

12V 10A Automotive Battery Charger

Operating Instructions



Features

- Short circuit and reverse polarity protected • Overheating protection
- Includes car accessory plug lead, battery clamps and ring terminal lead
- Suits 12V lead acid, Lithium (LiFePO₄), and calcium cells • AGM and Flooded modes
 - Defective cell detection • Trickle charge function • IP65 rated

Overview

This compact charger is suitable for all lead acid type and Lithium (LiFePO₄) and Calcium type batteries. It will charge 12V cells using a 7-stage charging circuit. It incorporates AGM and Flooded charging modes for use in various climates. The circuitry automatically diagnoses the battery 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.

Package Contents

- Battery charger
- Operating instructions
- Cable with battery clamps
- Cable with o-ring connectors
- Cable with cigarette lighter plug

Specifications

Operating voltage:	200-240V a.c. 50/60Hz
Charge end voltage:	14.4V +/- 0.25V (Flooded / GEL batteries / Lithium (LiFePO ₄) batteries) 14.7V +/- 0.25V (AGM) 16.0V +/- 0.25V (Calcium batteries)
Charging current:	10 A +/- 10% (Flooded, Gel, and Lithium (LiFePO ₄) batteries)
Rechargeable battery type:	12V lead-acid batteries (SLA batteries, AGM, GEL) 12V Lithium (LiFePO ₄) batteries 12V Calcium batteries
Battery charge capacity:	20 - 200Ah
Battery maintenance capacity:	20 - 300Ah
Protection Type:	IP65 (casing)
Dimensions	245 x 62 x 102mm

General Warnings

- The battery charger may only be operated with a supply voltage of 200-240V a.c. 50/60 Hz. And it can only charge one battery at a time.
- This product is only designed to charge 12V lead acid, Lithium (LiFePO₄) and calcium battery. DO NOT use it to recharge non-rechargeable batteries or other type of rechargeable batteries (e.g. NiCd, NiMH) due to the risk of fire and explosion!
- Maintenance, adjustments and repair work may only be carried out by a specialist or a specialised workshop with access to appropriate spare parts if required.
- If you notice any damage, do not use the battery charger anymore.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons, in order to avoid a hazard.
- Battery capacity must accord with the charger rated battery capacity.
- The unauthorized conversion and/or modification of the product is unsafe and is not permitted.
- The product may only be set up, used or stored in places that are not accessible to children. Danger to life!
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Do not leave packaging material lying around carelessly. It might become a dangerous toy for children!
- The product is not a toy. It is not suitable for children. Pay particular attention when children are present!

SAFETY INSTRUCTIONS

Please read through the operating instructions completely before operating the device. They contain important information for correct operation.

The warranty/guarantee will be void if damage is incurred resulting from non-compliance with these operating instructions! We assume no liability for any consequential damage! We do not assume any liability for damage to property or personal injury caused by improper use or the failure to observe the safety instructions!

Product Features

- Charges multiple types of Batteries: **This charger is programmed to charge Lead-Acid, Gel, AGM, Lithium (LiFePO₄), and Calcium Batteries.**
- Fully Automatic multi-stages charging system: Microprocessor constantly monitors battery voltage and automatically delivers the appropriate currents to allow the batteries to be used over a prolonged period, which means that it is ideal for the maintenance of seasonally used motor vehicles, boats and motorcycles so that the batteries are always ready to go and in perfect condition without damaging the batteries.
- Auto-Memory: The charger will return to last selected mode automatically after power re-started.
- Battery Recovery capability and dead battery detection: Capable to recover slightly sulphated batteries and automatically identifies in case of dead battery.
- Switch-Mode Technology: Switch mode charger has high efficiency in terms of less heat lost, much faster response during charging, compact Size, and Light Weight.
- Low Power Saving: Charger is programmed to reduce amount of charging current once the battery is fully charged.

