

## 6V/12V Automotive Battery Charger

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# Operating Instructions



## Features

- Short circuit and reverse polarity protected
- Overheating protection
- Suits 12V cells
- Includes car accessory socket lead, battery clamps and ring terminal lead
- IP65 rated
- DC power adapter mode 12V 10A
- Defective cell detection
- Trickle charge function

## Kit Contents

- Battery charger
  - Cable with battery clamps
  - Cable with o-ring connectors
    - Instructions manual
    - Car accessory socket lead

## M 8536B 6V/12V Automotive Battery Charger

### Overview

This compact charger is suitable for all lead acid type and Lithium (LiFePO4) type batteries. It will charge 12V non-lithium cells using a 6 stage charging circuit. The circuitry automatically diagnoses the battery style state and delivers the appropriate charge current to maintain optimum performance. The charger may be permanently connected without overcharging or damaging the battery which is ideal for seldom used vehicles.

### Technical Specifications

Model: M 8536B

Input: 220-240V a.c. 50Hz

Input Cable: 14AWG

Output:

13.8V 10A for lead acid batteries

14.4V 9A for LiFePO4 batteries

14.9V 10A for AGM/EFB batteries

12V 10A for DC power supply adapter

Max Voltage:

14.5V lead acid battery charging

14.9V AGM/EFB battery charging

14.4V LiFePO4 battery charging

Minimum starting voltage (lead acid battery): 2V

Cooling: Natural

Operating Temperature: -10°C to 50°C

IP Rating: IP65

Lead Acid Battery Capacity: 30-300Ah

LiFePO4 Battery Capacity: 9-300Ah

Overcharge Protection: Yes

Reverse Polarity Protection: Yes

Short Circuit Protection: Yes

Spark Proof: Yes

***Please Note: To achieve a complete charge for higher capacity batteries may take longer than 24hrs.***

**THIS MANUAL CONTAINS IMPORTANT SAFETY AND OPERATING INSTRUCTIONS,  
PLEASE SAVE THESE INSTRUCTIONS, KEEP WITH OR NEAR CHARGER AT ALL TIMES**

1. **WARNING: RISK OF EXPLOSIVE GASES.** Working in the vicinity of a lead-acid battery can be dangerous. Batteries generate explosive gases during normal battery operation. For this reason it is of the utmost importance that prior to each use of your charger, you read and follow the instructions provided exactly. The appliance is not intended for use by young children or infirm persons without supervision. Young children should be supervised to ensure that they do not play with the appliance.
2. To reduce risk of a battery explosion, follow these instructions and those marked on the battery.
3. **NEVER** smoke or allow an open spark or flame in the vicinity of the battery or engine bay where battery is installed.
4. **CAUTION:** To reduce the risk of injury, use the charger for charging rechargeable lead-acid batteries only. It is not intended to supply power to a low-voltage electrical system or to charge dry-cell batteries. Charging dry-cell batteries may cause them to burst and cause injury to persons and damage to property
5. Do not expose the charger to moisture, rain or snow. Use in a well ventilated and dry area.
6. Use of an attachment not recommended or sold by the battery charger manufacturer may result in a risk of fire, electric shock, or injury to persons.
7. To reduce risk of damage to electric plug and cord, pull by plug rather than cord when disconnecting the charger.
8. Make sure cord is located so that it cannot be stepped on, tripped over, or otherwise subjected to damage or stress.
9. Study all the battery manufacturer's specific precautions such as removing or not removing cell caps while charging, and recommended rates of charge.
10. Do not use the battery charger unless the battery voltage matches the output voltage rating of the charger.
11. Do not operate the charger in a closed-in area or restrict ventilation in any way.
12. Do not operate the charger with a damaged cord or plug.
13. Do not operate the charger if it has received a sharp blow, been dropped, or damaged in any way. Take it to a qualified repair station or return to place of purchase for evaluation.
14. Do not disassemble the charger. Take it to a qualified repair station or local dealer when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.
15. To reduce risk of electric shock, unplug the charger from an outlet before attempting any maintenance or cleaning.

