

12 Volt ⚡ 1.5 Amp

**SMART BATTERY
CHARGER, MAINTAINER
AND REJUVENATOR**

-  - Full
-  - Fault
-  - Charging
-  - Rejuvenation
-  - Lead-Acid
-  - Lithium

SELECT Battery type

Designed for all conventional
lead-acid and compatible
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 and compatible Lithium-Ion (Including LiFePO4) batteries ONLY from 5Ah to 35Ah.**
However the charger can also be used to **maintain batteries up to 120Ah.**
- 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 (1.5A/1500mA) 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 SETTING OR A LEAD ACID BATTERY ON 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.**
- **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 Lead Acid and Lithium battery type.**
- **Battery voltage retention analysis.**
- **Ultra lower power consumption (ECO Mode).**
- **Multi Stage: Lead Acid type batteries**
 - 1 - Automatic Rejuvenation
 - 2 - Soft start charging
 - 3 - Bulk charging
 - 4 - Battery cell check analysis
 - 5 - Absorption
 - 6 - Sulphation check analysis
 - 7 - Full / Float mode - Recharge Cycle every 7 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
- **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. **(Lead-Acid Mode Only)**
- **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.



- **Smart Hook:** The battery charger contains a built in foldable mounting hook at the rear of the unit. This can be used to hang the charger on a wall or motorcycle handlebars. The mounting hook conveniently folds back into the unit when not in use.

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 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. During this mode the power drawn is less than 0.36W 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. **(Lead Acid Mode Only)**

The Lead Acid battery type LED will flash when in Eco Mode.

BATTERY TYPES & CAPACITY:

- Suits 12V conventional lead acid batteries (VRLA) AGM, EFB, Gel & Wet, EFB and compatible **Lithium-ion (including LiFePO4) batteries**. It can also be used as a maintenance charger only for Calcium batteries if required in Lead Acid mode.
- 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.

Battery Capacity: Charging	5 - 35Ah (250 CCA)
Battery Capacity: Maintaining	5 - 120 Ah (900 CCA)

ELECTRICAL PARTS & ACCESSORIES:

AC Power Cord:	1.8m with SAA 2 Pin AU Plug
DC Output Lead:	1.2m with quick connect
Charging Leads:	Integrated quick connect 60cm Crocodile Clip Harness / Ring Terminal Harness

TECHNICAL SPECIFICATIONS:

Output	1500mA @ 12V
Input Voltage	100-240Vac / 0.4A(24W)
Input Frequency	50/60Hz
Charge Voltage	14.4V
Float Voltage	13.6V (Lead Acid mode only)
Start Voltage	2V
Operating Temperature	-15 to 50° C
Storage Temperature	-25 to 85°C
Operating Humidity	90% RH Max.
Size (L*W*H)	140mm x 65mm x 35mm
Weight	0.45kg
Approvals	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 IS SELECTED, SWITCH OFF AND UNPLUG BEFORE CONNECTING THE CHARGER TO YOUR BATTERIES.

For conventional Lead acid type batteries including (VRLA) AGM, EFB, Gel , Wet , Calcium sealed maintenance free batteries, press the battery select button to illuminate the Blue LED for **Lead Acid** type battery selection.

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



Battery Select Button

STEP 2 - Pre charge check & electrolyte level check (WET Lead-Acid type batteries)

- 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.

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 - Plug the battery charger back into Mains Power (240Vac)

- The charger will automatically start when AC power is connected and switched on. Once the charger is switched on, please check the correct battery type is selected as per STEP 1.

Note: If the Red FAULT comes on when turned on, please check your connections as it's likely that the Positive and Negative Leads are reversed. Refer to Trouble Shooting Page for further information.

THE CHARGING PROCESS: LEAD-ACID

1) Automatic Rejuvenation - Blue Rejuvenation LED Blinking

If the initial qualification detected that the battery was in poor condition, the automatic rejuvenation process will begin automatically. During the rejuvenation process a high voltage equalising and 16V 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. This feature is time limited and will transit to Soft Start after 24 hours.

2) Soft Start Charging - Blue Charging LED Flashing

Gently charges the battery using a reduced charge output until the battery voltages reaches 10V. If the battery voltage doesn't reach 10V within 24 hours, the safety timer protection will stop the unit from charging and the Red Fault LED will turn on.

3) Bulk Charging - Blue Charging LED ON

Uses the maximum charge output (1.5A) until the battery voltage reaches 14.4V. If the battery voltage doesn't reach 14.4V within 48 hours, the safety timer protection will stop the unit from charging and the Red Fault LED will turn on.

4) Battery Cell Check - Cell Analysis

During Bulk Stage, the charger will check and analyses the battery condition to determine whether the battery contains a dead/shorted cell. If this analysis fails, the Red Fault LED will flash.

