

SMART BATTERY
CHARGER, MAINTAINER,
REJUVENATOR AND
POWER SUPPLY

12 Volt ⚡ **25 Amp**



Designed for all conventional
lead-acid (AGM, Calcium
SMF, EFB, Gel, WET) and
Lithium (LiFePO4) batteries

OWNER'S MANUAL

AUSTRALIAN & NEW ZEALAND STANDARD AS/NZS 60335.2.29 APPROVED

IMPORTANT SAFETY ADVICE AND WARNINGS

- The charger is designed to charge **12V lead-acid type batteries (Gel, Calcium SMF, AGM, WET, EFB) and compatible Lithium-Ion (Including LiFePO4) batteries ONLY.**
- Always refer to the battery manufacturers specifications and recommendations if you're unsure of your battery charging requirements. **FOR LITHIUM TYPE BATTERIES PLEASE CHECK THE LITHIUM BATTERY MANUFACTURER SPECIFICATIONS TO ENSURE THE CHARGING VOLTAGE (14.4V) AND CHARGING CURRENT IS SUITABLE BEFORE USING THIS PRODUCT AS THERE MAYBE SOME LITHIUM-ION AND LiFePO4 BATTERIES NOT SUITABLE FOR CHARGING. DO NOT CHARGE A LITHIUM BATTERY ON LEAD ACID TYPE BATTERY SETTING OR A LEAD ACID BATTERY ON A LITHIUM SETTING.**
- Explosive gases may escape from the battery during charging so please ensure the battery is charged in a well ventilated area.
- This charger is designed for indoor use only and should never be exposed to water, rain, snow, liquids etc.
- Do not attempt to use the charger if it has been dropped or damaged.
- Do not attempt to use the charger if the cables or plugs are damaged.
- **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.**
- If battery acid contacts your skin or clothing, wash immediately with soap and water. If acid enters your eye, immediately flush the eye with running cold water for at least 10 minutes and seek medical attention. Someone should always be within range of your voice.
- Never attempt to charge a damaged battery, frozen battery or non rechargeable battery.
- Never place the charger on the battery or battery on the charger.
- When working with lead-acid batteries, remove personal metal items such as rings, bracelets, necklaces, watches and make sure you don't short circuit the battery terminals with any type of metal tool or piece of jewellery as this will cause an explosion. You can wrap your spanner with insulation tape to minimise the risk of a short circuit.
- NEVER smoke, use an open flame or create sparks near a battery or charger during charging operation as this may cause an explosion and explosive gases.
- Do not disassemble the charger. Take it to a qualified and authorised person for repair.
- If using a generator, you must ensure you use a surge protector to protect the charger from voltage spikes.
- The charger must not be used or played with by infirm persons or children. Also keep it away from any pets.

MAIN FEATURES

- **Smart battery charger & maintainer with reconditioning.**
- **Power Supply Mode.**
- **The battery charger is easy to use and requires no technical experience.**
- **Fully microprocessor controlled with safety timers at every stage.**
- **Battery condition analysis.**
- **Selectable battery type.**
- **Selectable charge rate / mode.**

