



12-VOLT RADIANT CHARGER OWNER'S MANUAL

Model: RC-2A12-4



Available at <http://www.teslachargers.com>

Read First Before Operating Charger

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WATCH THE VIDEO DEMONSTRATION OF THE 2A12
<https://www.youtube.com/watch?v=NdQIWWh2gm3s>

Learn more at <http://teslachargers.com>

About This Manual

The purpose of this manual is to explain how your new **RC-2A12** works, how to set it up, and how to operate it.

The unit is specifically designed to charge 12 volt, lead-acid batteries. This includes both "gel-cell" and liquid filled batteries with capacities from 14Ah up to 120Ah. Its operations are automatic and completely self-regulating.

It is also capable of charging Ni-Cd and NiMh batteries, in the same size and voltage range. It is not designed to charge Li-Ion batteries and is not recommended to be used to do so without damaging their internal regulator.

In spite of the fact that battery charging has become familiar and routine, there are still certain kinds of hazards associated with this process.

For these reasons, please take a few minutes and **read this entire manual before using your RC-2A12.**

This manual contains specific directions for unpacking and setting up the unit, charging a battery, and interpreting the behavior of the indicator lights. It also gives specific recommendations for use, and a review of risks and hazards.

Please keep this manual with your **RC-2A12** at all times, for use as a handy reference.

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Unpacking Your RC-2A12

Carefully unpack all of the parts to your RC-2A12 and inspect them for damage during shipping. If there is any damage, contact the shipping agent and immediately file a claim. As you unpack your unit, take an inventory of the parts to make sure that you have received a complete unit. You should have:

1. One RC-2A12 Charger Unit
2. One Universal Voltage Power Supply
3. One Power Supply AC Cord for US and Canada Customers only
4. One Owner's Manual

Keep all of the packing materials as they will be needed if you wish to store the unit, travel with the unit, or if you need to send it back for repair. if any of these parts are missing, contact the manufacturer at once and report the packing error.

Setting up your Charger

The RC-2A12 is a 2 amp charger, designed to charge 12 volt batteries, hence the name "2A12". The charger unit runs on 24 Volts DC, which is supplied by the Universal Power Supply that is included with the charger.

The **Universal Power Supply** will run on ALL household power, anywhere in the world. In all other countries but USA and Canada you will have to find a suitable AC cord as used for laptops. This power supply can be safely plugged into any ordinary AC power system that supplies power for home appliances. This includes:

- 1) 120 VAC 60 Hz systems in North America
- 2) 240 VAC 50 Hz systems in Europe, Asia, South America, and elsewhere
- 3) 100 VAC 50 Hz systems in Japan.

When plugged into any of these AC systems, the Universal Power Supply will produce the 24 Volts DC @ 2.5 Amperes that the RC-2A12 Charger requires.

STEP ONE:

Find a location where you plan to charge your battery and bring the battery, the charger and its power supply together in that location.

STEP TWO:

Find the nearest AC power receptacle to where you want to charge your battery. If it is close enough, simply plug the Universal Power Supply into the receptacle and place it near the battery. If the receptacle is too far away for the supplied cord to reach, then use an extension cord of appropriate length to span the distance.

STEP THREE:

Place the RC-2A12 charger between the power supply and the battery you wish to charge. Lay out the cords from the Charger and prepare to attach them to the battery terminals, and prepare to plug the power supply into the Charger.

Operating Instructions

Your RC-2A12 has two indicator lights, one **RED** and one **GREEN**. It has **NO ON/OFF** switch. The unit is turned **ON** by plugging it into the power supply and turned **OFF** by unplugging it from the power supply.

Step One: Things to do Before Operating the Charger

1. Check to make sure that the water levels of the battery to be charged are at the level specified by the manufacturer. If any of the cells are too low, add distilled water **ONLY**. Do not over-fill the cells, as charging may raise the level slightly.
2. Disconnect the battery from any circuitry the battery may be powering. If the battery is in a vehicle, disconnect the battery from the vehicle's wiring.

May damage other devices designed to operate at the battery voltage.

