

Automatic
Self-Heating 

Li Time

12.8V 140Ah

Smart  **x Dual Purpose** and More 
BLUETOOTH 5.0

PRODUCT (140A BMS) **MANUAL**

Lithium Iron Phosphate Battery (LiFePO4)

PRODUCT OVERVIEW

12.8V 140AH BATTERY

Operating Voltage: 12.8V

Charging Voltage: $14.4V \pm 0.2V$

Recommended Charge Current: 28A (0.2C)

Required Minimum Charge Current for Heating Function: 10A

Hot Cranking Amps (HCA): 1500A

Marine Cranking Amps (MCA): 1200A

Cold Cranking Amps (CCA): 900A

Max. Continuous Discharge Current: 140A

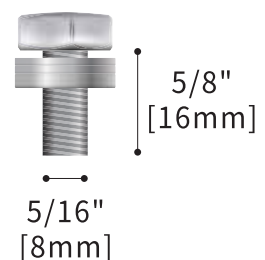
Max. Continuous Output Power: 1792W



ADDITIONAL COMPONENTS

M8- 5/8" [16mm] Terminal Bolts

The terminal bolts are used to secure multiple cable lugs to a single battery terminal. The bolts can be replaced with M8 bolts of other lengths based on actual needs.



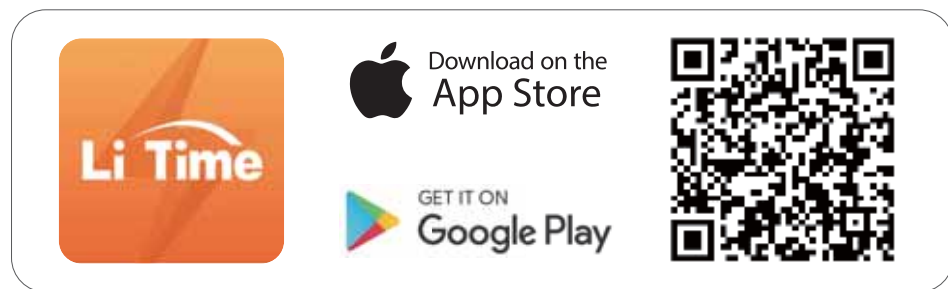
Insulating Caps for Bolts

24/7 MONITORING VIA LITIME APP

The LiTime 12.8V 140Ah Smart Dual Purpose Battery, integrated with Bluetooth 5.0, enables accurate and effortless real-time tracking and management of the battery status.

Step
1

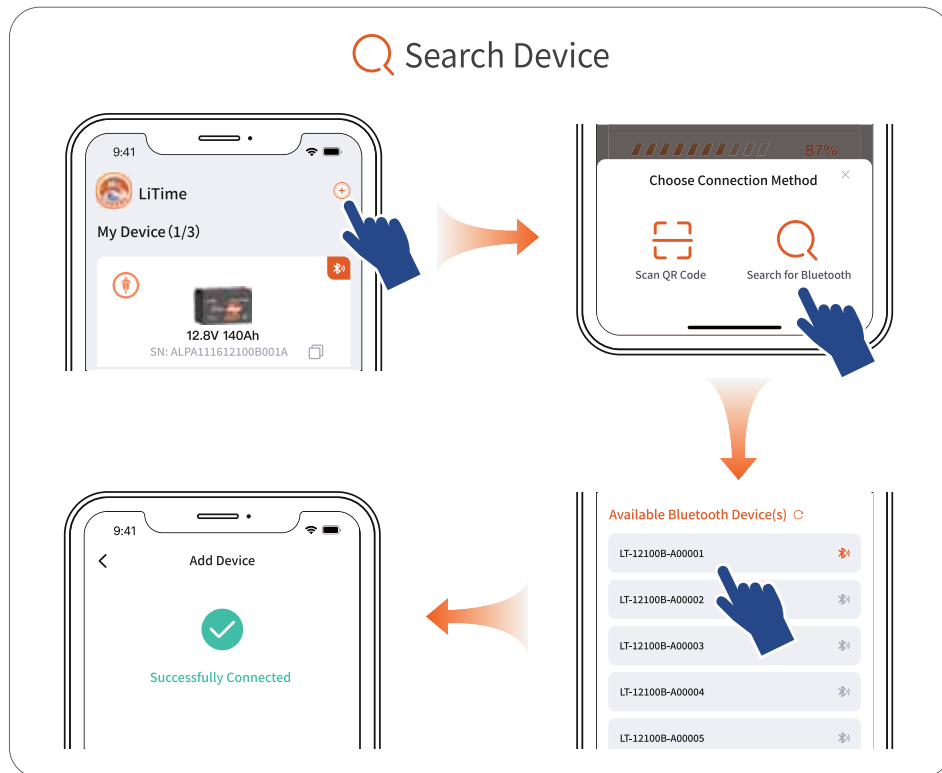
Download the LiTime APP and register your account.



Step
2

Pair the battery with the LiTime APP and effortlessly keep track of the battery's real-time status.





FCC STATEMENT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

RF Exposure Information: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

IMPORTANT SAFETY INSTRUCTION

■ Please keep the battery away from heat sources, sparks, flames, and hazardous chemicals.

■ **Maintain Adequate Ventilation and Heat Dissipation**

Place the battery in a well-ventilated area with sufficient heat dissipation to prevent overheating and damage.

■ **Size the Battery Cables and Connectors Appropriately**

Use high-stranded copper connectors and heavy gauge cables to handle possible battery loads. Make sure to keep identical cable lengths. Avoid accidents caused by unsuitable connectors or cables that make the connection a heat source during battery operation.

■ **Please tighten all cable connections, as loose cable connections can cause terminal meltdown or fire.**

■ **DO NOT puncture, drop, crush, burn, penetrate, shake, or strike the battery.**

The battery should be securely fastened during handling to prevent impact or dropping.

