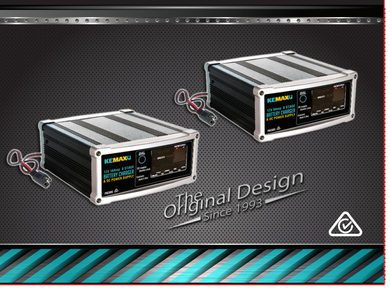
KEMAX
AUTOMOTIVE ELECTRONICS & ACCESSORIES

PBC88S
PBC168S

THE USER MANUAL

12V 8Amp / 12V 16Amp

8 STAGE BATTERY CHARGER & DC POWER SUPPLY



INTRODUCTION

The 12V 8 Amp and 16 Amp 8 Stage Smart Battery Chargers are designed to effectively charge most battery types; Lead-acid, Calcium, maintenance free, Gel and AGM. They are manufactured to the latest design parameters and highest quality levels. The specially designed charging system automatically selects the correct current setting for the size of the battery which helps to prolong battery life. The new design of this unit have 13.5V DC power source, it can use on household appliances 12V occasions. This manual is applicable for both 8 Amp and 16 Amp 8 stage battery chargers as they have the same functions with the exception of maximum output

IMPORTANT SAFETY INSTRUCTIONS

BEFORE OPERATING THIS BATTERY CHARGER, READ THE INSTRUCTIONS

- This battery charger is intended for indoor use only. Do not expose it to extreme weather conditions e.g. rain or dampness.
- Battery chargers contain hazardous voltages. There are no user serviceable components inside the charger. Do not disassemble the product. Your warranty will be void if this instruction is ignored.
- If the AC supply cord is damaged, it must be replaced by the manufacturer, its service agent or a similarly qualified person.
- Ensure the ignition and all of the accessories in the vehicle are switched off prior to connecting the battery charger.
- To avoid sparking, turn off and unplug the 240V mains power supply before making or breaking connection to the battery.
- 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 the use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance.

WARNINGS

- Lead acid batteries produce explosive gases. Do not smoke, and keep ignition sources away from batteries.
- Use only in a well ventilated area.
- Do not attempt to recharge non-rechargeable batteries.
- Do not use on dry cell, or batteries of a different technology.
- Do not attempt to charge frozen batteries. Allow the battery to stabilise in a temperature between 10°C and 20°C.
- Avoid contact with Battery Acid. If splashed in eyes, immediately rinse with clean running water.

If splashed on skinr immediately wash effected area with clean running water. Seek medical assistance.

NOTE: The warnings, cautions, and instructions detailed in this instruction manual cannot cover all possible conditions and situations that may occur. Common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

FEATURES

1. Built-in microchip monitoring and control system.
2. Able to test battery condition while charging (Faulty battery LED indicator and in built buzzer).
3. Accurate voltage and current detection and monitoring on both input and output; AC and DC.
4. Automatic selectable charge cycle for Gel, AGM, Lead-acid batteries, also manual selectable charge cycle for Calcium, Calcium-Calcium batteries provides the best possible charge for each battery type.
5. Complete charging cycle including desulphation/pulse, soft start, bulk, absorption, analysis, boost (equalisation), float, and maintenance to fully charge the battery and prolong battery life.
6. Even cell voltage function allows all battery cells to be charged equally.
7. Charger temperature control automatically adjusts the charging voltage relative to the temperature inside the charger to minimise battery and charger damage due to overheating.
8. Aptitude overcharging protection prevents the battery being damaged due to overcharging.
9. Reverse polarity protection.
10. Short circuit protection.

11. Minimum battery voltage required for battery charger to start charging is 0 Volts(Please take any load a way before charging).The battery charger pulses a small current (up to 3.6V at 50 mA) when the battery charger is switched on and not connected to a battery. This means that the battery charger will sense batteries with 0 Volts output and attempt to recharge them unlike many other multistage battery chargers that will not activate unless the battery has a voltage of between ~2V to 5V. If the leads of the battery charger are touched together a small spark may be noticed between the clamps however, this action will not damage the battery charger in any way.

    NOTE: Lead acid batteries with a voltage of less than 10.5V may be recharged. However, they may have suffered permanent damage as a result of Sulphation of the lead plates, which can not be fully corrected by the battery charger. To prolong battery life, it is recommended that lead acid batteries not be discharged to below 10.5V.

12. Includes two separate connection leads - alligator clamps for quick and easy temporary connection to a battery and ring terminal connectors for permanent connection to a specific hard to reach battery (boat, caravan, etc).
13. This unit have 13.5V6A (For PBC88S) or 12A (For PBC168S) DC power source, Can be applied to house hold appliances 12V occasions.