Protection Features

- Spark Resistant Short Circuit and Reverse Battery Protection: Prevents charger damage if battery leads are accidentally reversed
- Over Voltage Protection: Prevents high voltage spikes from damaging sensitive electronic components in the charger
- Electronic Current Limiting: Prevents overheating and damage caused by shorts or excessive loads
- Automatic Over-temperature Protection: Prevents charger damage from the events of abnormal ambient temperature or malfunction of components
- IP65: Dust and Splash resistant

Please note that the charger is protected with built-in thermal safety feature whereby the operating temperature of the electronic is constantly being monitored. If the operating temperature exceeds the pre-set safety level, the power of the charger will be reduced to prevent overheating. The result is that the output current will be reduced until the temperature drops sufficiently for a safe full performance again.

Notes on rechargeable batteries

- Make sure you observe all safety instructions and charging instructions of the battery manufacturer.
- Before connecting the battery to the battery charger, disconnect the battery from any loads or cables (turn off the loads first!).
- Always disconnect the ground connection from the battery before disconnecting the positive terminal.
- Disconnect the battery from the battery charger before connecting any loads to the battery.
- When connecting or disconnecting the battery, sparks might be produced. Therefore, make sure there is sufficient ventilation!
- Observe the polarity when connecting the battery to the battery charger. Red charger terminal is positive (+), black charger terminal is negative (-).
- Batteries must not be short circuited or thrown into fire. Risk of fire and explosion!
- Never try to dismantle or tamper with any type of batteries!
- Lead-acid batteries contain aggressive and corrosive acids. Avoid skin or eye contact with battery fluids!
- On skin contact, clean the affected areas thoroughly with water and soap. On eye contact, rinse the effected eye immediately with clear and cold running water! Then consult a doctor immediately!

Charging a Lead-acid Battery

First make sure your battery is a 12V SLA, 12V Lithium (LiFePO4), or 12V calcium battery.

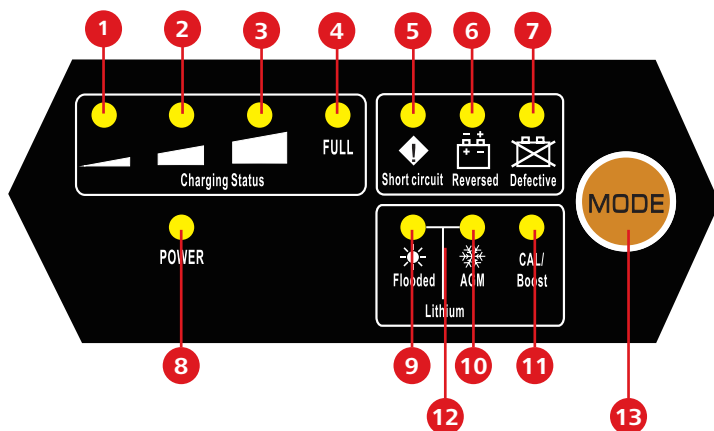
1. Do not charge batteries with different operating voltages!
2. Disconnect all loads from the battery. If the battery is installed in a vehicle, turn off the ignition and any other loads.

NOTE: Observe the instructions and safety information of the vehicle to find out how the vehicle battery should be charged. Modern vehicles are equipped with sensitive electronic parts and controls that can be damaged if you do not proceed properly!

3. Connect the battery charger to the mains power supply (200-240V a.c. 50/60 Hz).
First connect the clamp to the negative terminal and then to the positive terminal.
4. Select a function using the mode button.
5. Connect the battery charger to the battery with the correct polarity. If the polarity is not correct, LED 6 lights up.
6. If the Charging loop is in short circuit, LED 5 flashes. If the battery is defective in any other way LED 7 will be lit.
7. This battery charger is equipped with an automatic memory function, i.e. whenever AC supply is connected, it starts in last selected mode.
8. After the charging process is completed, disconnect the battery charger from the mains supply, in reverse sequence to the connecting procedure (Step 3).