It should be safely secured to a solid plane and the cables safely tied to a suitable location to avoid arcing and sparking due to friction.

DO NOT press it by placing heavy stuff on top of it for long periods, which may damage it due to an internal short circuit.

■ **DO NOT immerse the battery in water whether the battery is in use or on standby.**

■ **DO NOT open, dismantle, or modify the battery.**

■ **DO NOT touch the exposed electrolyte or powder if the battery casing is damaged.**

■ **Uncovered electrolyte or powder that has contacted the skin or eyes MUST be flushed out with plenty of clean water immediately. Seek medical attention afterward.**

■ **Avoid Short Circuit**

Please use circuit breakers, fuses, or disconnects that have been properly sized by certified electricians, licensed installers, or regional code authorities to protect all the electrical equipment in your system. The battery has a built-in battery management system (BMS) that protects the battery cells from over-charge, over-discharge, and over-current, however this alone will not protect your system from severe electrical conditions.

■ **Trained and certified technicians are required for safe and reliable installation. This product manual can only serve as a guideline as it cannot cover all possible scenarios.**

■ **Verify Correct Polarity**

Please verify the polarity before connecting the wiring. Reverse polarity can and will destroy the battery and other electrical equipment. Use a multimeter to determine proper polarity.

■ **Avoid Exposed Metal Terminals or Connectors**

The terminals of this battery are always live. Avoid exposed metal terminals or connectors; DO NOT place tools on the terminals or touch them with bare hands; DO NOT short circuit or use outside of specified electrical ratings.

■ **DO NOT dispose of the battery as household waste. Please use recycling channels in accordance with local, state, and federal regulations.**

WARNING

■ Batteries are potentially dangerous and proper precautions must be taken during operation and maintenance.

■ Improper use of the battery can lead to battery failure or other potential damage.

■ Improper configuration, installation, or use of related equipment in the battery system may damage the battery and other related equipment.

■ Please wear proper personal protective equipment when working on the battery.

■ Battery installation and maintenance must be performed by trained and certified technicians.

■ Failure to follow the warnings above can result in potential damage.

If you have any questions or need any help, please feel free to contact us (and leave your contact phone number) at service@litime.com, we will offer phone or email support in 12hrs.

PARAMETERS

Cell Type	LiFePO4
Nominal Voltage	12.8V
Rated Capacity	140Ah
Energy	1792Wh
Internal Resistance	$\leq 40\text{m}\Omega$
Cycle Life Times	$\geq 4000^{\text{①}}$
Cranking Times	$\geq 5000^{\text{①}}$
Battery Management System (BMS) Board	140A
Charge Method	CC/CV
Charge Voltage	$14.4\text{V} \pm 0.2\text{V}$
Recommended Charge Current	28A (0.2C)
Required Minimum Charge Current for Heating Function ^②	10A
Max. Charging Current	Outboard Alternator: 150A
	Charger: 140A
Hot Cranking Amps (HCA)	1500A
Marine Cranking Amps (MCA)	1200A
Cold Cranking Amps (CCA)	900A

Max. Continuous Discharge Current	140A
Max. Continuous Output Power	1792W
Max. Expansion (Series & Parallel)	For Starting and Deep Cycle: 4P, No Series For only Energy Storage: 4S4P
Dimension	L13*H6.77*H8.5 inch
	L330*W172*H216 mm
Housing Material	ABS (Flame Retardant Plastic)
Recommended Terminal Torquem	106.2 to 123.9 inch · lbs/ 12 to 14 N · m
Protection Class	IP67 ^③
Temperature Range	Charge: -20°C to 50°C / -4°F to 122°F
	Discharge: -20°C to 60°C / -4°F to 140°F
	Storage: -10°C to 50°C / 14°F to 122°F
Heating Temperature	Charge: -20°C to 5°C / -4°F to 41°F
Approx. Heating Time @10A	40-60mins (From-10°C / 14°F)
	60-80mins (From-20°C/-4°F)
FCC ID	2BDSV12140
MIC ID	220-JP7643

① The specified number of cycles or starts only applies to single energy storage or single starting applications. If used for dual purposes, the actual number of cycles or starts will vary based on actual usage.

② The charge current should be greater than 10A to activate the automatic self-heating function.

③ This product supports IP67 protection. To avoid potential issues, it is recommended to install the battery in a waterproof battery container and/or position it at a higher level. This will prevent the battery from being partially or wholly submerged in the water accumulated at the bottom of the boat.

