

## BATTERY CHARGER

# BC1



Installation and User Manual



**ATTENTION: To reduce the risk of electric shock, do not remove cover. Refer servicing to qualified service personnel. Disconnect the mains supply before connecting or disconnecting the links to the battery.**



**Read the Instruction Manual carefully before use. Verify that the selected charge curve is suitable for the type of battery You have to re-charge.**

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Explanation of Graphical Symbols



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the equipment's enclosure; that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the equipment.

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This product is covered by warranty.

The relative warranty certificate is attached to the Instructions Manual.

If the Manual is not provided with this certificate, please ask your retailer for a copy.

For further references, please write the serial number in the proper space:

**Serial No.** \_\_\_\_\_

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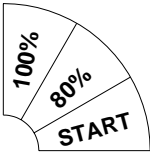
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Second Edition

### Installation and safety instructions

Battery charger BC1 has been designed to provide safety and reliable. It is necessary to observe the following precautions in order to avoid damage to persons and to the battery charger:

- Read the installation instructions contained in this Manual carefully. For further information put the Manual in a proper place.
- Fix the battery charger to a stable surface through the appropriate holes inserted on the fixing flanges. In case of installation on a vehicle it is advisable to use antivibration supports.
- Preferably the charger should be installed in the vertical position with the fan facing up. The horizontal installation is allowed. Never install in the vertical position with the fan facing down.
- Ensure all ventilation ports are not obstructed, to avoid the overheating. Do not put the battery charger near heat sources. Make sure that free space around the battery charger is sufficient to provide adequate ventilation and an easy access to cables sockets.
- Protect the battery charger from ingress of water. Do not pour liquids inside the case.
- Verify that the available supply voltage corresponds to the voltage that is stated on the battery charger name plate. In case of doubt, consult a retailer or local Electric Supply Authority.
- For safety and electromagnetic compatibility, the battery charger has a 3-prong plug as a safety feature, and it will only fit into an earthed outlet. If you can not plug it in, chances are you have an older, non-earthed outlet; contact an electrician to have the outlet replaced. Do not use an adapter to defeat the earthing.
- To avoid damaging the power cord, do not put anything on it or place it where it will be walked on. If the cord becomes damaged or frayed, replace it immediately.
- If you are using an extension cord or power strip, make sure that the total of the amperes required by all the equipment on the extension is less than the extension's rating.
- Disconnect the mains supply before connecting or disconnecting the links to the battery.
- To recharge Lead Acid batteries: WARNING: Explosive Gas – Avoid flames and sparks. The battery must be positioned in a correctly cooled place.
- Do not use to charge batteries installed on board of thermal engine cars.
- Avoid recharging of non-rechargeable batteries.
- Verify that the nominal voltage of the battery to be re-charged corresponds to the voltage stated on the battery charger name plate.
- Verify that the selected charging curve is suitable for the type of battery to be re-charged. In case of doubt, consult Your retailer. ZIVAN S.r.l. will not accept any responsibility in case of mistaken choice of the charging curve that may cause irreversible damage to the battery.
- In order to avoid voltage drop, thereby assuring 100% charge at the battery, the output cables must be as short as possible, and the diameter must be adequate for the output current.
- Do not try to service the battery charger yourself. Opening the cover may expose you to shocks or other hazards.
- If the battery charger does not work correctly or if it has been damaged, unplugged it immediately from the supply socket and from the battery socket and contact a retailer.

## LED Indicator



RED LED shows that the battery is in initial charging phase.  
 YELLOW LED shows that the battery charger has reached 80% of charge.  
 GREEN LED shows that the battery has reached 100% of charge.

Further information can be found in the description of the Charging Curve.  
**Example:** the RED LED on blinking indicates a constant tension phase.