- **Patented battery rejuvenation (reconditioning).**
 - **Battery voltage retention analysis.**
 - **Ultra lower power consumption (ECO Mode)**
 - **Multi Stage: Lead-acid type batteries (Gel, Calcium SMF, AGM, WET, EFB)**
 - 1 - Qualification - Battery condition check
 - 2 - Battery rejuvenation (recondition mode)
 - 3 - Soft start charging
 - 4 - Bulk charging
 - 5 - Absorption charging
 - 6 - Equalisation charging
 - 7 - Battery analysis
 - 8 - Float mode
 - 9 - Long term maintenance pulse charge. Recharge Cycle every 21 Days.
 - **Multi Stage: Lithium-ion (LifePO4) type batteries**
 - 1 - Lithium Activation
 - 2 - Soft start charging
 - 3 - Bulk charging
 - 4 - Absorption stage 1
 - 5 - Absorption stage 2
 - 6 - Full / Analysis
 - **Automatic diagnosis and charge:** On power up, the charger will automatically diagnose the battery condition and determine if the rejuvenation mode (reconditioning) or charge cycle is required.
 - **Patented battery rejuvenation technology:** The charger has a unique and patented rejuvenation feature which uses high voltage equalising and peak pulse reconditioning to repair sulphated batteries. This feature is fully automatic and depends on the internal impedance of the battery. It also depends on whether the battery is still connected in the vehicle.
 - **Can be left on 24/7 to ensure your battery is always maintained and fully charged:** The battery charger can be left unattended and left permanently connected all year round. The intelligent charger will monitor the battery voltage and will maintain it at peak performance.
 - **Short circuit and reverse polarity protection:**
 - **Heavy-duty and corrosion-resistant output connectors:**
 - **Crocodile clips and ring terminals:** It comes with a quick connect fly lead and 2 different kinds of connectors, crocodile clips and ring terminals. The ring terminals are integrated into the crocodile clip harness and are perfect for permanent connection to your battery. You can connect the ring terminals to the battery and tuck the lead away while you are using your vehicle and when you get back to your garage simply plug the lead back into the charger.
To detach the crocodile clips from the ring terminal harness, use a phillips head screw driver and remove the screws.
- SELECTABLE CHARGE RATES**
- **Rapid Charge Mode:** Uses maximum charging current to ensure the fastest charge time. You may hear the fan turn on during this mode.
 - **Silent Charge Mode:** Charges at a slightly reduced charge rate so the cooling fan is not required.
 - **Maintenance Mode:** Ideal and recommended for long term maintenance charging or for charging smaller batteries.
 - **Power Supply Mode:** Press & Hold the Charge Rate button for 3 seconds to activate and deactivate Power Supply Mode. When in Power Supply Mode, the Power Supply Mode LED and 25A LED will be ON. Power supply mode is only required if you don't have any batteries.

TEMPERATURE & SAFETY PROTECTION:

- **INTERNAL OVERHEAT PROTECTION:** The charger has a built-in overheat and an overload electronic circuit. This protects the charger from being damage if overheated or overloaded and will automatically decrease the charging current. Once the units internal temperature decreases to a safe level, the charger will resume normal charging.
- **SAFETY TIMER PROTECTION:** The charger has safety timers for every stage. If the battery voltage doesn't reach a certain voltage within a certain time, the unit will stop charging as it's highly likely that you're attempting to charge a severely discharged or heavily sulphated battery. If any of the stages time out, the charger will immediately stop charging in order to protect the battery. This will be indicated with the fault LED flashing slowly.
- **REVERSE POLARITY:** The charger has reverse polarity protection. If the charger output leads are connected reverse polarity, the fault LED will come on and the charger will be disabled. Simply unplug the charger from AC power and then connect the output leads to the correct polarity.
- **SHORT CIRCUIT PROTECTION:** The charger will automatically turn off if the output leads are short circuited and the fault LED will come on. This prevents the charger from being damaged if the positive and negative crocodile clips or the optional ring terminals accidentally touch each other while the charger is turned on.
- **ECO MODE:** This battery charger has a built in ultra low power consumption circuit. If AC power is connected and the battery is disconnected, after 10 seconds the charger will automatically go into an ECO mode. Both the selected Charge Rate and Battery Type LED's will flash GREEN to indicate ECO mode. During this mode the power drawn is less than 0.5W which totals 0.01kWh per day power consumption. If AC power is connected and the battery is connected, once the battery is fully charged and during the long term maintenance stage, the total power consumption is around 0.03kWh per day. Both the selected Charge rate and Battery type LED's will flash GREEN to indicate ECO mode.
- **TEMPERATURE COMPENSATION:** This battery charger comes with a temperature compensation sensor attached to the Negative Battery Clamp to ensure your batteries are charged at an optimum voltage. You'll need to disconnect the temperature sensor from the unit output then connect the mating connector on the charging leads to the unit. If you're using a different set of charging leads, leave the temperature sensor connected to the unit.

