

# **POWERTECH PLUS**

**12V / 24V, 7.2Amp / 3.6Amp 9 Stages Charging Smart Battery Charger**

## **MB3613 User Manual**



Thank you for purchasing this charger, please read this manual carefully before use to ensure your safety and optimal use of your product.

We recommend to keeping this manual for future reference.

**Suitable for Normal Lead Acid, Sealed, Gel or Lipo4 Batteries between 5-150Ah for 12V batteries and 5-120Ah for 24V batteries.**

## **IMPORTANT SAFETY INSTRUCTIONS**

### **Gases**

When the battery is being charged you may notice bubbling in the fluid caused by the release of gas. As the gas is flammable no naked lights should be used around the battery, and the area should be kept well ventilated.

Because of this risk of explosive gas only connect and disconnect the battery leads when the mains supply is disconnected.

### **Type of batteries**

This charger is only suitable for normal lead acid, sealed, gel or Lipo4 batteries and should not be used to recharge NICAD or any other type of battery.

### **Points of note**

- When not in use, store the charger in a dry area to avoid moisture damaging the internal parts.

### **Repair**

- The Battery Charger should not be opened. Any attempt at modification or repair by the user will entail the loss of your guarantee.
- The mains supply cord of this appliance can not be replaced; if the cord is damaged, the appliance should be discarded.

### **Danger!**

- Avoid getting electrolyte on your skin or clothes. It is acidic and can cause burns. If this occurs you should rinse the affected area with water immediately.
- If it gets into your eyes - wash thoroughly and seek medical attention immediately.
- Never charge a frozen battery. If battery fluid (electrolyte) becomes frozen, bring battery into a warm area to allow battery to thaw before you begin charging. Never let a battery on top of charger or vice versa.
- Do not touch the battery clamps together when the charger is on.
- Never operate charger if it has received a hard blow, been dropped, or otherwise damaged. Take it to a qualified professional for inspection and repair.
- Be sure to position the charger power cord to prevent it from being stepped on, tripped over, or damaged.
- Never pull out the plug by the cord when unplugging the charger. Pulling on the cord may cause damage to the cord or the plug.

### **Precautions When Working with Batteries**

- If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with running cold water for at least 20 minutes and get medical attention immediately.
- Never smoke or allow a spark or flame in vicinity of battery or Engine.

- Do not drop a metal tool on the battery. The resulting spark or short-circuit on the battery or other electrical part 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-circuit current high enough to weld a ring or the like to metal, causing severe burns.

## FEATURES

### Automatic and Intelligent 9-Stage Charging Curve

The MB3613 is controlled by a microprocessor with 9-stage charging characteristic for charging batteries automobiles, motorcycles, snow mobiles, tractors, personal watercraft, boats etc.

A microprocessor senses the condition of the battery to provide the right current and voltage to the battery (charging characteristic). This will give the best effect on charging and give the longest life to battery.