## Alarms

The flashing LED shows that an Alarm situation has occurred:

Condition	Alarm Type	Description (Action)
GREEN flash	Timeout	Phase 1 have a duration in excess of the maximal allowed. (Verify the battery capacity).
RED-YELLOW flash	Battery Current	Loss of output Current control. (Failure of the control logic).
RED-GREEN flash	Battery Voltage	Battery not in conformity (verify the nominal voltage) or loss of output Voltage control. (failure of the control logic).
RED-YELLOW-GREEN flash	Thermal	Overheating of semiconductors. (Verify the fan operation).
YELLOW-GREEN flash	Selection	An unavailable configuration has been selected (Verify the selector's position)

When there is an alarm the battery charger stops supplying current.

## Battery

A battery is characterised by two sizes: tension and capacity.

### Tension:

Each element has a nominal tension, which depends on the type of battery (no matter what size).

In order to reach higher tension, many elements are connected in series, so creating a "BATTERY" of elements.

The number of elements is calculated by dividing the nominal tension of the battery for the tension of each single element in the table:

Type	Nominal Tension
Pb	2 V/cell
NiCd	1,2 V/cell
NiMH	1,2 V/cell
NiZn	1,714 V/cell

### Capacity:

It is the quantity of electric charge that the batteries can supply to an external circuit before the tension decreases under the final limit value and it is obtained by multiplying the intensity of the discharging current **I**, expressed in ampere (**A**), for the discharging time **t** expressed in hours (**h**): **C = I x t**

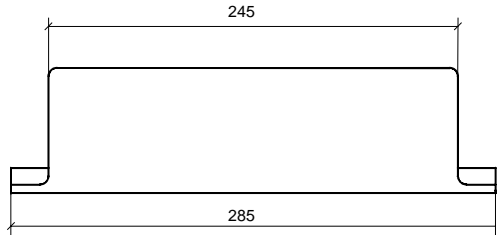
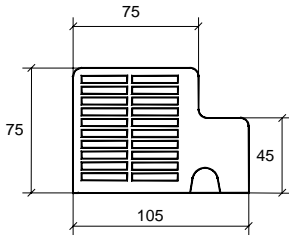
The traction battery capacity is normally referred to the discharging system of 5h: **C5 = I x 5h**.

The capacity values that can be recharged by the battery chargers can be found in the description of the Charging Curve (this value is not present in the curves able to charge any capacity).



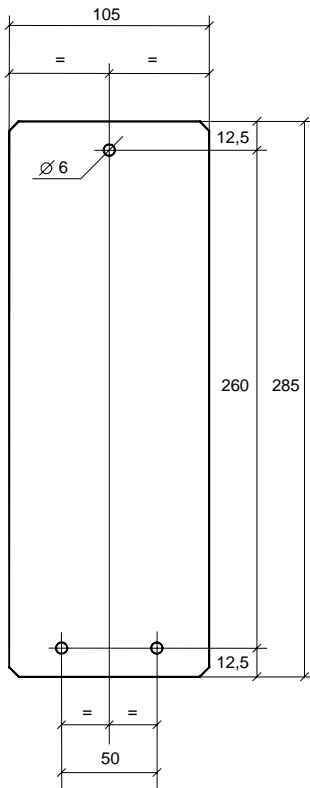
**This device is in conformity with the Low Voltage directive 73/23/EEC and EMC directive 89/336/EEC and their further modifications.**

### Mechanical dimensions



**N.B.** All dimensions are expressed in mm.

### Drilling details



**Advised Installation**

**N.B.** All dimensions are expressed in mm.

## TECHNICAL FEATURES

Ta=25°C unless otherwise specified.

### Mains side

Description	Symbol	Test Condition	Value and/or Range	Unit
Supply Voltage	V <sub>in</sub>	-	230 ± 10%	V <sub>eff</sub>
Frequency	f	-	50 ÷ 60	Hz
Absorbed Maximum Current	I <sub>in_max</sub>	P = P <sub>max</sub>	5	A <sub>eff</sub>
Power Factor	cosφ	P = P <sub>max</sub>	0,7	-
Absorbed Maximum Power	P <sub>in_max</sub>	P = P <sub>max</sub>	850	W