## **M 8536B 6V/12V Automotive Battery Charger**

**IMPORTANT: DO NOT use other DC output cords other than the one supplied or use an extension cord, as it could result in damage to the unit which will not be covered by warranty.**

### **PERSONAL PRECAUTIONS:**

- Someone should be within range of your voice or close enough to come to your aid when you work near a lead-acid battery.
- Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
- Wear complete eye protection and clothing protection. Avoid touching eyes while working near battery.
- If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters an eye, immediately flood eye with running cold water for at least 10 minutes and get medical attention immediately.
- Be extra cautious to reduce risk of dropping a metal tool onto battery. It might spark or short-circuit battery or other electrical part that may cause an explosion.
- Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid battery. A lead-acid battery can produce a short-circuited current high enough to weld a ring or like to metal, causing a severe burn.
- NEVER charge a frozen battery.

### **PREPARING TO CHARGE**

1. If it is necessary to remove the battery from a vehicle to charge it, always remove the grounded terminal from the battery first. Make sure all accessories in the vehicle are off in order to prevent an arc.
2. Be sure the area around the battery is well ventilated while charging is underway. Explosive gas can be forcefully blown away by using a piece of cardboard or other nonmetallic material as a fan.
3. Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes.
4. If battery is not sealed add distilled water in each cell until battery acid reaches level specified by Battery manufacturer. This helps purge excessive gas from cells. Do not overfill.
5. For a sealed battery without cell caps. Carefully follow manufacturers recharging instructions.
6. Study all the manufacturer's specific precautions such as removing or not removing cell caps while charging and the recommended rates of charge.
7. Determine the battery voltage by referring to the vehicle owner's manual and make sure it matches the output rating of the battery charger.

## LOCATING CHARGER

- Locate the charger as far away from battery as the DC cables permit.
- Never place the charger directly above or below the battery being charged and don't set a battery on top of the charger. Gases or fluids from the battery will corrode and damage the charger.
- Never allow battery acid to drip on the charger when maintaining or filling battery.

## CONNECTION PRECAUTIONS

Connect and disconnect DC output clips only after setting the charger power switch to off position, and remove the plug from the AC electric outlet. Never allow clips to touch each other.

### Follow these steps when battery is installed in a vehicle:

A spark near the battery may cause a battery explosion. To reduce risk of a spark near battery:

1. Position AC and DC cords to reduce risk of damage by bonnet, vehicle door or any moving engine.
2. Stay clear of fan blades, belts, pulleys, and other parts that can cause injury.
3. Check polarity of battery posts. A positive (pos, +) battery post may have a larger diameter than a negative (neg -) post.
4. Determine which battery post is grounded (connected) to the chassis. If the negative post is grounded to the chassis (as in most vehicles), see step 5. If the positive post is grounded to the chassis, see step 6.
5. For a negative-grounded vehicle: connect the positive (red) clip from the battery charger to the positive (pos,+) post of the battery first. Connect the negative (black) clip from the battery charger to the vehicle chassis engine block, remote from the battery and fuel line. Do not connect the clip to the carburetor, fuel lines, or sheet-metal body parts. Connect only to a heavy gauge metal part of the frame or engine block.
6. For a positive-grounded vehicle: connect the negative (black) clip from the battery charger to negative (neg,-) post of the battery first. Connect the positive (red) clip from the battery charger to the vehicle chassis or engine block, remote from the battery and fuel line. Do not connect the clip to carburetor, fuel lines, or sheet-metal body parts. Connect only to a heavy gauge metal part of the frame or engine block.
7. If using permanently mounted eyelet lead SAE connector, simply connect this to the charger output lead.
8. Connect charger AC supply cord to a mains electric outlet.
9. When disconnecting the charger, disconnect AC cord, remove clip from vehicle chassis, and then remove clip from the battery terminal.