SPECIFICATIONS

	PBC88S	PBC168S
Charger Type	Automatic switch mode 8 stage Battery Charger	Automatic switch mode 8 stage Battery Charger
Lead Length 240 Volts	2.0m	2.0m
Lead Length 12 Volts	0.5m	0.5m
Lead Connector Alligator Clips: Ring Terminal Connectors:	0.50m (1.0m total) 0.50m (1.0m total)	0.50m (1.0m total) 0.50m (1.0m total)
Input Power	180~250V,50Hz	180 ~ 250V,50Hz
Output Power	12v 8A ~96 watts	12v 16A ~ 192 watts
DC Power supply	13.5V DC 6A current	13.5V DC 12A current
Reverse Connection Protection	Yes	Yes
Short Circuit Protection (for when battery clamps are touched together)	Yes	Yes
Case Type	Anodised aluminium	Anodised aluminium
Operating Temperature(Ambient)	-15°C- 50°C	-15°C- 50°C
Chargeable Battery Types	12V Lead-acid Calcium Maintenance free Gel/AGM batteries	12V Lead-acid Calcium Maintenance free Gel/AGM batteries
Deep Cycle Battery Range	17AH to 150AH	24AH to 200AH
Automotive Battery Range	120 CCA to 800 CCA	140 CCA to 1600 CCA
Marine Battery Type	140 MCAto 1000 MCA	180 MCAto 2000 MCA
Time to Full Charge	6-20 hours	6-20 hours

CHARGE CYCLES

The KEMAX 8 Amp and 16 Amp Automatic 8 Stage Smart Battery Chargers contain 8 charge stages.

1. Desulphation/Pulse Stage
Prevents oxidisation and rejuvenates sulphated battery plates. Stabilises electrolyte consistency and minimises the battery temperature rising while charging. Recovers battery capacity and can help extend battery life. The pulse frequency is 60KHZ - 80KHZ, the voltage is 13.7V or 13.2V.

2. Soft Start
Minimises gassing and the build up of heat in the battery, unlike conventional battery chargers. Also improves electrolyte consistency which can become uneven from day to day use. The soft start function eliminates the disadvantages associated with conventional battery chargers and improves the batteries charging capability.

3. Bulk Charge
Maximum charge current is delivered to the battery to minimise charge times.

4. Absorption
Reduces the current supplied to the battery and ensures that the battery has been completely charge without being overcharged.

5. Analysis - Testing the Battery While Charging
While charging the battery, the control system will monitor the condition of the battery. Eg: Damaged battery plates, or internal components. If any damaged components are detected the charger will give warning sound and the Faulty Battery warning LED will come on.

6. Boost/Equalisation Charge
After fully charging the battery, the charger will equalise all of the cells in the battery by providing a steady voltage specific to the battery type at 100% of the chargers puls current.

Charger Type	Boost/equalisation values for 8 amp battery charger		Boost/equalisation charge values for 16 amp battery charger	
	Output Volts	Output Current	Output Volts	Output Current
Calcium Battery	16.2V puls	8 Amps	16.2V puls	16 Amps
Lead Acid Battery	15.4V puls	8 Amps	15.4V puls	16 Amps
AGM/Gel Battery	15.4V puls	8 Amps	15.4V puls	16 Amps

7. Float Charge
After the boost charge the current will drop to approximately 1 amp to maintain the battery in a fully charged and ready to use state.

8. Maintain Charge
When the float stage is completed the charger will produce a pulse output to of 1Hz at a voltage of 13.5V Gel, 13.5V Lead Acid/A6M or 13.8V Calcium. If a load is applied and the battery voltage drops to approximately 12.4 Volts the charger will respond and restart again from the Absorption stage.

BATTERY PROTECTION SYSTEMS

Over charging protection
The advanced microchip monitoring and controlling system will ensure that the battery does not become overcharged which can result in the loss of electrolyte or an internal short circuit which can cause damage to the battery.

Overload protection
Overload protection will activate when the current exceeds 120% of the maximum working current, and when voltage rises higher than 16.5V.

High temperature protection
High temperature protection will activate when the internal temperature of the charger rises above 50°C. If this occurs, charger output will be reduced. Once the temperature drops below approximately 35°C, the charger output will return to normal. The purpose of this feature is to protect the battery and battery charger when they are being used in environments with very high ambient air temperatures.

Even charging function
By slowly raising the voltage the battery cells with a lower voltage are not charged too quickly, which can overheat individual battery cells, compared to battery cells with a higher voltage.

