01/2024

Zenith LITHIUM

User manual
Batterie Zenith Lithium

THESE INSTRUCTION CONCERN THE FOLLOWING MODELS: **ZLI012100**

IMPORTANT: the "General Warranty Conditions" in force and available on the website www.unionbatteryservice.it are to be considered an integral part of this manual and binding.

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1. INTRODUCTION

a. The “ZENITH LITHIUM” series batteries are lithium ion batteries identified with the ONU number UN3480, class 9 (subsequently referred to as "lithium batteries"). The legislation in object also regulates the packaging methods, of product identification as well as the directives for transport.

b. They are complex devices and are mainly composed of LiFeP04 type lithium ion cells (more commonly referred to as LFP) and control electronics called BMS (Battery Management System). The BMS performs all and only the control functions to keep the battery itself safe. When it detects anomalies, it blocks the operation of the battery (during this event no voltage value will be measured at the ends of the battery output cables). In the following paragraphs we will look at these aspects in more detail.

c. The batteries are equipped with an ON/OFF button for turning the BMS on/off. In the OFF position, no voltage value will be measured at the ends of the battery output cables. The OFF position of the button is not sufficient to prevent any short circuits (it could be accidentally pressed), it is therefore always recommended to appropriately isolate the terminals of the battery output cables.

d. Before storing, transporting, installing and using the battery, carefully read this manual, as well as the general conditions of warranty and the technical data sheet of the battery itself, available on the website www.unionbatteryservice.it or simply by framing the QR code printed on the upper label. The data shown on the upper battery label shows only the main technical information.

e. For any doubts or questions, the technicians at U.B.S. UNION BATTERY SERVICE are available to provide adequate technical support.

2. STORAGE

a. Store the battery in suitable environments in compliance with the reference regulations in force, considering the characteristics of the product as indicated in point a) of the Introduction.
b. Store in environments protected from bad weather, properly ventilated and which respect the temperatures indicated in the technical data sheet of the product.
c. Store the battery in a vertical position (with handles at the top and legible packaging writing).
d. Store the battery with a charge capacity between 30% and 50%. Periodically check that this value is maintained.
e. Store the battery switched off (button OFF) and in the original packaging.
f. Store ensuring that the packaging/battery is not deformed.
g. Promptly report any smoke/flames coming out of the battery to the competent bodies. Warn of danger any other people present and appropriately report the affected area.

3. TRANSPORT

a. Transport the battery in compliance with the regulations reference in force, considering the characteristics of the product as indicated in point a) of the Introduction.
b. Transport the battery switched off (button OFF) and in the original packaging.
c. Transport the battery in a vertical position (with handles in high and legible packaging writing).
d. Transport the battery ensuring that the packaging/battery are not subjected to deformation or damage. It is allowed place the battery on a pallet as long as it is suitable secured and the cables do not have to bear the weight of others overlapping elements.
e. During transportation the battery must be adequately stored protected from the weather.
f. During transport the battery must be protected from short circuits circuit, including contact with conductive material inside the packaging itself which could cause a short circuit.
g. Transport the battery with a charging capacity that respects the reference regulations (see ADR, IMO, IATA), in any case never more than 50%.

4. PRE-INSTALLATION

a. Before proceeding with the installation it is necessary to check the compatibility between the battery and the application on which it will be used:

I. read the battery data sheet.
II. Check that the rated voltage of your load is compatible with that of the battery: it is forbidden to connect batteries in series.
III. Check the absorption of your load (constant and peak) and compare them with those allowed by the battery.
IV. Check the dimensions, weight and length of the cables are compatible with your application.
V. Check that the working environment temperature is within limits indicated in the technical data sheet.
VI. Check that the battery charger is suitable for charging the charger.