## M 8536B 6V/12V Automotive Battery Charger

Follow these steps when the battery is outside the vehicle:

A spark near the battery may cause a battery explosion. To reduce risk of a spark near battery:

1. Check polarity of battery posts. A positive (pos, +) battery post may have larger diameter than a negative (neg, -) post.
2. Attach at least a 1.8m long 0.75mm insulated battery output cable from the charger to the negative (neg, -) battery post.
3. Connect the positive (red) clip from the battery charger to the positive (pos, +) post of battery.
4. Position yourself and the free end of the cable as far away from battery as possible. Then connect the negative (black) clip from the battery charger to free end of the cable.
5. Do not face battery when making final connection.
6. Connect charger AC supply cord to a mains electric outlet.
7. When disconnecting the charger, always do so in sequence of connecting procedure and break first connection while standing as far away from battery as practical.

NOTE: A marine (boat) battery must be removed and charged on shore. To charge it on a boat requires equipment specially designed for marine use. This charger is not suitable for operating on a boat.

### OPERATING INSTRUCTIONS

**AUTOMATIC OPERATION** - Your new battery charger is completely automatic and can be left plugged into the mains power. The charger output depends on the condition of the battery it is charging. When the battery is fully charged, the display will indicate "good" and show battery level at 100%. The charger will switch itself to a storage charge mode. It will automatically monitor and maintain the battery at full charge.

**CABLE CONNECTIONS** - Your new battery charger is equipped with two output leads, a red positive lead, and a black negative clip lead. Plus an eyelet lead suitable for permanent connection to battery terminals. Always connect or disconnect the output leads BEFORE plugging into AC power.

For all battery types: Connect the red positive (+) lead to the positive terminal of the battery. Connect the black negative (-) lead to the negative terminal of the battery.

Note: If the charger is left connected to a lead acid battery for long periods of time, check water levels periodically as directed by the battery manufacturer, to ensure electrolyte is maintained at a proper level.

**ATTENTION: THE BATTERY CHARGER HAS SPARK FREE, POLARITY AND SHORT CIRCUIT PROTECTION BUILT IN. NEVER ALLOW THE TWO CLIPS TOUCH EACH OTHER. CHARGE ONLY ONE BATTERY AT A TIME.**

**MINIMUM VOLTAGE** - When in lead acid (Pb) charge mode. The charger will not produce a voltage (turn on) until it recognizes at least three volts from the battery. The battery charger clips must be clipped to a battery in the correct polarity to initiate output voltage and begin charging.

When in Lead Acid (Pb) charge mode if the charger is hooked up in reverse polarity, the Fault symbol will turn on indicating that the connection has been made in reverse of the battery polarity and a charge has not been initiated.

Clips must be reconnected in the proper polarity to start the charger, Red to Positive (+ to +) and Black to Negative (- to -).

**NOTE: DO NOT TURN YOUR BATTERY CHARGER ON AND OFF REPEATEDLY (Plug and Unplug) WITHIN A SHORT PERIOD. IF THIS HAPPENS, UNPLUG BATTERY CHARGER FROM AC POWER, WAIT FOR ONE MINUTE AND THEN CONNECT THE CHARGER AGAIN.**

### **ESTIMATED TIME TO CHARGE**

Use the following formula to calculate your approximate time to complete charging your battery:

$$\text{Battery Capacity} \div \text{Charger Current} = \text{Hours to charge.}$$

or

$$\text{Amp Hours (Ah)} \div \text{Amps} = \text{Hours to charge.}$$

For example, if have a 60Ah battery and the charger delivers 4.5A current, you can find the number of hours by dividing 60 by 4.5 = 13.3 hours.

If you have a high capacity battery, it can take more than 24 hours to reach full capacity. For faster charging, purchase a higher current output charger.

### **FULLY DISCHARGED BATTERIES - Lead Acid (Pb) Charge Mode:**

If your battery is totally discharged (below 2 volts), the charger circuitry will not start due to its internal safety circuit. The internal safety circuit of the battery charger must sense more than 2 volts in the battery before it will allow the charging circuit to turn on. In this case (battery voltage between 0.5V-2.0V) the Fault symbol will flash, which means charging has not been initiated. If the battery voltage is less than 0.5V, the charger will be return to standby mode.

