

# **ULTIMATRON FRANCE**

## **INSTRUCTIONS FOR USE**

**LX SMART BMS SÉRIE 12.8V**

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**ULTIMATRON  
FRANCE**

# ULTIMATRON FRANCE

ENGLISH





**ULTIMATRON  
FRANCE**



Dear Customer,

Congratulations on the purchase of your battery. We invite you to read very carefully the following instructions presented in your user manual in order to prevent and avoid possible damage when using your battery. Any damage that may be caused by disregard of the instructions and advice for use will not be covered by our warranty and we decline any responsibility.



# INSTRUCTIONS FOR USE **CATALOG**

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# 1. Product description

## 1.1 General information

Lithium batteries are certainly the best alternative to lead batteries because they have a stable voltage supply even under heavy load. In addition to its extremely high weight advantage, it also offers a huge reserve of energy. The integrated BMS (Battery Management System) makes it suitable for all Ultimatron LiFePO<sub>4</sub> batteries for 12V DC applications. The additional capacity of Ultimatron LiFePO<sub>4</sub> batteries can be easily reached. The lithium iron phosphate battery (LiFePO<sub>4</sub>) is the safest type of conventional lithium battery. The nominal voltage of the LiFePO<sub>4</sub> battery is 3.2V but the lead battery is 2V. Therefore, a 12.8V LiFePO<sub>4</sub> battery consists of four batteries connected in series.



### Performance and efficiency

Ultimatron LiFePo<sub>4</sub> batteries can directly store more than 96% of the energy supplied.

Available capacity is fully used with the same output voltage.



### Easy replacement of the existing battery

The dimensions of the case are identical to the most common batteries such as AGM, lead-acid or GEL batteries. Existing pole terminals can also be used with round poles. No need to replace the battery holder or change the charge structure.



### Surveillance via Bluetooth

Thanks to the integrated and practical Bluetooth interface, the battery status can be checked at any time using your smartphone or tablet (Android or Apple iOS). You have all the important data on your battery at your fingertips without other wired battery monitors.



### BMS (Batterie management system)

It is an electronic system allowing the control and the charge of the different elements of a storage battery. The BMS built into each battery ensures that the battery is protected from improper handling. It switches the battery in case of undervoltage or overload, and turns on automatically as soon as the problem is fixed.



### Battery Charging

It does not need to wait for the battery to be fully charged. The Ultimatron LiFePo4 battery charges up to 10 times faster than conventional lead batteries. Existing charge controllers or chargers can also be used in the installation.



### Areas of application

The fields of application of lithium batteries are diverse, especially for stationary or mobile use. In particular mobile homes, solar, electric boats, electric scooters, golf cars or even electro mobiles / wheelchairs and cleaning machines are more and more frequently equipped.

## 1.2 Product characteristics



### High performance traction

Especially for mobile or stationary use with the highest requirements



### LiFePO4 100Ah lithium battery replaces a 200Ah lead battery

Thanks to maximum usable capacity



### Safest lithium (LiFePO4) technology

Lithium-iron-phosphate, no gas, no danger of explosion or fire. No need maintenance



### Long service life

Maximum service life with more than 3000 cycles, even with regular deep discharge



### High discharge current

High discharge performance without voltage drop for large consumers such as coffee machines and air conditioning systems



### Light weight

Up to 70% weight savings compared to lead-acid batteries



## Low automatic discharge

Stored / unused, only about 3% per month

### Flexible use



Motorhomes and caravans

Photovoltaics, solar systems and renewable energies

High performance traction

Fishing, electric boat engines and depth sounders

Emergency power supply and Uninterruptible power supply (UPS)

Mobile homes and leisure

### 1.3 BMS (Battery Management System)

It is an electronic system allowing the control and the charge of the different elements of a storage battery. The BMS built into each battery ensures that the battery is protected from improper handling. It switches the battery in case of undervoltage or overload, and turns on automatically as soon as the problem is fixed.

#### The important significance of a battery management system (BMS)

##### Important facts:

- 1 A LiFePO<sub>4</sub> cell breaks down if the cell voltage drops below 2.5V.  
(Note: sometimes recovery is possible by charging with a low current, less than 0.1 C).

2 A LiFePO<sub>4</sub> cell will fail if the voltage across the cell exceeds 3.65V.

3 The cells of LiFePO<sub>4</sub> battery do not automatically compensate each other at the end of the charge cycle.

#### **The additional functions of a BMS are:**

- Protection of the cell against undervoltage by cutting the load over time.
- Protection of the cell against overvoltages by reducing the charging current or by stopping the charging process.
- System shutdown in case of overheating.
- Battery charging is stopped at low temperature.

A BMS is therefore essential to avoid damaging the lithium batteries. When the system is not in use, damage due to deep discharge can occur when small loads (such as alarm systems, relays, standby current of certain loads, reverse current flow from chargers of battery or charge controllers) slowly discharge the battery. If you are unsure of a residual current draw, disconnect the battery by opening the battery disconnect switch, removing the fuse (s), or disconnecting the positive terminal on the battery when the system is not in use.

A discharge current is particularly dangerous if the system has been completely discharged and shut down due to a low cell voltage. After a cut-off due to a low cell voltage, a reserve capacity of approximately 5Ah per 100Ah of battery capacity remains in the battery. The battery will be damaged if the remaining reserve capacity is removed from the battery. A residual current of 10mA, for example, can damage a 200Ah battery if the system is left in the discharged state for a long period.

## 2. Safety rules

### 2.1 General rules

Please note these instructions and keep them! Make sure it is near the LiFePO<sub>4</sub> lithium battery.

Work on the LiFePO<sub>4</sub> lithium battery should only be carried out by a specialist.

