



Renaissance Charge LLC



12V RADIANT CHARGER OWNER'S MANUAL

CHARGER MODELS: RC-2A12, RC-2A12-2



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 lead-acid batteries can be extended dramatically. In many cases, this charging system has shown to be able 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 FROM HYDROGEN GAS. MAY RESULT IN BLINDNESS, SERIOUS INJURY, PERMANENT DISFIGUREMENT AND SCARRING.

Batteries generate explosive hydrogen gas, even 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 short circuited 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 each time before using your charger, you read and understand this manual and any warnings and instructions by the battery manufacturer. Follow these instructions exactly.

TO HELP REDUCE THIS RISK:

- 1) Wear Personal Protective Equipment**
 - ALWAYS wear complete eye protection *that protects from all angles*. Wear gloves to prevent exposure to battery acid.
- 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 or under 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 (instead of plug), make sure clips make good contact by twisting or rocking them back and forth several times.
- If necessary to remove battery from vehicle to charge, ALWAYS turn off all accessories in the vehicle. Then ALWAYS remove grounded terminal (connected to vehicle frame) from battery first.
- 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)

- 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. For a battery without removable caps (maintenance-free battery), carefully follow manufacturer's instructions on charging.
- Some sealed maintenance-free batteries have a battery condition indicator. A light or bright colored dot indicates low water. Such a battery needs to be replaced, not charged or jump started.

- Charge battery with caps in place. Most U.S. batteries are made with flame arresting caps. 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 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 DC cables permit.
- ALWAYS keep other people away from the battery.

5) Avoid Contact With Battery Acid

- Battery posts may have acid corrosion. DO NOT get corrosion in your eyes. Avoid touching eyes while working near battery.
- ALWAYS use a battery carrier. Carrying a battery by hand may put pressure on its ends, causing acid to be forced out vent caps.
- ALWAYS have plenty of fresh water and soap nearby in case battery acid contacts eyes, skin or clothing. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters 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 spray out battery acid.

6) Avoid Overcharging Batteries

- 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.

7) Follow Other Manufacturers' Recommendations

- 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.

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 **GROUND**ED 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.

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

- DO NOT disconnect battery from charger while charging.
- To reduce risk of electric shock, 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.
- The polarity of the charger and the battery MUST ALWAYS match to avoid damage to battery and charger. If the battery must be disconnected from the charger before the charge cycle is complete, FIRST disconnect the power from the charger before disconnecting from the terminals of the battery.

4) Proper Wiring

- An extension cord should only be used if absolutely necessary. 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 modify charger circuitry.
- To reduce risk of damage to plug and cord when disconnecting charger, ALWAYS pull on plug - NEVER on cord.
- Locate cord so that it will not be stepped on, tripped over, or otherwise subject to damage or stress. DO NOT lay extension cord on battery or charger. DO NOT operate charger with damaged cord or plug - replace them immediately.
- Determine battery voltage by referring to vehicle or equipment specifications. Make sure the battery to be charged is the same voltage as the charger. For example, charging a 6V battery with a 12V charger may destroy the charger, the battery or both.
- **This battery charger is designed for charging SPECIFICALLY SIZED, LEAD-ACID batteries only.** DO NOT attempt to charge dry-cells, lithium-ion, nickel-cadmium, alkaline, or any other type of battery commonly used with home appliances, flashlights, etc. These batteries may burst and cause injury to persons and damage to property. **Charging**

a battery whose amp-hour rating or CCA rating is below that specified by the charger may cause the battery to heat excessively, reducing its life and creating a safety hazard.

- This charger is not intended nor designed to supply low-voltage power for applications other than battery charging. **Never charge a battery while the battery is powering another appliance or load.**
- 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, sulfation buildup 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) The technology incorporated in the design of this battery charger is of particular advantage in charging heavily or partially sulfated batteries. 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 charger for your application. For example, a small charger, such as the RC-2A12-2, that charges at the 2A rate would be an ideal trickle charger to a large 100AH battery. However, this charger will charge a 20AH battery much faster more forcefully. As such, any possible gain in capacity, resulting from the use of this type of charger will be much more dramatically seen in the 20AH (the smaller) battery. In order to maintain the long life of a healthy, newer battery, a slower, gentler charge is recommended. In order to desulfate 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 20 and 125 amp-hours (AH) or flooded type lead-acid starter batteries rated between 175-1000 cold cranking amps (CCA). 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) Sealed Lead-Acid Batteries (Gel Cells)

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 these cases, conventional charging techniques are ineffective in charging them. The Renaissance™ Charger,

although not designed for these batteries, can be used to charge them, breaking through the sulfation layers where other chargers cannot, amazingly restoring capacity and extending battery life . Continued charging, however, with the Renaissance™ Charger is not recommended for these batteries because of the offgassing that occurs as a side effect of this process. charger is not designed for use with sealed (non-refillable) or maintenance free lead-acid batteries. Although it may be advantageous to use this charger at times on heavily sulfated batteries of this type, consistent charging with this charger may cause excessive venting (offgassing), shortening the life of these batteries.

