10-YEAR LIMITED WARRANTY

INTERSTATE®
LI24M12V60, LI27M12V100,
LI31M36V50, LI31M24V60
LITHIUM MARINE BATTERY

SAFETY & OPERATION MANUAL

POWER BEYOND COMPARE™

Please read this manual carefully before use and retain it for future reference. Not following instructions and warnings may void warranty and lead to battery failure, serious injury, death and property or product damage.

INTERSTATE®

CONTENTS

IMPORTANT: The batteries are shipped partially charged and must be fully charged using a LiFePO4 lithium charger with automatic shutoff feature before use. The warning label provides important safety information and charging guidelines. Additionally, the battery must be registered to activate the extended warranty.

The ABYC E-13 Standard outlines essential guidelines for the safe, reliable and proper installation of LiFePO4 (lithium iron phosphate) batteries on boats. It provides guidance so that lithium-ion battery systems are correctly integrated and operated in marine environments. To view the full standards, please visit abycinc.org.

SAFETY INSTRUCTIONS

Please read this guide and follow all safety precautions and warning signs related to the product before installation, operation or maintenance. Always shut down the system and check for hazardous voltage before changing connections or performing maintenance. Interstate Batteries® is not liable for any violations of general operational safety requirements or safety standards related to the design, production or use of batteries. Inspect the charging/discharging plug and harness for signs of overheating or melting during regular use. Contact Interstate® support at 888.772.3600 if you notice any issues.

For further direction on safe and proper handling, please consult a professional.

WARNING

DO NOT immerse the battery in water.

DO NOT use or store the battery near sources of fire or heat.

DO NOT reverse the positive (+) or negative (-) terminals.

DO NOT connect the battery directly to AC outlets.

DO NOT expose the battery to fire or direct heat.

DO NOT short-circuit the battery by connecting wires or other metal objects to the positive (+) and negative (-) terminals simultaneously.

DO NOT pierce the battery case with a nail or other sharp objects or break it open with a hammer or step on it.

DO NOT strike, throw or otherwise subject the battery to physical shock.

DO NOT attempt to disassemble, open or modify the battery in any way.

DO NOT use the battery in combination with primary (such as dry cell batteries) or batteries of different, capacity, type, technology or brand.

DO NOT use the battery if it gives off an odor, generates heat, becomes discolored or deformed or appears abnormal in any way. If the battery is in use or being recharged, remove it from the device or charger immediately and discontinue use.

DO NOT use a desulfation-type charger. Always affix battery cables to battery terminals securely with original bolts and nuts supplied. The battery and/or vehicle may be damaged by sparks caused by loose connections.

Please recycle this product in accordance with your local laws and regulations when the product has reached the end of its useful life.

Keep out of the reach of children and pets.

CAUTION: Misuse or abuse of the battery may result in failure, serious injury, death or property damage, and will void the warranty.

For further direction on safe and proper handling, please consult a professional.

WARNING

WHEN USING A TROLLING MOTOR:

Lithium batteries deliver higher and more stable voltage than lead-acid batteries, which can cause brushed electric motors to overheat or sustain damage if operated at full power for extended periods. To minimize risk, it is recommended to limit motor speed to 85% or below when using lithium batteries with a brushed motor. Always reference the host device's user manual to confirm proper compatibility with a lithium battery before installation or use.

WARNING

INCOMPATIBLE BATTERY TYPES:

Do not combine Dual Purpose and Deep Cycle batteries in a series or parallel configurations. Always use the same type, model, voltage, and capacity when creating a battery bank.

WARNING

When storing the battery, maintain a state of charge between 60%-80%. If the battery will be stored for longer than two months, the battery should be cycled at least once every three months.

For further direction on safe and proper handling, please consult a professional.

BATTERY INSTALLATION

Safety Precautions

Always wear proper eye protection and personal protective equipment (PPE) when handling batteries. Remove all jewelry or metallic objects that might come into contact with the battery before starting the removal or installation process.