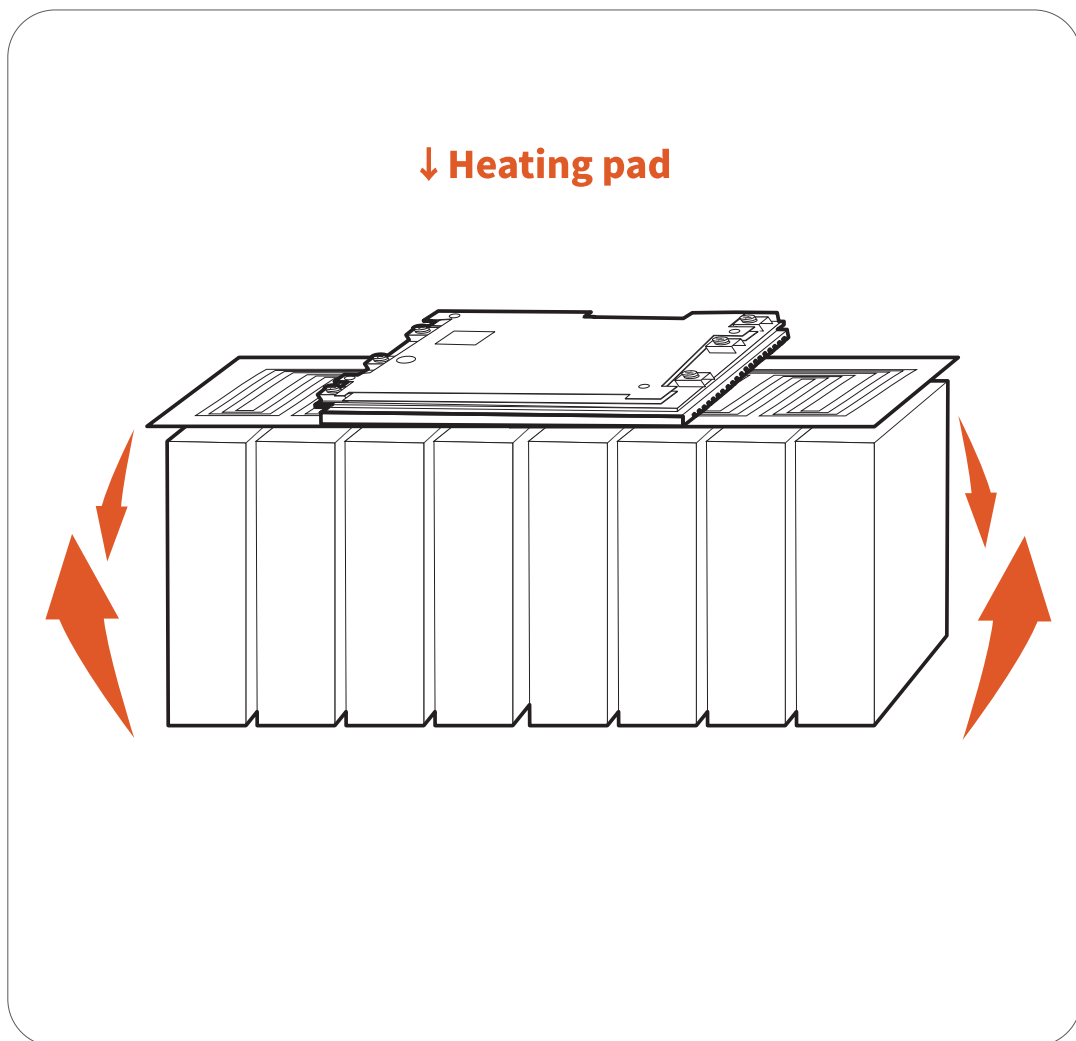
AUTOMATIC SELF-HEATING FUNCTION

The automatic self-heating function will be activated by the BMS when the battery is connected to a charger @ -20°C to 5°C / 4°F to 41°F . The heating will be stopped when the battery temperature has reached the set value, which normally takes approx. 40-60 mins from -10°C / 14°F and approx. 60-80 mins from -20°C / -4°F .

The battery will be normally charged after the heating has been stopped.

HOW DOES IT LOOK LIKE?

The heating pad is installed on the top side of the battery, providing sufficient heating and more comprehensive protection of your battery.

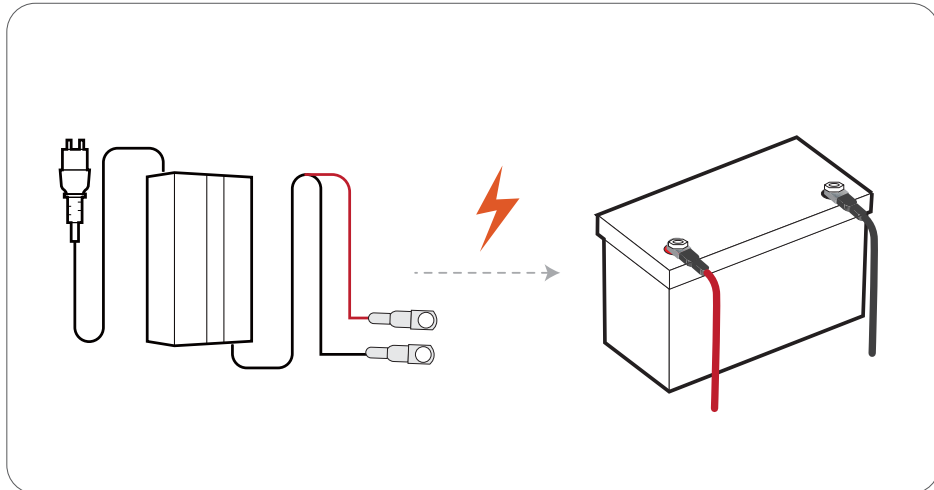


HOW DOES IT WORK?

Step
1

Connect the battery to the charger.

(DC charging voltage: 14.2V~14.6V, DC charging current > 10A)

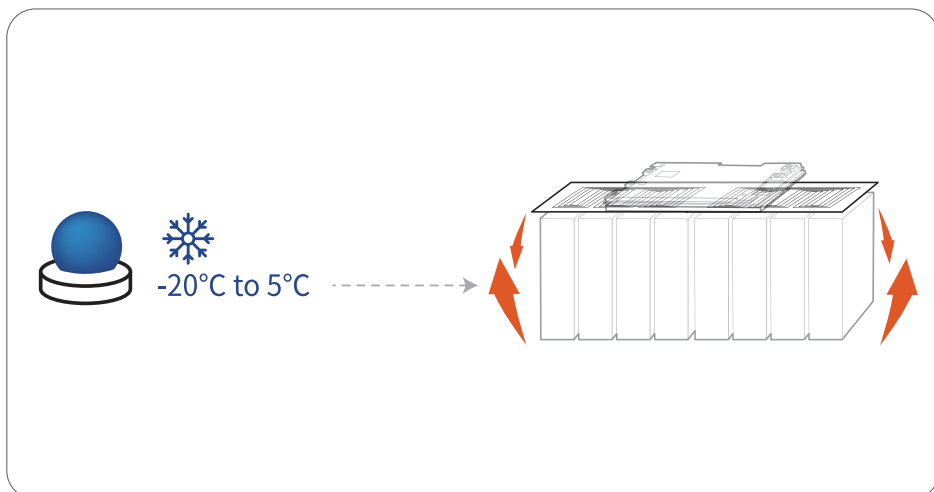


Step
2

The temperature sensors will detect the battery temperature.