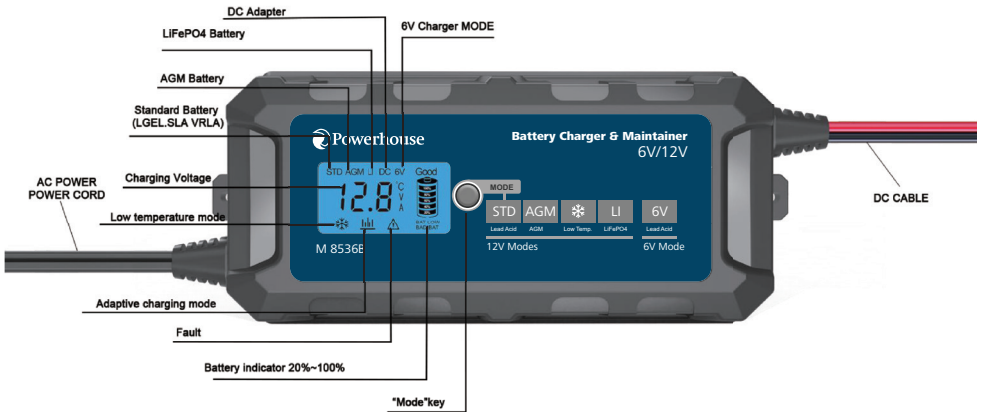
Note: Unless the battery was rapidly discharged, most 12 Volt lead acid batteries that retain a state of charge of less than 9 volts are likely to be worn out or defective.

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## 72-HOUR SAFETY FEATURE

A 72 hour safety timer will commence anytime the charger is on. This feature is designed to protect marginal batteries from over charging. If the battery voltage reaches the proper level within 72 hours, the charger will automatically switch to maintenance mode. If your battery is marginally defective, the battery charger will stop all the charging processes in order to protect the marginal battery from over charging. Please check the battery condition, as it could also indicate that it is a very large (high capacity) battery in good condition that is not yet fully charged. When this happens, the display will show "BAD BAT".

## VISUAL GUIDE TO YOUR BATTERY CHARGER

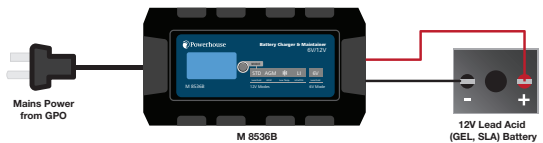


## HOW TO CONNECT

The charger can be connected in different ways for different charging purposes.

### Standard 12V Lead Acid Charging

AC power is connected to the wall socket properly. Press "MODE" key. The LCD will show "STD". The charger is switched to standard battery mode (GEL, VRLA, SLA). Correctly connect the charger output leads (Red "+", Black "-") to battery positive and negative respectively.

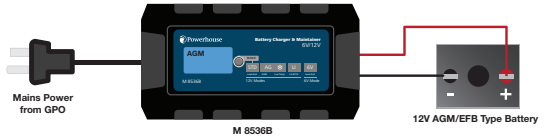




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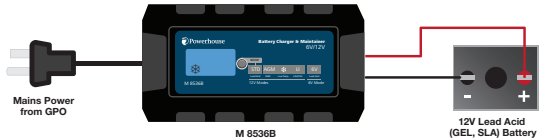
## 12V AGM/EFB Battery Charging

A.C. Power is connected to the wall socket properly. Press "MODE" key twice. The LCD will show "AGM". The charger is switched to AGM/EFB battery mode (AGM). Correctly connect the charger output leads (Red "+", Black "-") to battery positive and negative respectively.



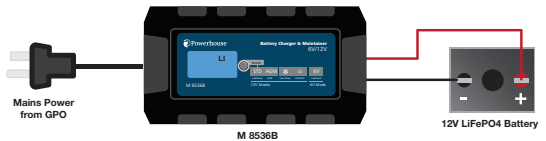
## Low Temperature Lead Acid Charging

When the ambient temperature is below -10°C, press "MODE" key three times. The LCD will show "❄". This mode can be set for battery charging to facilitate the rapid recovery of the battery capacity. **12V LEAD ACID STANDARD AND AGM/EFB ONLY.**



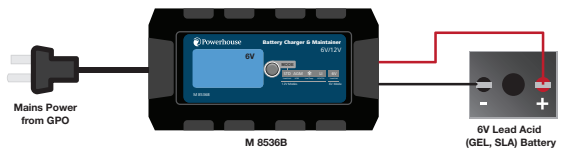
## LiFePO4 Battery Charging

A.C Power is connected to the wall socket properly. Press "MODE" key four times. The LCD will show "LI", the charger is switched to LiFePO4 battery mode (LiFePO4). Correctly connect the charger output leads (Red "+", Black "-") to battery positive and negative respectively.