Installation Steps:

1. Check Voltage: Before installation, measure the battery's voltage with a voltmeter. Charge the battery if necessary.
2. Disconnect Old Battery: First, remove the negative cable followed by the positive cable from the old battery.
3. Remove Battery: Remove any holddown brackets or straps, then remove the battery.
4. Install New Battery: Place the new lithium battery on the tray.
   Note: If the battery size differs, you may need to install a new tray of the appropriate size.
5. Secure the Battery: Ensure the battery is properly secured in the vehicle. Attach the positive cable first, followed by the negative cable. Be careful not to over-tighten the terminal bolts. The maximum torque is 9.5 Nm (7 lbf-ft).

Group 31 LiFePO4 Battery–Power Button Operation Guide

This outline explains how to operate the power button on Group 31 (Li31M36V50 and Li31M24V60) LiFePO4 batteries and what behavior to expect.

Initial Power-On

Batteries are shipped in the OFF state. To turn the battery ON, press and hold the power button (located on top) for 3 to 5 seconds.

For further direction on safe and proper handling, please consult a professional.

Power-On Indicator

After holding the button, a green LED ring around the button will light up, indicating the battery is powered on.

Battery Operation

The battery stays ON until manually turned off by pressing and holding the button for 3 to 5 seconds.

Note: The LED may turn off after inactivity—this does not mean the battery is off.

To confirm power status, use a multimeter to check the Open Circuit Voltage (OCV):

- ON: OCV reads above 24V or 36V (depending on battery rating).
- OFF: OCV reads below 10V DC.

Powering Off

To turn the battery OFF, press and hold the power button for 3 to 5 seconds until the LED turns off.

Confirm shutdown by verifying the OCV is less than 10V DC with a multimeter.

Check for Parasitic Voltage Drain

- After installation, test for parasitic voltage drain, which can come from systems like alarms or electronic control modules.To test, turn off the engine and connect a multimeter (in mA mode) in series between the battery's negative terminal and the vehicle's negative cable. Check the vehicle's drain current.
  - > If the drain current is less than 1 mA, you can proceed with the lithium battery installation.
  - > A lithium battery can discharge easily if the drain current is between 1 mA and 3 mA. It's recommended that the battery voltage be checked monthly.
  - > If the drain current exceeds 3 mA, wait to install the lithium battery until the vehicle's charging system is repaired.

Connect Li Deep Cycle Battery via Bluetooth

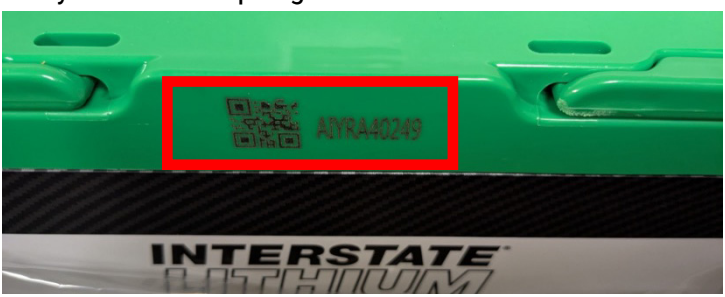
Install IB Li Deep Cycle from the App Store or Google Play.

Download on the App Store

GET IT ON Google Play

Find Your Battery Serial Number.

Your battery's serial number is located on the back of the battery toward the top edge:



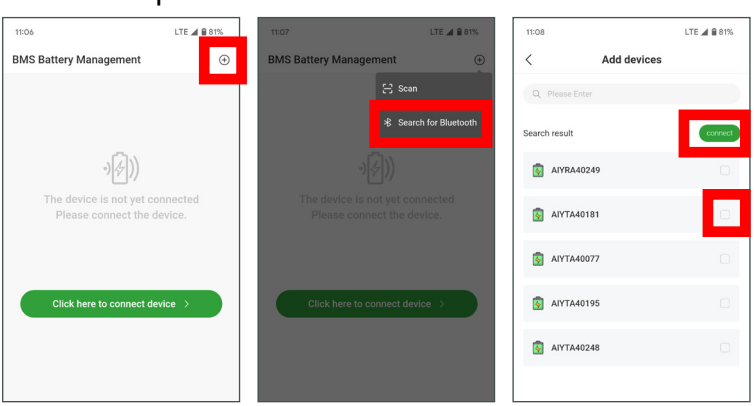
Connect the App to Your Battery

Follow these steps to pair the LiFePO4 app with your battery:

Step 1: Return to the application home screen and press the + symbol.

Step 2: Press the "Search for Bluetooth option".