(1) When the battery temperature is between -20°C to 5°C / -4°F to 41°F , the BMS will start to heat the battery through the heating pad, and the battery will not be charged during the heating process. And it will continue to Step 3.

Or (2) when the battery temperature is $>5^{\circ}\text{C}$ / 41°F , the battery will be normally charged and the heating function will not be activated.



Step
3

When the battery temperature has reached the set value, the heating will be stopped and the battery will be charged.

(Which normally takes approx. 40-60mins from -10°C / 14°F and approx 60-80mins from -20°C / -4°F .)

THINGS TO KNOW BEFORE USING

GENERAL

When using the battery, be careful to **avoid metal or conductive objects touching the positive and negative poles** of the battery **at the same time**, otherwise it may cause a short circuit.

Install the battery upright with post bolt facing up, and it could not be mounted upside down. If you need to mount the battery at its side, contact service@litime.com to confirm the direction.

Tightly screw in the post bolts. Having loose battery terminals will cause the terminals to build up heat resulting in damage to the battery.

Regularly check the battery to **ensure that it is securely mounted and that the terminals are screwed tightly**.

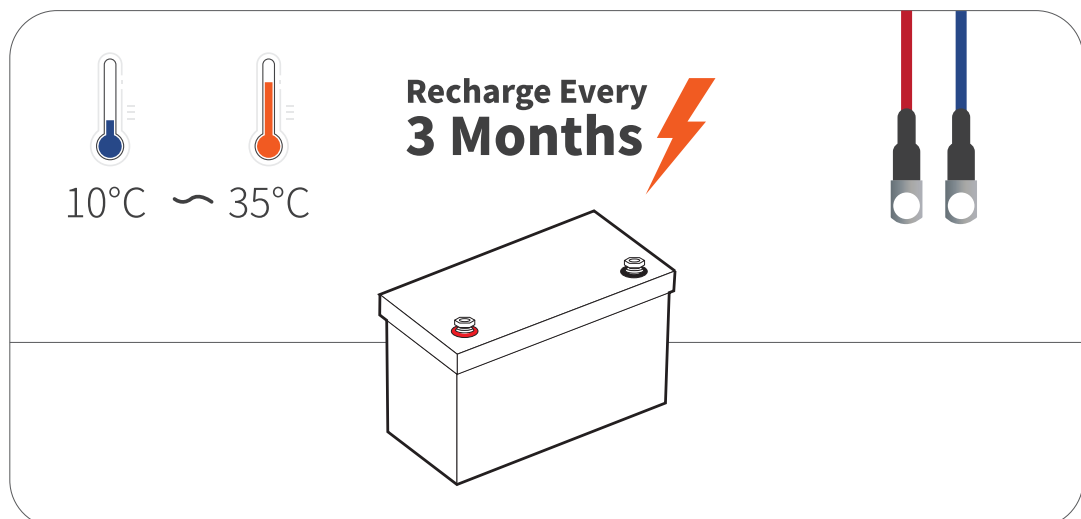
Suggestions for **Long-term Storage**:

○ Temperature

The battery can be operated at a temperature of -20°C to 60°C / -4°F to 140°F, and a temperature between [10°C to 35°C / 50°F to 95°F](#) is ideal for long-term storage. Store in a fireproof container and away from children.

○ Capacity

For a longer-lasting product, it is best to store your battery [at a 50% charge level](#) and recharge every three months if it is not going to be used for a long time.



STARTING USAGE

- **DO NOT** use as a starter battery for any type of vehicle, such as cars, motorbikes, tractors, etc.
- This product does not apply to (outboard) motors that use a charging coil instead of an alternator.
- **Secure the battery** during marine starting applications such as fuel outboard motors or in shaking environments like RVs **to prevent any damage caused by shaking.**
- Different lengths of connecting cables will result in a certain amount of cable resistance loss, which is **generally 3% to 10%**. If the voltage drop caused by cable resistance in your system exceeds this range, **reduce their total length.**
- Fully charge the battery before first use. **Battery voltage lower than 11.5V will not be able to start motors.**
- The duration of a **single start** cannot exceed **3 seconds**. When **the primary ignition fails**, wait for **15 seconds** before restarting. If the motor still cannot be started after **three ignitions**, check for other causes and wait **5 minutes** before igniting again.
- **In low temperatures**, the additional resistance of the battery due to coldness may slightly weaken its ability to discharge, resulting in poor starting performance. In this case, **try starting again**. The internal current will heat the battery itself and restore normal starting performance.
- This product can be charged via an outboard alternator. The voltage regulator in the alternator will charge the battery with the appropriate charging current and voltage (**normal output voltage is 14.4V**). **If the regulator does not work properly, the battery may be damaged.** Any damage caused by a faulty voltage regulator will **void the warranty**.

CHARGING METHODS

SOLAR PANEL(S) & CONTROLLER

Solar Panel

☆ Recommended Power: $\geq 600W$

- The battery can be fully charged in one day (with effective sunshine 4.5hrs/day) by 600W solar panels.
- It may take more than one day to fully charge the battery by $\geq 600W$ solar panels since the duration and intensity of light would be a great factor for their charging efficiency.

Controller

☆ Recommended Charging Current:

28A (0.2C)	The battery will be fully charged in around 5hrs.
70A (0.5C)	The battery will be fully charged in around 2hrs.

☆ Recommended Charging Mode: **12V (14.6V) LI (LiFePO4)**

Controller Settings

Refer to the below parameters if you need to manually set up your controller. As different types of batteries have different charging modes, it is recommended to set only the following parameters for LiFePO4 batteries. The settings for other types of batteries do not apply to LiFePO4 batteries except for the following settings.

