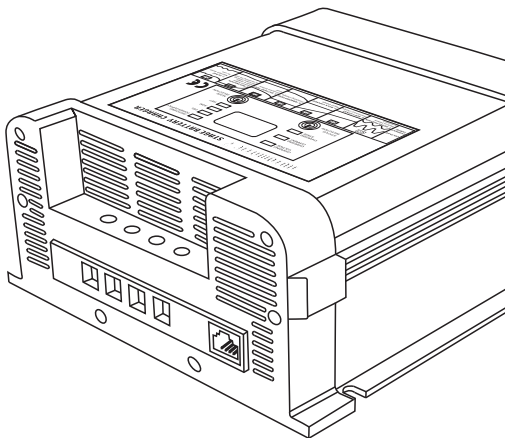


# Smart Battery Charger

**Automatic 7 stage battery charger with switching mode**

**12V 10A, 24V 5A, 12V 20A, 24V 10A**



※ THE IMAGE SHOWN HERE IS INDICATIVE ONLY, PLS REFER TO THE ACTUAL PRODUCT.

## 1. Important information

Thank you for purchasing our smart battery charger. Please read this instruction manual carefully before operating the device. Keep this manual in a safe place for future reference. This instruction manual is part of the product. It must be handed over along with the device if it is passed on to a third party.

## 2. Introduction

This compact smart battery charger uses the latest switch-mode technology and is specifically designed to charge lead-acid batteries in a dual battery system to their best ability. The automatic 7 stage charging algorithm delivers much faster and more efficient charging, without the issue of voltage drops. Thanks to the boost-charging feature, the charger can improve battery condition and recover some lost battery capacity from older batteries. This also improves the charge delivered to your battery, increasing battery life and preventing premature battery failure.

This smart battery charger can be used for GEL/AGM/WET batteries by pressing the mode selection button. This smart battery charger can also be used as a constant power supply to run accessories that require a stable and constant DC voltage. For safety reasons, the input and output of the charger are completely isolated and the batteries are protected from overcharging.

The cooling fan has dual thermal / charge current control. When the temperature reaches 45 degrees, or when the charge current reaches 20A, the cooling fan will start working. It will switch on and off automatically to control the internal temperature of the unit.

The battery will start charging and the charger will produce DC output only once it is connected to the battery. This is because the charger measures the voltage of the connected battery first, and then chooses one of the 7 charging stages from which it should start charging the battery. For a battery between 9-11V it will start with the stage C-1; if the battery is producing 11-12.6V it will be C-2 stage; for the battery 12.6V-14V the charger will start from bulk charge C-3 stage (see the description of charging stages in section 6 of the manual).

DC short circuit protection: when short circuit is detected, DC output will be cut off and LCD display will show "-P-". Once short-circuit is resolved, the charger will automatically reset.

Over heat protection: when the temperature reaches 75 +/- 5C, LCD display will show "-P-". When the temperature reduces, the charger and LCD display will automatically reset.

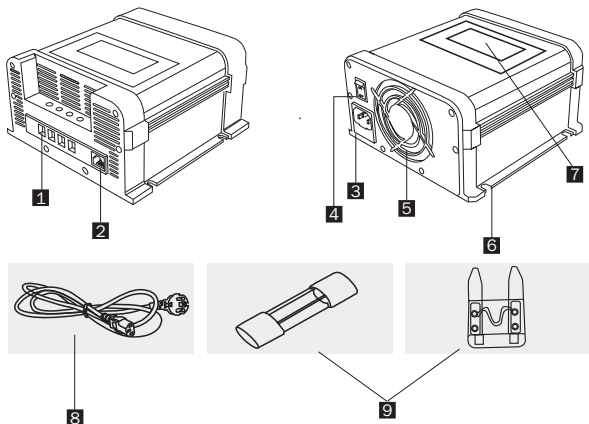
## 3. Warning

Risk of electric shock! Do not open the device if it has been connected to the AC power source.

