

BATTERY LINK

By **HAIGH**

Pro Series

MICROPROCESSOR CONTROLLED

BATTERY CHARGER

WITH MULTI-STAGE CHARGING SYSTEM

INSTRUCTION MANUAL



SAA APPROVAL No. SGSEA/080536

Part No. MCU070

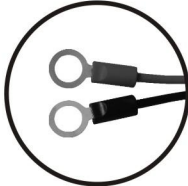
IT IS ESSENTIAL YOU READ THE ENTIRE CONTENTS OF THIS MANUAL BEFORE USING THIS PRODUCT. FAILURE TO DO SO COULD RESULT IN INJURY, PROPERTY DAMAGE OR PRODUCT FAILURE.

KEEP THIS MANUAL FOR FUTURE REFERENCE

CONNECTORS



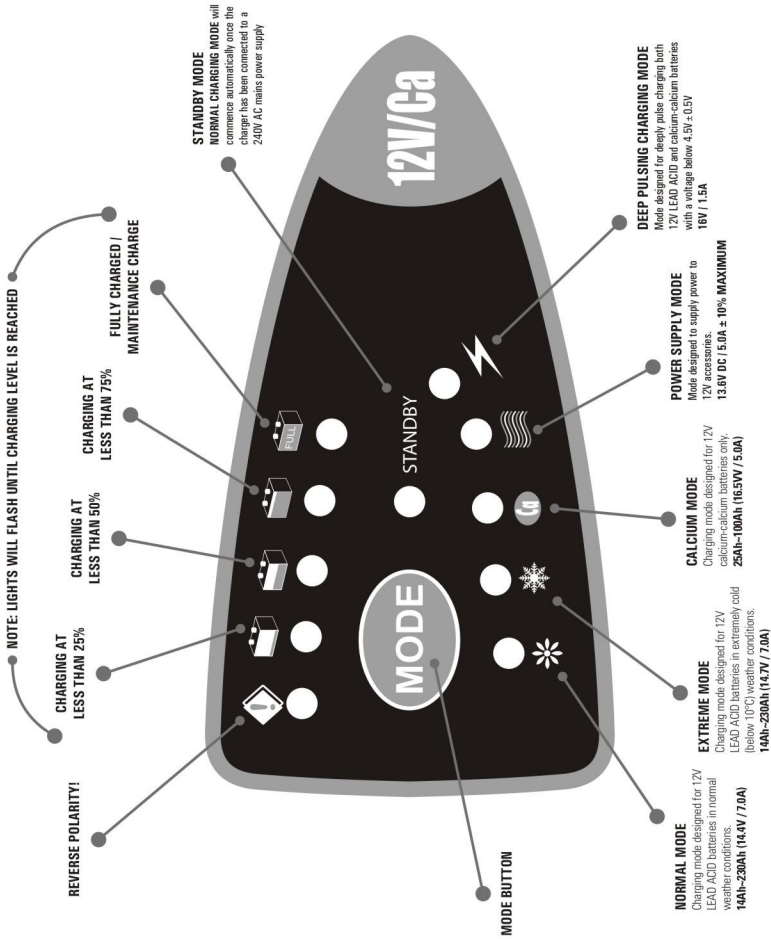
CLAMPS



TERMINALS CONNECTORS



ACCESSORIES ADAPTOR



INTRODUCTION

The MCU070 charger is designed for charging single 12 volt lead acid (starting) batteries widely used in motor vehicles, motorbikes and marine craft. These batteries are often referred to as WET CELL, GEL or AGM with capacities ranging from 12V/14Ah to 12V/230Ah or calcium-calcium batteries from 12V/25Ah to 12V/100Ah. It will also charge deep cycle batteries (including calcium-calcium) used to power electric outboards, winches, golf carts, 12 volt refrigerators & freezers. The charger can also be used as a power supply with maximum 13.6 volt DC 5.0A output current. Please note this power supply will not operate for equipment requiring more than 5 amps at "start up".

NOT TO BE USED ON NON-RECHARGEABLE BATTERIES.

In all applications you must NOT connect the charger to mains power until battery or power supply connections have been completed. Prior to disconnecting the charger from either a battery or after use as power supply, you must FIRST turn off mains power supply at power point.

WHAT DOES MCU STAND FOR?

MCU stands for (MICRO CONTROL UNIT) meaning there are different stages of the charging process:

1. Diagnosis & Recovery
2. Four Stage Bulk Charging
3. Absorption Charging
4. Float Charging
5. Maintenance Charging
6. Deep Pulse Charging

These different stages enable the battery to be recharged to almost 100% capacity. The charger can remain connected to the battery indefinitely without any damage being caused to the charger or battery.