LiFePO<sub>4</sub> lithium batteries are a bit heavy. In the event of an accident, they can become bullets! Make sure to fix it correctly and firmly, and always use suitable transport equipment. Handle lithium batteries with care.



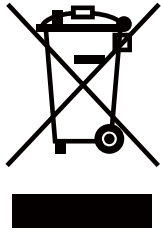
#### Risk of explosion and fire

The lithium battery connection is still active. Therefore, do not place any object or tool on the battery. Avoid short circuits. Use insulated tools. Do not wear metallic objects such as watches, bracelets, etc. on your body. In the event of a fire, use class D fire extinguishers, foam or CO<sub>2</sub> extinguishers.

### 2.2 Identification

	Follow the instructions for safe use. Follow the instructions on the battery and in the user manual.
	Warning. Follow the instructions.
	Note the temperature.
	Fire, open light and smoking prohibited! Avoid sparks when handling cables and short circuits.
	Not waterproof.
	This product or parts of this product may be recycled.
	Conformity mark.

## 2.3 Elimination



Batteries marked with the recycling symbol must be returned to recognized recycling centers. After consultation, they can also be returned to the manufacturer. Batteries are not allowed in household or industrial waste.

## 2.4 Important notes

- Never expose to direct sunlight. Protect from heat.
- The LiFePO4 battery should always be dry and kept clean if possible.
- Avoid any type of damage, such as falling, drilling or similar damage. (Risk of short circuit).
- Note the positive (+) and negative (-) poles on the LiFePO4 battery and pay attention to the correct polarity.
- Pay attention to the correct assembly.
- Do not short-circuit the LiFePO4 battery.
- Do not open the LiFePO4 battery without consulting Ultimatron.

# 3. Installation of the battery

Make absolutely sure that the LiFePO4 battery is not connected with the opposite polarity. If the battery is not connected correctly, the BMS will be irreparably damaged and must be replaced by a new BMS. This is not a warranty case.

### 3.1 Verification

After receiving the LiFePO4 battery, please check if the device has been damaged in any way (e.g. transportation). In this case, please do not put the device into operation and contact the seller.

### 3.2 The installation conditions

As long as the battery holders are already available and suitable, they can continue to be used. Make sure that the LiFePO4 battery is installed and fixed so that it cannot move back and forth during use (tension the strap).

### 3.3 Debug

Due to variations in operating temperature and charge-discharge rate, the cycle capacity may be different from the nominal capacity. Do not disassemble the battery without authorization from the supplier. Parallel and series are acceptable. In parallel, it can accept 10 parallels. In series, it can accept up to 4 series. The series and parallel structure can accept up to 4S4P.

The operating temperature :

Discharge temperature: -20 ~ 60°C

Storage temperature: -5 ~ 35°C

Charge temperature: 0 ~ 55°C

### 3.4 Protection against short circuits



#### Single battery installation

The battery must be protected by a fuse.

### 3.5 Charging the battery before use

The battery is fully charged to approximately 30% when shipped from the factory. It is recommended to fully discharge and charge the new battery before use.

### 3.6 Maintenance

No direct maintenance is required. To maintain the battery, keep the connection electrode and the surface clean, tighten the clamp and lightly grease. Use at least once every three months to maintain the battery and calibrate the state of charge.

### 3.7 Storage

- The Li-ion battery pack should be stored in a cool, dry and well-ventilated area, and should be far from the fire and the high temperature.
- The best Voltage in storage is 12.8V~13.6V.
- The battery should be stored in the temperature range of the product specification. The best storage temperature is 0~40 ° C. The best humidity is 60 ± 25%.
- If there is a long storage period of more than 2 months, it is recommended to charge and discharge the battery extra.

### 3.8 Transportation

- Do not mix the battery products with other cargo.
- Do not immerse the battery products in water or get it wet.
- The maximum temperature during transportation is below 50°C.

## 4. Use of the battery

### 4.1 Charge and discharge

The LiFePo4 battery charges quickly. The time is considerably reduced. There are no long waiting times. Since there is no memory effect with this battery, it does not always need to be fully charged. The service life tends to increase if the battery is not always fully charged. An adaptation of the devices previously used, such as a solar charge regulator or the like. It is not necessary to charge the battery. The recommended charging voltage is 14.6V.

The lead-acid battery charger can be used, but it is recommended to use a dedicated lithium battery charger.

- Do not exceed the maximum permitted charge voltage.
- Use the battery only within the specified temperature range.
- The final charge voltage of the battery measured 14.6V at the battery pole.
- Use only DC chargers suitable for regulated load characteristics.
- Only switch on the charger after connecting the charger to the battery. After charging, please first turn off the charger, then disconnect the battery from the charger.
- If necessary, the battery management system (BMS) will automatically balance the battery charge. Due to the high discharge current and the short charging time, the battery of the battery can lose balance during a long service life. This can cause a loss of capacity and overload the unit. This battery balancing can be performed in charge and rest modes.

## 4.2 Charging voltage

- Recommended charging voltage: 14.6V
- Constant voltage duration: 2 hours for a 100% charge, or a few minutes for a 98% charge.
- Maximum charge voltage: 14.6V per battery.
- Recommended storage voltage: around 13V per battery.

## 4.3 Cell voltage to « allow discharge »

The threshold below which battery discharge is not authorized is 2.5V as standard.

## 4.4 Minimum temperature to « allow charging »

By default, the threshold at which a low temperature alarm is triggered is 0° C.

## 4.5 Conditions for series and parallel connection

- The batteries must be of the same batch and of the same model.
- Before connecting the batteries in series or parallel, please charge them fully.