BATTERY TYPES & CAPACITY:

- Suits 12V conventional lead acid batteries (VRLA) Gel, Calcium SMF, AGM, WET, EFB and compatible **Lithium-ion (including LiFePO4) batteries.**
- The Ah (Ampere-hour) capacities shown below are to be used as a general guide only. Some batteries may be able to handle a higher charge current. Refer to the battery manufacturers specifications and recommendations for your charging requirements.

	12V 25A CHARGER		
Charge Rate:	2A	15A	25A
Charging	15 - 40Ah (290CCA)	45 - 300Ah (2100CCA)	75 - 500Ah (3600CCA)
Maintaining	< 120Ah (870CCA)	< 450Ah (3250CCA)	< 750Ah (5400CCA)

ELECTRICAL PARTS & ACCESSORIES:

AC Power Cord:	1.8m with SAA 3 Pin AU Plug
DC Output Lead:	250mm with 50A Anderson Connector & Temperature Compensation Sensor.
Charging Leads:	1.5m Integrated Crocodile Clips / Ring Terminals with Temperature Compensation extension sensor. Note: To use the ring terminals you'll need an Alan key to remove the bolts from the crocodile clips

TECHNICAL SPECIFICATIONS:

Output	25A @ 12V DC
Input Voltage	220-240Vac / 3.0A
Input Frequency	50Hz
Charge Voltage (25°C)	Gel - 14.1V AGM&WET/EFB - 14.4V Calcium - 14.7V Lithium - 14.4V
Equalising Voltage	Gel - 14.3V AGM&WET/EFB - 14.6V Calcium - 15.5V
Float Voltage	13.6V (lead-acid type batteries only)
Power Supply Output	13.8VDC / 25A Max.
Start Voltage	2V
Operating Temperature	-15 to 50°C
Storage Temperature	-25 to 85°C
Operating Humidity	90% RH Max.
Temp. Compensation	-25mV/°C
Size (L*W*H)	279mm x 141mm x 67mm
Weight	2 kg
Approvals	CE, AS/NZS, EMC

CHARGING INSTRUCTIONS:

STEP 1 - DETERMINE AND SELECT YOUR BATTERY TYPE BEFORE CONNECTING THE CHARGER TO YOUR BATTERY. PLUG IN CHARGER AND TURN AC POWER ON. ONCE THE CORRECT BATTERY TYPE AND CHARGE RATE IS SELECTED, SWITCH OFF AND UNPLUG BEFORE CONNECTING THE CHARGER TO YOUR BATTERIES.

For conventional Lead acid type batteries including (VRLA) Gel, Calcium SMF, AGM&WET/EFB, press the battery select button to illuminate the Green LED for your required battery type.

For compatible Lithium-ion (LiFePO4) batteries, press the battery select button to illuminate the Green LED for **Lithium** type battery selection.

STEP 2 - Pre charge check & electrolyte level check

- Check the Battery Electrolyte levels (Not required on sealed & maintenance free batteries or Lithium batteries).
If necessary, remove the vent caps and add distilled water so the levels are halfway between the upper and lower fill lines.
 - Check the battery voltage, type and Ah capacity to ensure the charger is compatible.
 - Ensure the battery is in a well ventilated area and the charger should be as far away from the battery as the cables permit.
- Note:** The Temperature Sensor should be connected to the Negative Battery terminal.

STEP 3 - Connecting the battery charger to your battery



If the Battery is **out of the vehicle**:

Connect the Red/Orange (+) Crocodile clip or ring terminal to the positive (+) battery terminal. Connect the Black (-) Crocodile clip or ring terminal to the negative (-) battery terminal.

If the battery is still **in the vehicle**, determine if the vehicle is positively or negatively earthed.



If **Negatively Earthed (Most Common)** – FIRST Connect the Red/Orange (+) Crocodile clip or ring terminal lead to the positive (+) battery terminal and then connect the Black (-) Crocodile clip or ring terminal lead to the vehicle's chassis or negative (-) battery terminal. **DO NOT** connect the Black (-) lead to the carburettor or fuel lines.