M 8536A 12V Battery Charger

Function Diagram



1	LED 1 - Charging indicator (0 - 25%)
2	LED 2 - Charging indicator (25 – 50%)
3	LED 3 - Charging indicator (50% or above)
4	LED 4 - Charge indicator (fully charged)
5	LED 5 - Short Circuit indicator
6	LED 6 - Cables connected with reversed polarity indicator
7	LED 7 - Battery Defective indicator
8	Power/stand-by indicator
9	MODE 1 – Flooded mode (14.4V / 10A for Lead) in normal temperature
10	MODE 2 – AGM mode (14.7V / 10A for Lead) in low ambient temperature
11	MODE 3 - This mode is suitable for 12V Calcium batteries or for the deep discharged battery due to stratified acid.
12	MODE 4 - This mode is suitable for 12V Lithium (LiFePO4) batteries (LiFePO4)
13	MODE Selection

Operating Modes

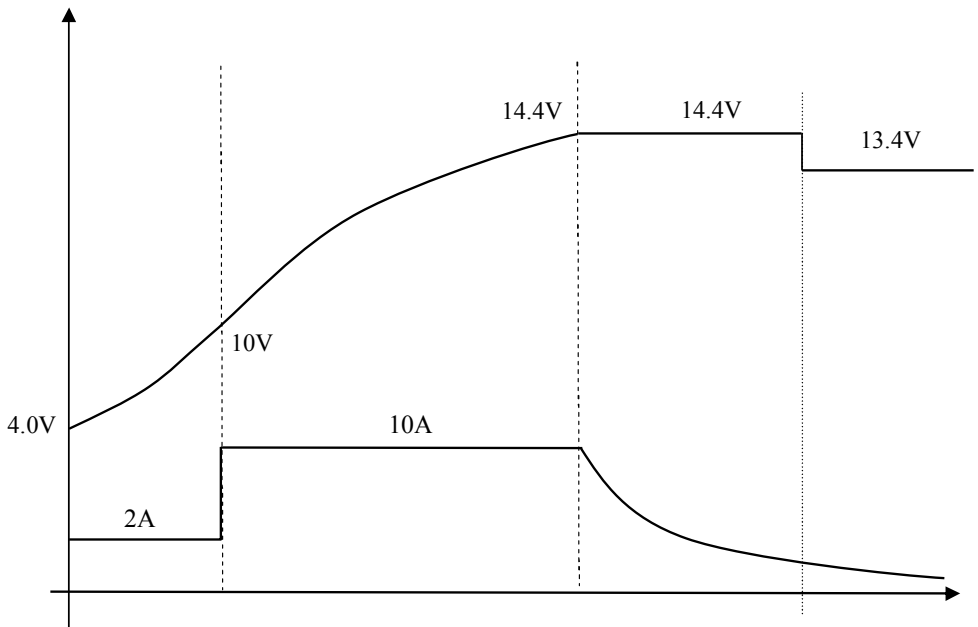
Mode Select

Press the MODE button (13) to activate or deactivate the selected mode.

Mode 1: Flooded (14.4V +/- 0.25V, Max. 10A)

- This mode is suitable for Flooded and GEL lead-acid batteries with a capacity above 20Ah at normal ambient temperature.
- To select this mode, select the MODE button (13) until LED 9 'FLOODED' lights up.
- When the battery is fully charged (14.4V +/- 0.25V), LED 4 'FULL' lights up. The device automatically switches to float or maintenance charging.