## Standard 6V Lead Acid Charging

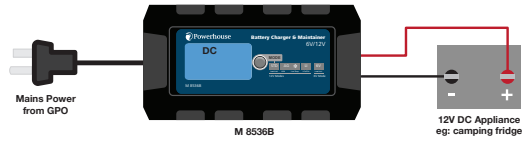
A.C Power is connected to the wall socket properly. Press "MODE" key five times. The LCD will show "6V". The charger is switched to 6V standard battery mode (GEL, VRLA, SLA). Correctly connect the charger output leads (Red "+", Black "-") to battery positive and negative respectively.



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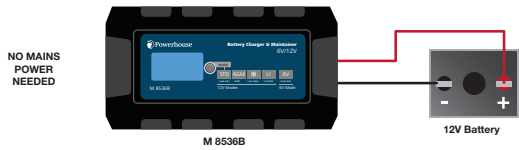
## 12V DC Adapter Mode

To operate the charger as a 12V DC power supply, connect mains 240V power to the charger. With no device connected to the output socket, press and hold MODE button for 3-5 seconds. The charger will enter DC Power mode and the LCD will display "DC". In this mode the charger can deliver 12V DC at up to 10A current.







## 12V Battery Tester Mode

The charger can be used for testing your battery status. Correctly connect your battery positive and negative with the charger leads, without the AC power connected. The LCD will indicate battery capacity 20-100% or "BAT LOW". **12V BATTERIES ONLY.**





## LCD INDICATORS - 6/12V STANDARD/AGM/LOW TEMP MODES.

LCD visual	Operating Mode	Indication
Power On	0V	A.C. power is connected to the wall socket properly. Charger is in standby. No battery connected.
STD Mode	12V lead acid battery charging mode	The charger is switched to 12V lead-acid (Pb) battery charging mode (standard, GEL, SLA, VRLA). Max charging voltage 13.8V.
AGM Mode	12V AGM/EFB battery charging mode	The charger is switched to 12V lead-acid (Pb) battery charging mode (AGM). Max charging voltage 14.9V.
6V Mode	6V lead acid battery charging mode	The charger is switched to 6V lead-acid (Pb) battery charging mode (Standard flooded, AGM, GEL, VRLA, SLA)
	Low temperature charging mode	When the ambient temperature is below -10°C, this mode can be set for battery charging to facilitate the rapid recovery of the battery capacity. NOTE: ONLY FOR 12V LEAD ACID BATTERIES (Standard, AGM/EFB).
	20% - 100% charging processes	Battery charge processes will commence. The 6-stage charging process includes: qualification, soft start phase, adaptive charging phase, bulk phase, absorption phase, fully charged with maintenance phase.
	Adaptive charging	The charger can make a calculated guess for the battery capacity, automatically adjust the charging current, to avoid overcharging battery, while using this charger for a small capacity battery.
GOOD	Fully charged maintenance	The charging process is completed and the battery is in maintenance mode. It can be returned to service if necessary or left safely connected to the charger indefinitely.
BAD BAT	Bad battery	The battery is worn out or is possibly defective. Suggest replacement.
BAT LOW	Battery voltage is low	The 12V battery voltage is under 9V; or the 6V battery voltage is under 4.5V.
	Fault	Reverse polarity or output short-circuit protection.

## BATTERY TESTER MODE

The charger can be used for testing your battery capacity. Simply connect your battery's positive and negative terminals with the charger leads, whilst the AC power is disconnected. The LCD will indicate battery 20-100%. "BAT LOW" will be indicated ie. the battery voltage is LOW.

