



REJUVENATOR™ SERIES UNIVERSAL RECHARGEABLE BATTERY CHARGER

OWNER'S MANUAL MODELS: RC-1AU-120, RC-1AU-240

! READ FIRST BEFORE OPERATING CHARGER !

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Renaissance Charge would like to thank you for purchasing this high performance battery charger. The revolutionary technology employed by this charger has shown that the lives of Ni-Cd, Ni-MH, and lead-acid batteries can be extended dramatically. In many cases, this charging system has demonstrated the ability to charge batteries that could not be charged with conventional, off-the-shelf chargers. New batteries have even shown to develop larger storage capacities. We are confident that charging with the Renaissance™ Charging System will give you longer run times and extended battery life, allowing you to get the most out of your battery powered applications. We welcome your questions, comments, and testimonials at www.r-charge.com.

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Section 1: SAFETY INSTRUCTIONS

! DANGER! RISK OF BATTERY EXPLOSION. MAY RESULT IN BLINDNESS, SERIOUS INJURY, PERMANENT DISFIGUREMENT AND SCARRING.

Batteries can even explode during normal operation. People have been injured by battery parts flying in an explosion. They can explode under normal operating conditions, such as starting your car. They can explode under abnormal conditions, such as jump starting, or if shorted by a tool. They can explode in a parked car or sitting on a table.

To help reduce the risk of these dangers and injury, it is of the utmost importance that before using your charger, you read and understand this manual and any warnings and instructions by the battery manufacturer.

TO MINIMIZE RISK OF INJURY, ALWAYS:

1) Wear Personal Protective Equipment

- ALWAYS wear complete eye protection that protects from ALL angles. Wear gloves to prevent exposure to battery chemicals.

2) Avoid Flames and Sparks Near Battery and Fuel

- ALWAYS keep flames, matches, lighters, cigarettes or other ignition sources away from battery.
- DO NOT put flammable material on, near, or under battery or

charger. DO NOT use near gasoline vapors.

- Do not operate the charger near a source of flame or spark.
- Do not smoke near battery while charging.
- If charger is equipped with battery clips, make sure clips make good contact by twisting or rocking them back and forth several times.
- ALWAYS be sure to turn off the battery-powered device before disconnecting the battery in preparation for charging.
- DO NOT disconnect battery from charger while charging.
- A tool touching both battery posts or causing electrical conduction to be made between the battery posts is a short circuit and will spark. When using metal tools on or near battery, be extra cautious to reduce risk of a short circuit, possibly causing a burn, fire, or battery explosion. DO NOT drop a tool on battery.

3) Reduce Explosive Gas (Hydrogen)

- If charging a flooded (refillable) lead-acid type battery, before connecting charger, ALWAYS add distilled water to each cell until battery acid covers plates to help purge extra gas from cells. DO NOT overfill. Battery acid expands during charge. After charging, fill to level specified by battery manufacturer.
- If battery to be charged has caps, charge battery with caps in place. DO NOT pry caps off sealed batteries. Place wet cloth on batteries with non-flame arresting caps.
- Be sure area around battery is well ventilated before and during charging process. NEVER charge any battery in a closed-in or restricted area. This may result in fire and/or explosion.

4) Stay Away From Battery When Possible

- NEVER put face near battery.
- ALWAYS locate charger as far from battery as cables permit.

- ALWAYS keep other people away from the battery.

5) Avoid Contact With Battery Acid

- Battery posts may have chemical corrosion. DO NOT get corrosion in your eyes. Avoid touching eyes while working near battery.
- ALWAYS have plenty of fresh water and soap nearby in case battery chemicals contact eyes, skin or clothing. If battery chemicals contact skin or clothing, wash immediately with soap and water. If chemicals contact eye, immediately flood eye with cold running water for at least fifteen (15) minutes and get medical help immediately.
- In very cold weather, a discharged battery may freeze. NEVER charge a frozen battery. Gases may form, cracking the case, and leaking battery chemicals.

6) Avoid Overcharging Batteries

- NEVER overcharge a battery. A Ni-Cd, Ni-MH, or lead-acid battery can vent excessive amounts of explosive gas.
- Battery chargers can overcharge a battery if left connected for an extended period of time, resulting in loss of water, creation of hydrogen gas, and excessive heating of the battery.
- Although it is normal for a battery to warm at the end of its charge, a battery under charge should never stay warm for more than a few hours before the charger shuts off. *A battery that is excessively warm or warm for an excessive amount of time is overcharging.* Batteries in substandard condition may exhibit unusual behavior while under charge resulting in an overcharging condition. It is a good idea to monitor the battery on charge whenever possible to avoid this.