If **Positively Earthed** – FIRST Connect the Black (-) Crocodile clip or ring terminal lead to the negative (-) battery terminal and then connect the Red/Orange (+) Crocodile clip or ring terminal lead to the vehicle's chassis or positive (+) battery terminal. **DO NOT** connect the Red/Orange (+) lead to the carburettor or fuel lines.

STEP 4 - Connect the battery charger to Mains Power (240Vac)

- The charger will automatically start when AC power is connected and switched on.
- **IMPORTANT:** Please double check and make sure the correct Battery Type and your desired Charge Rate is selected to suit your battery once the unit is turned on as per STEP 1.
- **Note:** If the Fault Indicator LED illuminates Red, please check your connections as it's likely that the Positive and Negative Leads are reversed.

THE CHARGING PROCESS: LEAD ACID (Gel, Calcium SMF, AGM&WET/EFB)

1) Qualification - Battery Condition Check

When the charger is first switched on it checks the battery condition to determine whether the battery needs reconditioning. During this qualification process it checks the internal impedance and initial voltage of the battery and it will determine how much charge current, if any that the battery will accept.

2) Automatic Enhanced Battery Rejuvenation - Blue Charging LED Double Flash

If the initial qualification detected that the battery was in poor condition, the patented rejuvenation process will begin automatically. During the rejuvenation process a high voltage equalising and peak pulse reconditioning charge is used to repair the sulphated battery. This unique patented feature will break down and dissolve the lead-sulphate crystal build up on the battery plates which will extend the life of your battery. It can also balance out high concentrations of acid. The equalisation voltage will be 16V maximum. If the battery voltage doesn't reach 9V within 24 hours, the Rejuvenation process will time out.

Manual Enhanced Rejuvenation Mode

To manually rejuvenate your batteries, simply press and hold both the Battery Type and Charge Rate buttons simultaneously for 3 seconds until the Blue Bulk LED flashes (Double flash). This mode will last for 24 Hours. To stop rejuvenation mode, press and hold both the Battery Type and Charge Rate buttons simultaneously for 3 seconds until the Blue Bulk LED stops flashing rapidly.

Important Note: Please check your Battery Type and Charge Rate selection to ensure you haven't accidentally changed these settings.

3) Soft Start Charging - Blue Charging LED Flashing Slow (Single Flash)

Gently charges the battery using a reduced charge output until the battery voltages reaches 11V. If the battery voltage doesn't reach 11V within 6 hours, the safety timer protection will stop the unit from charging and the Red Fault LED and Blue Bulk LED will start flashing.

4) Bulk Charging - Blue Charging LED ON (Charge Voltage depends on battery type selection)

Uses the maximum selected charge output until the battery voltage reaches 14.1/14.4/14.7V. If the battery voltage doesn't reach this within 24 hours, the safety timer protection will stop the unit from charging and the Red Fault LED will start flashing and the Blue Bulk LED will be ON.

5) Absorption Charging - Blue Charging LED ON and Green Full LED Flashing

Uses a constant voltage while reducing the charging output current to ensure the battery receives a full charge without overcharging the battery.

6) Equalisation Charging - Blue Charging LED and Green Full LED both flashing

A well proven process that carefully overcharges the battery to restore it's full capacity. The Equalisation stage for CALCIUM Battery type selection is automatic. The Equalisation stage for AGM&WET(EFB) and GEL Battery Types only occurs if the initial start voltage is below 11 Volts.

7) Battery Analysis - Green Full LED ON

The battery analysis stage checks the condition of the battery after the charge cycle is completed. If the battery voltage drops too quickly during the analysis mode, this means the battery is probably faulty. If the battery analysis failed, this is indicated by the Green Full LED flashing.

8) Float Mode - Full Green LED ON

This stage allows you to keep the charger connected 24/7 to ensure your battery is well maintained and kept 100% fully charged. Float mode will maintain the battery at a constant 13.6V.

9) Long Term Maintenance - Full Green LED ON

During long term maintenance / float mode, the unit will apply a special pulse charge to ensure the battery is kept in optimal condition.