## LiFePO4 BATTERY CHARGING MODE

LCD signal	Operating Mode	Indication
Power On	0V	A.C. power is connected to the wall socket properly. Charger is in standby. NO battery connected.
Li	LiFePO4 battery charging mode	The charger is switched to LiFePO4 battery charge mode.
	20% - 100% charging processes	Battery charging processes will commence. The whole 5-stage process includes: PCM activation, bulk phase, absorption phase, fully charged.
GOOD	Fully charged	Charging is complete and battery can be put into service or left safely on the charger indefinitely.
BAD BAT	Bad battery	The battery is worn out or is possibly defective. Suggest replacing battery.
BAT LOW	Battery voltage is low	The battery voltage is under 9V.
	Fault	Reverse polarity or output short-circuit protect.

### Lithium Iron Phosphate (LiFePO4) Battery Charging Mode

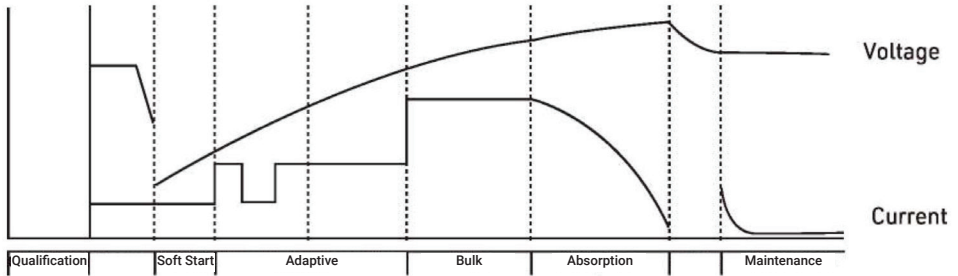
1. Please be sure not the touch clips together and make sure connect the red positive (+) lead to the positive terminal of the battery, and the black negative (-) lead to the negative terminal of the battery.
2. The charger can be used for testing your battery. Correctly connect your battery positive and negative with the charger leads. There is no need to connect AC power.

**TROUBLESHOOTING CHECKLIST**

No LCD signal	<p>A. Disconnect the charger from the AC outlet. Check connections to the battery and ensure they are good.</p> <p>B. Check to ensure that there is power at the AC outlet by plugging in a table lamp or power meter.</p>
LCD Signal is ON. No charging current	<p>A. Battery is not connected.</p> <p>B. The battery may be damaged or below 2 volts. Charge process will not begin. In this case the "Bad Battery" light will be on.</p>
BAT LOW signal is ON	Battery voltage is under 9V.
BAD BAT signal is ON	The battery is worn out or is possibly defective. Suggest replacing the battery with a battery.
The charger is charging but the 20 - 100% signal does not come on	<p>A. The battery is worn out or is possibly defective. Suggest testing and/or replacing battery with battery.</p> <p>B. The battery may have an excessive current draw caused by a potential short circuit. Disconnect battery from charger. Suggest testing and/or replacing the battery.</p> <p>C. The charged battery is larger than the charger's marked capacity (shown in manual). Please recharge with larger capacity charger.</p>

## LEAD ACID CHARGING PHASES

During charging of cells, lead acid batteries go through 6 stages to ensure both safety and best longevity for your connected battery. The phases are outlined below.



### 1. Qualification Phase

This initially ensures the battery is in good condition prior to launching normal charge processes. As a safety measure, charge processes will not begin if battery is below 2 Volts.

### 2. Soft Start Phase

Soft Start is applied when the charger has detected a battery at a very low initial state of charge. Voltage and current are delivered at a specified rate to help the battery recover prior to entering pulse charge mode.

### 3. Adaptive Phase

The charger can automatically make a calculated guess for the battery capacity and adjust the charging current to avoid overcharging the battery.

### 4. Bulk Charge Phase

With the battery now having gone through 'Qualification' and 'Recovery' phases as needed, the Bulk Charge phase gives the battery constant current, taking the battery up to 80% of its full capacity.