## 4. This device has been CE tested and conforms to the applicable directives and standards.

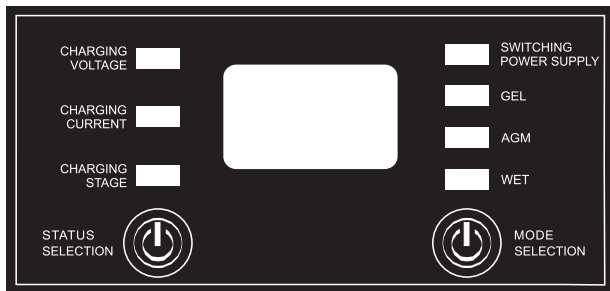
## 5. Battery charger diagram and components

Package includes smart charger unit, user manual, AC power cable and spare fuse(s).



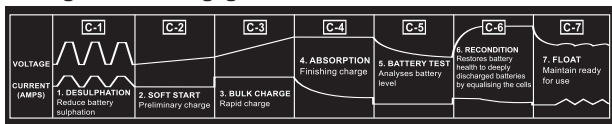
- |                            |                            |                      |
|----------------------------|----------------------------|----------------------|
| 1. Battery charging output | 2. Remote control terminal | 3. AC input terminal |
| 4. Power ON/OFF switch     | 5. Cooling fan             | 6. Mounting hole     |
| 7. LCD display             | 8. AC power cable          | 9. Fuse              |

## The LCD screen display and button function



- 5.1 To view charging voltage, press the status selection button until the charging voltage LED turns on. The LCD screen will display the charging voltage.
- 5.2 To view charging current, press the status selection button until the charging current LED turns on. The LCD screen will display the battery charging current.
- 5.3 To view which charging stage the smart battery charger is in, press the status selection button until the charging stage LED turns on. The LCD screen will display the charging stage (there are 7 in total).
- 5.4 Status selection button: by pressing the status selection button, the LCD display will change to display charging voltage, charging current or different charging stages.
- 5.5 Switching power supply LED: if you want to use this charger as a switching power supply unit, please press and hold (3-5s) the mode selection button repeatedly until the switching power supply LED turns on. There are three colours in switching power supply mode. Green- 13.2V, red- 13.4V, orange- 13.8V.
- 5.6 GEL/AGM/WET battery charging LEDs: press and hold (3-5s) the mode selection button to set the battery type (note that the unit will operate at different charging voltages for each battery type – details are included in Specifications section further down).
- 5.7 Mode selection button: press and hold (3-5s) this button to either switch the charger into power supply mode, or set GEL/AGM/WET battery type for charging.
- 5.8 LCD display: will work in auto-rotation mode, when it will automatically rotate between showing the charging voltage / charging current / different charging stage. When overheating or short-circuit protection functions are enabled, the screen will display “-P-“. Display will be shown for 60 seconds, before automatically switching off. Press any button to wake up the display.

## 6. 7-stage automatic charging



This is a fully automatic battery charger with 7 charge stages.

Automatic charging protects your battery from being overcharged. So you can leave the charger connected to the battery indefinitely.

7-stage charging is a very comprehensive and accurate charging process that gives your battery longer life and better performance compared to using traditional chargers.

7-stage chargers are suitable for most battery types including GEL, AGM, WET batteries. They may also help restore drained and sulphated batteries.

The 7 stages are:

Desulphation; Soft start; Bulk charge; Absorption; Battery test; Recondition; Float

**Desulphation:** the desulphation stage may break down sulphation that occurs in batteries that have been left flat for extended periods of time, returning them back to full charge. Sulphation occurs when lead-sulphate hardens and clogs up battery cells.

**Soft start:** A preliminary charge process that gently introduces power to the battery. This protects the battery and increases battery life.

**Bulk charge:** charging with maximum current until approximately 80% battery capacity.

**Absorption:** charging with declining current to maximize up to 100% battery capacity.

**Battery test:** Tests to see if the battery can accept the charge and retain power. If unable, the battery may need replacing.

**Recondition:** choose the recond program to add the recond step to the charging process. During the recond step voltage increases to create controlled gassing in the battery. Gassing mixes the battery acid and gives back energy to the battery.

**Float:** the float stage maintains the battery at 100% charge without overcharging or damaging the battery. This means the charger can be left connected to the battery indefinitely. The battery charger has an 7-stage fully automatic charging curve, the cycle is repeated infinitely. If the terminal voltage drops below a lower limit, the charger automatically goes back to the beginning of the charging curve.