Step 3: Select the option that matches your batteries serial number and press the "connect" button.



For further direction on safe and proper handling, please consult a professional.

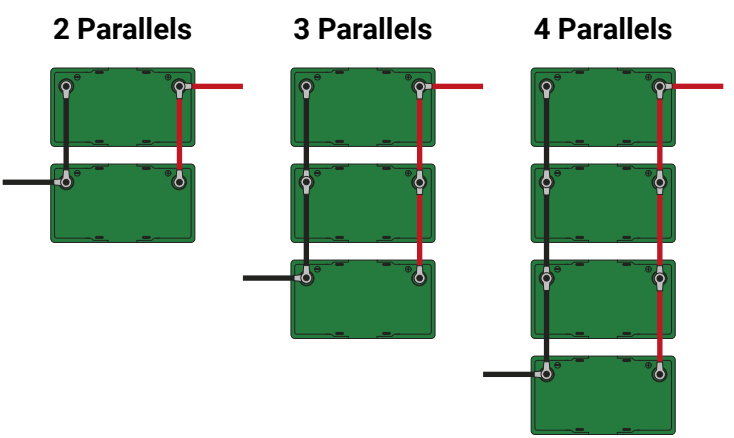
Parallel Connection

Connecting batteries in parallel increases the overall capacity of the battery group, extending the usable time. However, this does not increase the maximum discharge current of the entire battery group.

When connecting multiple batteries in parallel, the wiring harnesses between the batteries must be of equal length. This helps to minimize uneven voltage drops.

For selecting the appropriate wiring harness:

- Always consult a professional.
- Interstate offers suitable bus bars available for purchase as accessories. It is recommended to use these bus bars instead of traditional cables when connecting lithium batteries in parallel or series. For any other types of connections, consult a qualified professional.
- Ensure that the wiring harness is rated to handle the electrical load. Consult a licensed electrician to ensure compliance with safety standards.
- Do not connect more than 4 lithium batteries in parallel.



For further direction on safe and proper handling, please consult a professional.

Series Connection

Connecting batteries in series increases the total energy (Watt-hour) available for charge and discharge. However, the battery pack's overall capacity (Amp-hour) does not increase, so the charge and discharge rate remain the same.

Series Connection Limits:

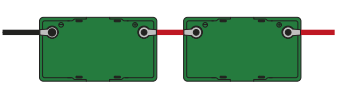
- **12V series:** Up to 4 batteries
- **24V series:** Up to 2 batteries
- **36V series:** Series connection is not allowed

When connecting multiple batteries in series, the wiring harnesses between the batteries must be of equal length. Ensure the wiring harness can handle the electrical load. Always consult a licensed electrician for compliance and safety. Interstate offers suitable bus bars available for purchase as accessories. It is recommended to use these bus bars instead of traditional cables when connecting lithium batteries in parallel or series. For any other types of connections, consult a qualified professional.

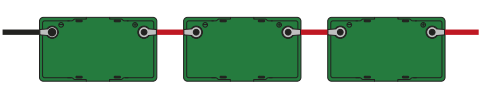
Maintenance Tip:

If the usage time noticeably shortens after a long-term series connection, we recommend periodically disconnecting the batteries and recharging them individually.

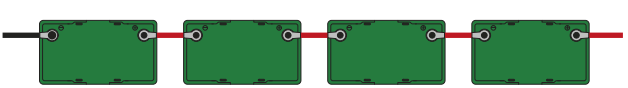
2 Series



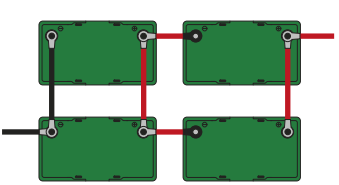
3 Series



4 Series



2 Series/2 Parallels

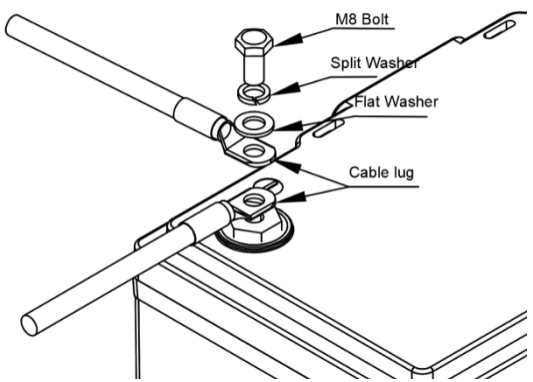


For further direction on safe and proper handling, please consult a professional.