b. Check with particular attention that the environment in which you intend to install the battery (e.g.: home, shed, boat, camper, vehicle, etc.) can accept the presence of lithium batteries.
c. Once the battery has been removed from the packaging, carefully check its integrity. DO NOT install the battery if any part of it is deformed or mechanically damaged.
d. DO NOT install the battery and promptly notify the competent persons, if the battery emits smoke, excessive heat, fire or liquid leaks. Step away promptly, make other people safe and the surrounding area. In case of contact with liquid, wash thoroughly with water and consult a doctor.
e. **ZENITH LITHIUM batteries fall into this categoryUN3480, lithium ion, 9, (E), and are certified according to reference standards indicated in the CE certificate (see declaration of conformity). The customer (user) is aware of the product he is using and is therefore required to take ALL precautions**

Demonstrative example of ZLI012100 battery data sheet

Corrente costante di scarica / Constant discharge current	*200A*
Corrente impulsiva di scarica / Impulse discharge current	*Max 250A per 15"* *Max 400A per 3"*
Corrente max di carica consigliata *Max recommended charging current*	*100A*
Corrente impulsiva di carica / Impulse charge current	*> 150A per 10"*
Tensione di carica consigliata / Recommended charging voltage	*13.9V*
Tensione di carica massima / Maximum charging voltage	*14.6V*

Demonstrative example of ZLI012100 battery data sheet

Temperatura di scarica massima *Maximum discharge temperature*	*-15°C / +60°C*
Temperatura di scarica consigliata *Recommended discharge temperature*	*-10°C / +45°C*
Temperatura di carica massima / Maximum charge temperature	*0°C / +60°C*
Temperatura di carica consigliata *Recommended charge temperature*	*+5°C / +40°C*

necessary for correct/compatible installation and use, you will also have to verify that the environments in which are employed are equipped with ALL devices safety required by law, with particular attention to firefighting solutions. It will be the care and responsibility of the customer/installer position the batteries in such a way that any dangerous situations do not spread, generating a domain effect.

5. INSTALLATION

a. **It will be the installer's responsibility to connect the batteries to the full compliance with the reference regulations in function of the application and characteristics techniques thereof.**

b. The red (positive pole) and black (negative pole) cables which the battery is equipped with, are used both for the phase both for discharge and for charging.

c. These cables should NEVER be cut. Possible extensions must be agreed with the U.B.S. UNION BATTERY SERVICE technicians.

d. d. During assembly make sure they are appropriately insulated and the button battery is OFF. **Absolutely avoid any short circuit between the two polarities.**

e. For connecting the battery to load/battery charger, we recommend the use of "BUSBAR" (not supplied with the battery, but available upon request).

f. f. You can apply/crimp the plug connection to the load/battery charger, directly on the cables, respecting the polarities. It's recommended the use of suitable tools for ensure connection quality and avoid resulting in battery malfunctions. Such plugs are not included in the battery, but available on request.

g. The battery must be installed in a vertical position (handles at the top and legible writings on the lateral label). Any other placements will go agreed with the U.B.S UNION BATTERY SERVICE technicians.

h. Install the battery in suitable places ventilated..

i. If multiple batteries are installed in the same compartment, position them at a certain distance from each other (1 – 2 cm at least), to ensure adequate cooling of the same.

j. To fix the battery use the inserts threaded available on both sides of the battery, or special straps (not supplied) positioned in such a way as not to jeopardize the correct battery operation.

k. It is absolutely forbidden to weld, screw or apply other fixing brackets in any way directly on the battery.

l. The battery must NOT be tampered with or altered in its entirety, for any reason.

m. The fastening of the battery must be such that guarantee its total integrity during daily use and for the entire period of use.

n. DO NOT immerse the battery in any liquid.

o. Keep the battery away from intense sources of heat.

p. The battery must NEVER be opened.

q. DO NOT obstruct the safety valve.