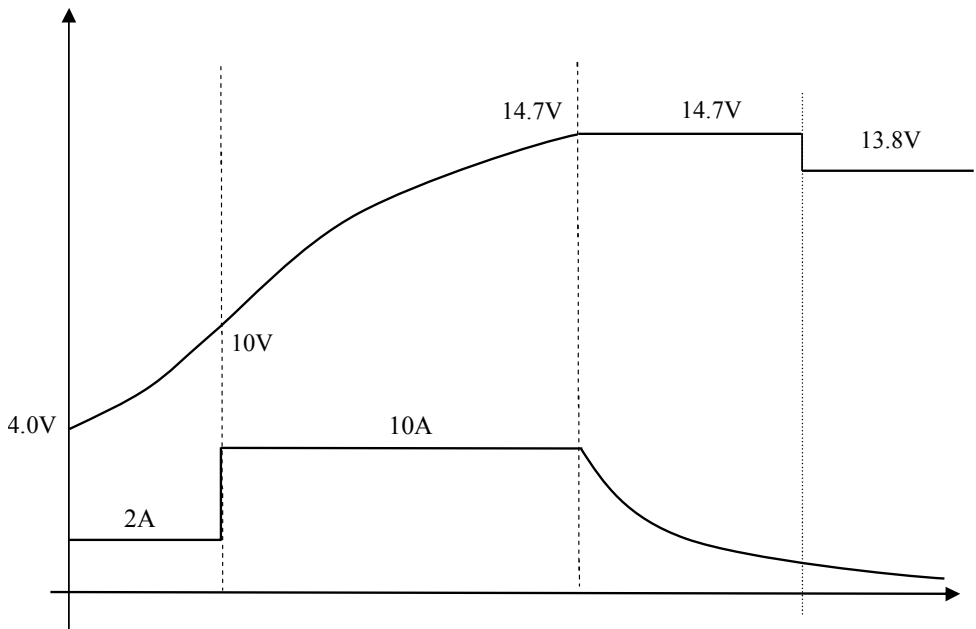
Charging Profile for 14.4V battery



Mode 2: AGM (14.7V +/- 0.25V, Max. 10A)

- This mode is suitable for AGM battery.
- This mode is also suitable for Flooded and GEL lead-acid batteries with a capacity above 20Ah at low ambient temperature.
- To select this mode, select the MODE button (13) until LED 10 'AGM' lights up.
- When the battery is fully charged (14.7V +/- 0.25V), LED 4 'FULL' lights up. The device automatically switches to float or maintenance charging.

Charging Profile for 14.7V battery



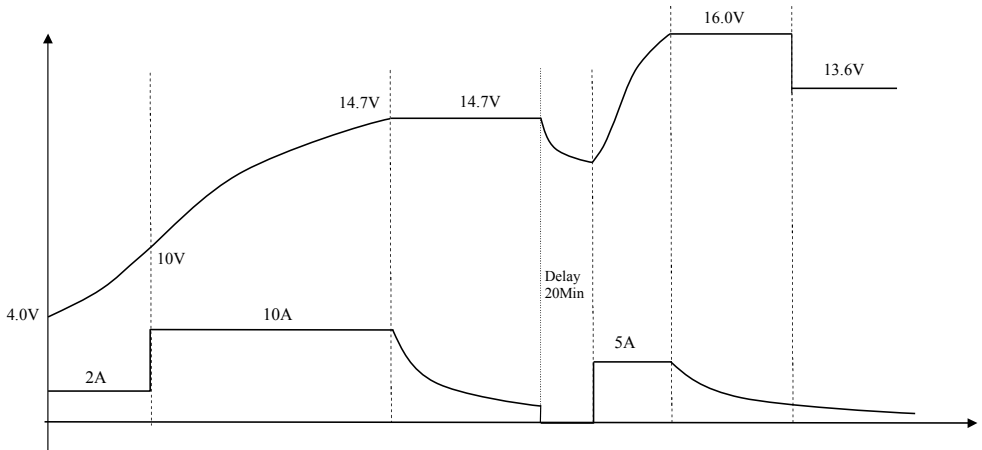
Mode 3: Calcium / Boost (16V +/- 0.25V, Max. 10A)

Use this mode with care. High voltage may cause some water loss!

- This mode is suitable for Calcium battery from 20Ah upwards at normal ambient temperature.
- The maximum charging current is 10A +/- 10 % until 16V +/- 0.25V is reached.
- This mode could also be used to regenerate deep-discharged or sulphated Lead Acid batteries from 20 Ah upwards.
- To select this mode, select the MODE button (13) until LED 11 'CAL/BOOST' lights up.
- When the battery voltage reaches 16V +/- 0.25V, LED 4 'FULL' lights up. The device automatically switches to float or maintenance charging.

NOTE: You can also use this mode with AGM batteries specified by the manufacturer to be suitable for a higher charge end voltage. Please observe the charging instructions of the battery manufacturer.