### 5. Absorption Phase

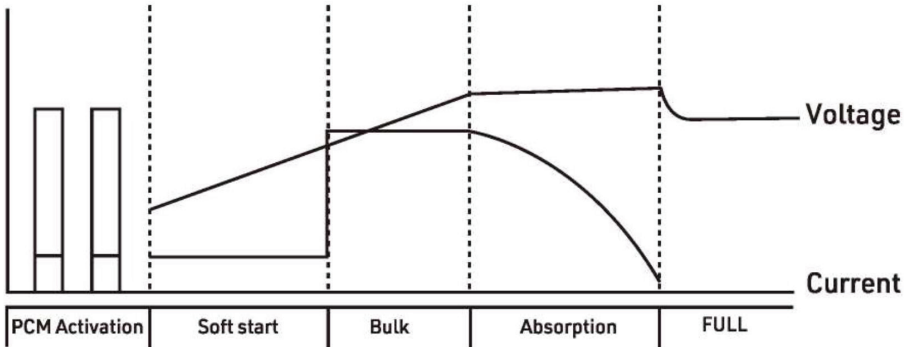
In the Absorption phase, the battery is given constant voltage, while current is reduced based on actions taken from ongoing battery monitoring, until the battery is 100% charged.

### 6. Maintenance Phase

The fully charged battery can be left safely connected to the charger indefinitely. The charger will constantly monitor the battery and "turn-on" again as needed to maintain the battery at a full state of readiness.

## LiFePO4 LITHIUM CHARGING PHASES

During charging of cells LiFePO4 batteries go through 5 stages to ensure both safety and best longevity for your connected battery. The phases are outlined below:



### 1. PCM Activation

Once the charger has been properly connected to the battery, it will deliver a constant pulse frequency to activate the PCM before it enters into the charge program.

### 2. Soft Start Phase

Soft start is applied when the charger has detected a battery at a very Low initial state of charge. Voltage and current are delivered at a specified rate to help the battery to recover prior to bulk charge.

### 3. Bulk Charge Phase

With the battery now having been activated and gone through the Soft Start phase as needed the bulk charge phase gives the battery constant current, taking the battery up to 80% of its full.

### 4. Absorption Phase

In the absorption phase the battery is given constant voltage while current is reduced based on actions taken from ongoing battery monitoring, until the battery is 100% charged.

### 5. Full Charge

Charging is complete and the battery can be returned to service or left safely on the charger indefinitely.

## M 8536B 6V/12V Automotive Battery Charger

Altronic Distributors warrants this product for one year from date of purchase from Altronics or its resellers to the consumer. If this item is part of an installation or another product, please contact the installer or supplier for your warranty.

During the warranty period, we undertake to repair or replace your product at no charge if found to be defective due to a manufacturing fault. The warranty excludes damage by misuse or incorrect installation (i.e. failure to install and operate device according to specifications in the supplied instruction manual), neglect, shipping accident, or no fault found, nor by use in a way or manner not intended by the supplier. For speakers, misuse includes burnt out voice coils.

For repair or service please contact your **PLACE OF PURCHASE**.

If this item was purchased directly from Altronics please make a warranty claim by:

### **1. FOR MAIL ORDER CUSTOMERS (includes school and trade orders),**

- a) Ringing us on 1300 797 007 and quoting your tax invoice number.
- b) Upon contacting Altronics, we will issue an R.A. (Return Authorisation). As Altronics have a number of service agents throughout Australia, a copy of the R.A. will be emailed, faxed or mailed to you with full instructions of how and where to send the goods. The freight for shipping goods back to Altronics for all repairs is at the customer's expense.
- c) A copy of the R.A. form, (or at the very minimum, the R.A. number) must accompany the goods to effect the repair.
- d) Altronics will pay the return freight to the customer where the warranty claim has been accepted.
- e) Please quote the R.A. number in any correspondence to us.

### **2. FOR OVER THE COUNTER PURCHASES; to make a warranty claim, please return the goods to us in any of our stores, with a copy of your proof of purchase (tax invoice).**

- a) Upon leaving the goods at one of our stores, an R.A. number will be issued to you.
  - b) Once repaired, you will be contacted, advising that the goods are ready to be collected from the store.
- It is at Altronics discretion as to whether the goods will be repaired or replaced (whilst under warranty); and as to whether identical goods will be used to replace the item due to changes of models / products.

**Note: Under no circumstances should you attempt to repair the device yourself or via a non-authorised service centre, as this will invalidate the warranty!**

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.