THE CHARGING PROCESS: LITHIUM

1) Lithium Activation - Blue Charging LED Blinking

The charger sends a signal to wake up the Lithium battery management system (BMS) so it can detect the battery voltage and commence charging if safe to do so.

Note: If the Lithium Activation stage isn't waking up the BMS (Blue charging LED isn't coming on), you can activate power supply mode on the unit by holding the Charge Rate Button down for 3 seconds. **Important:** After around 1 minute, press and hold the Charge Rate button again for 3 seconds to put the unit back into charging mode and the unit will commence charging.

2) Soft Start Charging - Blue Charging LED Flashing

Gently charges the battery using a reduced charge output until the battery voltage reaches 10V. If the battery voltage doesn't reach 10V within 6 hours, the safety timer protection will stop the unit from charging and the Charging, Full and Lithium LED's will all flash.

3) Bulk Charging - Blue Charging LED ON

Uses the maximum selected charge output until the battery voltage reaches 14V.

If the battery voltage doesn't reach 14V within 24 hours, the safety timer protection will stop the unit from charging and the Charging, Full and Lithium LED's will all flash.

4) Absorption Charging Stage 1 - Blue Charging LED ON and Green Full LED Flashing

Uses a constant voltage of 14V while reducing the charging output current to ensure the battery receives approximately 90% charge without overcharging the battery.

5) Absorption Charging Stage 2 - Blue Charging LED ON and Green Full LED Flashing

Steps up the constant voltage to 14.4V while reducing the charging output current to ensure the battery receives a full charge without overcharging the battery.

6) Float Mode - Full Green LED ON

Once the battery is fully charged, the Green Full LED will come on. The charger output will stop. However it will continue to monitor the battery condition as it will enter Long Term Analysis mode.

Long Term Analysis - Full Green LED ON

During long term analysis mode, the charger will monitor the battery level and reactivate the charger output if the voltage drops below 12.8V to ensure the battery is always ready when you need it.

STEP 5 - Disconnecting the Battery charger from Battery

• **If the Battery is out of the vehicle:**

- (1) Switch OFF and Remove the AC Power Socket from the outlet.
- (2) Remove the Black lead and then the Red lead.

• **If the battery is still in the vehicle:**

- (1) Switch OFF and Remove the AC Power Socket from the outlet.
- (2) Remove the lead from the vehicle chassis.
- (3) Remove the lead from the battery.

Note: Check electrolyte levels if possible after charging as they may need topping up with distilled water. (This does not apply to Sealed Maintenance Free batteries and Lithium type batteries)

LED STATUS INDICATOR TABLE:



Note: If the Battery Type and Charge Rate LED's are both flashing, this indicates no battery is detected or is below 2V and the unit is in Eco Power Saving mode.

BATTERY TYPE / CHARGE RATE SETTING

To change battery type, press the Battery Select button.

To change the charge rate, press the Charge Rate button.

MANUAL REJUVENATION SETTING

For manual rejuvenation, press and hold the Battery Type Button for 3 seconds. (This feature will not work for Lithium type batteries. Only use for lead-acid type batteries.