CHARGING	Charge /Bulk /Boost Voltage	14.4 \pm 0.2V
	Absorption Voltage	14.4 \pm 0.2V
	Over Voltage Disconnect	15V
	Over Voltage Reconnect	14.2V
	Tail Current	2.8A (0.02C)
DIS-CHARGING	Under Voltage Warning	11.6V
	Under Voltage Recover	12V
	Low Voltage Disconnect	10.8V
	Low Voltage Reconnect	12.4V

BATTERY CHARGER

Use 14.6V lithium iron phosphate (LiFePO₄) battery charger to maximize the capacity.

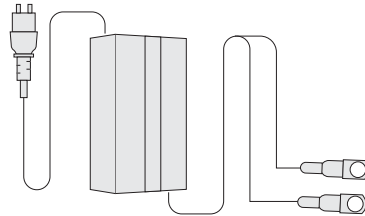
☆ Recommended Charging Voltage: Between 14.2V to 14.6V

☆ Recommended Charging Current:

28A (0.2C)	The battery will be fully charged in around 5hrs.
70A (0.5C)	The battery will be fully charged in around 2hrs.

Tips

① It's recommended to disconnect the charger from the battery after fully charging.



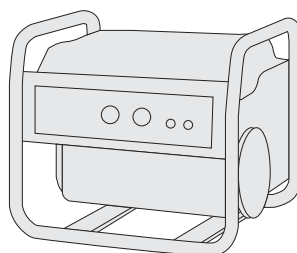
ALTERNATOR / GENERATOR

LiTime battery can be charged by an alternator or generator. If the alternator/generator supports DC output, a DC-to-DC charger needs to be added between the battery and the generator; if the alternator/generator supports AC output, please refer to the recommendations in "Battery Charger" above to add a suitable battery charger between the battery and the generator.

☆ Recommended Charging Voltage: Between 14.2V to 14.6V

☆ Recommended Charging Current:

28A (0.2C)	The battery will be fully charged in around 5hrs.
70A (0.5C)	The battery will be fully charged in around 2hrs.



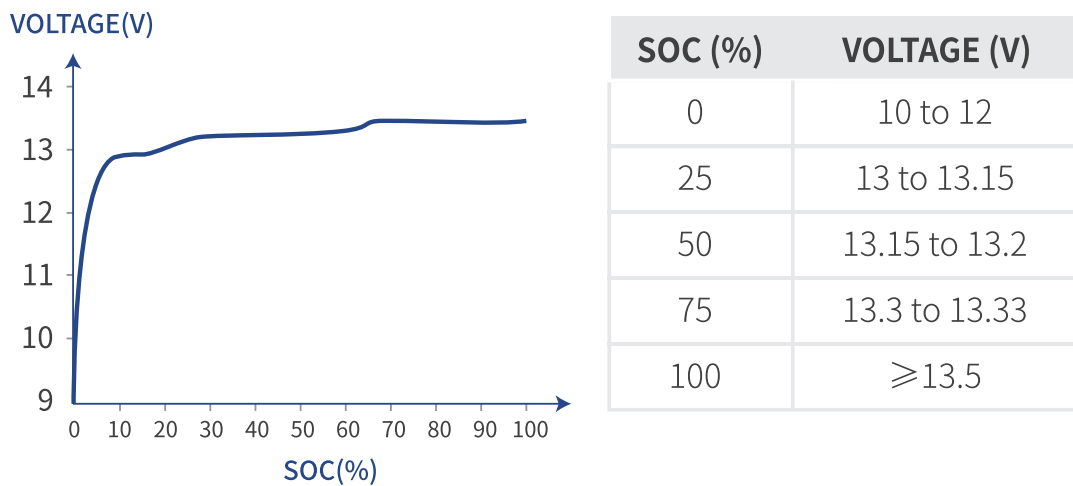
HOW TO ESTIMATE THE BATTERY CAPACITY

STATE OF CHARGE (SOC)

The battery capacity could be roughly estimated by its resting voltage (not charging/discharging voltage).^①

Since the voltage of each battery is slightly different, and the voltage measurement is affected by the measuring instrument, ambient temperature, etc., the following parameters are for reference only. The actual SOC of the battery is based on the discharge capacity under load.

Resting Voltage: The voltage is measured after the battery has been disconnected from the charger and loads with zero current, and left alone for 3 hours.



① Based on the characteristics of LiFePO₄ batteries, the voltage measured by all LiFePO₄ batteries during charging/discharging is not the real voltage of the battery. Therefore, after charging/discharging and disconnecting the battery from the power source, the voltage of the battery will gradually drop/increase to its real voltage.

RECOMMENDED CABLE SIZING

Battery cables should be properly sized to handle the expected load. Refer to the table below for amperage ratings for different sizes of copper cables.

PVC COPPER CABLE SIZE (AWG/mm ²)	AMPACITY (A)
14 (2.08)	20
12 (3.31)	25
10 (5.25)	35
8 (8.36)	50
6 (13.3)	65
4 (21.1)	85
2 (33.6)	115
1 (42.4)	130
1/0 (53.5)	150
2/0 (67.4)	175
4/0 (107)	230

The above values are from NEC Table 310.15(B)16 for copper cables rated at 167°F (75°C) operating at an ambient temperature not exceeding 86°F (30°C). Cables longer than 6 feet (1829 mm) or ambient temperature higher than 86°F (30°C) may require heavier gauges to avoid excessive voltage drops with undersized ones.

