



# BC BATTERY CONTROLLER LITHIUM 7000



Thank you for buying the new professional battery charger BC LITHIUM 7000, fully automatic and featuring a 7-cycles charging technology. BC LITHIUM 7000 is compatible with all 12V LiFePO4 batteries and it is provided with special charging program, called POLAR MODE, developed for charging LiFePO4 batteries with low ambient temperatures. Moreover, BC LITHIUM 7000 executes a complete test procedure, analysing the battery and the vehicle's charging system. The device is controlled by a microprocessor which is in charge of monitoring in real time the current status of your battery and executing autonomously the 7 following charging cycles.

## CHARGING ALGORITHM - BC LITHIUM 7000

**Phase 1 - Initialization:** the device verifies the battery conditions and an integrated sensor measures the ambient temperature: at low temperatures (< 5°C) the charging current is limited and the POLAR MODE is automatically activated.

**Phase 2 - Recovery:** if the battery is deep discharged, the device tries to recover it, taking it back to a higher voltage, necessary for the execution of the following step.

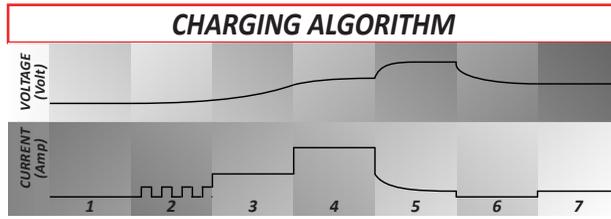
**Phase 3 - Soft Charge:** if the battery is in a condition of significant undercharge, the device provides a light pulsing current to the battery, to overcome this critical phase.

**Phase 4 - Bulk Charge:** during this phase, the device provides full current to the battery, recovering about 85-90% of the battery capacity.

**Phase 5 - Equalization / Absorption:** during this phase the device recovers the remaining 15-20% of the battery capacity, and the state of charge of the different battery cells is rebalanced.

**Phase 6 - Battery Analysis:** the device stops providing current to the battery for a short time, in order to verify whether the battery is able to retain the charge received during the previous phases. This test is periodically repeated during the maintenance.

**Phase 7 - Maintenance:** the device keeps your battery in the best charge conditions for very long periods (even months) during which your vehicle is left unused, without any possible drawback (battery overcharge/overheating...).



## BC LITHIUM 7000 - FEATURES

- LCD display with blue backlight for an easy vision (even in the distance at night), which shows: the charging cycle executed (Charge, Desulfation, Maintenance...), the battery voltage (Digital Voltmeter) and any occurring problems (polarity inversion, short circuit, battery not connected...).

- **Integrated temperature sensor to measure the ambient temperature: in case a low temperature is detected (< 5°C), the POLAR MODE is activated (Yellow LED on).**

- Real time monitoring of the main battery parameters during every charging cycle.

- Battery Overcharge Protection, which triggers in case the microprocessor detects a voltage level higher than a given fixed threshold.

- Automatic and user-friendly test procedure. The device executes autonomously and sequentially the following tests:

1. Battery Voltage at rest;
2. Battery Cranking Power while cranking the engine;
3. Alternator/Regulator Test.

Upon conclusion of every cycle, the device switches automatically to the next one, without any external intervention: **BC LITHIUM 7000 CAN BE LEFT ALWAYS CONNECTED TO THE BATTERY WHEN THE VEHICLE IS LEFT UNUSED.**

The device belongs to BC Battery Controller family of battery chargers, distributed by the best battery/car/motorbike dealers. All the products BC Battery Controller have been designed, manufactured and tested according to the current norms in force in the European Union in order to comply with all the requirements for electronic equipments (i.e. device safety, electromagnetic compatibility). Please read carefully this manual and follow all its recommendations before using and installing the device.

## DIRECTIONS

This device has to be used according to the working conditions it has been designed for. Any other use is to be considered either dangerous or improper. The device is suitable for charging LiFePO4 batteries. Do not use the device for NiCd, NiMH, other types of lithium batteries or non-rechargeable batteries. The manufacturer is completely exonerated from whatever responsibility for possible damages due to either wrong or improper use of the device. It is important to remember that the following basic usage principles have to be considered whenever using the device:

- Do not touch the device with wet hands (or wet feet).
- Do not touch the device barefoot.

