

## General Instruction Sheet CM Range 3 Stage Battery Chargers

This new range of battery chargers utilises the latest computer controlled technology designed to give greater charging control of Lead Acid batteries, with increased product reliability.

**What follows is the procedure for the correct operation of the battery charger:**

- 1) Make sure the charger is unplugged.
- 2) Connect the battery as determined by the charger leads. **Red** connector to **positive (+)** **Black** connector to **negative (-)**.
- 3) Plug the charger in and switch ON.
- 4) During start up the charger will determine battery status and depending on the result will switch to either **bulk** charge mode (**red indicator ON**) or **float** charge mode (**green indicator ON**). **Note**, when the charger enters float charge mode the battery is 100% fully charged.
- 5) If neither of the indicators illuminate then unplug the charger, check the fuse in the plug, replace if necessary, plug back in and switch ON.

### Features

**Short Circuit Protection** - Prevents damage to the charger if the dc output is short circuited, visual indication is by alternate flashing red and green indicators.

**Reverse Polarity Protection** - Prevents damage to the charger if the battery is accidentally connected in reverse, visual indication is by a continuous flashing red indicator.

**High Temperature Protection** - If the internal case temperature rises above a pre-determined level the system is designed to automatically shut down the charging current, thus reducing the case temperature. As the temperature reduces the charger will automatically turn up to the maximum charging current available. Simultaneous flashing of the red and green indicators will visually indicate high case temperatures.

**Soft Start** - On power up the system will enter a "soft start" mode. This facility checks for possible faults i.e. reverse battery connection, short circuit etc. before offering maximum charge current.

**Constant Current Bulk Charge and 3 Stage Charging** - Provides the fastest possible way to recharge a SLA battery without overcharging.

**Constant Voltage Float** - Compensates for self discharge, holding the battery at peak charge, ready for use. The battery can be left on charge until required without fear of overcharging.

**Proportional Charging** - Automatically, proportionally adjusts the second (constant voltage) stage length of charge based on the time taken to carry out the first (constant current) stage. This facility allows optimal charging by eliminating overcharging and compromise of fixed charge timers.

### Operation

First stage - constant current (CC) mode. Visual indication: **Red LED ON, Green LED off.**

Second stage - constant voltage (CV) mode. Visual indication: **As above.**

Third stage - float charge mode. The battery will be maintained 100% charged. Visual indication: **Green LED ON, Red LED off.**

**Note, On power up the charger will appear to be in "float" mode for a short period of time. This is to complete all checks as described in feature "soft start".**

### LED Protocol

Charger Status	LED Status
Bulk charge mode	Red - static ON
Float charge mode (charge complete)	Green - static ON
battery reversal detected	Red - flashing
High temperature detected	Red + Green flashing simultaneously
Short circuit	Red + Green flashing alternately
Open circuit	Red + Green static simultaneously