

LiFePO₄ Lithium Batteries

LC Dual Series

Instruction Manual

ACTIVE

ADVANTAGES OF YOUR ECTIVE LC BATTERY



High Cycle Stability

More than 4000 cycles at 80 % DoD results in lower costs over the operating life.



Short Charging Times

Lithium batteries are ready for use again at full power much faster than conventional batteries.



Built-in Protection

The integrated battery management system (BMS) protects the battery and allows completely worry-free use.



Easy to Store

LiFePO₄ batteries can be stored for more than 6 months thanks to the extremely low self-discharge rate.



Long Service Life

Lithium batteries have a particularly long service life - and require very little maintenance.



Absolutely Safe

Due to their chemical composition, it is impossible for LiFePO₄ batteries to burn or explode.



Extreme Heat Tolerance

The battery continues to work reliably even at ambient temperatures of over 60 °C.



Less Weight

LiFePO₄ batteries weigh only around a third to a quarter of a comparable conventional battery.



Cold Resistance

LC Dual batteries can be charged even at extremely low temperatures of down to -20 °C.

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BEFORE INSTALLATION AND FIRST USE



Before connecting and commissioning the battery, make sure that both the packaging and the battery are undamaged.



To ensure that the battery functions reliably in the long term, it must be charged to at least 80 % of its capacity within 14 days of delivery.

MODELS OF THE ECTIVE LC DUAL SERIES

Model	Nominal Voltage	Nominal Capacity	CCA (5 sec.)	Energy	Capacity at 25 A	Dimensions (L x W x H) in mm
LC 75 Dual	12,8 V	75 Ah	825 A	960 Wh	180 min	242 × 175 × 190
LC 105 Dual	12,8 V	105 Ah	1100 A	1344 Wh	252 min	278 × 175 × 190
LC 120 Dual	12,8 V	120 Ah	1320 A	1536 Wh	288 min	315 × 175 × 190
LC 135 Dual	12,8 V	135 Ah	1485 A	1728 Wh	324 min	353 × 175 × 190
LC 150 Dual	12,8 V	150 Ah	1650 A	1920 Wh	360 min	392 × 175 × 190

DUAL PURPOSE

Supply Battery: ECTIVE LC DUAL PURPOSE batteries are capable of providing supply power to electrical devices over a longer period. With these batteries, you can safely and efficiently power various electrical accessories and onboard equipment on your vehicle, such as lights, radios and other electronic devices commonly found on boats and RVs.

Starter Function: In addition to their primary function as supply batteries, ECTIVE LC Dual Purpose batteries are designed to provide a brief, high burst of power to start an engine. This can make ECTIVE LC Dual Purpose batteries an extremely useful backup option in emergency situations or specific vehicle setups.

SAFETY INSTRUCTIONS

- Before using your battery for the first time, be sure to read these instructions and follow the safety guidelines and operating instructions.
- Keep these instructions in a safe place. They are also available for download at ective.de.
- Only use the battery for the purposes intended in these instructions. The manufacturer is not liable for any damage caused by any other or improper use.
- Caution! The battery terminals are permanently live. Avoid short circuits and do not place any tools or other conductive objects on the battery. Do not wear any metal objects on your body, such as watches or jewellery, when working with the battery.
- In the event of a battery fire, use a CO₂ fire extinguisher, foam or a class D fire extinguisher.
- Installation, maintenance and other work on the battery may only be carried out by trained specialists. Only insulated tools may be used when working on the battery and protective goggles and safety clothing must be worn.
- Protect the battery from high temperatures (over 60 °C), direct sunlight, dirt and moisture.
- Protect the battery from physical damage. Do not open the battery without consulting the manufacturer. Dispose of damaged batteries in accordance with the statutory regulations.
- Avoid reverse polarity and ensure that the battery is installed correctly.
- If substances leak from the battery housing and come into contact with the skin or eyes, rinse immediately with plenty of clean water and contact a doctor.

TRANSPORTATION

The battery may only be transported in the original packaging or an appropriate alternative packaging that fulfils the relevant requirements: The battery belongs to category UN3480, class 9, packing group II and consequently it must be packed in accordance with packing instruction P903 (transport by land or water: ADR, RID & IMDG) or P965 (air transport: IATA).