Step Two: The Charging Process

1. Plug the Universal Power Supply's AC plug into a suitable household (single phase) wall receptacle (See Safety Considerations).
2. Connect the DC power output of the Universal Power Supply to the DC power input jack of the RC-2A12 Charger. At this point, both the **RED** and **GREEN** indicator lights should FLASH at the same time.
3. Connect both of the Charger's output connectors to the corresponding battery terminals. Make sure that the Charger's Red (+) clip is connected to the battery's positive (+) terminal post, and the Charger's Black (-) clip is connected to the battery's negative (-) terminal post. After this is done, the **RED** light should come ON and stay on SOLID.
4. As the battery charges, the **RED** light will stay on solid until near the end of the charging process. As the charge nears the end, the **GREEN** and **RED** lights will begin to FLASH alternately.
5. When the battery is finished charging, the **GREEN** light will come on SOLID. At this point, the battery should be disconnected from the charger. These are typical CHARGING TIMES for the batteries listed:

Fully discharged 25 AH or 200 CCA Battery	.	.
approx. 11 Hours		
Fully discharged 50 AH or 400 CCA Battery	.	.
approx. 22 Hours		

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

NOTES ON CHARGING TIMES

Charging times for your battery may be different from those listed, depending on their condition. If your battery is only half discharged, you will need only half as much time to charge it. Some old batteries may not accept a charge and will heat up on charging.

Charging times for "deep cycle" batteries are based on their amp-hour ratings [AH]. Charging times for "engine starting" batteries are rated in cold cranking amps [CCA]. These may vary widely, depending on the size of the battery and its state of discharge.

Charging for longer times may damage battery. **CAUTION:** If at any time the battery gets hot (above 120F or 49C) during the charging process, **STOP** charging. Have your battery checked.

STEP THREE: TURNING THE CHARGER OFF

After the battery is charged, the **GREEN** light will turn to a solid (non-flashing) state, indicating that the charging cycle is finished. At this point, the battery should be disconnected from the charger. If the charger is left connected to the battery after the charging cycle is finished, the charger will continue to perform a maintenance type charge (float), flashing the **GREEN** and **RED** lights from time to time. Note that it may take several days or even weeks to fully charge older sulfated batteries depending on how large and sulfated. User does not have to wait till **GREEN** light is solid before using battery.

After the battery is disconnected from the charger, unplug the charger from the power supply, unplug the power supply from the wall socket, and put the charger and power supply away in a safe place.

Battery Charging Recommendations

1. 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 charged with conventional 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, that charges at a 2.5 amp rate, would be an ideal trickle charger to a large 100AH battery. However, this charger will charge a 20AH battery much faster and more forcefully.
4. This charger is designed to charge flooded type deep cycle lead-acid batteries that are rated between 14 and 125 AH (amp-hour), or flooded type lead-acid starter batteries rated between 175-1000 CCA (cold cranking amps). Charging batteries smaller than this may result in excessive boiling of the battery, causing unnecessary off-gassing.

5. Sealed Lead-Acid Batteries (Gel Cells) have the inherent advantage of being unspillable, however, 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 off-gassing (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.
6. If the battery you wish to charge is in a vehicle, disconnect the positive terminal of the battery from the vehicle's electrical system before connecting the charger to the battery.

Troubleshooting

The RC-2A12 has two indicator lights on it; one **RED** and the other **GREEN**. These indicator lights will always tell you the condition the charger is in according to the following 6 possibilities. If the charger is doing something you don't understand, look at what the two indicator lights are doing and refer to this list.

1) Both Lights are OFF:

- Charger is not receiving any power from the power supply AND it is not connected to a battery to be charged.

- IF the Universal Power Supply is plugged into an AC wall receptacle AND the charger is plugged into the power supply, THEN there is no power at the AC wall receptacle. Verify that the AC wall receptacle works.
- IF the AC wall receptacle works, THEN check to see if the Universal Power Supply connections are secure. Check to make sure that the AC power cord is seated firmly in the wall receptacle and that the DC power jack is inserted completely into the charger. Check also the AC power cord as well.