### Charging characteristic:

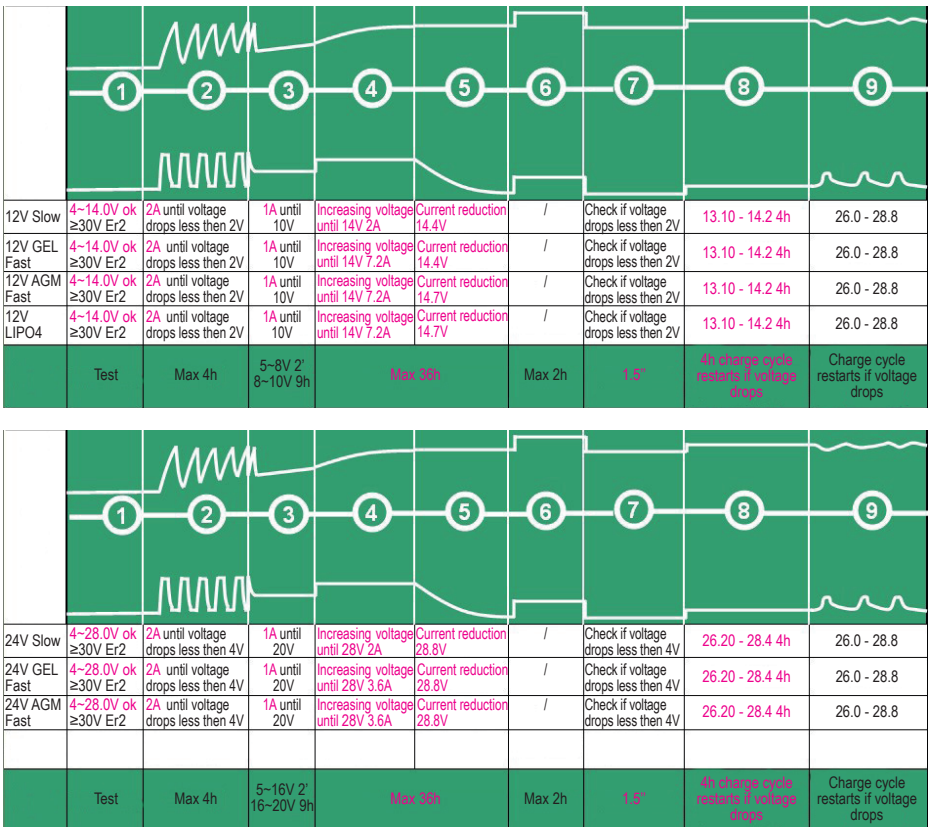


FIG.1

**Battery Test and Precharge (Stage 1):**

Check the battery voltage to make sure battery connections are good and the battery is in a stable condition before beginning the charge process

**Desulphation (Stage2):**

Detects sulfated batteries. Pulsing current and voltage, removes sulfate from the lead plates of the battery restoring the battery capacity

**Soft Start (Stage 3):**

Initial battery test to determine battery condition. If the battery is severely discharged, charger will begin the Soft Start stage. Charging starts with reduced current until battery voltage reaches a normal condition for charge.

**Bulk (Stage 4):**

Major charging stage where the battery receives the majority of its charge. During this stage the battery brought to 75 - 80% of its charge. The charger delivers maximum current until the terminal voltage has risen to the full charge level for Normal battery.

**Absorption (Stage 5):**

Completes the charge up to virtually 100% at a constant voltage. The current tapers off after the current reached the minimum level.

**Recondition (Stage 6):**

Select "Recondition" mode, charged by higher voltage to recondition the sulfate of the battery to save battery life.

**Analysis (Stage 7):**

Tests if the battery can hold charge. Batteries that can not hold charge may need to be replaced.

**Float (Stage 8):**

Low constant voltage, minimal charge current, battery is fully charged

**Pulse (Stage 9):**

Maintaining the battery at 95-100% capacity. The charger monitors the battery voltage and gives a pulse when necessary to keep the battery fully charged

**Power Supply:**

MB3613 has a power supply mode setting which has a constant voltage of 13.8V and current up to 5A, keep to provide power to computer system of modern car when replacing battery (Please don't reverse battery connection to avoid the damage on the charger).

**Temperature Compensation**

A sensor will automatically adjust the charging voltage if the temperature deviates



from  $-20^{\circ}\text{C}$  to  $+45^{\circ}\text{C}$ . A high temperature environment will lower the voltage and freezing condition is handled by higher voltage. A low temperature heightens the output voltage, and hot condition is handled by lower voltage.

### **Voltage compensation**

Because of some voltage drop in the cables, the actual voltage at the clamps of the battery can be lower than the charger output voltage. A special circuitry inside the unit will monitor the true input voltage to the battery and adjust the output voltage of the unit accordingly. This will maximize the charging efficiency.

### **Reverse-polarity protection**

This unit offers reverse-polarity protection under charging modes, the RED LED will illuminate and the charging process will not start. If this happens, unplug immediately from mains, connect the red clamp to positive (+) battery post, and black clamp to negative (-) post, then plug into the mains power and the charging process will start.

### **Short-circuit protection**

Should you accidentally touch the clamps together whilst the mains power is on, the unit will not perform charging. Unplug from mains, disconnect and start the process again being careful not to touch the clamps together.

### **Charge Memory**

If power off on charging, MB3613 can automatically restart charging base on previous on previous power down status for battery and charging current.

ATTENTION: Once the clamp of charger is disconnected from the battery, this memory is erased and the charging mode will need to be reselected.

### **Other features**

Anti Spark Protection

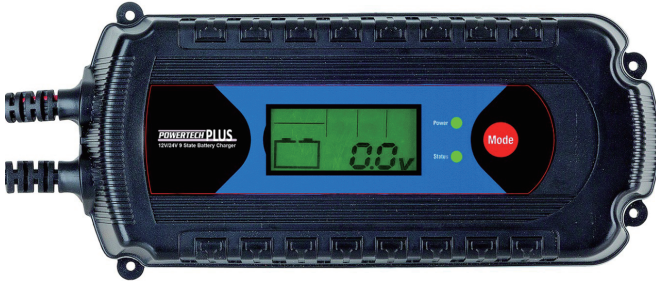
Battery and Charger Overheating Protection

It will give a warning buzz while error occurs

Waterproof Plastic Housing. Ingress Protection Rating IP65

# OPERATION

## Charger LED display



### Power LED -

Green color LED to indicate Power is connect to charger

### STATUS LED -

Green color LED to indicate that the battery is charging. Red color LED to indicate a charging failure, battery problem or reverse polarity.