BATTERY TERMINALS

The internal thread depth of the battery's positive and negative terminals is 11 mm. When selecting a bolt, ensure that after accounting for the wiring harness(es), flat washers, spring washers (when compressed) and any other connectors, the remaining depth of the bolt is between 5 mm and 11 mm.

If the bolt's threaded portion exceeds 11 mm, it may cause irreversible damage to the terminals' internal threads. Such damage is considered user error and is not covered by the limited warranty.



Note: Do not tighten the bolt beyond the specified torque rating of 9.5 Nm (7 lbf-ft).

BATTERY CHARGING

Charging Voltage

Use a charger that features a dedicated lithium profile with the Constant Current / Constant Voltage (CC/CV) function as well as an automatic shutoff feature.

The charger's full charge voltage should be set within the following ranges:

- **12V series:** 14.4V–14.6V
- **24V series:** 28.8V–29.2V
- **36V series:** 43.2V–43.8V

For further direction on safe and proper handling, please consult a professional.

Note: If the charger's full charge voltage is too low, the battery pack may not reach a full charge, which can shorten battery life. Any reduction in battery life due to insufficient charging will void the remaining warranty on the battery or batteries.

Float Charge Voltage

Maintaining a lithium battery at full charge voltage for extended periods can cause irreversible damage. To prevent this, we recommend switching the battery to a float charge state once it is fully charged.

The recommended float charge voltage settings are as follows:

- **12V series:** 13.6V–13.8V
- **24V series:** 27.2V–27.6V
- **36V series:** 40.8V–41.4V

Charging Current

The charging current for a single battery should not regularly exceed 20% of its Amp-hour (Ah) rating. Maintaining the charge current at this level (0.2C) helps reduce thermal stress and prevent potential damage to the battery.

The charging current for a parallel battery pack should not regularly exceed 20% of the Amp-hour (Ah) rating of a single battery.

Charging Temperature

Whether batteries are connected in parallel or series, we recommend maintaining the charging environment temperature between 68º–77ºF (20º–25ºC). If the ambient temperature is higher than this range, reduce the charging current to help prevent increased battery degradation.

Important Note: Both high charging temperatures and excessively high charging currents can speed up battery degradation over time:

1. **High Charging Temperature:** Charging in a hot environment can cause thermal stress, leading to reduced capacity, shorter lifespan and potential safety risks like overheating or swelling.
2. **High Charging Current:** Charging with too much current generates excess heat, putting strain on the battery, which accelerates capacity loss and shortens lifespan.

BATTERY DISCHARGING

Discharge Cut-off Voltage

When the battery pack is exhausted, the built-in battery management system (BMS) will cut off the discharge circuit to prevent the battery from being deeply discharged. We recommend setting the load cut-off discharge voltage higher than the built-in BMS cut-off protection voltage when in use.

We recommend:

12V series set above 11V

24V series set above 22V

36V series set above 33V

Discharge Current

Discharge current limits are listed on the back of the battery. For parallel battery packs, we recommend that the total discharge current is no greater than a single battery's maximum allowable discharge current.

Discharge Temperature

Whether in parallel or series, we recommend maintaining the battery discharge environment temperature between 68º–77ºF (20º–25ºC). We recommend reducing the discharge current if the actual operating conditions result in an excessively high ambient temperature.

For further direction on safe and proper handling, please consult a professional.

STORAGE

Storage temperature management

If storing for three months or less, acceptable environmental/ ambient temperature exposure range is: -4°F to 95°F (-20°C~35°).

If storing up to six months, acceptable environmental/ ambient temperature exposure range is: 32°F to 77°F (0°~25°C).

Storage humidity management

Relative humidity should be kept between 30% and 60% to ensure the battery remains condensation free.

Regular maintenance management

If the battery will be stored for longer than three months, it is essential to charge, discharge and then recharge the battery at least once every three months and keep its state of charge at 60%-80%.

For further direction on safe and proper handling, please consult a professional.