6. USE

a. The new battery is shipped from the warehouses U.B.S. UNION BATTERY SERVICE with the ability of charging that never exceeds 50%. It is therefore recommended to recharge it completely before use.

b. It is recommended to turn on the battery first and then connect it to the load.

c. The flat battery must be recharged promptly.

d. Use ONLY a suitable charger, with I voltage and current values corresponding to as indicated on the battery data sheet.

e. If installed on electric vehicles, the battery accepts refills coming from recovery systems of energy, as long as it is within the indicated parameters on the technical data sheet.

f. If charging occurs via photovoltaic panels, program the panel control unit themselves, using the charging parameters contained in the battery data sheet.

g. IMPORTANT: the temperature values of the battery during charging are more restrictive compared to those established during the discharge. Evaluate them carefully.

h. The LEDs on the battery cover indicate the status of Charge (S.o.C.) and any anomalies.

i. DO NOT use the battery, and move away from the itself by promptly notifying the bodies competent (responsible / Fire Brigade) and alarming any colleges present, then report the dangerousness of the area, if the battery:

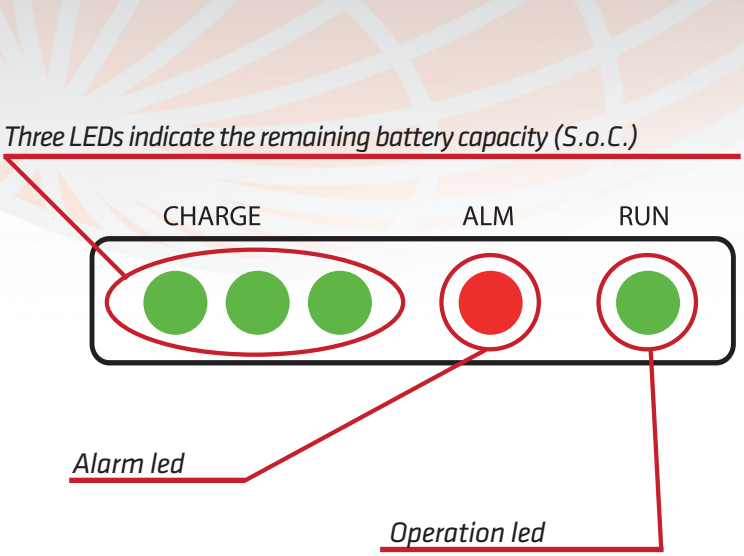
I. is too hot
II. Emits smell/smoke
III. Releases of fire
IV. Liquid comes out. In case of contact with the electrolyte leaked from the battery, wash abundantly with water and consult a doctor.

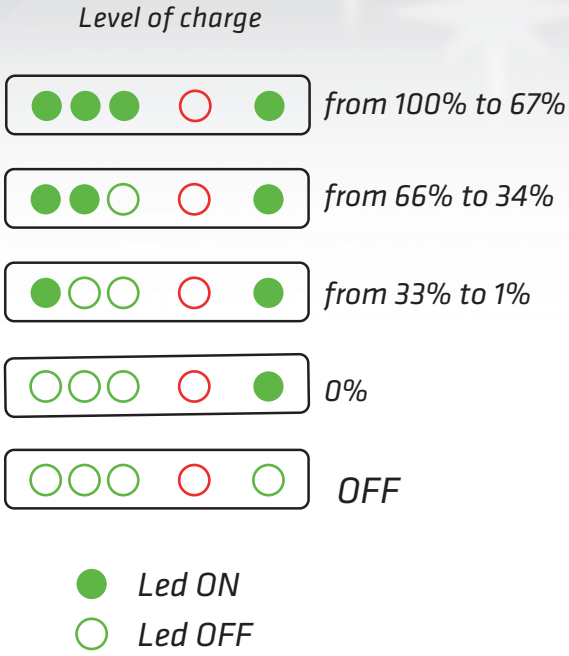
j. If the battery is not used for a long time periods (over a month), leave it off and with the charging capacity between 30% and 50%. Check it periodically.

k. Always recharge the battery if it's not used for long periods (over a month).

l. The battery is equipped with an internal data memory so any event will be recorded. In this way you can also verify the correct usage.