7) Follow Other Manufacturers' Recommendations

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2) Remove Jewelry

- ALWAYS remove personal metal items (such as rings, bracelets, necklaces and watches) when working with a battery. A short circuit through one of these items can melt it causing a severe burn.

3) Avoid Charger Abuse

- To reduce risk of electric shock, ALWAYS unplug charger from outlet before attempting any maintenance or cleaning.
- DO NOT disassemble charger. Disassembly of the charger WILL void the warranty.
- DO NOT expose charger to rain, snow, water, gas, oil, etc.
- DO NOT operate charger if it has received a sharp blow, been dropped, or otherwise damaged in any way.
- DO NOT operate charger with clips shorted together.

4) Proper Wiring

- Use of improper extension cord could result in a risk of fire and/or electric shock. If your charger model has a grounded, 3-wire plug, use ONLY a grounded, 3-wire type cord. NEVER use a 2-wire cord and an adaptor! The cord MUST be plugged into a grounded outlet. Make sure it is properly wired, in good electrical condition, and wire size is large enough so there is not significant line voltage drop.

5) Proper Use of the Charger

- DO NOT disconnect battery from charger while charging. If the battery must be disconnected from the charger before the charge cycle is complete, first turn the charger off before disconnecting from the terminals of the battery.
- To reduce risk of damage to plug and cord when disconnecting

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- Before using charger, read all instructions for, and caution markings on: (1) charger, (2) battery, and (3) related product using battery. Follow their recommended rate of charge.
- **This battery charger is designed for charging SPECIFICALLY SIZED (0.12 to 7 amp-hour), Ni-Cd, Ni-MH, or lead-acid batteries only. Charging a battery whose amp-hour rating is below that specified by the charger power level setting may cause the battery to heat excessively, reducing its life and creating a safety hazard.**

ELECTRICAL WARNINGS



DANGER! RISK OF ELECTRICAL AND FIRE HAZARD. MAY RESULT IN DEATH, SERIOUS INJURY, SHOCK OR BURNS.

This charger, like all electrical products, MUST be treated with respect. Follow these instructions to reduce electrical hazard risk.

1) Proper Grounding and AC Power Connection

- Some charger models MUST be grounded to reduce risk of electric shock. If the charger is equipped with an electric cord having an equipment grounding conductor and a grounding plug, the plug MUST be plugged into an electrical outlet that is properly installed and GROUNDED in accordance with all local codes and ordinances. If you ever feel even a slight shock from this or any electrical appliance, stop, walk away. Turn off electricity to outlet, and have it inspected by an electrician. You may have a dangerous, improperly wired outlet.
- DANGER - NEVER alter AC power cord or plug provided. If it will not fit outlet, have proper outlet installed by a qualified electrician. Improper connection can result in a risk of an electric shock.

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charger, ALWAYS pull on plug - NEVER on cord.

- DO NOT operate charger with damaged cord or plug - replace them immediately.
- Locate power cord and charger output leads so that they will not be stepped on, tripped over, or otherwise subject to damage or stress.
- DO NOT operate charger in or near water. Charging a battery on board a boat floating in water requires a battery charger specially designed to marine charging standards. Move the battery to dry land for charging with this charger.

Section 2: BATTERY CHARGING NOTES

- 1) If a battery is not *completely* recharged after each use, chemical buildup on the battery's plates increases slightly with each charge/load cycle and impedes the battery's ability to be charged and/or deliver power. If the battery is overcharged, the battery will heat, causing excessive thermal expansion and contraction. This causes damage to the internal structure of the battery, causing it to fail as well. Renaissance™ chargers incorporate several innovative design techniques which minimize both undercharging and overcharging.
- 2) In many cases, the Renaissance™ battery charger may be able to charge and even increase the capacity of batteries that are not able to be adequately charged with conventional battery charging techniques employed by the majority of battery chargers on the market today.
- 3) It is very important to choose the right charging rate for your application. For example, a small charger, such as the RC-1AU-120, charging at the 1A rate would provide a fairly gentle charge to a 7AH battery. However, if a 1AH battery is substituted for the 7AH battery, the charger will charge the battery much

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faster and more forcefully. As such, any possible gain in capacity, resulting from the use of this type of charger will be more quickly and dramatically seen in the 1AH (the smaller) battery. In order to maintain the long life of a healthy, newer battery, a slower, gentler charge is recommended. In order to rejuvenate or equalize an older battery in substandard condition, use a faster, more forceful charge.