FIG.2

## Charger LCD display

The unit is built-in with LCD display for showing charger status:BUTTON AND MODE

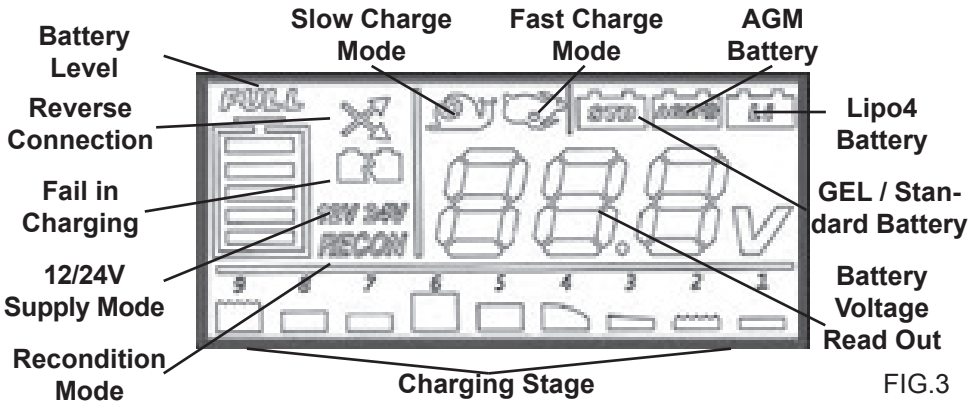


FIG.3

## MODE BUTTON:

The Mode button on unit is used to select the 9 different battery charger mode as below.

1. "12V/STD/SLOW" Mode



Slow charge (Max. 2A Charging Current) with Standard or GEL lead acid battery

2. "12V/STD/FAST" Mode



Fast charge (Max. 7.2A Charging Current) with Standard or GEL lead acid battery.

3. "12V/AGM/DEEP/FAST" Mode



Fast charge (Max. 7.2A Charging Current) with AGM type lead acid battery.

4. "12V/LI/FAST" Mode



Fast charge (Max. 7.2A Charging Current) with Lipo4 battery.

## 5. "RECONDITION" Mode

**RECON**

A special mode to recondition your battery after the battery has not been used for long time or after long deep discharge that degrade the battery performance.

The Recondition mode may decrease the battery life hence consult your battery vendor for advise if necessary.

## 6. "24V/STD/SLOW" Mode



Slow charge (Max. 2A Charging Current) with Standard or GEL lead acid battery

## 7. "24V/STD/FAST" Mode



Fast charge (Max. 3.6A Charging Current) with Standard or GEL lead acid battery.

## 8. "24V/AGM/DEEP/FAST" Mode



Fast charge (Max. 3.6A Charging Current) with AGM type lead acid battery.

## 9. "POWER SUPPLY" Mode



Change the battery charger into a Power supply with 13.8V fix voltage, with max. of 5A current.

# START CHARGING YOUR BATTERY

## PLEASE READ CAREFULLY BEFORE USING

**Suitable for 12V and 24V Normal Lead Acid, Sealed, Lipo4, Leisure or Gel Batteries between 5-150Ah for 12V batteries and 5-120Ah for 24V batteries.**

### 1. PREPARING THE BATTERY

- Firstly remove the caps from each cell and check that the level of the liquid is sufficient in each cell. If it is below the recommended level, top up with de-ionized or distilled water.

Note: Under no circumstances should tap water be used.

- The cell caps should not be replaced until charging is complete. This allows any gases formed during charging to escape. It is inevitable that some minor escape of acid will occur during charging.

**For permanently sealed battery, it is not necessary to carry out the above checks.**

### 2. CONNECTION

- Connect the positive charging lead (red) to the positive terminal post of the battery (marked P or +). Connect the negative charging lead (black) to the negative terminal post of the battery (marked N or -).


