MARSRIVA

USER MANUAL

Lead Acid to Lithium Battery

MR-LFP12-9-LAR

www.marsriva.com

BATTERY USE INSTRUCTIONS

1. General rules

Observe these instructions and keep them located near the Li-ion Battery for future reference. Work on the Li-ion Battery should be carried out by qualified personnel only.

Any uncovered battery material such as electrolyte or powder on the skin or in the eyes must be flushed with plenty of clean water immediately. Then seek medical assistance. Spillages on clothing should be rinsed out with water.

Too deep discharges damage the Li-ion battery seriously and can even be dangerous. Therefore. use of an external safety relay is obligatory.

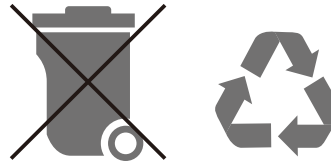
Li-ion Batteries are heavy. If involved in an accident they can become a projectile! Ensure adequate and secure mounting and always use suitable handling equipment for transportation. Handle with care because Li-ion Batteries are sensitive to mechanical shock.

Never try to open or dismantle the Li-ion Battery. Electrolyte is very corrosive. In normal working conditions contact with the electrolyte is impossible. If the battery casing is damaged do not touch the exposed electrolyte or powder because it is corrosive.

Explosion and fire hazard. Terminals of the Li-ion Battery are always a live; therefore do not place items or tools on the Li-ion Battery. Avoid short circuits. too deep discharges and too high charge currents. Use insulated tools. Do not wear any metallic items such as watches. bracelets. et cetera. In case of fire. you must use a type D. foam or CO2 fire extinguisher.

Disposal of Li-ion Batteries

Batteries marked with the recycling symbol must be processed via a recognized recycling agency. By agreement. they may be returned to the manufacturer. Batteries must not be mixed with domestic or industrial waste.



Non-compliance with operating instructions. repairs made with other than original parts. or repairs made without authorization render the warranty void.

2. General information about LiFePO4 batteries

Lithium iron phosphate (LiFePO4 or LFP) is the safest of the mainstream li-ion battery types. The nominal voltage of a LFP cell is 3.2V (lead-acid: 2V/cell). A 12.8V LFP battery therefore consists of 4 cells connected in series; and a 25.6V battery consists of 8 cells connected in series.

- Charge Profiles
  Batteries must be charged using a dedicated lithium battery harger. For 12V series batteries, use a 14.6V charger, and for 24V series batteries, use a 29.2V charger. Note that the charging current should be within the specified value.
- Standard Charge Mode
  For 12V series batteries at 5℃~45℃ temperature, charged to 14.6V at a constant current of 0.2C, and then charged continuously with constant voltage of 14.6V until the current was current is less than 0.02C.

3. Why a Battery Management System is essential

- The functions of a BMS are:

  If the battery voltage is too low, the battery disconnects the load in time to prevent the battery voltage from being too low. When the battery is charged, if the voltage is too high, it will actively stop charging to prevent the battery from over-voltage.

  If the battery temperature is too high, the output is turned off. Therefore, in order to prevent damage to lithium ion batteries, BMS is essential. A BMS is therefore indispensable to prevent damage to Li-ion batteries.

- Protection Function:

  Over charge voltage protection

  Over discharge voltage protection

  Over current protection

  Temperature protection

  Short circuit protection

4. Battery environment

- Ventilation

  Batteries do not release gas during normal use. There are no specific ventilation requirements for batteries installations, although sufficient airflow should be provided to prevent excessive heat build-up.

- Battery orientation

  Batteries may be installed in any horizontal or vertical orientation except with the terminals facing downward.

- Battery environment

  Batteries should be stored and installed in a clean, cool and dry place, keeping water, oil, and dirt away from the batteries. Battery chargers should also be installed in well-ventilated, clean areas that are easily accessible. Relative humidity should be <90%.

5. Maintenance and upkeep

- For the first time, the battery can reach its maximum capacity after 3 – 5 times of use; The battery should be used in an air-circulated, dry environment, avoiding proximity to sources of ignition;

- The best working environment temperature of the battery 15℃ to 35℃ , outside of this temperature range will affect the normal operation of the battery;

- Cannot short-circuit the positive and negative terminals of the battery to avoid danger;

- Can not use organic solvents to clean the battery shell; if an accident occurs, use carbon dioxide fire extinguishers, use carbon tetrachloride, sand and other fire extinguishing equipment;

- Battery failure, please send it to the manufacturer's authorized office or the relevant agencies to properly handle, please do not discard to avoid danger.

