Battery Charger / Maintainer User manual

THIS MANUAL CONTAINS IMPORTANT SAFETY AND OPERATING INSTRUCTIONS:

Recommended: For long term storage, maintaining battery, offset discharge, extends the life of the battery pack. Designed to never overcharge your battery even during long term storage.

IMPORTANT SAFETY INSTRUCTIONS:

Please read this manual and follow the instructions carefully.
The **48V 2A charger** is designed to charge **48 V lead-acid, Gel and AGM batteries**

- We always recommend that you check the battery manufacturer specifications to prevent flames and sparks.
- Explosive gases may escape from the battery during charging. Provide ventilation to prevent flames and sparks.
- For indoor use. Do not expose charger to rain, snow or liquids.
- For charging lead-acid, Gel and AGM batteries ONLY
- Battery acid is corrosive. Rinse immediately with water if acid comes into contact with skin or eyes.
- Never charge a frozen battery.
- Never charge a damaged battery.
- Do not charge a non-rechargeable battery.
- Never place the charger on the battery while plugged in to the wall outlet.
- Be extra cautious to reduce risk of dropping a metal tools onto batteries. It might spark or short circuit battery or other electrical part that may cause explosion.
- When working with a lead-acid battery, remove personal metal items such as rings, bracelets, necklaces, watches, etc.…
- Never smoke or allow a spark or flame in vicinity of battery.
- In order to reduce risk of electric shock, unplug charger from AC outlet before doing any maintenance or cleaning. Turning off controls will reduce risk.

- The charger is not to be used by children or by people who are not able to understand the manual, unless they are supervised by a responsible person who ensues the proper use of the charger.

MAIN FEATURES: Smart charger plus Maintenance and Recondition Function.

- High efficiency (>85%) without FAN, no noise charging.
- Charging rate is selectable, suited for various battery types.
- Automatic battery temperature compensation for extending battery life.
- Lower battery voltage start to charging, can charge severely discharged or heavily sulfated battery.
- Seven stage charging process, automatically reconditions the battery, recovers capacity on older batteries.
- Reverse polarity protection, short circuit protection, spark free contact.
- Ultra low input power consumption for stand by mode.
- Easy to use, clear charging status display.
- Fully controlled by microprocessor.

Multi Charge of States:

  - Battery desulphation charging
  - Soft start charging
  - Bulk charging
  - Absorption charging
  - Recondition charging
  - Float charging
  - Long term maintenance charging

- Short circuit or reverse polarity protection: The charger will automatically turn off when the output short circuits or reverse polarity occurs to prevent any damage.
- Heavy-duty cables
- Corrosion-resistant output connectors.
- Wall mount ready: The battery charger is built with four mounting holes for wall mounting if desired.

Temperature and Safety protection:

The charger contains 4 safety protections:

INTERAL OVERHEAT PROTECTION: The charger is built with a overheat and overload electronic circuit. When the charger over heats, the charger will decrease the charging current. If the temperature is decreased, the charger will resume to normal charging.

TIMER PROTECTION: The charger provides the maximum charging time for each charging state; this condition may occur if attempting to charge a big capacity or defective battery. Once the charger has timed out, the charger will stop charging to protect your battery, the RED LED will slow FLASH, while this situation occurs, please check your battery status.

REVERSE POLARITY: The charger has reverse battery protection. If a reverse battery exists (Red LED ON, while output leads are connected backwards) simply re connect properly to the battery, there is no need to unplug charger from AC power.

SHORT CIRCUIT PROTECTION: The charger has output short-circuit protection. If the charger output lead short condition exists (Red LED ON, while output leads are connected backwards) simply unplug charger from AC power and properly re connect as described in this manual. The charger employs hardware and smart programming to automatically detect the output connections. Once the charger detects the output short circuit or reverse polarity, it will not deliver any output current, and will not cause any danger.

TECHNICAL SPECIFICATIONS:

Model:	48V 2A
Type:	Smart and Automatic
Input (UL version):	115Vac 50/60 Hz
Input (CE version):	220 - - 240Vac 50/60 Hz
Output voltage:	48V
Output current:	2A
Output Volt at no load:	<1.5V
Min. Start volt	>8.0V
Temperature Compensated	-96mV / °C
Size (L*W*H)	205*90*52 (mm)
Net weight	850g
Approval	SAA, CE, FCC

ELECTRICAL PARTS:

Delivered with:

AC power cord: 6 feet SPT-2 with UL plug or HO3VVH2-F with SAA plug or CE plug.
Output lead: 6 feet SPT-2 2X18AWG with connector or battery clamps.

ENVIROMENTAL CHARACTERISTICS:

Operating temperature range: 0 to 40 °C
Storage temperature range: -10 to 80 °C
Operating humidity range: 90% RH Max

ECO MODE:

If AC power is connected, and the battery is not connected, the charger will automatically go into ECO MODE. When the AC power is presented and battery disconnected, the input power draw is less than 1.5W, equal to power consumption of 0.04KWh per day; after the battery is fully charged and during long term maintenance stage, the total power consumption is around 0.05KWh per day.