- Do not expose the device to the atmospheric agents (rain, water, saltiness...).

Please verify that the input and output cables are in good conditions before using the device. If the input cable is damaged, do not use the device: ask the manufacturer or an authorized service agent for repair or replacement.

Before executing any cleaning/maintenance operation on the device, please check the device is not connected to the power outlet. In case the device does not work properly, do not attempt to repair it; please ask either your local dealer or the equipment manufacturer (info@batterycontroller.it) for support. Any attempt to open unduly the device shall cause the withdrawal of the warranty.

## CONTENT OF THE PACKAGE

1. BC LITHIUM 7000 battery charger, with supply cable and battery connection cable directly coming out of the battery charger, consisting of two high insulation grade red and black wires (length: 2 meters).
2. Waterproof battery connector with eyelets, to be connected to the battery + saver cap.
3. Optional accessories may be included according to the selected kit: battery connector with clamps and/or universal cigar socket adapter for both standard (diam. 18 mm) and German (DIN. 4165 - diam. 12 mm) cigar sockets.
4. Copy of this manual.

## BATTERY TYPES

The battery charger BC LITHIUM 7000 is specifically designed for the maintenance of all 12V LiFePO4 batteries currently available on the market), thanks to the charging algorithm executed. Please refer to the "Technical Data" for indications about the battery capacity range to which your battery charger is addressed.

## BATTERY CONNECTOR WITH EYELETS INSTALLATION PROCEDURE

When charging a battery in a vehicle, it is advisable to install the battery connector with eyelets, which allows to perform the following procedure just once. The user is kindly requested to execute the installation with maximum care (see "Directions" and "Safety" sections). If necessary, please entrust qualified personnel with the execution of the steps reported here below:

- Connect the eyelets to the battery: the black wire shall be connected to the (-) negative battery terminal, the red wire to the (+) positive battery terminal.
- Fix the connector in a stable and easy-to-reach place on board (for example, under the saddle).

## BATTERY CONNECTOR WITH CLAMPS INSTALLATION PROCEDURE

If the battery is out of the vehicle, just connect the black clamp to the (-) negative battery terminal and the red clamp to the (+) positive battery terminal. If charging the battery in a vehicle, connect first to the battery terminal not connected to the chassis (usually the positive one, red clamp to the + battery pole), and then connect the other clamp to the chassis, far from the battery and the fuel line. After using the device, disconnect in reverse sequence.



**IP44 - WEATHERPROOF SUITABLE FOR OUTDOOR USE**  
Protection against water splash and solid foreign bodies > 1 mm

## BC LITHIUM 7000 INSTALLATION PROCEDURE - BATTERY CHARGING

- **Connect the device to the power outlet. Please note that connecting the device first to the battery and not to the power outlet, the Testing Working Mode gets activated.**
- The LCD Display turns on, showing the message: "Error: Battery not connected".
- Remove the connector saver cap from the cable with eyelets and connect the battery charger to the cable. Otherwise, connect the battery charger to the battery through the insulated clamps (see previous section) or the cigar socket adapter.
- After a few seconds, the LCD display will show the charging cycle under execution as well as the battery voltage.

## BC LITHIUM 7000 INSTALLATION PROCEDURE - BATTERY TESTING

- Connect the device to the battery and not to the power outlet.
- The LCD Display will show the scrolling message "BC TESTER". Follow the instructions to proceed with the test.

## BATTERY CHARGER DISCONNECTION PROCEDURE

Please follow the following steps to disconnect the battery charger from the battery:

- Disconnect the battery charger from the power outlet.
- Disconnect the battery charger from the cable with eyelets and put the saver cap on the connector. Otherwise, disconnect the clamps from the battery or the cigar socket adapter from the cigar socket.
- Put the battery charger back in its box to minimise its exposure to atmospheric agents.

## BATTERY CHARGING WORKING MODE

In case of normal working conditions, the display shows the following messages:

- Charging Cycle: "Battery in... Recovery / S. Charge / Charge / Equaliz. / Verify / Mainten."
- Battery voltage (for example "13.5V") and battery State of Charge.

- In case a low ambient temperature (< 5°C) is detected at the beginning of the charging procedure, the display indicates that the POLAR MODE is active.

For more details about the charging steps, please read the "Charging Algorithm" section.