### Battery side

Description	Symbol	Test Condition	Value and/or Range	Unit
Output current ripple	-	I = I <sub>1</sub>	< 5%	-
Absorbed current	I <sub>a</sub>	Equipment turned off	< 1	mA
Output voltage ripple	-	U = U <sub>1</sub>	< 1%	-
Maximum power supplied	P <sub>max</sub>	U = U <sub>1</sub> , I = I <sub>1</sub>	720	W
Output capacity	C	-	1000	μF

### General

Description	Symbol	Test Condition	Value and/or Range	Unit
Operating range of temperature	ΔT	-	from -20 to +50	°C
Maximum relative humidity	RH	-	90%	-
Switching frequency	f <sub>c</sub>	-	80 ± 5%	kHz
Efficiency	η	At each condition	> 85%	-
Maximum size	a×b×c	Without connecting cable	285×105×75	mm
Weight	-	Without connecting cable	1390	g
Enclosure class	-	-	IP20	-

**Protection and Safety**

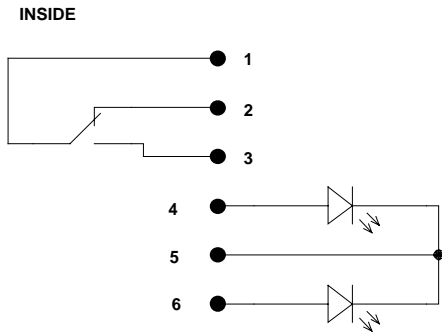
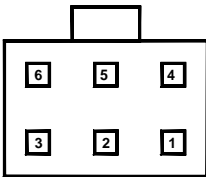
<b>Description</b>	<b>Symbol</b>	<b>Test Condition</b>	<b>Value and/or Range</b>	<b>Unit</b>
Insulation	-	Mains to Battery side	1250	$V_{AC}$
Insulation	-	Mains side to Earth	500	$V_{DC}$
Insulation	-	Battery side to Earth	500	$V_{DC}$
Leakage current	$I_L$	Supplied equipment	< 3	mA
Input fuse	F1	Inside the equipment	10 (delayed)	A
Output fuse	F2	Inside the equipment	40	A
Minimum output voltage of operation (Battery Detector)	-	Equipment turn on	1,3	V/cell
Reverse output polarity	-	At the connection to the Battery	Protection provided by fuse F2	-
Thermal protection of semiconductors (Temperature of Thermal Alarm)	-	$T_a=55^{\circ}C$	100	$^{\circ}C$
Safety Requirements (Rules)	-	EN60335-1, EN60335-2-29	-	-
EMC Requirements (Rules)	-	EN55014-1, EN61000-3-3 EN55014-2, EN61000-4-2 EN61000-4-4, EN61000-4-5 EN61000-4-6, EN61000-4-11	-	-

Options with connectors 6 poles

Pin	Use
1	Common contact net presence
2	Normally closed contact for mains presence
3	Normally opened contact for mains presence
4	Red LED anode
5	Common cathode LED
6	Green LED anode

Technical features : exchange contacts  
 0,3A 125VAC  
 0,3A 110VDC  
 1A 30VDC

Connector - Diagram connection





**Options with connectors 4 poles and 2 poles**

**Connector 4 poles**

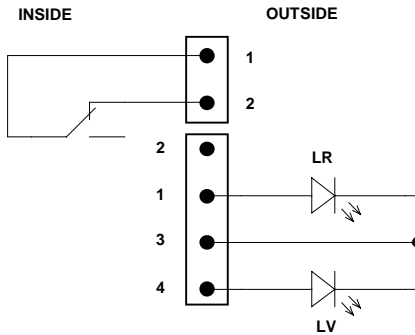
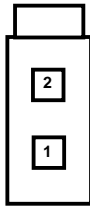
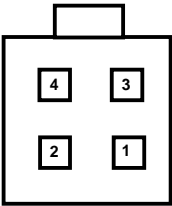
Pin	Use
1	Red LED anode
2	Not used
3	Common cathode LED
4	Green LED anode

**Connector 2 poles**

Pin	Use
1	Common contact net presence
2	Normally closed contact for mains presence

Technical features:    exchange contacts  
                                  0,3A 125VAC  
                                  0,3A 110VDC  
                                  1A 30VDC

**Connector - Diagram connection**



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