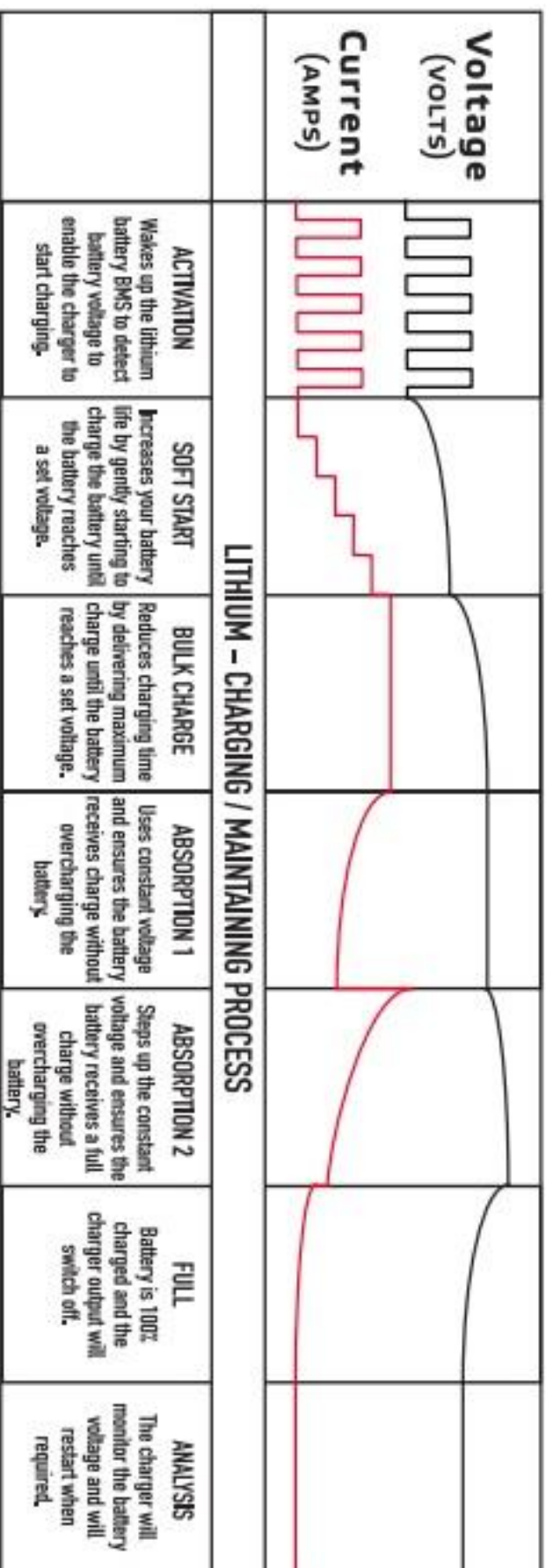
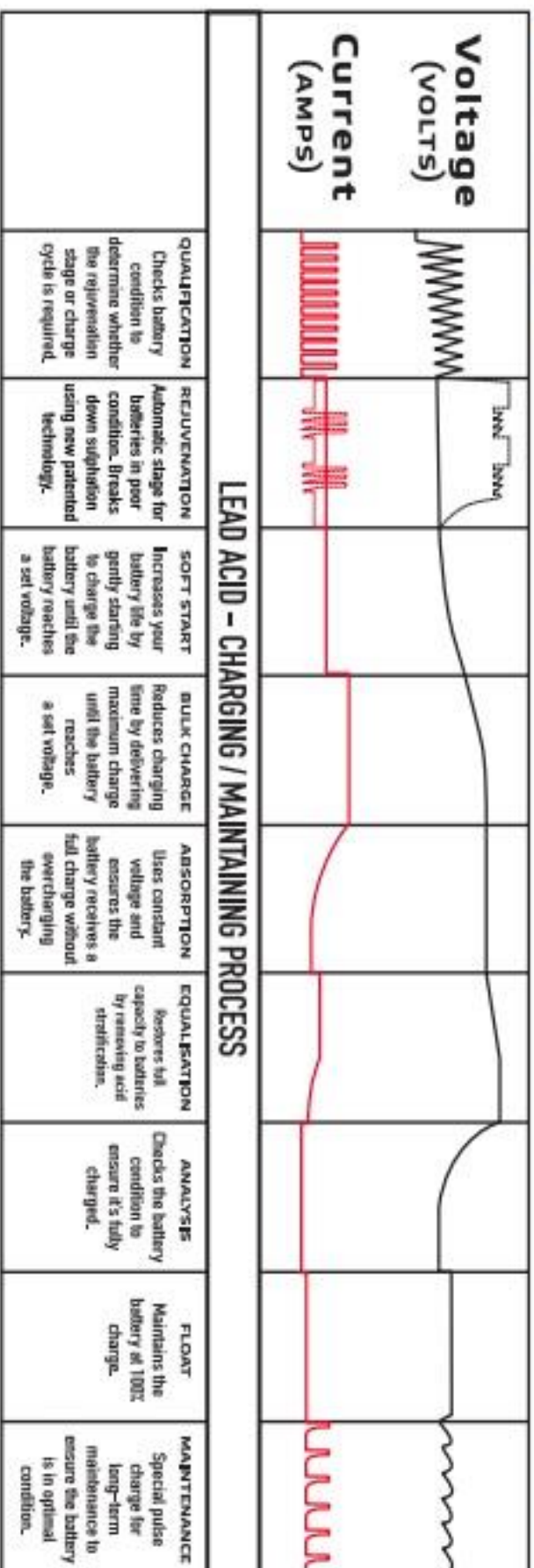
POWER SUPPLY MODE - 13.8V / 25A Max Output