## 7. Caution!

- 7.1 The device is for indoor use, do not use the device near flammable materials or in any location that may accumulate flammable fumes or gasses.
- 7.2 Appliance shall only be used with rated voltage and frequency.
- 7.3 Hot surface when operating, especially at full load condition.
- 7.4 Make sure the polarity is correct.
- 7.5 Do not locate the device on the top of the battery. Especially wet type battery. It may generate gas vapor while charging.
- 7.6 Do not charge non-rechargeable batteries.
- 7.7 Use the appliance only in the described manner.
- 7.8 Do not expose the device to a heat source, such as direct sunlight or heating.
- 7.9 Store the device in a dry and cool place.
- 7.10 Do not open, no user serviceable parts inside.

## 8. Instructions for use

8.1 First connect to the battery, switching on the charger, then the battery will begin to charge with a 7-stage charging programme. The LCD display will alternate automatically between different data. When overheating and short circuit protection kicks in, the LCD screen will display “-P-“.

8.2 The LCD screen will remain on for 60 seconds, then will automatically switch off. Press any button to wake up the display.

8.3 Hold down the 'mode selection' button to change the mode. Note: there are three colours in switching power supply mode: green – 13.2V, red – 13.4V and orange – 13.8V.

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8.4 Press the 'status selection' button to change the LCD display data.

8.5 The charger includes a second pair of output terminals for connecting another battery with a different capacity.

## 9. Trouble shooting

Problems and symptoms	Possible cause	Solutions
No DC output or charger cannot startup	No AC input	Check the AC power source
	Overheating shutdown	Allow the device to cool down
	Poor contact of battery terminal	Check the connection between charger and battery
	Output short circuit	
Battery charging not stable	AC input voltage is not stable	Check input AC voltage if it is within the input voltage range
	Incorrect battery type chosen	Select the correct battery
Charger cannot switch to float	Battery cable connected to the battery is too thin	Change cable to proper size
	Battery in poor condition	Replace battery

## 10. Safety operation!

- 10.1 If cables have to be fed through walls with sharp edges, always use tubes or ducts to prevent damage.
- 10.2 Do not pull on the cables, fasten the device and cable securely. Lay the cable so that it cannot be tripped over.
- 10.3 Ensure the device is standing firmly that it cannot tip over or fall down.
- 10.4 Children should be supervised to ensure that they do not play with the device.
- 10.5 Do not allow water to drip or splash on the device.
- 10.6 Make sure the air inlets and outlets of the device are not covered.
- 10.7 Operate the device only if you are certain that the hosing and connection cables are undamaged.
- 10.8 Do not reverse the polarity of the connection to the battery.
- 10.9 Disconnect the supply before making or breaking the connections to the battery.
- 10.10 Warning! Risk of electric shock! Do not open the device if connected to AC power.

## 11. Specification

Model	BC1210	BC2405	BC1220	BC2410
Input voltage range	190-265V AC ~ 50Hz			
Bulk/Absorption charging	14.2V/14.6/14.8V DC selectable (12V) 28.4V/29.2/29.6V DC selectable (24V)			
Floating charging	13.2V/13.5/13.8V DC selectable (12V) 26.4V/27V/27.6V DC selectable (24V)			
Max. DC output current	10A	5A	20A	10A
Output voltage	12V	24V	12V	24V
Suggested battery capacity	15-100Ah		25-200Ah	
Output ripple	<50mA at full load			
Efficiency up to	88%			
Operating temperature	0-40°C			
Isolated DC output	2			
Ventilation	Cooling fan ; By thermal & current control			
Dimensions(mm)	176x175x95 (LxWxH)			

### Battery type and charging voltage setting

Battery type	Floating charging		Bulk/absorption charging	
	12V	24V	12V	24V
GEL /SLA	13.2V	26.4V	14.2V	28.4V
AGM	13.5V	27V	14.6V	29.2V
WET/calcium	13.8V	27.6V	14.8V	29.6V

## 12. Warranty

The warranty covers the cost of parts and labour for the repair, or the cost of replacement of the item (at the manufacturer's discretion) if a product defect is found during the warranty period.

The warranty will not apply where the device has been misused, altered, neglected, improperly installed or used, or physically damaged, either internally or externally, or the device has been used in an unsuitable environment.

If you suspect a problem with the device, please contact your supplier or distributor for troubleshooting and advice.



### Disposal

When the device has become unusable, dispose of it in accordance with the appliance disposal regulations.