SERIES / PARALLEL CONNECTION

THE PREMISE OF CONNECTION

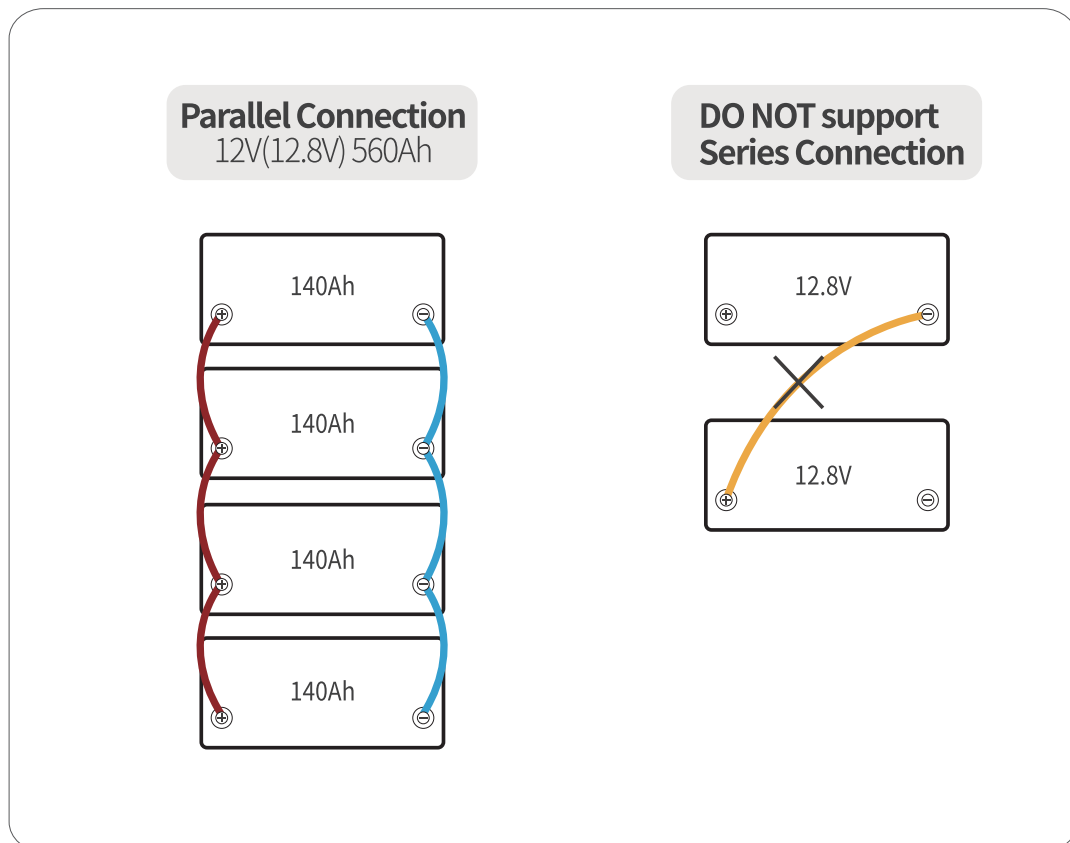
To connect in series or /and parallel, batteries should meet the below conditions:

- identical batteries with the same battery capacity (Ah) and BMS (A);
- from the same brand (as lithium battery from different brands has their special BMS);
- purchased in near time (within one month).

LIMITATION FOR SERIES/PARALLEL CONNECTION

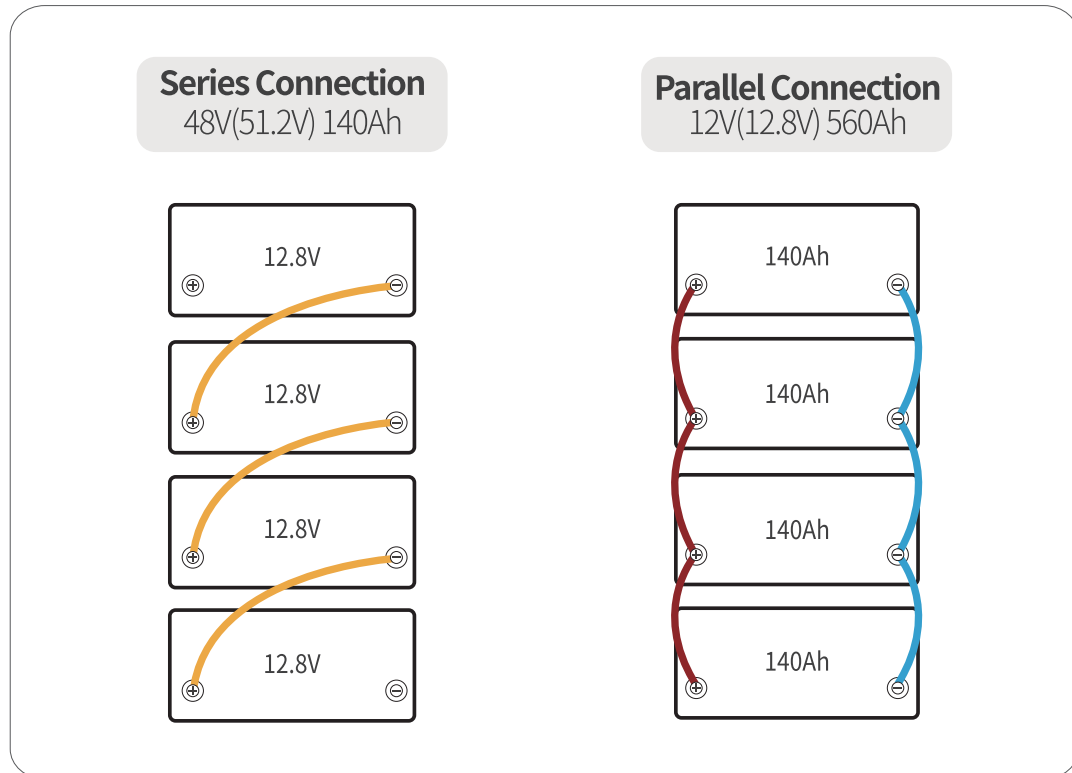
For Starting and Deep Cycle

Support connecting **up to 4 identical batteries** in parallel for up to: 12V (12.8V) 560Ah battery system.



