESHOOTING

1. Issue	**Cannot be charged.**
Possible Causes	1) Loose connection. 2) The charger is not compatible. 3) Ambient temperature is too low or too high. 4) Battery low voltage protection.
Solutions	1) Ensure all connections are secure. Tighten all cables. 2) Verify that the charger is compatible with lithium iron phosphate (LiFePO4) batteries. 3) Set the appropriate charging voltage. For a 12V battery system, the charging voltage should be between 14V and 14.6V. 4) Ensure the charging current is suitable for your battery. For our 12V battery, the optimal charging current is 20A, with a maximum of 50A. 5) Check that the ambient temperature is within the operation range. If it is too cold or too hot, the low and high temperature cut-off protection will be activated. 6) When the battery voltage drops below 10V, it will enter low voltage protection mode. To resolve this, remove all wiring cables first, then use a battery charger or solar charge controller with a lithium battery activation function to charge the battery when the ambient temperature is above 41°F. Once the battery voltage recovers above 11V, it can be charged normally. If the issue persists, feel free to contact our support team.
2. Issue	**Cannot be fully charged.**
Possible Causes	1) Charging current is too low. 2) Discharging current is higher than charging current.

Solutions	1) If the charging current is too low, it will take longer to fully charge the battery. We recommend using a compatible charger with at least 5A current to charge the battery. 2) If the battery is also powering your appliances, and the output power is higher than the input power, the battery will not fully charge. We recommend disconnecting all load connections first, and then charging the battery. If the issue persists, feel free to contact our support team.
3. Issue	**Battery has no power output and cannot power up the device.**
Possible Causes	1) Battery is completely discharged. 2) Loose or poor cable connections. 3) Battery terminals are dirty or corroded. 4) Charger is not compatible or malfunctioning. 5) Device issues. 6) Battery is faulty or dead.
Solutions	1) Charge the battery fully using a compatible charger. Ensure the charger is properly connected and working. 2) Check all cable connections to and from the battery. Make sure the connections are secure and free from corrosion. Tighten any loose connections. 3) Clean the battery terminals with a dry cloth. 4) Ensure the charger is suitable for your battery type and is functioning correctly. Try using a different, compatible charger to see if the battery starts charging. 5) Verify that the device you are trying to power is working properly. Try powering another device with the battery to rule out issues with the device itself. If the issue persists, feel free to contact our support team. 6) If the battery is old or has been used for a long time, it might be defective. Test the battery with a multimeter or another compatible device to check its voltage. If the battery is faulty, you may need to replace it.

IMPORTANT SAFETY INSTRUCTIONS

Installation

- Do not install the battery in a location that may be flooded.
- Do not short the battery terminals.
- Do not reverse the polarity connections.
- Do not expose the battery to fire, extreme heat, or place it near any heat sources.
- Do not drop the battery from a height.
- Do not strike or puncture the battery.

Operation

- Use certified and compatible lithium iron phosphate battery chargers to charge the battery.
- Do not open, dismantle, repair, tamper with, or modify the battery.
- Do not connect or disconnect terminals from the battery without first disconnecting the loads.
- Do not insert foreign objects into the positive or negative terminals of the battery.
- To ensure optimal performance, keep all battery wiring cables under 15.4 feet (5 meters) to prevent voltage drops.
- Do not over-discharge the battery. When the battery level drops below 10%, charge the battery immediately.

Application Usage

- When using the battery for a trolling motor, connect a circuit breaker to prevent instantaneous high power output that may damage the battery.
- When using the battery in a vehicle, it's strongly recommended to secure it firmly in place.
- Keep the battery in a well-ventilated and dry place.
- Do not immerse the battery in water.
- The battery cannot be used as a starting battery (engine battery).

Liability Disclaimer

HQST accepts no liability for any damage caused by:

- Force majeure events, including fire, typhoon, flood, earthquake, war, and terrorism.
- Intentional or accidental misuse, abuse, neglect, improper maintenance, or use under abnormal conditions.
- Improper installation, improper operation, or malfunction of a peripheral device.
- Contamination with hazardous substances or radiation.
- Alterations to the product without express written consent from the manufacturer.

LIMITED WARRANTY TERMS AND CONDITIONS

Our Limited Warranty applies exclusively to products sold and shipped by HQST or by retailers and distributors authorized by HQST. If you encounter issues with our batteries, it is covered by a 10-year manufacturer's defect warranty from the date of purchase. Please note, this warranty does not cover damage resulting from negligence or misuse.

What This Warranty Does Not Cover

This warranty does not cover damage due to: (a) transportation, (b) storage, (c) improper use, (d) failure to follow product instructions or perform preventive maintenance, (e) modifications, (f) unauthorized repairs, (g) normal wear and tear, (h) external causes like natural disasters, accidents, abuse, or other events beyond our control.

Warranty Coverage Period

The warranty begins on the date your purchase is shipped and lasts for ten (10) years (the "Warranty Period"). The warranty period does not extend if the product is repaired or replaced. We reserve the right to modify the availability of this warranty at our discretion, but such changes will not apply retroactively.

CUSTOMER SUPPORT

If you encounter any issues or need assistance, please reach out to us with:

a. Your purchase order number.
b. A detailed description of the issue.
c. Clear photos or videos of the problem.
d. An email to **sales@myhqsolar.com** .
e. Or scan the QR code below to submit a contact form.

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