UNIBatt Li-ion

USER MANUAL

unicum

Table of contents

1) Background information

To ensure proper and safe use of the UNIBatt battery, please read and retain this manual. Ensure that personnel installing, operating and handling this battery is trained and familiar with all these guidelines before using the product.

All safety instructions must be carefully observed to avoid accidents.

a. Limitation of liability

UNICUM shall not be held responsible for any damage or injury caused by failure to comply with the standards and procedures described in this manual. As an example, and not exhaustively, all direct and indirect damage to products and third parties caused by improper use of the battery or by modifications made to the product by unqualified or unauthorised personnel is excluded.

2) Safety standards

Only authorized and properly trained personnel should handle the battery by strictly applying the instructions described in this manual.

Battery overcharging, incorrect wiring, reversed polarity or short circuits between cable strands can cause extremely dangerous safety damage.

NEVER attempt to open or disassemble the battery! In case of accidental contact with the contents of the battery, rinse contaminated areas of the skin with plenty of water and contact a doctor for medical assistance (see paragraph 2.a).

Never expose the battery to strong heat sources or fire. Never expose the battery to direct sunlight.

Never short-circuit the battery cable strands, either directly or indirectly (by conductive objects).

Do not pierce the battery casing with sharp objects; do not break or step on it.

Always use the battery within operating conditions specified in the following paragraphs.

Do not use the battery if it smells strange, is very hot, discoloured or deformed, or if it shows any other unusual problem. If the battery is in use or being charged, disconnect it immediately and do not use it again.

a. What to do in case of an accident

If, due to a major accident, the structure of the battery should be damaged to the extent that the user comes into contact with the substances contained in the battery, it will be necessary to do the following:

- In case of inhalation: leave and move away from the contaminated area and call a doctor or emergency services.
- In case of contact with eyes: rinse with water for 15 minutes and seek medical advice or assistance immediately.
- In case of skin contact: wash skin with soap and water and seek medical advice or assistance immediately.
- If swallowed: call emergency number immediately.
- In case of fire: use any extinguisher to stop the fire. Dry chemical extinguishers are preferred if available. Although less effective, water can also be used to cool the battery. In any case, notify the fire brigade. If the fire develops in an area that is too dangerous (presence of highly flammable or explosive material), leave the area immediately and call the fire brigade.

3) Usage recommendations

ALWAYS charge a new battery before first use! (See CHARGING THE BATTERY section 7).

Never remove the PVC casing around the battery.

Despite the IP55 protection, UNIBatt should always be kept as dry and clean as possible. Never put the battery in the water.

Protect UNIBatt from falls or mechanical shocks.

Do not solder directly to the battery terminals.

Never connect the battery directly to an electrical outlet plug.

The optimum operating temperature range for the battery is between -10°C and +60°C.

In case of a solar installation, the combination of UNIBatt with a charge controller is strongly recommended to protect the efficiency of the product over time.

4) Product Description

Battery type:	LiFePO4
Nominal voltage:	12V
Maximum charging voltage:	13.8V
Minimum discharge voltage:	10V
Capacity:	6.25Ah
Continuous discharge current:	5A
Maximum discharge current:	50A (less than 600ms)
Impedance:	approx. 160mΩ
Dimensions:	diameter: 50mm length: approx. 395mm (excluding cable glands)
Weight:	700g
Operating temperature:	-10°C to +60°C

5) Benefits

- Close to 100% efficiency.
- Particularly higher power at start-up: between 30% and 50% more than equivalent lead acid batteries.
- Particularly long service life: up to 3 times longer, compared to lead acid batteries.
- Long storage capacity due to very low self-discharge (< 40µA) - more than one year (lead acid batteries: 6 months).
- A deep discharge does not compromise the proper functioning of the battery after recharging.
- Environmentally friendly - Contains no toxic products, corrosive acids or heavy metals.
- Waterproof - acid free, no leakage problems.
- Fast charging with high currents possible.
- Stable discharge voltage (even in not fully charged battery conditions) and low internal resistance.
- Safety - non-explosive and non-flammable.
- Three times lighter in weight than lead acid batteries of the same capacity.

6) Assembly and wiring

Check the battery's state of charge and supplied voltage before installation. If the charge is insufficient, recharge it with an external charger.

For mechanical fixing of the battery use 50mm diameter clamps like this one (or equivalent):

Collars are not supplied with the battery.