7. INDICATOR INSTRUCTIONS





Battery ON and in status of operation (charge/discharge)	
BMS block the battery (alarm state)	

CAUSE OF THE ALARM STATE	
Over discharge	
Current oukses beyond the allowed limits	
Short circuit	
Battery temperature too high	
Battery temperature too low	

8. STANDARD PROCEDURE FOR THE MANAGEMENT OF THE ALARM STATUS

When the battery goes into alarm, wait more than 30 seconds for the red alarm LED turning off automatically.
When switched off, check the state of charge of the battery and, if not completely discharged, it will be possible to use it.
If the automatic shutdown does not occur, disconnect the battery from the load, turn it off and on by the ON/OFF button, or connect it to the "ZHF.LH" series compatible charger.

If the charger does not start automatically, press and hold the red trigger button (located above the output cables) until the red LED on the charger lights up constantly.
If even in this case the charger does not start, it means that the battery has a thermal problem, so wait for the alarm to automatically switch off. The wait could be long: minutes or hours.

9. MANAGEMENT OF "THE ALARM STATUS"

- **OVER DISCHARGE**
  Procedure: Follow the standard procedure.

- **CURRENT PULSES BEYOND THE ALLOWED LIMITS** *(see technical data sheet)*
  Procedure: After 10 times in an hour that the battery goes into alarm due to current pulses, the BMS will go into permanent block. To reset it, follow the standard procedure.

- **SHORT CIRCUIT**
  Procedure: The red alarm LED will remain active until the BMS is manually reset. To carry out the manual reset, follow the standard procedure.

- **BATTERY TEMPERATURE TOO HIGH** *(see technical data sheet)*
  Procedure: Disconnect the battery from the load and wait for the temperature to drop. When the red alarm LED go off, check the state of charge of the battery and, if not completely discharged, reconnect it to the load.

- **BATTERY TEMPERATURE TOO LOW** *(see technical data sheet)*
  Procedure: If the battery temperature is below 0°C it will be possible to discharge the battery (till -15C°) but not to charge it. Even if the discharge is not allowed: disconnect the battery form the load and wait for the temperature rising. When the red alarm LED go off, check the state of charge of the battery and, if not completely discharged, reconnect it to the load.

10. ON/OFF BUTTON MODE

If the battery is on, using the ON/OFF button, we can access different modes:

a. If pressed once, the RUN LED will start flashing and you will enter the low consumption mode (Low Power Mode).
b. If held down until the status LEDs turn off, the battery will turn off. To turn the battery back on.
c. Press the button again.

11. LOW CONSUMPTION MODE

The "low consumption" mode allows you to reduce the self-discharge of the battery (caused by the BMS), in order to preserve its capacity. In this mode the battery is not active and the RUN LED will continue to flash.
To reactivate it, the user must perform one of the following steps:

- Press the ON/OFF button.
- Connect the charger to the battery.
- Discharge the battery.

Low power mode is activated when the battery remains on for more than 24 hours without being used.

11. ZENITH LITHIUM DISPLAY

a. The display connects to the battery's RS485 port.
b. For connection cable lengths, see the codes available on the website www.unionbatteryservice.it .
c. For connection and programming methods, read the instructions available on the website www.unionbatteryservice.it .

12. MAINTANANCE

a. The battery does not require any complex maintenance.
b. Check over time that:

I. there are no deformations/breakages/tampering of the container and of all the other visible components of the battery.
II. There is no oxidation in the power/signal connections.
III. Do not remove the cover closing screws.
IV. The locking ring nuts of the output cable PGs are always adequately tightened.

13. REPAIR

a. The battery is repairable as several elements that compose it can be replaced.
b. Any repair activity MUST be carried out only and exclusively by U.B.S. UNION BATTERY SERVICE technicians or authorized by it in writing.
c. Any different action immediately invalidates every liability for the product of U.B.S. UNION BATTERY SERVICE.

14. DISPOSAL

a. For disposal, carefully follow the regulations in force at the time you have to do so.

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