ULTIMATRON FRANCE

INSTRUCTIONS FOR USE

SMART BMS SERIE 12.8V

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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

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1 . Product description

1.1 General information

This user manual was created by Ultimatron-France and contains important information relating to the proper care and maintenance of your lithium battery. This manual only applies to Ultimatron lithium battery products. It does not apply to other lithium batteries or chemistries. Please read through the guide in detail before installing and using your new lithium battery. Reading this guide in its entirety will help you achieve high performance and a longer life from your lithium batteries. Should you have any questions concerning safety precautions, installation or the use of your Ultimatron lithium battery, please contact us:

Email: info@ultimatron-france.fr

Online chat is available 24/7 on our website www.ultimatron-france.fr

Performance and efficiency

Ultimatron LiFePo4 batteries can directly store more than 96 % of the energy supplied. Available capacity is fully used with the same output voltage.

Lithium Iron Phosphate (LiFePO4) batteries are safe to use indoors and outdoors. However, as with any electronics, safety measures must always be taken. Please follow the instructions within this user manual for safe handling and operation of your Ultimatron lithium batteries.

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.

Monitoring 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 IOS). You have all the important data on your battery at your fi ngertips without other wired battery monitors.

BMS (Battery Management System)

An internal BMS (Battery Management System) to protect the battery from misuse. The BMS protects against over-charge, over-discharge, low-temperatures, high-temperatures, short-circuits, high-voltage and low- voltage. The BMS also helps in balancing the individual cells.

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.

Various application

The fi elds 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

Environmental- friendly

Lead-acid batteries contain a large amount of heavy metal- lead, which produces waste liquid, while lithium iron phosphate batteries do not contain any heavy metals, and there is no pollution in production and use

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

The volume of the lithium battery of the same capacity is 2/3 of the volume of the lead-acid battery, and the weight is 1/3 of the latter.

Low self-discharge

The self-discharge rate of fully charged Li-ion stored at room temperature for 1 month is about 3%

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:

A LiFePO4 cell breaks down if the cell voltage drops below 2.5V.

(Note: Sometimes recovery is possible by charging :

- Connect the same model of battery to charge in parallel to wake up the battery.

- Use a charger without voltage detection to charge with a low current less than 0.1 C.).

2 A LiFePO4 cell will fail if the voltage across the cell exceeds 3.65V.

3 The cells of LiFePO4 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 fl ow 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 5 Ah per 100 Ah 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 LiFe-PO4 lithium battery.Work on the LiFePO4 lithium battery should only be carried out by a special- ist.LiFePo4 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 suit- able transport equipment. Handle lithium batteries with care.

Always wear protective gear when handling batteries.Use a wrench with a rubber coated handle.Do not place any objects on top of batteries.Do not place batteries on a metallic surface.Check that all cables are in good condition.Make sure all cable connections are properly tightened.

Install and remove batteries using the lifting handles provided.Keep sparks, flames and metal objects away from batteries.Have Ultimatron MSDS on the premises.

Have a fire extinguisher of the following type: a foam extinguisher, CO_2, ABC dry chemical, powdered graphite, copper powder or soda (sodium carbonate) on the premises.

2.2 Identifi cation

	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:

The model with Heating film: -20 ~ 55°C

Standard model: 0 ~ 55°C

3.4 Protection against short circuits

Single battery installation

The battery must be protected by a fuse.

3.5 Battery Orientation

Ultimatron LiFePO4 batteries can be installed upright or on their sides. Please ensure the battery is fastened if installed in a moving vehicle, such as in an RV or a boat.

3.6 Storage

Some people use their LiFePO4 batteries seasonally such as while camping in the summer or while ice fishing in the winter. It is common for some people to store lithium batteries during the off-season. When storing LiFePO4 batteries, it is important to store them properly to ensure they do not get damaged and to keep them at peak performance for many years ahead. Based on the temperature and length of time, here's a summary of how to store your LiFePO4 battery:

Recommended storage temperature: -5 to +35°C
Storage up to 1 month: -20 to +60°C
Storage up to 3 month: -10 to +35°C
Extended storage time: +15 to +35°C

It is highly recommended to store lithium batteries indoor during the off season. LiFePO4 batteries have a low self-discharge rate of 3% a month. This means that when a lithium battery is stored, it'll lose 3% of its charge capacity every month. In order to prevent a higher rate of discharge, we recommend disconnecting all power draw from your batteries. When you store LiFePO4 batteries, it is important that you store them with a state of charge (SOC) of 30% or higher. A higher state of charge is recommended when storing for an extended period of time. If you want the battery to retain a good level of charge after the storage period is over, you should charge them to 100% and store them in that fully charged state.

There are major consequences if you store your LiFePO4 battery without a charge. Because of the 3% self-discharge rate, the battery can become over-discharged. The level of discharge can potentially go below what the BMS can protect. This is why it is very important to charge your lithium battery before you store it. It is highly recommended that you also store the lithium battery at room temperature, especially when storing them for an extended period of time. Refer back to the above information to see how long you can store LiFePO4 at various temperature ranges. Over-discharging the cells due to storage without a charge can cause permanent damage and void your 5-year battery warranty. The Ultimatron built-in BMS logs all activities performed on the battery including storage. Every charge and every discharge is recorded, along with various other factors, such as temperature.

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.

5. Technical support

If you have any questions regarding the purchase or use of the battery, we will be happy to assist you.

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