- 6) If battery is in a vehicle, disconnect the positive terminal of the battery from the vehicle before connecting the charger to the battery.

Section 3: OPERATING INSTRUCTIONS

Follow these three steps in this order.

STEP 1. BEFORE OPERATING CHARGER

- 1) Check to make sure the acid levels of the battery to be charged are at those specified by the manufacturer. If not, add distilled water. DO NOT OVERFILL. SEE SECTION 2 FOR SAFETY.
- 2) Make sure power cord is unplugged before using charger.
- 3) Disconnect battery from any circuitry the battery may be powering.

STEP 2. TURNING THE CHARGER ON

- 1) Connect both of charger's output connectors to the corresponding battery terminal, making sure that charger's '+' is connected to battery's '+' and charger's '-' is connected to battery's '-'. If polarity is reversed, the charger will not come on. LED should flash red until power is connected. During the charging process, the LED indicator will show solid (non-flashing) red.
- 2) Connect the DC power output of the charger's power supply to the DC power input of the charger.
- 3) Plug the charger power supply's AC plug into a suitable (See Sections 1 & 6) single phase wall receptacle. (Note that if power is not connected within approximately 60 seconds after the battery is connected to charger, the charger must be disconnected from the battery and then reconnected.)
- 4) Make sure the battery does not become disconnected from the charger while the charger is charging the battery. This will 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 25 AH or 200 CCA Battery.....approx. 11 HRS.

Fully discharged 50 AH or 400 CCA Battery.....approx. 22 HRS.

Fully discharged 100AH or 850 CCA Battery.....approx. 44 HRS.

IMPORTANT NOTE ON CHARGE TIMES

Charging times for your battery may be different from these depending on their condition. If your battery is only half discharged you will need only half the time to charge. Some old batteries may not accept a charge and will heat up on charging. **CAUTION: If**

you feel your battery is not charged after these times, have it checked. Charging times for deep cycle batteries are based on their Ampere Hour ratings [AH]. Charging times for starting batteries rated in cold cranking amps (CCA) vary widely depending on size and state of discharge. **Charging for longer times may damage battery. CAUTION: If at any time the battery gets hot (above 125°F) or acid comes out of vent caps, STOP charging.** Have your battery checked. Charging may not be possible. Your battery may have a shorted cell and need to be replaced.

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. For this reason, it is still important to disconnect the power from the charger before disconnecting the battery from the charger. **Never disconnect the battery charger from the battery during the charging process or damage and/or explosion may result. The charge cycle may be stopped at any time by unplugging the charger from the wall outlet and then disconnecting the battery from the charger.**

Note that the charger draws a small amount of power from the battery when the power to the charger is disconnected. For this reason, be sure to disconnect the battery from the charger when charger is not in use.

Section 4: TROUBLESHOOTING

1) **Charger will not come ON**

- Charger is not plugged into AC wall receptacle.
- There is no power to the AC wall receptacle.
- Battery is not connected to charger.
- Charger polarity is reversed. Battery '+' is not connected to charger '+', '-' to '-', etc.
- Battery resting voltage is below 9 volts. Batteries in an extremely discharged or poor condition must be brought above this voltage to allow charger circuitry to operate.
- Battery has shorted cell(s). Batteries in this condition may be too weak to accept a charge and should be replaced.
- 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 posts and try again.
- A flashing red status of the LED indicator indicates that the battery is properly connected, but the charger has no power available to it. Check all power connections to the charger. Be sure to check if the circuit breaker to the wall power outlet is not tripped. After making sure that there is voltage at the wall receptacle, disconnect all of the connections, reconnect the charger to the battery and then connect the power supply to the charger.

2) **Battery becomes too hot (125° F or more)**

- 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.

3) 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).

Section 5: SPECIFICATIONS

Power Supply (for both chargers)

- INPUT: 100-240V~50-60HZ, Single Phase
- OUTPUT: 24V DC, 2 to 2.5A (max)

RC-2A12 Charger

- INPUT: 24V DC, 2 to 2.5A (max)
- OUTPUT: 12-17 VDC, 4A (max)

RC-2A12-2 Charger

- INPUT: 24V DC, 2 to 2.5A (max)
- OUTPUT: 12-17 VDC, 2.5A (max)

MADE IN U.S.A.

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.