The battery has been tested in accordance with the UN Manual of Tests and Criteria, Part III, Subsection 38.3 (ST/SG/AC.10/11/Version 5).

BATTERY MANAGEMENT SYSTEM (BMS)

All ECTIVE lithium batteries have an integrated battery management system (BMS). This helps to conserve the battery, protect it from damage and extend its service life. If a problem occurs, the BMS switches off the battery so that there is no longer any voltage at the terminal connections. Once the problem has been rectified (e.g. the connection to the load has been disconnected), the BMS automatically switches the battery back on again.

Overload protection: Protection against excessive discharge currents

Deep discharge protection: Protection of the individual cells from deep discharge

Overvoltage protection: Protection of the cells against excessive charging voltage

Cell balancing: Continuous equalisation of the cells at the same charge level

Charge control: Protection against faulty or unsafe charging

Temperature protection: Protects the battery from excessive temperatures

Short-circuit protection: Protection against short circuits

▲ In the event of a deep discharge, the integrated BMS switches off automatically to protect the battery from possible damage. To reactivate the BMS and thus the battery, ideally use a charger for LiFePO₄ batteries. Battery chargers for lead batteries that have a supply mode can also be used for this purpose. Alternatively, the BMS can also be reactivated using a second battery connected in parallel.

MAINTENANCE AND STORAGE

LiFePO₄ batteries do not require any regular maintenance.

Keep the battery clean and ensure that the connections are secure. Use a damp cloth for cleaning. Routinely check the battery and connections for damage.

If the battery is not used for a longer period of time (several months), disconnect it to avoid unnoticed discharge. If necessary, cover the terminals to protect them from short circuits. Ensure that the storage location is cool, well ventilated and protected from sunlight. Self-discharge is approximately 1 - 3 % per month.

Charge the battery to at least 80 % before storage. Check the charge level at least once a year and recharge the battery accordingly. Do not use a trickle charger.

Ensure that batteries that have been stored in very cool conditions (down to -20 °C) are slowly brought up to operating temperature.

INSTALLATION

General Installation Advice

▲ Check the casing and terminals for damage before installation. If the battery is damaged, do not use it under any circumstances.

▲ Ensure that the polarity of the connections is correct!

▲ Protect the terminals from short circuits!

▲ Use an appropriate external fuse!

Ensure that the battery is firmly and securely installed and that it cannot move during use. Use a battery holder or a strap for example.

LiFePO₄ batteries can be mounted upright or sideways.

Fully charge the battery before using it for the first time.

Ensure that the battery is not exposed to direct sunlight or heat sources.

Switch off loads before connecting them to the battery.

Installation as Starter Battery

- Park your car in a safe and well-ventilated area away from open flames or sparks.
- Turn off the car ignition and any electronic accessories to avoid electrical shorts.
- Open the hood of the car and locate the old battery. Identify the negative (-) terminal on the old battery and disconnect the negative cable first. Then disconnect the positive (+) terminal. It is usually a red wire.
- After removing the old battery, clean the cable terminals with a wire brush and then clean the battery tray. Place the new battery onto the tray and firmly secure it with hold-down clamps to prevent movement. Make sure the positive and negative terminals are on the correct sides.
- Connect the positive cable to the positive terminal on the new battery and tighten the nut. Connect the negative cable to the negative terminal on the new battery.
- Double-check the connectors. Start the car.

Installation as Supply Battery

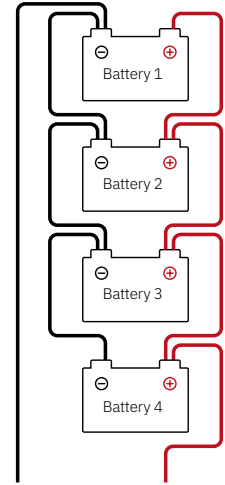
- When selecting a suitable location for your supply battery, please ensure that the space is protected from extreme temperatures, physical damage, and direct sunlight, and supports the weight of the supply battery.
- After ensuring that the battery is firmly and securely installed and that it cannot move, connect the positive (+) and negative (-) terminals of the LFP battery to the corresponding terminals of your electrical system. Protect the terminals from short circuits.
- Install a battery isolation switch or disconnect switch between the LFP battery and your electrical system. This switch allows you to safely disconnect the battery from the system for maintenance or in case of emergencies.
- Before connecting your LFP battery to a charging system (e.g. a solar panel array), please ensure that it is compatible with LFP batteries and can provide the appropriate charging voltage and current. Once the installation is complete, test your electrical system to ensure everything is functioning correctly.