4) This charger is designed to charge flooded type deep cycle lead-acid batteries that are rated between 0.12 and 7 amp-hours (AH). Charging batteries smaller than this may result in excessive heating of the battery causing premature failure of the battery. Charging batteries larger than this may take an excessive amount of time during which the charger may prematurely end its automatic charging cycle and/or overheat.

5) Rejuvenation and Charging

Most batteries whose capacity range lies within the recommended ratings for this charger are sealed (non-refillable). And, although these batteries have the inherent advantage of being unspillable, because the water inside these batteries cannot be replenished, the batteries eventually "dry out". When this happens, the battery's life is over. These batteries are particularly susceptible to being destroyed prematurely by overcharging which causes excessive offgassing (water loss). In many cases, however, these batteries are rendered useless by undercharging, and, in many cases, conventional charging techniques are ineffective in charging them. Use the Renaissance™ Charger, in these cases, to rejuvenate these batteries by breaking through the chemical layers and dendrite formation when other chargers cannot to amazingly restore capacity and extend battery life. Then, after these batteries have had their capacity restored, it may be of advantage to return to a slower, gentler charge or charging rate for normal routine charging. The

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below). If the battery terminals are unlabeled, connect one way and if charging doesn't begin reverse the connections. The charger is reverse polarity protected and will not be damaged if polarity is inadvertently reversed.



Figure 1.



Figure 2.

potent, rejuvenating power of the Renaissance™ charger has been found to be of tremendous advantage to battery longevity when used as part of a regularly scheduled maintenance charging routine (for example, 1 out of every 5-10 charge cycles).

Section 3: OPERATING INSTRUCTIONS

Follow these three steps in this order.

STEP 1. BEFORE OPERATING CHARGER

- 1) Place the charger and the battery away from any combustible material. Choose a location in accordance with the safety instructions in Section 1 of this manual.
- 2) Connect charger to proper voltage AC power outlet (110-120V for Model # RC-1AU-120, 220-240V for Model # RC-1AU-240).
- 3) Disconnect battery from any circuitry the battery may be powering.

STEP 2. TURNING THE CHARGER ON

- 1) Connect each of charger's output connectors to the corresponding battery terminal, making sure that the charger's positive '+' red clip is connected to battery's positive '+' terminal and charger's negative '-' black clip is connected to battery's negative '-' terminal. (See figure 1 below). If the battery's terminals are such that a mechanical clamping connection is not possible, use the magnets provided with the charger to secure the necessary electrical connections. (See figure 2
- 2) Choose the appropriate voltage setting to match the voltage of the battery to be charged. One may choose to deviate from the recommended power settings as marked on the panel in order to increase or decrease the charge rate as desired. (See Section 2: Part 3.) However, attempting to charge a battery too fast, using a voltage setting higher than recommended may cause the charger operate outside of its specified electrical parameters. This will cause the DC circuit breaker on the back panel to trip. If this occurs, lower the voltage setting, wait for the breaker to cool, then reset the breaker by pressing its button, and restart the charging process.
- 3) Turn the charger on. If the polarity is reversed, the charger will not come on. LED should flash red until power is connected. if charging does not begin, battery voltage may be too low. **See Section 4.2 BEFORE operating the voltage detection bypass (VDB) button.** During the charging process, the LED indicator will show solid (non-flashing) red.
- 4) Make sure the battery does not become disconnected from the charger while the charger is charging the battery. This can make a dangerous spark which can cause an explosion. Note also that if the battery gets disconnected and reconnected while under charge, the automatic charge cycle will be reset, possibly causing the charging process to take longer than necessary.
- 5) See CHARGING TIME below for length of charge.

Fully discharged 1AH (1,000mAH) battery.....approx. 2-4 HRS.
Fully discharged 3AH (3,000mAH) battery.....approx. 4-8 HRS.
Fully discharged 7AH (7,000mAH) battery.....approx. 8-14 HRS.

IMPORTANT NOTE ON CHARGE TIMES

Charging times for your battery may be different from these depending on brand and condition. If your battery is only half

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discharged you will need only half the time to charge. Some old batteries may not accept a charge and will heat up on charging. It is common for a battery's *first* few charge cycles on the Renaissance™ charger to take longer than normal as a result of the charger's rejuvenating characteristics.

⚠ CAUTION

If at any time the battery:

- 1) Gets hot (above 140°F or 60°C) or
- 2) Stays warm (above 100°F or 38°C) for more than 4 hours,
STOP CHARGING.

- 6) This charger is not intended nor designed to supply power for applications other than battery charging. Never charge a battery while the battery is powering another appliance or load.