Connect the battery electrically to the operating circuit. First connect the - phase (white wire) and then the + phase (brown wire). Always take care not to short-circuit the wires when connecting the battery.

7) Charging the battery

Always use an intelligent charger that is specially adapted to lithium batteries, as they have an algorithm adapted to lithium that is different from lead/acid.

During charging the temperature should be in the 10-45°C range.

Below 13.80V the battery must be charged.

To avoid damaging the battery, the charging voltage should NEVER exceed 15.0V.

Always remove the battery from its usage location before connecting it to the charger.

If the battery feels too hot at touch, stop the charging procedure. Allow the battery to cool down before resuming the charging procedure.

After charging, leave the battery at rest for 1 hour before usage.

8) Maintenance

NEVER attempt to open the battery.

Always make sure that the connection terminals are clean (no rust or dirt).

Every 180 days, check the condition of the battery with a tester or other means.

When winterizing the pool, always remove the battery from its location and store it in a dry place in accordance with the recommendations below.

9) Storage

Store in a clean, dry (60% to 75% humidity) and well-ventilated place.

The temperature of the storage place should remain within the 0-30°C range; ideal storage temperature is 25°C.

Avoid contact with corrosive substances.

Keep away from heat and flame.

10) Transport

Always check national regulations in force concerning the transport of lithium batteries and observe them.

Do not strike or subject the battery to strong blows and do not throw it away.

Do not immerse or wet the battery.

Do not transport the battery with flammable or explosive substances or sharp objects.

11) Disposal of a used battery

As with all other lithium batteries, UNIBatt should be disposed of in accordance with national regulations for this type of equipment.

Never dispose of the product in household waste but take it to the nearest recycling centre.

After dismantling and during transport, insulate the two wires of the electrical phases with insulating tape or equivalent.

12) Option: Connection to WIN500-MPPT charge controller

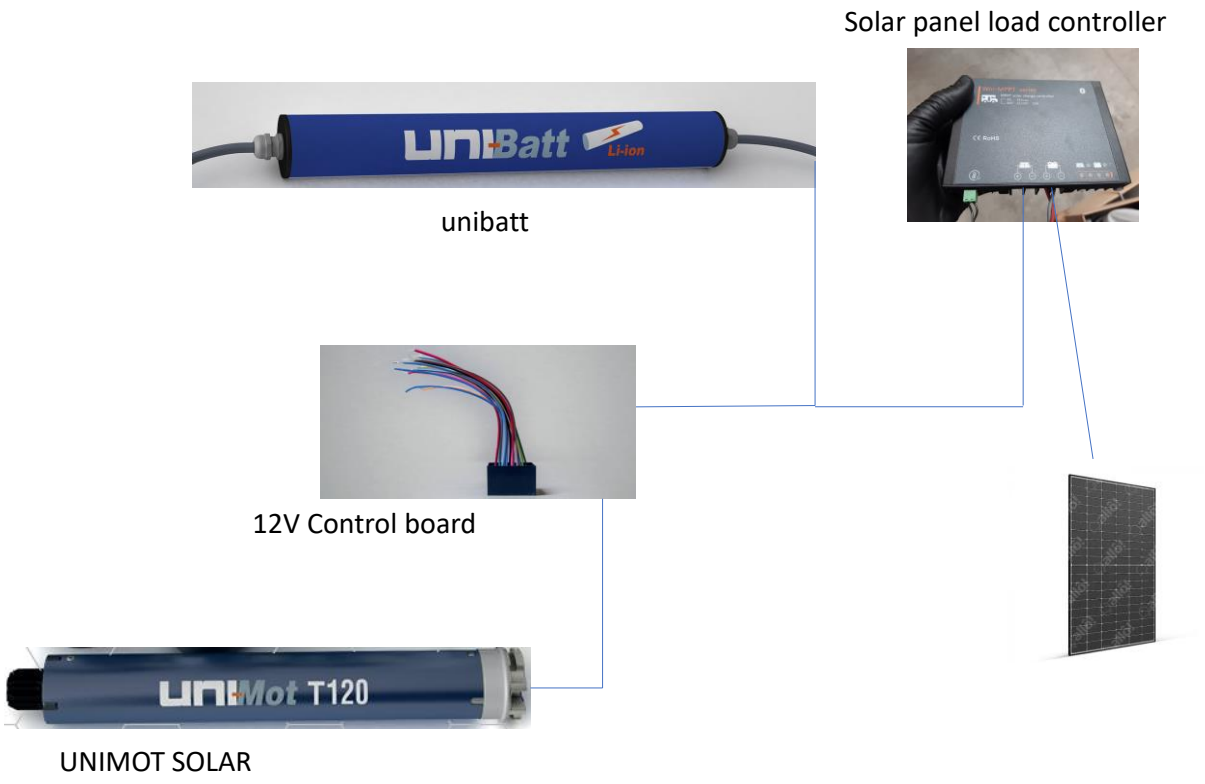
UNICUM strongly recommends the use of a charge controller with UNIBatt when the application is powered by a solar panel.