Parallel connection (12 V)

When several ECTIVE batteries are connected in parallel, the total capacity is increased while the voltage remains the same. This also leads to correspondingly higher charging and discharging currents.

▲ Ensure that only batteries of the same type, age and capacity are connected in parallel. Fully charge all batteries individually beforehand.

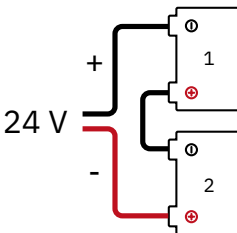
A maximum of four ECTIVE LC Dual batteries may be connected in parallel.



Series connection (24 V / 36 V / 48 V)

To increase the total voltage while maintaining the same capacity, you can connect a maximum of two ECTIVE LC Dual batteries in series.

▲ Ensure that only batteries of the same type, age and capacity are connected in parallel. Fully charge all batteries individually beforehand!



CHARGING

⚠ Attention! Please observe the following instructions when charging the battery:

- When choosing a charger, make sure that it is suitable for LiFePO_4 batteries and that the final charging voltage corresponds to that of your battery. Connecting unsuitable chargers can damage your lithium battery immediately and permanently.
- The charging current and charging voltage must not exceed the maximum values of your battery.
- If the BMS interrupts the charging process, check the battery and the charger immediately.
- Only switch on the charger after you have connected it to the battery. Switch it off before disconnecting it. Disconnect the charger from the battery if you do not plan to use it for a longer period of time.
- You should charge the battery as quickly as possible if the charge level falls below 20 % or the BMS has switched off the battery due to undervoltage.
- Fully charge a new battery before using it for the first time.
- At low temperatures, the battery is charged at a reduced charging current, which results in a longer charging process. Batteries of the ECTIVE LC Dual Purpose Series may be charged at temperatures as low as $-20\text{ }^\circ\text{C}$.

SERVICE / COMPLAINTS

When manufacturing ECTIVE products, we ensure compliance with the strictest quality criteria. Accordingly, the statutory warranty for production and material defects applies at the time of delivery.

The warranty and liability for damage are excluded in the following cases:

- Damage to the device due to overvoltage and mechanical damage.
- Connection and installation errors.
- Use of the device for unintended purposes.
- Mechanical modifications without written authorisation from the manufacturer.
- Wear and tear during normal use.

These conditions are recognised when the battery is put into operation. Any use of the battery is at your own risk. The warranty claim can only be asserted with a corresponding proof of purchase.

If you have any questions about your battery, please contact our customer service. Please provide us with the article and invoice number.

Service contact

batterium GmbH

Robert-Bosch-Straße 1, 71691 Freiberg am Neckar, Germany

T: +49 7141 1410870

info@ective.de | ective.de

Tipp: When contacting us directly, please have your customer or invoice number and the article number ready.

RETURNS

If you wish to return your battery, use the original packaging or an equivalent alternative (see section „Transportation“). A warranty claim cannot be made if the packaging is inadequate. In that case, the product is considered damaged and cannot be refunded.

Please also enclose the following documents with your consignment:

- Copy of the invoice
- Reason for the return with a detailed description of the problem or fault

Please send returns to the following service address:

batterium GmbH

Robert-Bosch-Straße 1, 71691 Freiberg am Neckar, Germany

T: +49 7141 1410870

info@ective.de | ective.de

DISPOSAL

Never dispose of LiFePO_4 batteries in household or commercial waste! Instead, the batteries must be returned to collection points for recycling. Alternatively, you can contact the manufacturer to return them.

When disposing of the battery, ensure that it is fully discharged and insulate the terminals to prevent short circuits.



Please dispose of all packaging material correctly or recycle it.

In Germany, the Electrical and Electronic Equipment Act [ElektroG] regulates the placing on the market, disposal and recycling of electrical and electronic equipment.



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