CHARGING INSTRUCTIONS

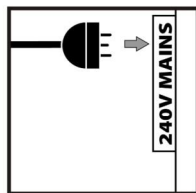
Please read this manual carefully prior to operation.

Make sure that the 240V power outlet you will be using for the charger is in the OFF position before inserting the power cord.

Connect the desired attachment (clamps, terminal connectors, or accessories adaptor) to the charger.

Before connecting the charger to the battery we strongly recommended that battery is removed from the vehicle and charged in a well ventilated location.

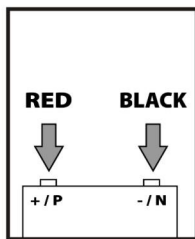
For more information please see the 'CAUTION' section of this manual



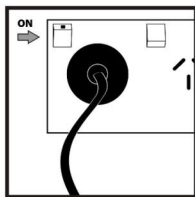
BATTERY CONNECTION INSTRUCTIONS

When connecting the charger to the battery:

- Ensure the battery posts are clean and free of corrosion.
- Connect the charger clamps or terminals to the battery in the following order:
RED to the positive post of the battery (marked P or +) and BLACK to the negative post of the battery (marked N or -)
- It is important to ensure that either battery clamps or terminals make solid contact with each terminal post.



Once this is completed switch on the mains power supply to activate the charger and the "STANDBY" LED should light up. NORMAL CHARGING MODE will commence automatically ("STANDBY" LED will go off). The correct MODE must be selected as follows if you want to charge the battery in different modes.



SELECTING CHARGING MODES

FOR LEAD ACID BATTERIES: NORMAL CONDITIONS

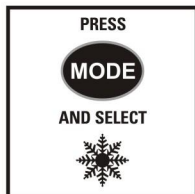
For charging under normal weather conditions you must select **NORMAL MODE**. There is **NO** need to press the **MODE** button as this will commence automatically once the charger has been connected to a mains power supply.

For more information regarding the different modes, see page 6-7

FOR LEAD ACID BATTERIES: EXTREME CONDITIONS

For temperature conditions of 10°C or below, you must select **EXTREME MODE** by pressing the **MODE** button.

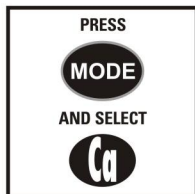
For more information regarding the different modes, see page 6-7



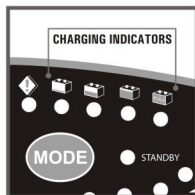
FOR CALCIUM-CALCIUM BATTERIES:

You must hold down the **MODE** button momentarily, until you see the light for **CALCIUM MODE** illuminate.

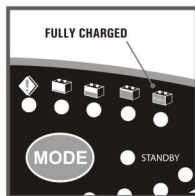
For more information regarding the different modes, see page 6-7



Once the correct mode has been selected the battery will begin the charging process. You can monitor the batteries progress by the charge indicators located above the **MODE** button.



When the battery is fully charged the "FULLY CHARGED" LED will light up. From this point on the battery will be receiving a maintenance charge.



RESCUING A DEAD BATTERY

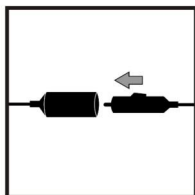
When initially connected to a battery, the charger will automatically detect the voltage of the battery and then change to **PULSE CHARGING MODE*** (Diagnosis & Recovery Mode) if the voltage is within the range of $4.5V \pm 0.5V$ to $10.5V \pm 0.5V$, the charging indicator will begin flashing to indicate that analysis is underway. This **PULSE CHARGING MODE*** won't stop until the battery voltage rises to $10.5V \pm 0.5V$. Once $10.5V$ is reached, the charger changes to **NORMAL CHARGING MODE** and the indicator will cease flashing. The battery will then charge normally. **Diagnosis & Recovery Mode** will rescue many "FLAT" batteries (over 4.5 volts) and allow the battery to accept a normal charge.

**Only available FOR NORMAL & EXTREME TEMPERATURES MODES*

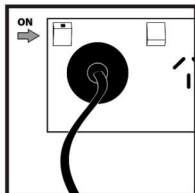
Note: If a battery does not recover after a period of time on charge it may be **FAULTY** and therefore can no longer accept a charge. In these cases the charger will remain in the "STANDBY" mode to indicate that the battery may be **FAULTY**. We suggest you have the battery checked by an automotive battery reseller or auto electrician. The **REVERSE POLARITY** symbol indicates only if the charger has been connected incorrectly (reverse connection). Automotive batteries have an average life of 3 years in Australian conditions.