2) RED and GREEN Lights are Flashing Simultaneously

- The power supply is plugged into the wall receptacle and the charger is plugged into the power supply, but the charger is NOT connected to any battery.
- IF the battery charger IS connected to a battery, check the connections for corrosion, or a broken wire, as the charger does not recognize the battery connection as being present.

3) RED Light is Flashing Quickly:

- The Charger is receiving power from the power supply, but its output wires are connected to a **DANGEROUS CONDITION**.
- The Charger is connected to the battery in reverse. Disconnect and reconnect while observing the proper polarity. (BLACK clip must connect to the Negative Battery Terminal and the RED clip must connect to the Positive Battery Terminal).
- The battery is deeply damaged and is producing a "short circuit" condition. The battery may not be able to be charged. Disconnect immediately.

- The two clips that are supposed to be connected to the battery are directly touching each other. Disconnect them immediately.
- DO NOT LET THE CHARGER REMAIN IN THIS CONDITION!

4) RED Light is ON Solid

- The Battery voltage is LOW.
- WHEN the power supply is connected to the charger and the charger is connected to the battery, the Solid RED light means the battery is being charged.
- WHEN the power supply is NOT connected to the charger, but the charger is connected to the battery, the Solid RED Light means the battery is low, but is NOT being charged.

5) RED and GREEN Lights Flashing Alternately

- The battery is being charged AND is approaching the end of the charging cycle.
- The battery is already fully charged and is cycling in the "float" mode.

6) GREEN Light is ON Solid

- The battery is fully charged and can be disconnected from the charger.

Safety Considerations

The following statements are included for safety considerations. Even though these statements may describe situations that seem extremely unlikely, they are possible, under normal conditions. Therefore, please familiarize yourself with these risks and hazards for your safety and the safety of others.

Batteries generate hydrogen gas, even during normal operations. Hydrogen gas is explosive if ignited accidentally. This means that serious injury, including permanent disfigurement, scarring, and blindness, can occur in the vicinity of a charging battery. People have been injured by battery parts flying in an explosion. People have been injured by battery acid spraying on them in an explosion. These are rare, but possible hazards of charging batteries.

A battery can explode under normal operations, such as starting your car. They can explode under abnormal conditions, such as jump starting a car, 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 the possibility of these injuries, it is extremely important that you read and understand this manual, as well as any warnings and instructions by the battery manufacturer. For your own safety, follow these instructions.

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 keeps flames, matches, lighters, cigarettes, or ignition sources away from batteries.
- Do not put flammable material on or under charger. DO NOT use near gasoline vapors.
- Make sure charging clips make good, secure electrical contact with the battery terminals by twisting or rocking them back and forth several times.
- To avoid interference and/or prevent damage to vehicle electrical systems, ALWAYS disconnect battery from vehicle before charging a battery that is in a vehicle. 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, 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 may need to be replaced.

- Charge battery with caps in place. Most US batteries are made with flame arresting caps. **DO NOT** pry caps off sealed batteries.
- Be sure area around battery is well ventilated before and during the charging process. **NEVER** charge a battery in a closed-in or unventilated area. This may result in a fire and/or an explosion.

4) Stay Away From Battery When Possible

- Never put face near 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 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 Manufacturer's 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

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 the AC power cord or plug provided. If it will not fit the outlet, have a proper outlet installed by a qualified Electrician.

SPECIFICATIONS

Universal Power Supply

Input: 100-240 VAC, 50-60 Hz (single phase power)
Output: 24 VDC @ 2.5 A (maximum)

RC-2A12 Battery Charger

Input: 24 VDC @ 2.5 A (maximum)
Output: 6-17 VDC @ 2 Amps (average)

SERVICING YOUR RC-2A12

If for any reason this equipment stops working properly, contact the manufacturer immediately at:

Energenx, Inc.
Phone: 208 772-3303
Email: service@energenx.com

There are **NO USER SERVICABLE PARTS** inside your RC-2A12. Any attempt to open the unit, repair it yourself, or have it repaired by a third party, voids the Limited Warranty and offer of Free Service and repair by the manufacturer.

1 Year Limited Warranty on all parts and service.