COMMON FAULTS AND SOLUTIONS

PROBLEM	POSSIBLE CAUSE	SOLUTION
Battery pack does not charge	External wiring harness may be damaged or incorrectly connected.	Ensure correct wiring and tighten bolts to the specifications shown 9.5Nm (7 lbf-ft). If the problem persists, contact Interstate Batteries support at 888.772.3600.
	The ambient temperature is higher than the charging high temperature limit.	Move battery to environment with ambient temparture between 65°F and 80°F and allow to acclimate for a minimum of 2 hours before reattempting to charge. If problem persists, contact Interstate Batteries Support at 888.772.3600.
	The ambient temperature is lower than the charging low-temperature limit.	Move battery to environment with ambient temparture between 65°F and 80°F and allow to acclimate for a minimum of 2 hours before reattempting to charge. If problem persists, contact Interstate Batteries Support at 888.772.3600.
	The charging voltage does not match the current battery voltage.	Use the charging voltage or charger recommended by the manufacturer. If the problem persists, contact Interstate Batteries support at 888.772.3600.

For further direction on safe and proper handling, please consult a professional.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Battery pack does not charge	If the battery has been over-discharged, the BMS will be in protection mode and the terminal OCV will read 0 volts. Traditional chargers will not activate the charge function if 0 volts are detected.	Only use chargers with a specific lithium charging profile that is properly sized for your battery's requirements. It is also recommended that the charger includes a wake-up function and automatic shutoff feature.
Battery pack does not discharge	Check whether the external wiring harness is connected correctly.	Ensure correct wiring, tighten bolts as required, etc. If the problem persists, contact Interstate Batteries support at 888.772.3600.
	The ambient temperature is higher than the high temperature limit.	Move battery to environment with ambient temperature between 65°F and 80°F and allow to acclimate for a minimum of 2 hours before reattempting to discharge. If problem persists, contact Interstate Batteries Support at 888.772.3600.

For further direction on safe and proper handling, please consult a professional.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Battery pack does not discharge	The ambient temperature is lower than the low temperature limit.	Move battery to environment with ambient temperature between 65°F and 80°F and allow to acclimate for a minimum of 2 hours before reattempting to discharge. If problem persists, contact Interstate Batteries Support at 888.772.3600.
Run time drops dramatically	As the load increases, the battery core temperature will increase and could exceed the BMS protection limit.	Reduce the load and wait for the battery to cool down before reattempting to charge or discharge. If the problem persists, contact Interstate Batteries support at 888.772.3600.
The load increases, and the power suddenly goes out	The wiring harness may be loose causing the power circuit impedance to increase.	Fasten the wiring harness. If the problem persists, contact Interstate Batteries support at 888.772.3600.
	The discharge current exceeds the current protection value of the internal BMS.	Disconnect the load and wait for recovery (voltage is restored on the port). If the problem persists, contact Interstate Batteries support at 888.772.3600.

For further direction on safe and proper handling, please consult a professional.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Long-term storage, power consumption decreases	The battery pack BMS has self-consumption of electricity.	Store with 60%–80% charge.
	The lithium-ion battery cell has irreversible capacity loss.	Contact Interstate Batteries support at 888.772.3600.
Shorter operating time at low temperatures	Because of low-temperature effects, a lithium battery discharged at 0.2C delivers about 70% of rated capacity at 32°F/0°C and about 50% rated capacity at -4°F/–20°C.	Operate the battery in the temperature range of 59°F to 77°F (15°C to 25°C) for maximum longevity and performance.

For further direction on safe and proper handling, please consult a professional.

WARRANTY INFORMATION

For details about the Interstate Batteries limited lithium warranty, please visit our warranty page at InterstateBatteries.com/support/warranty

BATTERY DISPOSAL

WARNING

1. DO NOT dispose of the battery in the trash.
2. DO NOT include a lithium battery with lead-acid battery recycling.
3. Recycle or dispose of the battery in accordance with all federal, state and local regulations or bring it to the nearest recycling facility.

Visit InterstateBatteries.com/recycling to recycle with us.

For further needs, contact the distributor or dealer from the original purchase.

WARNING: This product can expose you to chemicals including, lithium and nickel, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

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BATTERY MUST BE RECYCLED

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InterstateBatteries.com

For further direction on safe and proper handling, please consult a professional.