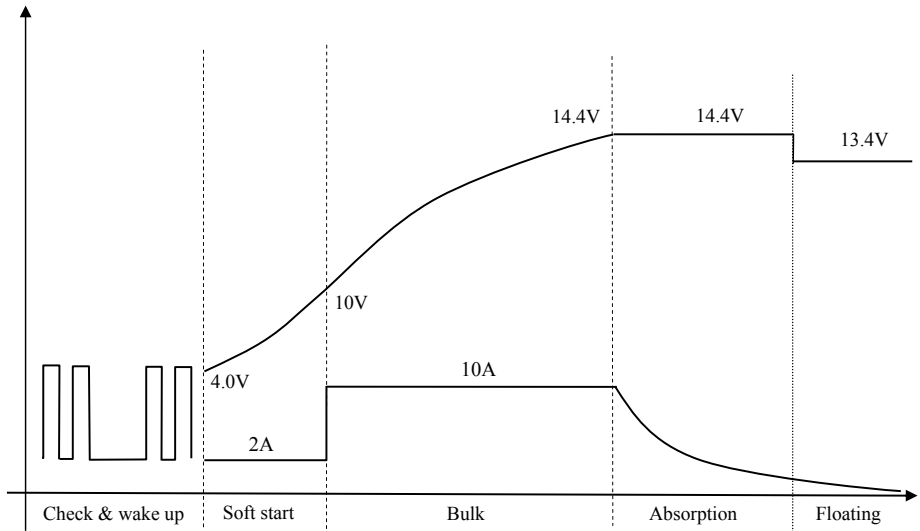
Charging Profile for 16.0V battery



Mode 4: Lithium (LiFePO4) (14.4V +/- 0.25V, Max. 10A)

- This mode is suitable for Lithium (LiFePO4) battery.
- The charger will automatically reset the low voltage protection for those deep discharged Lithium (LiFePO4) batteries filtered by the battery management system (BMS).
- To select this mode, select the MODE button (13) until both LED 9 'FLOODED' and LED 10 'AGM' lights up.
- When the battery is fully charged (14.4V +/- 0.25V), LED 4 'FULL' lights up. The device automatically switches to float or maintenance charging.

Charging Profile for 12V Lithium battery



Power Supply function (Max. 10A)

- The charger can also be used as a power adapter (max. 10A).
- There is no dedicated mode (switch) to select the Power supply function. This power supply function is only triggered automatically to provide the power when external load is drawing with a maximum current of 10A.
- Do not power any products that require a stabilised operating voltage of 12V (e.g. computers).
- Make sure there is no load connected from the charger before the mode is activated.

Regeneration function

This function is designed to regenerate deep-discharged batteries. It cannot be directly selected. If a deep discharged rechargeable battery is connected to the charger, the regeneration mode is the first mode to start.

Low charging current are used to try and bring the deep discharged rechargeable battery to a normal battery voltage again. When the battery reaches a normal voltage, the charger will continue charging using the regular process.

Defective rechargeable batteries

The charger recognises defective rechargeable batteries automatically. In this case the selected charging programme will not be started. LED 7 lit.

Cleaning

Disconnect the battery charger from the battery and the mains voltage before cleaning it. Clean the outside of the product with a clean, dry, and soft cloth. Do not use harsh cleaning agents to avoid discolouration.

Caution

- Operation under adverse ambient conditions must be avoided under all circumstances. Adverse ambient conditions include: ambient temperatures above 40°C, flammable gases, solvents, vapours, dust, and relative humidity above 80%.
- Do not use the battery charger inside a vehicle. The battery charger must not be used in the vicinity of flammable substances or gases.
- Ensure that there is sufficient ventilation during operation. Never cover the battery charger or the connected battery.
- Never charge lead-acid or Lithium (LiFePO₄) batteries in containers or poorly ventilated rooms.
- Explosive gases can be generated during the charging process!
- Keep the battery charger as well as the battery away from ignition sources. Do not smoke while handling the battery charger or the battery! There is danger of explosion!
- Never operate the device immediately after it has been taken from a cold to a warm room. The condensation generated can cause malfunctions and there is also the risk of an electric shock!

Disposal

At the end of its useful life, this product must **not** be disposed of together with normal household waste, but has to be dropped off at a collection centre for the recycling of electrical and electronic devices. This is indicated by the trash can symbol on the product, on the instruction manual or on the packaging.

The materials of which this product is made are recyclable pursuant to their labelling. With the reuse, the recycling of the materials or other forms of scrap usage you are making an important contribution to the protection of the environment.

Please ask your local administration office for the appropriate disposal centre.