**Once you connected the MB3613 battery charger to AC power, it will sound a tone for 0.5 seconds and all of the LEDs on the touch panel will be on for a short time.**


**Warning! Always disconnect the AC plug from the AC mains socket before connecting or disconnecting the appliance to or from the battery.**

### 3. CHARGING

- Connected to power supply and the battery, the charger will automatically enter into charging status, it is working on slow charging stage for 12V batteries by default. The slow charge icon will illuminate, and the charger is automatically detecting the battery. This is the standard charging mode.
- Within the first 5" after connecting the charger to the power supply you can select a different charging mode:
  1. Hold the Mode key to switch to 24V and back.
  2. Pressing the mode key to select one of the nine charge modes.
- After 5" the charge starts according to the setting.

### 4. WHEN CHARGING IS COMPLETE



When the Stage 8 icon  and Full **FULL** illuminates, the battery is completely charged. The battery charger now switches to the Float mode and doesn't require your attention until the next time it is used, it will automatically maintain your battery.


If LCD stage 9 icon  illuminates, it indicates that the charger has automatically maintained your battery.

Switch off the mains supply, unplug the charger, and disconnect the leads from the battery posts. NOT to be done for permanently sealed battery: Inspect the liquid levels in each cell and top up. If necessary, using the correct fluid. Replace the caps. Any surplus fluid around the cell tops should be wiped off (this should be done with extreme care as it may be acidic/corrosive).


Where appropriate, if the battery has been removed for charging, replace it and reconnect the cables.

### 5. BATTERY FAULT

If fail red LED indicator lights or blinks and LCD Fail icons   illuminate, the following occurs:

Er1 - Fail Red LED blinks 

Improper connection of Charger and battery polarity

Er2 - Wrong battery 

Battery voltage 12V mode  $\geq 15V$ , 24V mode  $\geq 30V$

Er3 - Battery voltage doesn't reach a normal condition for charge.

12V (4V- 8V 2Min ) , (8V-10V 9Hr)

24V (4V-16V 2Min ) , (16V-20V 9Hr)

Er4 - Battery that can not hold charge

Er5 - Charging stopped under "Desulphation" or "Absorption" mode, then press "MODE" button could resume to charging, if still have the same problem, maybe caused by:

- 1. Battery is over-sulfated
- 2. Battery can't be charged
- 3. Battery can't hold the charge

Under these conditions, the battery charger will stop charging.

Flashing red LED and a buzzer mean wrong battery voltage selection.

## MAINTENANCE AND CARE

It is essential to keep your battery regularly charged throughout the year, especially during the winter months. In the winter the effectiveness of your car battery is reduced by the cold. Oil is thick. Engines are difficult to start and the heater, windscreen wipers and lights are all draining power. It is at this time that batteries have to be at peak power. If your battery is not regularly maintained and kept fully charged, it can cause problems and a possible breakdown.

Listed are some helpful hints on how to keep your battery healthy in conjunction with your Battery Charger.

### **Faulty Cells**

Batteries are usually made with six cells. One of these cells can deteriorate or get damaged. If, after several hours charging your battery is still flat, you should test the battery.

### **ONLY for NOT sealed batteries:**

Take hydrometer readings from each cell in the battery. If one reading is lower than the others, this could indicate a faulty cell. If necessary, get an Auto-Electrician to check your battery. One faulty cell is enough to ruin your battery.

It is pointless to continue using it and you would be better getting a new one.

### **Care**

Sometimes the battery may appear flat, but this could simply be dirty or loose connections on your battery terminals. It is important to maintain the leads on a regular basis. Do this by removing the leads from the battery, clean the inside of each connector and terminal posts on the battery, smear the terminal posts and connectors with Vaseline, refit in their correct positions and tighten firmly.

It is essential to keep the electrolyte level above the plates.

Note, however, that you should not overfill it, as the electrolyte is strongly acidic. When topping up do not use tap water. Always use distilled or de-ionized water. It is important to keep the acid level up. If necessary have it checked by your garage.

### **Checking the condition of your battery (ONLY for NOT sealed batteries)**

Using a hydrometer, which can be purchased, from most motor accessory stores, you can check the specific gravity of the electrolyte in each cell. The hydrometer is used to suck up a quantity of fluid from the cell. The weighted float inside the hydrometer will register the condition of that cell. Put the fluid back into the cell after testing, taking care not to splash the fluid about.

Distributed by:  
TechBrands by Electus Distribution Pty. Ltd.  
320 Victoria Rd, Rydalmere NSW 2116 Australia

Ph: 1300 738 555  
Int'l: +61 2 8832 3200  
Fax: 1300 738 500

[www.techbrands.com](http://www.techbrands.com)

Made in China