OPERATION

Selecting Battery Type
KEMAX Automatic 8 Stage Battery Chargers have intelligent technology which analysis battery condition, via battery voltage and current and provides the most suitable charge cycle to battery, however some calcium battery need high voltage and more current to put in. So when you charge the Calcium battery please push select button to hold 3 seconds when LED display Calcium, if push button again, it will switch to ordinary modle. Also these charger can supply DC power source for household appliances 12V occasions. Please push the button twice time, the LED will display DC power supply then it will output 13.5V 6A (PBC88S), 13.5V 12A (PBC168S) source. The DC power supply have overload and short circuit protection. If overloaded, the output voltage will drop untill 0 V. If short circuit, the output will switch off. Also LED flash.
If you want to switch off DC power supply, just push button again, it will switch to charge modle, LED on screen will off.

LED DISPLAY FUNCTIONS

8Amp charger shown

Battery Type Selecte	Calcium
DC Power Supply	13.5V 6A (PBC88S), 13.5V 12A (PBC168S)
Faulty Battery	Battery is faulty and may not be able to be charged
Desulphation	Desulphation charging stage
Soft Start	Soft start charging stage
Bulk	Bulk charging stage
Absorption	Absorb charging stage
Analysis	Analysing battery condition
Boost	Boost charging stage
Float	Float charging stage
Maintenance	The battery is fully charged and is being maintained by the battery charger
Battery Status	Displays the current battery charge level

Suitable for negatively (-) grounded vehicles where the negative lead from the battery is connected to the vehicles chassis or engine block.

PLEASE READ AND FOLLOW THE OPERATING INSTRUCTIONS CAREFULLY.

Step 1 - Inspecting the Battery
Remove the vent caps of the battery to be charged and ensure the electrolyte is at the correct level of approximately 6mm above the plates. If the electrolyte level is low top up using distilled water and refit the vent caps.

Step 2A - Connecting the charger to a battery in a vehicle
Ensure the ignition and all of the accessories in the vehicle are switched off as this will maximise the charge that your battery receives. If accessories in the vehicle are left on and their power consumption exceeds the output of the battery charger your battery will still go flat with the charger connected and operating.

A) Connect the red positive (+) lead of the battery charger to the positive (+) post of the battery.
B) Connect the negative (-) lead of the battery charger to the chassis or another grounded metal component away from moving parts and the fuel system.
C) Plug the battery charger to the 240 volt mains power supply.
D) Select the battery type.

Step 2B - Connecting the charger to a battery out of a vehicle

A) Connect the red positive lead (+) of the battery charger to the positive post (+) of the battery.
B) Connect the black negative (-) lead of the battery charger to the negative post (■) of the battery.
C) Plug the battery charger to the 240 volt mains power supply.
D) Select the battery type.

Step 2C - Connecting the charger to a battery in a vehicle using the terminal connector lead
Ensure the battery charger is located in a position that is not exposed to excessive heat, dust and vibration and away from moisture.

A) Unscrew the nuts from battery terminals and slide the eyelets from the terminal connector lead over the bolts - Red terminal connector to the positive (+) battery terminal - Black terminal connector to the negative (-) battery terminal. Do not extend the length of the charger leads as this will result in a voltage drop and reduce charging performance.
B) Loosely secure the cable near the plug end of the terminal connector lead in an easily accessible area around the battery.
C) Plug the battery charger lead into the plug end of the terminal connector lead as required for charging.
D) Plug the battery charger to the 240 volt mains power supply.
E) Select the battery type.

Step 2D - Permanently connecting the charger to a battery in a vehicle
If permanently connecting the battery charger to a battery in a vehicle it is recommended that the connecting leads be hard wire to the battery and an inline fuse included.

A) Ensure the battery charger is located in a position that is not exposed to excessive heat, dust and vibration and away from moisture.
B) Do not extend the length of the charger leads as this will result in a voltage drop and reduce charging performance.
C) Cut and wire in an inline fuse on the positive (+) lead of the ring terminal connector:
   10amp inline fuse for the 8 amp battery charger
   20amp inline fuse for the 16 amp battery charger
D) Connect the red positive (+) lead from the charger to the positive side of the battery. You should be able to bolt the ring terminal to the battery terminal.

E) Connect the black negative (-) lead from the charger to the negative side of the battery. You should be able to bolt the ring terminal to the battery terminal.
F) Plug the battery charger to the 240 volt mains power supply.
G) Select the battery type.

NOTE: When not connected to the mains power supply and turned on the battery charger will draw a small current from the battery as it continues to analyse the batteries condition. To minimise the risk of flattening your battery it is recommended that the inline fuse be removed if the charger is not used for an extended period of time (3 months +).

Disconnecting the charger from a battery

A) To avoid sparking, turn off and unplug the 240V mains power supply before making or breaking connection to the battery.
B) Remove the black negative (-) then the red positive (+) of the battery charger from the battery or unplug the terminal connector lead.
C) Inspect the electrolyte levels in the battery and top up if required.

MAINTENANCE

- Keep the battery charger in a clean dry environment.
- There are no user serviceable parts inside the battery charger and it must not be disassembled.