Possible occurring anomalies are indicated by the device as follows:

- "Error: Power Input Missing".
  - "Error: Battery not connected".
  - "Error: Battery Inversion of Polarity" (polarity inversion or short circuit).
  - "Battery with low Level of Charge": the Battery Analysis found that the battery can not retain the charge received; it may be necessary to substitute it.
- In case of wrong installation or functioning, please disconnect the device following the procedure reported in the "Disconnection Procedure" section.

## BATTERY TESTING WORKING MODE

After showing the message "BC TESTER" on the display, the test procedure will start. During the execution of the test the device will show all the instructions and results.

- Battery S.O.C. Test at rest: **the battery must be unused for 2 hours or more.** Test result: battery voltage and estimate of the battery State Of Charge.

- Battery Cranking Power Test: **the duration of the engine cranking has to be less than 1 second.** Test result: "Excellent / Good / Fair / Poor".

- Alternator/Regulator Test: **run the engine at about 2500 rpm during the 30 seconds following the engine cranking.** Test result: "Test successfully passed / Charge ok but a bit weak / Charge weak; please check / Charge high; please check".

During the Cranking Power Test, if the battery voltage drops down too much, the device may reset. The battery may have not enough power: recharge it or substitute it.

## ACCESSORIES

The default harness can be varied with a full set of accessories to allow a very quick connection to the battery. For any further information about this topic, please visit the "Accessories" section on [www.batterycontroller.co.uk](http://www.batterycontroller.co.uk) web site or ask your local dealer.

## MAINTENANCE

In order to ensure a regular functioning, it is suggested to periodically check the correct and stable connection of the eyelets to the battery and to remove dust and oil from the battery poles with a metallic brush. Please read the "Safety" section before.

The device has been specifically designed to be maintenance-free. Please remove possible dust which may get accumulated on the cover of the device using a delicate detergent to avoid damaging the stickers. In case any item of the kit does not work correctly, please contact either your local dealer or the manufacturer asking for item repairing or substitution. Any attempt to open the device shall imply the warranty becomes no longer valid.

## WARRANTY

Forelectronica Srl provides a 36 months warranty to cover the device malfunction or failure due to improper assembly/manufacturing or breakage of any internal component. Parts, whose deterioration is because of the usage, are not covered by the warranty. Any repairing right under manufacturer's warranty decays in any of the following cases: improper use of the device; unduly opening of the device; repairing performed by unauthorised personnel.

This warranty is limited to the original buyer of the device and it can not be transferred to third parties. This warranty excludes implicit forms of warranty, including possible damages due to the usage of the battery charger: Forelectronica Srl is exonerated from any damage to either persons or goods due to the usage of its products. The transportation expenses to return the defective device, together with the Warranty Coupon reported here and the supplier ticket, are to be paid by the purchaser.

## STATEMENT OF CONFORMANCE

Forelectronica Srl declares under its responsibility that the battery chargers BC Battery Controller fulfil all European norms and regulations.  
Rules of reference: EN60335-1, EN60335-2-29, EN62233 (in accordance with Directive LVD 2006/95/EC and subsequent amendments); EN55014-1, EN55014-2, EN61000-3-2 and EN61000-3-3 (in accordance with Directive 2004/108/EC and subsequent amendments).

## MANUFACTURER:

Forelectronica Srl  
Via Meucci, 11 20080  
Cislano (MI) - ITALY  
info@batterycontroller.it



## WARRANTY COUPON

This warranty covers the device malfunction or failure due to improper assembly/manufacturing or breakage of any internal component. Parts, whose deterioration is because of the usage, are not covered by the warranty. This warranty excludes implicit forms of warranty: Forelectronica Srl is exonerated from any damage to either persons or goods due to the usage of its products.

**Model:** \_\_\_\_\_  
**Anomalies Description:** \_\_\_\_\_

Attention! This coupon has to be returned together with the supplier ticket and the device in its original packaging.

## TECHNICAL DATA

MODEL	BC LITHIUM 7000
Input Voltage	220±240V ac, 50-60Hz
Output Voltage	14.2V - nominal 12V
Charging Current	7.0 A max
Diagnostics & Safety	Battery Poles Inversion Short Circuit Overheating
Charging Algorithm	Automatic 7 cycles
Battery Types	12 V LiFePO4
Battery Capacity	3-100 Ah
Operating Temperature	from - 20°C to + 50°C