The model proposed by UNICUM, WIN500-MPPT, is also equipped with a Bluetooth function that allows the user to have on his smartphone a lot of information about the battery.

NOTE: Carefully read the instructions for use of the charge controller inside its packaging.

a. Wiring diagram including the charge controller

As an example, the following diagram shows the connections needed to power UNIMot Solar:



When wiring the charge controller always proceed as follows:

1) Connect battery first, starting with the negative pole and then the positive.
2) Connect solar panel last, starting with the negative pole and then the positive.

b. How the app works

The application will be provided to you by your UNICUM distributor or can be downloaded from www.unicum.tech/

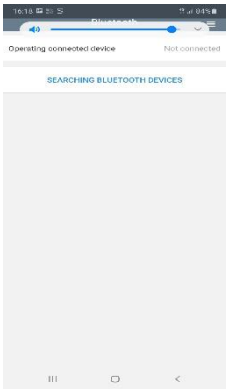
Make sure that the WIN500-MPPT controller is working properly (blue LED on).

Once you have installed the application on your phone, launch it and perform the following procedure:

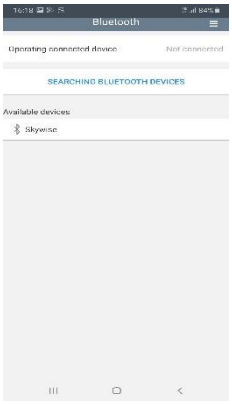
1) Starting the application

2) Connection to the charge controller:
search for reachable devices.

Click on "SEARCHING BLUETOOTH DEVICES"



3) Connection to the charge controller:
click on the device named "Skywise".



4) Visualisation of the status of the installation (monitoring window)

The screen displays the following information:

- Radiation level: day or night

- Percentage of battery charge

- Load present on the controller output

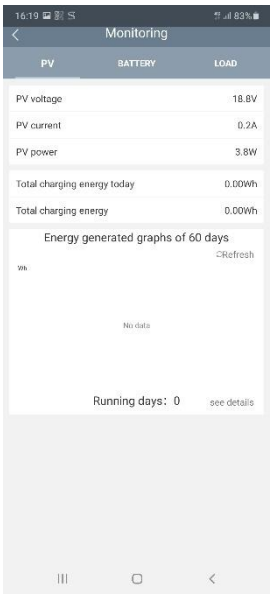
- "PV" tab: voltage, current and electrical power generated by the solar panel at that moment.

- “Battery" tab: voltage, supply current and temperature of the battery at that moment.

- “Load" tab: voltage, current and electrical power used by the device that is powered by UNIBatt.

Other functions and views are available for further analysis.

By clicking on one of the three tabs above you will have access to cumulative data and statistics on the last 60 days of controller operation.



Settings menu

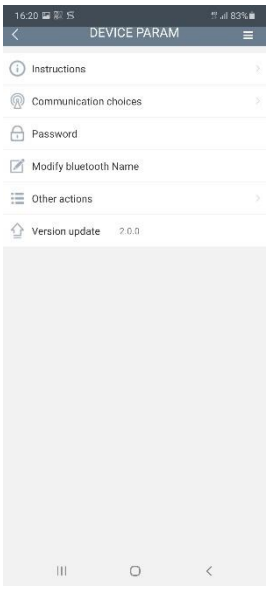
This menu can be accessed by clicking on the small gear positioned in the upper right corner of the monitoring window.

This menu allows you to, among other things:

- Access the online help ("Instructions" function).

- Protect the application with a password ("Password" function).

- Change the name of the charge controller ("Modify Bluetooth Name" function).
  This function is particularly useful if you want to manage several charge controllers with the same application.



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