For ONLY Energy Storage

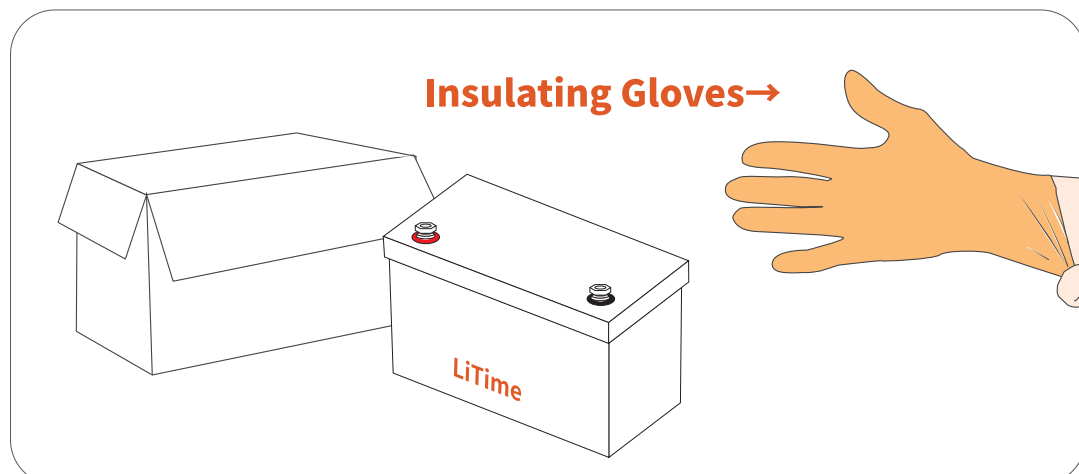
Support connecting **up to 16 identical batteries** for up to:
4 in series as **48V (51.2V)** battery system or
4 in parallel as **560Ah** battery system.



HOW TO CONNECT BATTERIES

Step 1 Wear Insulating Gloves

Wear insulating gloves for protection before connecting. Please pay attention to operation safety in the process of connection.



Step2 Voltage Balancing Before Connection

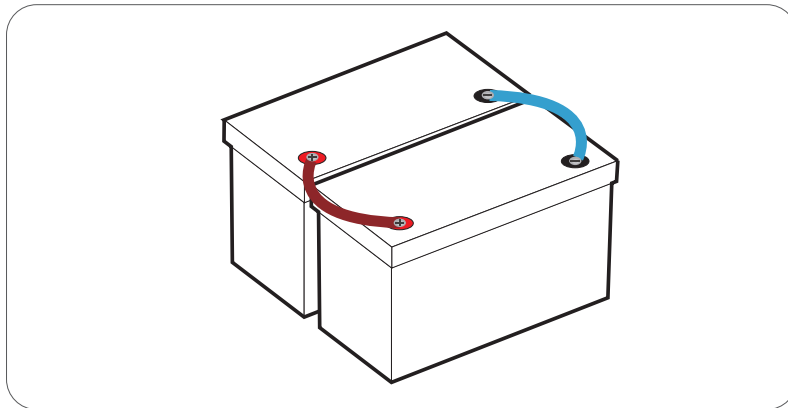
Below two steps are necessary to reduce the voltage difference between batteries and let the battery system perform the best of it in series or/ and in parallel.

Step
1

Fully charge the batteries separately.
(voltage at rest: $\geq 13.5V$)

Step
2

Connect all of the batteries in parallel, and leave them together for 12~24hrs.

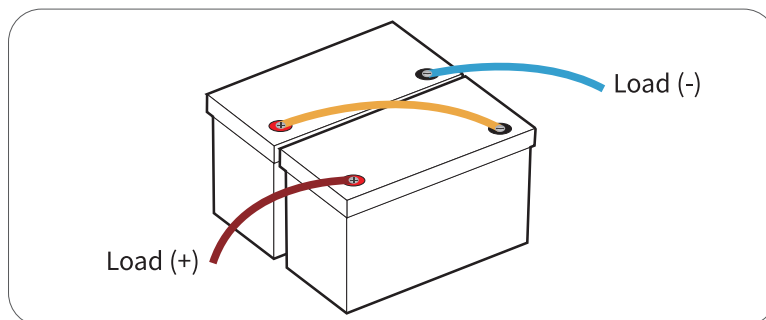


Step
3

They're now ready for the connection.

Step3 Battery-to-Battery Connection

○ #1 Connect Batteries in Series **+** to **-**
(Available for Energy Storage Only)



After series connection, the voltage of the battery system will be doubled according to the number of batteries you connect.

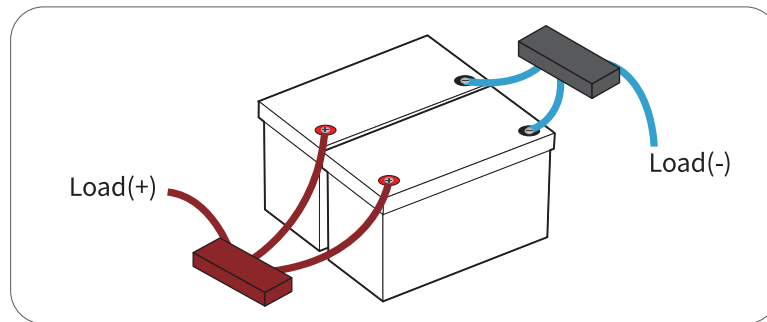
E.g. If two 12.8V 140Ah batteries are connected in series, the battery system will be 24V (25.6V) 140Ah.

○ #2 Connect Batteries in Parallel

+ to **+**

- to **-**

Refer to Page 15 for total input & output connection



After parallel connection, the capacity of the battery system will be doubled according to the number of batteries you connect.

E.g. If two 12.8V 140Ah batteries are connected in parallel, the battery system will be 12V (12.8V) 280Ah.