STEP 3. TURNING THE CHARGER OFF

After the battery is charged, the LED indicator will turn to solid (non-flashing) green, indicating that the charging cycle is finished. After the charging cycle is over, the charger will continue to perform a maintenance (float) type charge, flashing the LED green from time to time. If the LED is either solid red or flashing green, it is important to turn the charger off before disconnecting the battery from the charger. The charge cycle may be stopped at any time by turning the power switch off on the rear panel of the charger.

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connections and try again. **BE SURE POLARITY IS CORRECT BEFORE PRESSING VDB BUTTON, OR DAMAGE TO THE CHARGER MAY RESULT.** DO NOT, however, operate charger longer than 60 seconds with VDB button depressed. NEVER mechanically secure VDB button in depressed position. DO NOT attempt to charge batteries that will not charge under the normal procedures outlined in this manual. Dispose properly and immediately of all batteries that will not take a charge.

- The battery connections may have become corroded or tarnished, preventing the charger from detecting the presence of the battery. If this is the case, clean the battery clips and/or battery terminals and try again.

3) Battery becomes too hot (greater than 140° F or 60°C)

- Battery is too small for charger. See Section 2.
- Battery is in poor condition. If one area of the battery is excessively hotter than another area while battery is under charge or load, this may indicate a failed cell. Replace battery.

4) Charging cycle doesn't end (green light never comes on).

- Interrupted power source. If the line voltage is interrupted, surged, or erratic (i.e. a brownout, blackout etc.), the circuitry in the charger may cause the charger to act erratically. Disconnect the charger from the power source, disconnect the battery from the charger, and check to see that the battery is charged. If not, then, repeat the charging process as normal after correcting any abnormal line voltage condition(s).
- Battery connections are not secure. Poor electrical connection can cause intermittent electrical contact, causing the charge cycle to keep repeating. Correct as necessary.

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Section 4: TROUBLESHOOTING

1) Charger will not come on (no LED)

- Charger is not plugged into AC wall receptacle.
- There is no power to the AC wall receptacle.
- The AC circuit breaker in the power (rocker) switch on the rear panel has tripped. Reset the breaker by rocking the switch to the ON position. If the breaker trips again, DO NOT attempt to operate charger. Have charger serviced by factory-authorized service center only.

2) Charge cycle will not begin (flashing LED)

- Battery is not connected to charger. Check to make sure good electrical contact is made.
- Charger polarity is reversed. Battery '+' is not connected to charger '+', '-' to '-', etc. Reverse battery connections and try again.
- DC circuit breaker has tripped. Lower voltage setting, allow circuit breaker to cool, press circuit breaker button to reset, and attempt to restart charging process.
- Battery resting voltage is below 0.5 volts. **Before going further, be sure to establish that battery connections are made with proper polarity.** Push and hold voltage detection bypass (VDB) button in upper right corner of back panel to activate charge cycle until battery voltage comes up. **Important note: bypassing the voltage detection circuitry may allow one to inadvertently reverse charge the battery. Again, check to make sure polarity is correct before pressing VDB button.** If after holding VDB button pressed for 60 seconds the charger reverts back into error mode (flashing red led) upon release of button (assuming electrical connections are secure), battery may be internally physically damaged and unable to take a charge. Check battery

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Section 5: SPECIFICATIONS

RC-1AU-120 Universal Rechargeable Battery Charger

- INPUT: 110-120V AC, 1A, 50-60 HZ
- OUTPUT: 1.5-24 VDC, 1.25A

RC-1AU-240 Universal Rechargeable Battery Charger

- INPUT: 220-240V AC, 0.5A, 50-60 HZ
- OUTPUT: 1.5-24 VDC, 1.25A

ONE (1) YEAR LIMITED WARRANTY

This equipment is warranted to be free from defects in material or workmanship for one (1) year from date of purchase. Repair (or, at our option, replacement) will therefore be made of any unit which proves to be defective during this period provided the unit is returned properly packed, with all transportation charges prepaid, to the store from which it was purchased. Any repair approved hereunder will be made without charge to the owner for parts and/or labor. This limited warranty extends only to the original purchaser, is not transferable, and is limited to the purchase price of the equipment. In no event will Renaissance Charger, LLC. be liable for any incidental or consequential damages resulting from the equipment or any defect.

Claims under this limited warranty must be accompanied by the original sales receipt or shipping documents that establish date of purchase.

This limited warranty does not extend to units which have been subjected to misuse, abuse, neglect, or accident or to units that have been used in violation of operating instructions. Equipment which, in our judgment, shows evidence of having been altered, modified, or serviced without our authorization will be ineligible for service under this limited warranty.

This warranty gives you specific rights, and you also may have other rights which vary from state to state. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion(s) or limitation(s) may not apply to you.

MADE IN U.S.A.

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