CHARGING INSTRUCTIONS:

Step 1 – Pre-Charge Check and Electrolyte Level Check:

- Check the battery electrolyte level (Only for Flooded or WET battery) 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 pack to ensure it is a 48v system

Step 2 – Connecting the battery charger to your battery:

- If the battery is out of the vehicle:
  - Connect the Red lead from the charger to the positive (+) battery terminal.
  - Connect the Black lead from the charger to the negative (-) battery terminal.

- If the battery is still in the vehicle, determine if the vehicle is positively or negativity earthed.
  - If Negatively earthed (most common) – First connect the Red (+) battery charger lead to the Positive (+) battery post and then connect the Black (-) battery charger lead to the vehicle's chassis and away from the fuel line.

  - If Positively earthed – First connect the Black (-) battery charger lead to the Negative (-) battery post and then connect the Red (+) battery charger lead to the vehicle's chassis and far away from the fuel line.

Step 3 – Connect the battery charger to the main power (110v-120v):

- Connect the battery charger to AC powered socket.
- The charger will automatically start when AC power is connected and switched on.
  (***NOTE:*** If the fault indicator LED illuminates Red, please check your connections as its likely that Positive and Negative leads are reversed. Refer to Trouble shooing page for further information)

THE CHARGERING PROCESS:

The charging stages and performance are as follows:

Battery Initial condition check:

- When the battery is connected and AC power is on, the charger will automatically diagnose the battery condition, and then determine if the battery charger engages the desulphation stage or goes into charging cycle.
- If the battery can be normally charged, its voltage raises slowly above 9V, it will directly go into soft start stage; if the battery voltage still can not reach 9V after 6 hours, it begins desulphation mode.

Smart charging mode:

There are following stages:

Desulphation charging mode:

- 20% charging LED is ON.
- Engage high peak pulse for deep-discharge or sulphated battery.
- Dissolves the lead sulphated crystal brings the electrolyte fluid to a well-distributed state.
- The battery voltage will increase slowly.

Soft start charging mode:

- 20% charging LED is ON.
- The battery voltage will increase slowly.

Bulk charging mode:

- 80% charging LED is ON.
- The battery will be charged to about 80%.
- The charger delivers an almost constant current 2000mA until the battery voltage reaches the set value.

Absorption mode:

- 80% charging LED is ON.
- The battery can charge up to almost 95%.
- The charging current tapers and the charging voltages are kept constant at the set value.
- The full LED is flashing.

Recondition charging:

- Engages this charging mode for aged battery or under charged battery.
- Balances the battery cell.
- The FULL LED is flash (if this situation occurred)

Float mode:

- Full LED is ON.
- The float mode allows the charger to effectively be left connected to your batteries; it works at a safe level and ready for use.

Maintenance mode:

- Full LED is on.
- The program engages a special charging waveform and monitors the battery voltage, if the battery voltage sinks, the special pulses will keep the battery in optimal state, if the battery voltage drops even lower, the battery charger will switch into bulk charging. The maintenance mode allows the charger to be connected to the battery over the course of the season; If possible, check the electrolyte liquid level in the battery.

Step 4 – Disconnecting the charger from the battery:

- If the battery is out of the vehicle:
  - Switch OFF and remove the AC power socket from the outlet.
  - Remove the black lead and then the red lead.
  - Check electrolyte levels if possible. (as they may need topping up with distilled water after charging)

- If the battery is in the vehicle:
  - Switch OFF and remove the AC power socket from the outlet.
  - Remove the black lead from the battery.
  - Remove the red lead from the battery.
  - Check electrolyte levels if possible. (as they may need topping up with distilled water after charging)

TROUBLE SHOOTING:

Charger does not work? – *Indication:* No indicator lights on. *Possible causes:* No AC power.
Suggestion: Check AC connections and make sure Power Point is switched ON.

Charger has no DC output? – *Indication:* Fault RED LED is ON. *Possible causes:* Output is short circuited, Reverse polarity connection to battery.
Suggestion: Check DC connection between charger and battery, make sure they are not short circuiting. Check that the crocodile clips/ring terminals are connected to the correct polarity.

No Charging current? – *Indication:* FULL and Fault RED LED are flashing. *Possible causes:* Battery s severely sulphated. Overheat protection mode.
Suggestion: Check the battery condition, battery may need to be replaced.

Long charging time, Full LED does not come on? – *Indication:* Fault RED LED is flashing.
Possible causes: Battery capacity to large. Battery is defective.
Suggestions: Check the charger specifications matches the battery capacity. Battery cannot be charged and must be replaced.

MAITENANCE:

- The charger is maintenance free. If the power cord is damaged, the charger must sent back to SC Carts for maintenance. The case should be cleaned occasionally. The charger should be disconnect from the power while cleaning.