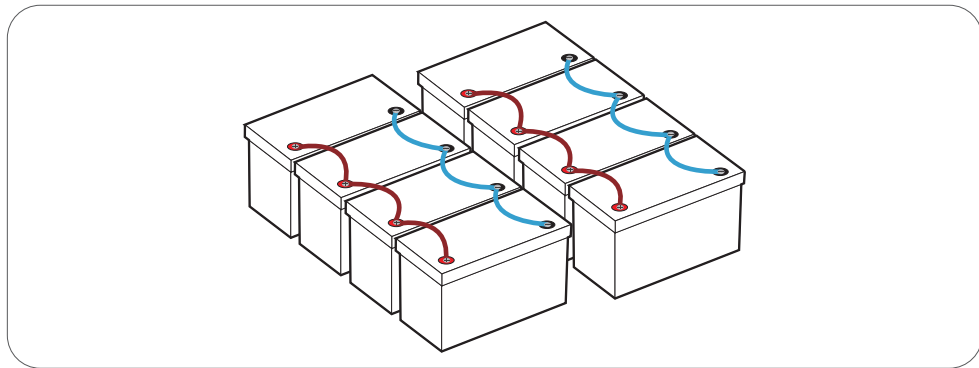
○ #3 Connect Batteries Both in Series & Parallel

(Available for Energy Storage Only)

Connect in parallel first, then series.

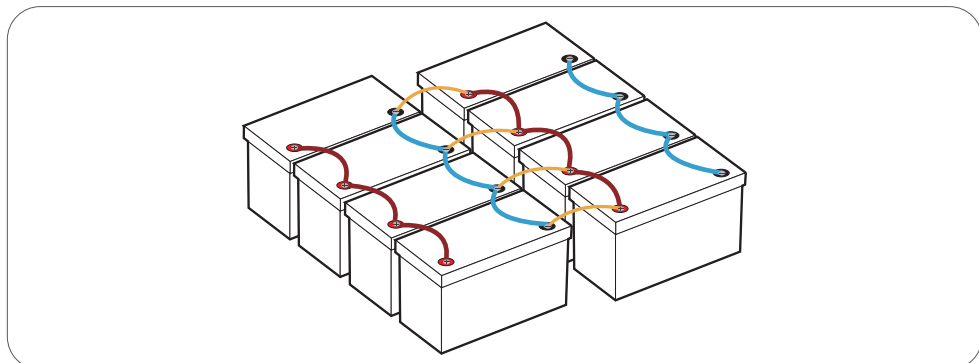
Step
1

Connect the batteries in parallel.



Step
2

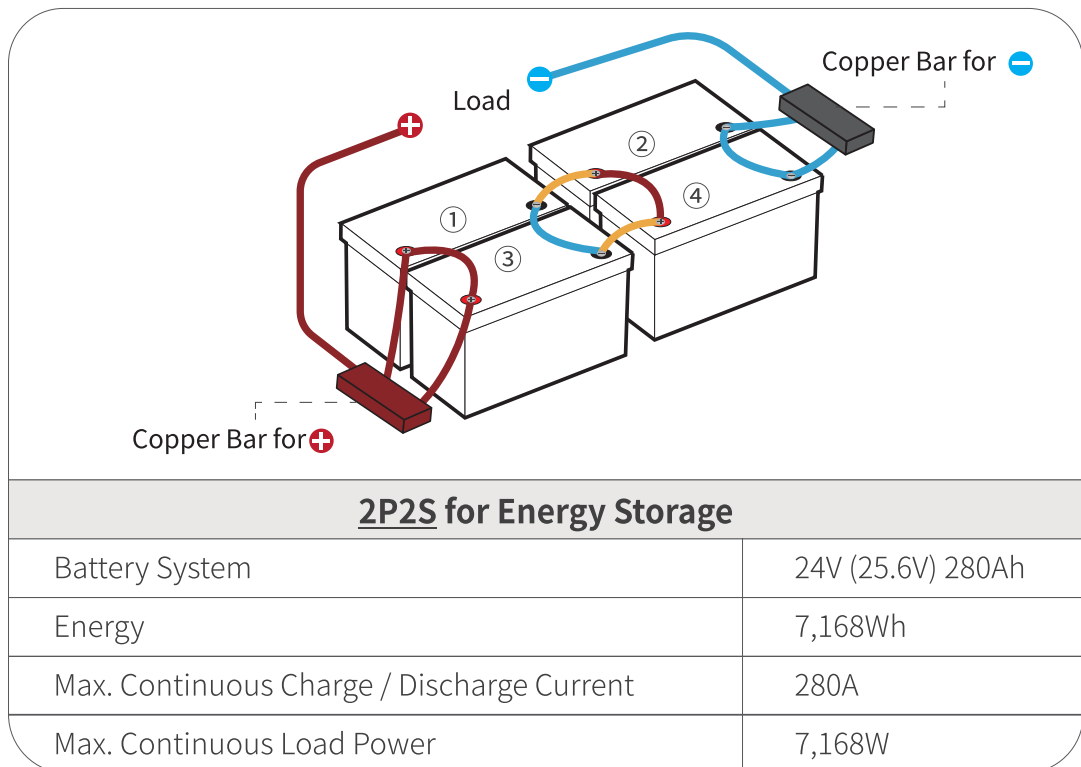
Connect the paralleled battery systems in series.



Step 4 Total Input & Output Connection

Use two **copper bars** (instead of battery terminals) to connect all the positive and negative output/input cables, ensuring that the input & output currents of each battery are balanced. (Not required when connecting batteries only in series.)

It is not recommended to use one terminal as the total positive or negative output/input of the battery system as the connected terminals may heat up or even melt if the total output/input current of the battery system is too high.



① As **-** of ① / ③ is connected in series with **+** of ② / ④, please do not connect **-** of ① / ③ / with **-** of load or **+** of ② / ④ with **+** of load, otherwise the battery system will fail to connect in series.

② Please do not connect in reverse order, which may affect the use of the batteries.

Step 5 Rebalancing Every 6 Months

It is recommended to rebalance the battery voltage every six months following Step 2 on Page 13 if you're connecting multiple batteries as a battery system, as there might be voltage differences after six months of the battery system running.