5) Absorption Charging - Blue Charging LED ON

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

6) Sulphation Check Battery Analysis - Blue Charging 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. This is indicated by the Green Full LED flashing.

7) 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. Recharge Cycle every 7 days.

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.

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 24 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 charge output (1.5A) until the battery voltage reaches 14V.

If the battery voltage doesn't reach 14V within 48 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

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

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:**

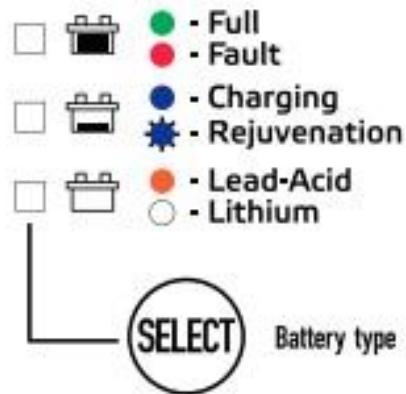
- (1) Switch OFF and Remove the AC Power Socket from the outlet.
- (2) Remove the Black lead and then the Red/Orange lead.

• **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:



Description - Lead Acid Mode	LED Indicators			
	Charging	Full	Lead Acid	Fault
Eco Mode - energy saving (no battery connected)	OFF	OFF	Flash	OFF
AC Power on - no battery connected / detected	OFF	OFF	ON	OFF
Rejuvenation	Slow Flash	OFF	ON	OFF
Soft Start Charging	Flash	OFF	ON	OFF
Bulk Charging	ON	OFF	ON	OFF
Absorption Charging	ON	OFF	ON	OFF
Bad Cell, Sulphated battery	OFF	OFF	ON	OFF
Reverse Polarity, Soft Start or Bulk Charging time out error	OFF	OFF	ON	ON
Full / Float mode	OFF	ON	ON	OFF
Final Analysis check fail	OFF	Flash	ON	OFF

Description - Lithium Mode	LED Indicators			
	Charging	Full	Lithium	Fault
AC Power on - no battery connected / detected	OFF	OFF	ON	OFF
Lithium Activation	Slow Flash	OFF	ON	OFF
Soft Start Charging	Flash	OFF	ON	OFF
Bulk Charging	ON	OFF	ON	OFF
Absorption Charging	ON	OFF	ON	OFF
Reverse Polarity, Soft Start or Bulk Charging time out error	OFF	OFF	ON	ON
Fully Charged	OFF	ON	ON	OFF

CHARGING CURVES

	Voltage (VOLTS)	Current (AMPS)
LEAD ACID - CHARGING / MAINTAINING PROCESS		
REJUVENATION Automatic stage for batteries in poor condition. Breaks down sulphation using patented technology.		
SOFT START Increases your battery life by gently starting to charge the battery until the battery reaches a set voltage.		
BULK CHARGE Reduces charging time by delivering maximum charge until the battery reaches a set voltage.		
CELL ANALYSIS Analyses the battery condition to check whether there is a dead or shorted battery cell.		
ABSORPTION Uses constant voltage and ensures the battery receives charge without overcharging the battery.		
ANALYSIS Analyses the battery condition to make sure the battery isn't sulphated and is holding charge.		
FULL/FLOAT Battery is 100% charged and is maintained at a safe voltage. Recharge Cycle every 7 days		

	Voltage (VOLTS)	Current (AMPS)
LITHIUM - CHARGING / MAINTAINING PROCESS		
ACTIVATION Wakes up the lithium battery BMS to detect battery voltage to enable the charger to start charging.		
SOFT START Increases your battery life by gently starting to charge the battery until the battery reaches a set voltage.		
BULK CHARGE Reduces charging time by delivering maximum charge until the battery reaches a set voltage.		
ABSORPTION 1 Uses constant voltage and ensures the battery receives charge without overcharging the battery.		
ABSORPTION 2 Steps up the constant voltage and ensures the battery receives a full charge without overcharging the battery.		
FULL Battery is 100% charged and the charger output will switch off.		
ANALYSIS The charger will monitor the battery voltage and will restart when required.		

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?	Red Fault LED is ON or Battery type LED is flashing	- Reverse polarity protection - Loose / bad connection to the battery - No battery connected or detected. - Battery voltage is below 2V so the charger is not recognising a battery is connected and is going into Eco mode.	- 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.
The full light won't come on.	Red Fault LED is ON or 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. If trying to maintain a dead flat larger capacity battery, switch the AC power off then back on to reset and resume charging. - Battery needs to be checked out or replaced.
Green Full LED flashing.	Green Full LED flashing.	- Final analysis check failed.	- Battery is sulphated or lost capacity and is not holding charge. Battery needs to be checked out or replaced.