USING THE CHARGER AS A POWER SOURCE

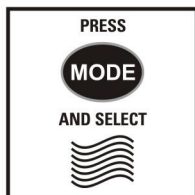
Connect the accessory you wish to power using the accessories adaptor that came with this charger.



Switch on the mains power supply to activate the charger and the "STANDBY" LED should light up. At this point **NO** charge is being delivered to the battery.



Hold down the **MODE** button until you see the light for **POWER SUPPLY MODE** illuminate. At this point you should be able to turn on and use your accessory.



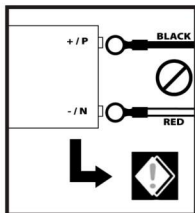
CHARGER PROTECTION FUNCTIONS

To ensure safe operation, the charger has inbuilt protection against incorrect connection, short circuiting and overheating. The charger monitors the connection process and prevents "SPARKING" from occurring. The charger casing is graded "IP65" - Unit sealed protecting against dust and low pressure jets of water from all directions (*Special conditions).

**240V plug and lead are not to be exposed to weather.*

If the leads are connected incorrectly (e.g. Positive on Negative) the Reverse Polarity Protection will cut-in automatically and the REVERSE POLARITY LED will illuminate and the battery charger will switch off.

If the charger becomes too hot during the charging process, it will reduce the power output automatically to prevent causing damage to itself.



UNDERSTANDING MODES

STANDBY

After battery connection is completed and mains power is delivered to the charger, the STANDBY mode will illuminate. If no MODE is selected the battery charger will commence charging in NORMAL mode. If the battery is faulty, the charger will remain in STANDBY mode. For different charging modes other than NORMAL press the MODE button to select.

NORMAL MODE (14.4V / 7.0A)



This mode is designed for charging 12V lead acid batteries with a capacity of 14AH to 230AH in normal conditions. Charging will commence at 7.0A \pm 10% current and the charging indicators will remain illuminated or flash to representative the battery level until the battery is charged up to 14.4V \pm 0.25V. All the charging indicators will remain illuminated when the battery is fully charged. If the charger is left connected to the battery while still connected to the 240V AC mains power supply, a nominal charge (maintenance charge) is provided.

EXTREME MODE (14.7V / 7.0A)



This mode is designed for charging 12V lead acid batteries with a capacity of 14AH to 230AH in extreme cold conditions (maximum 10°C or below). Charging will commence at 7.0A \pm 10% current and the charging indicators will remain illuminated or flash to representative the battery level until the battery is charged up to 14.7V \pm 0.25V. All the charging indicators will remain illuminated when the battery is fully charged. If the charger is left connected to the battery while still connected to the 240V AC mains power supply, a nominal charge (maintenance charge) is provided.

**CALCIUM
MODE
(16.5V / 5.0A)**



This mode is designed for charging 12V calcium-calcium batteries with a capacity of 25AH to 100AH in normal conditions. Charging will commence at $5.0A \pm 10\%$ current. The charging indicators will remain illuminated or flash to representative the battery level until the battery is charged up to $14.7V \pm 0.35V$. At this point the charging current will be cut off for approximate 30 minutes then the battery will be changed by charging with a constant voltage at 16.5V and constant current at 1.5A until the battery is charged up to $16.5V \pm 0.35V$. All the charging indicators will remain illuminated when the battery is fully charged. If the charger is left connected to the battery while still connected to the 240V AC mains power supply, a nominal charge (maintenance charge) is provided.

WARNING - THIS MODE IS SPECIFICALLY FOR CHARGING CALCIUM - CALCIUM BATTERIES ONLY. CHARGING GEL, SLA AND NORMAL LEAD ACID BATTERIES ON THIS MODE WILL CAUSE DAMAGE TO THE BATTERY.

**POWER
SUPPLY
MODE
(13.6V / 5.0A)**



This mode is only to be used as a 13.6V 5.0A power supply. Before any 12V appliance (below maximum 5.0A power consumption) is connected please attach the accessory plug included with this charger. Connect charger to 240V AC mains power supply. The "STANDBY" indicator will illuminate then hold down the "MODE" button for approx 5 seconds to activate the POWER SUPPLY indicator. Once illuminated the charger is now ready to provide the a 12V power source with $13.6V \pm 0.25V$ and $5A \pm 10\%$ constant voltage and output current.