6. Safety Precautions

- In order to prevent accidents such as leakage, heat generation, fire, explosion, and performance degradation of lead-converted lithium batteries, please use the batteries normally according to the following specifications. We are not responsible for accidents caused by failure to follow the specifications.
- Hold it lightly and try to avoid violent vibration;
- Do not immerse the battery in water or other liquids, pay attention to moisture;
- Should avoid the battery positive and negative end short circuit;
- Please charge according to the charging environment temperature 1℃ to 25 ℃ for charging, must be in our company designated, lead to lithium battery charger for charging; not to use other chargers to charge privately;
- Discharge control current≤30A, discharge ambient temperature -10℃ to 55℃ ;
- It is prohibited to disassemble the battery, disassembling the battery may cause internal short circuit, which may lead to decomposition of internal substances, fire and explosion. In addition, disassembling the battery may make the battery electrolyte leakage, and the electrolyte inside the battery will cause damage to the human body; if the electrolyte splashes on the skin, eyes or other parts of the body, please flush with water immediately, and go to the hospital for treatment immediately;
- Do not dispose of the discarded batteries by fire, as this may result in explosion and other dangerous accidents;
- If the battery is damaged, the battery is deformed, the electrolyte is leaking or you smell the electrolyte and other abnormal phenomena, do not use the battery any more and send it to the authorized office of the manufacturer or the relevant organization for proper disposal. In addition, the battery leaking electrolyte should be kept away from fire source to avoid causing explosion;
- Users are not allowed to dismantle the battery cover privately and are strictly prohibited to open it, otherwise, our company will not be responsible for it.

7. Precautions During Transportation

- Batteries are adapted to automobiles, trains, airplanes and other modes of transportation, and should avoid sunshine, rain and violent vibration during transportation;
- Batteries must be insulated with shockproof material and marked with a label with fragile words to avoid damage to the batteries caused by bumps on the way;
- It should be upward and marked with a good upward labeling, do not put it upside down, nor can it be placed at random;
- Batteries in the transportation loading and unloading process must be gently held and placed, do not collide at random;
- Do not press heavy objects on the battery for transportation, to avoid extrusion causing damage to the battery;
- Do not mix with flammable, explosive, and sharp metal objects for transportation;
- There should be moisture-proof, water-proof and fire-proof labels on the packages to avoid danger due to transportation.

8. Specifications

Model	MR-LFP12-9-LAR
Nominal Voltage	12.8V
Rated Capacity	9Ah
Rated Energy	115.2Wh
Cycle Life	≥2000 cycles @+0.2C/-0.2C, 80% EOL
Self Discharge	1% / months
Charge	
Charge Voltage	14.4V
Charge Current (Rec.)	4.5A
Charge Current (Max.)	9A
Discharge	
Discharge Cut-off Voltage	10.0V
Discharge Current (Max.)	9A
Pluse Current	9A
Environment	
Charge Temperature	0℃ to 55℃
Discharge Temperature	-20℃ to 60℃
Humidity	5% – 95%
General	
IP Class	IP30
Terminal	F2
Plastic Case	ABS
Dimensions (L*W*H)	151 × 94 × 95mm
Weight	Net Weight: 2.9kg (Gross Weight: 3.2kg)

All above information shall be changed without prior notice,
Marsriva reserves the right to explain and update the latest information.

Thank you for purchasing Marsriva product

PRODUCT WARRANTY CARD

Product :

Model :

Purchase Date (DD / MM / YY) :

Customer Name :

Telephone Number :

E-mail Address :

Dealer's Name and Address :

Serial Number* :

This Warranty applies only if the Product was newly manufactured on the Date of Purchase and not sold as used, refurbished, or manufacturing seconds. Please keep the proof of purchase and this warranty card for future service requests.

IMPORTANT!

Please store this card in a secured location for future reference.
Marsriva reserves the right to request this card before accepting repair requests.
This does not affect or limit your mandatory statutory rights.

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Specifications are subject to change without notice, all product drawings are for reference only.