To activate Power Supply mode, press and hold the Charge Rate Button for 3 seconds.

Charging Mode Description	LED Indicators				
	Charging	Full	Selected Battery Type	Selected Charge Rate	Fault
Eco Mode - energy saving (no battery connected)	OFF	OFF	Flash	Flash	OFF
AC Power on - no battery connected / detected	OFF	OFF	ON	ON	OFF
Rejuvenation (Gel, Calcium, AGM&WET Battery type selection only)	Double Flash	OFF	ON	ON	OFF
Soft Start Charging	Single Flash	OFF	ON	ON	OFF
Bulk Charging	ON	OFF	ON	ON	OFF
Absorption Charging	ON	Flash	ON	ON	OFF
Equalisation Charging	Flash	Flash	ON	ON	OFF
Full Float Maintenance mode	OFF	ON	ON	ON	OFF
Rejuvenation - Failed (Gel, Calcium, AGM&WET Battery type selection only)	Double Flash	OFF	ON	ON	ON
Soft Start Charging - Time Out Error	Single Flash	OFF	ON	ON	Flash
Bulk Charging - Time Out Error	ON	OFF	ON	ON	Flash
Reverse Polarity or Short Circuit Error	OFF	OFF	ON	ON	ON
Final Analysis Sulphation / Shorted cell check fail. Over Temperature Protection	OFF	OFF	ON	ON	Flash

Power Supply Mode Description	LED Indicators		
	Power Supply Mode	25A	Fault
Power Supply Mode is ON.	ON	ON	OFF
Reverse Polarity / Short Circuit	ON	ON	ON

CHARGING CURVE



TROUBLE SHOOTING

Problem	Indication	Possible Causes	Suggested Solution
Charger does not work?	No Indicator lights on	- No AC power	- Check AC connections and make sure the AC Power Point is switched ON. - Try a different AC Power Point which you know is working.
Charger has no DC output?	Fault Red LED is ON	- Output is short circuited - Reverse polarity protection - Loose / bad connection to the battery	- Check DC connection between charger and battery and make sure they are not short circuited. (Touching each other) - Check that the crocodile clips have not fallen off or come loose. - Check that the crocodile clips/ ring terminals are connected to the correct polarity. Note: The charger output is only present when connected to a battery.
No charging current?	Fault Red LED is Flashing	- Battery is severely sulphated - Battery has a damaged cell - Overheat protection mode	- Check the battery condition, age etc. - Battery may need replacement. - Move battery & charger to a cooler environment.
The full / float light won't come on.	Fault Red LED is Flashing or Full Green LED is Flashing Charging LED is ON/Flashing with Fault LED flashing	- Battery Ah capacity too large for the battery charger and it has timed out - Battery is defective - Battery is severely sulphated	- Check the charger specifications match the battery capacity. Eg. make sure battery capacity is not too big for the charger. - Battery may need replacement. - Charge rate selected might be too low for the battery. Switch charger off and on and try again or try a higher charge rate setting providing it doesn't exceed the maximum charge limit for your battery.

NOTE: If the Battery Type and Charge Rate LED's are both flashing, this indicates no battery is detected and the unit is in Eco Power Saving mode. If a battery is connected the voltage maybe to low (below 2V) for the charger to start. Otherwise check all connections from the charger to the battery.