Note: 12 volt power supplies commonly produce 13.6V without any detrimental affects to 12V equipment.

**DEEP
PULSE
CHARGING
MODE
(16.5V / 1.5A)**



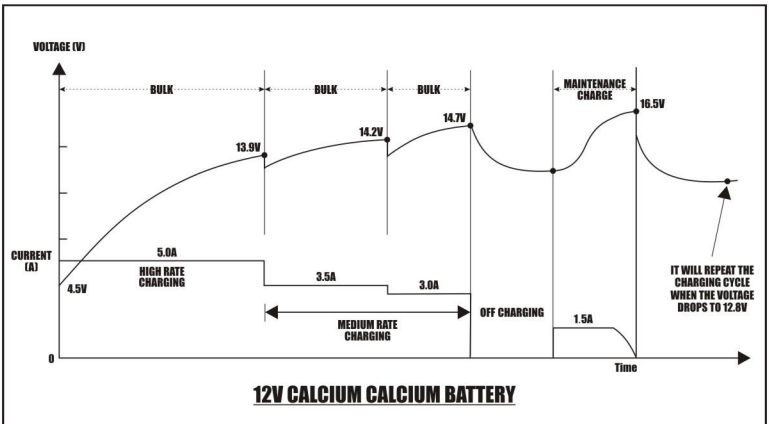
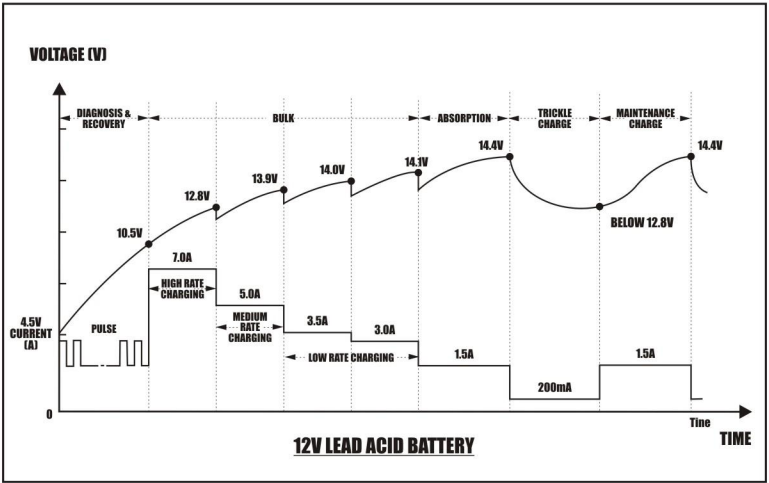
This mode is designed for deep pulse charging 12V lead acid batteries with a capacity of 14AH to 230AH and voltage below 4.5V. Connect the output terminals of the charger to the battery. Connect charger to 240V AC mains power supply. The "STANDBY" indicator will illuminate then press the "MODE" button and select the DEEP PULSE CHARGING MODE. Once selected, the indicator will keep flashing to indicating that the DEEP PULSE CHARGING has commenced at $16V \pm 0.25V$ voltage and $1.5A \pm 10\%$ current. The indicator will turn off as soon as the battery can accept the normal charging procedure (over $4.5V \pm 0.25V$) or for up to 7 hours maximum. If a battery does not recover after this period of time on charge it may be FAULTY and therefore can no longer accept a charge. In these cases the charger will remain in the "STANDBY" mode to indicate that the battery may be FAULTY. We suggest you have the battery checked by an automotive battery reseller or auto electrician.

BULK CHARGING TIMES

For approximate 80% charge. Times may vary depending on conditions.

12V LEAD ACID BATTERY		12V CALCIUM CALCIUM BATTERY	
BATTERY SIZE (AH)	TIME (HR)	BATTERY SIZE (AH)	TIME (HR)
14	2.5	25	9
60	7.5	35	15
100	12	55	20
120	15	75	25
230	29	100	30

BATTERY CHARGING DIAGRAMS



SPECIFICATIONS

12V LEAD ACID BATTERIES

Input Voltage AC	240V 50Hz 135W	Efficiency	75%
Output Voltage	Nominal: 12V	Charging Voltage	14.4V \pm 0.25V or 14.7V \pm 0.25V
Input Current	1.2A RMS max	Charging Current	7A \pm 10% or 1.5A \pm 10%
Housing Protection	IP65 (Unit sealed against dust and low pressure jets of water)		
Ambient Temperature	-20°C to 50°C, Reduced output power at higher temperature		
Type of Charger	Ten step, fully automatic, switch mode with maintenance charging		
Type of Batteries	12V Lead-acid batteries (WET, MF, AGM and GEL)		
Battery Capacity	14Ah-230Ah	Ripple	Max 150mV 0.3A
Dimensions(LxWxH)	205x94x51mm	Back Current Drain	< 5mA
Weight	0.842kg	Noise Level	50dB (Tested from a distance of 50CM)

12V CALCIUM CALCIUM BATTERIES

Input Voltage AC	240V 50Hz 135W	Efficiency	75%
Output Voltage	Nominal: 12V	Charging Voltage	16.5V \pm 0.25V
Input Current	1.2A RMS max	Charging Current	5A \pm 10% or 1.5A \pm 10%
Housing Protection	IP65 (Unit sealed against dust and low pressure jets of water)		
Ambient Temperature	-20°C to 50°C, Reduced output power at higher temperature		
Type of Charger	Ten step, fully automatic, switch mode with maintenance charging		
Type of Batteries	12V Calcium Calcium Batteries		
Battery Capacity	25Ah-100Ah	Ripple	Max 150mV 0.3A
Dimensions(LxWxH)	205x94x51mm	Back Current Drain	< 5mA
Weight	0.842kg	Noise Level	50dB (Tested from a distance of 50CM)

FAULT FINDING

- PROBLEM:** "STANDBY" indicator illuminates but the "MODE" button won't allow you to cycle through the different charging modes.
POSSIBLE FAULT: Charger not connected to battery.
Check terminal connection.
Battery is not 12V.
Battery is below 4.5V (refer to RESCUING A DEAD BATTERY section)
For 12V CALCIUM-CALCIUM BATTERY CHARGING MODE, the output terminals need connecting to the calcium-calcium battery first, press the "STANDBY" button and hold for more than 5 seconds until "CA" symbol illuminates.
- PROBLEM:** No spark when charging clamps or terminals touch together.
ANSWER: Charger features an inbuilt safety device to prevent sparking if clamps or terminals accidentally touch together.
- PROBLEM:** Multimeter will not provide a reading between charging clamps prior to connection to battery.
ANSWER: The charger will only operate when connected to a 12V battery with more than 4.5V. A multimeter voltage reading will only be provided when the charger is connected to the battery.

! CAUTION !

- **ALWAYS** disconnect the charger from the mains supply before connecting to or disconnecting from the battery.
- **WARNING: EXPLOSIVE GASES** - Prevent flames and sparks. Provide adequate ventilation during charging.
- **DO NOT** charge a battery near flammable materials, naked flames, gas pilot lights or gas hot water systems.
- This charger is specially designed for charging one single 12V Lead Acid Battery at a time. **DO NOT** use this charger for charging **NON-RECHARGEABLE** batteries.
- **DO NOT** leave the charger connected to the battery when the charger is **NOT** connected to mains power supply.
- If the battery is found to be too hot or is leaking fluid during the charging process, immediately stop operation. Fluid from the battery is **ACIDIC** and can cause burns and corrosion.
- It is strongly **RECOMMENDED** that batteries (in motor vehicles) be removed before charging. If this is **NOT** practical please make sure that the battery terminal **NOT** connected to the chassis is connected to the charger first. The other connection is to be made to the chassis, clear of any battery cables and fuel lines. The charger can now be connected to the mains power supply.
- After charging battery in automotive vehicle, disconnect the battery charger from mains power supply. Then remove the chassis connection and then the initial battery connection.
- The **ACID/FLUID** within a battery is a highly corrosive and poisonous. It can produce flammable and toxic gases when recharged and will explode if ignited. When working with batteries, always wear eye protection, remove jewellery and ensure the area is well ventilated. If spilt - it will cause severe burning to eyes, skin, clothing, damage paintwork and corrode many metals. Ensure that 240V AC power is disconnected from any appliance in the vicinity of the spill and immediately wash any area that has been affected with water.
- **DO NOT** allow battery acid to mix with salt water. This will produce chlorine gas which may be deadly.
- This charger is **NOT** intended for use by young children or infirm persons unless they have been adequately supervised by a responsible person to ensure that they can use the appliance safely.
- Young children should be supervised to ensure that they **DO NOT** play with the appliance.
- The casing of this charger is graded IP65. (Sealed against dust and low pressure jets of water). **NOTE:** The 240V plug and lead are not to be exposed to weather.

