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# REV

## Owner's Manual

Portable Charging System for Electric Vehicles.



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Features and Specifications

The SafeAll REV is the solution for mobile charging of electric vehicles. Please read the entire owner’s manual before operating and familiarize yourself with the location and function of the controls, proper operation, features and safety precautions. Save this manual for future reference.

- Dimensions: 31"W x 37"L x 29"H
  - Dry weight: 330 lbs.
  - Fuel capacity: 10.9 gallons
  - Up to 48-amp charging output
  - Level 2 charging system with monitor
  - Up to one mile per minute charging capability
  - Compatible with all makes and models of EVs
- Includes Tesla Charging Plug Adapter
  - Smartphone app for operation
  - 25-foot charging cord
  - Battery-powered electric start
  - AC power source functionality w/ 15,000 watt peak output
  - One-year warranty



# One-Time Initial Setup

**IMPORTANT!** Place the REV where a Wi-Fi network or phone hotspot is available. This is necessary to update the monitor to the latest EV charger firmware.

1. Remove the bolts securing the REV to the pallet.
2. Fill the gas tank. Use clean, fresh, regular unleaded gasoline with a minimum octane rating of 87 and an ethanol content of 10% or less by volume. DO NOT mix oil with gasoline.
  - a. Remove the gasoline cap located on top of the REV.
  - b. Slowly add gasoline to the tank. The tank is full when gasoline reaches the red circle on the screen. WARNING! Do NOT overfill. Gasoline can expand after filling. A minimum of 1/4" (6.4 mm) of space left in the tank is required for gasoline expansion, although more than 1/4" (6.4 mm) is recommended. Gasoline can be forced out of the tank as a result of expansion if overfilled and can affect the stable running condition of the REV.
3. Check for proper oil levels. The REV comes standard with oil; however, confirm the proper oil levels before operating. 10W-30 automotive oil is required.
4. Remove front panel and connect red (+) battery terminal. The positive cable is disconnected during shipping.
5. SafeAll has partnered with Emporia Energy to operate the REV charging system. Select the phone or tablet that will be utilized when operating the REV charging system and download the "Emporia Energy" app onto the phone or tablet from the Apple App Store, Google Play or online at [emporiaenergy.com/app](http://emporiaenergy.com/app)

**NOTE:** Multiple devices can be utilized per any one account. Your phone will connect via Bluetooth to the system, and then you'll connect to a nearby Wi-Fi router. The original paired device must allow permission for a secondary device. See Section 7 under the SafeAll App Powered by Emporia. Make sure you have your Wi-Fi name and password. This application works with a Wi-Fi signal of 2.4GHz.

6. Start the REV Charging Unit.

**WARNING:** Before starting, DISCONNECT all electrical loads and NEVER start or stop the REV with electrical devices plugged in or turned on.

- a. Turn the fuel valve to the "ON" position. (Locate the valve below the fuel tank. See diagram on the fuel tank behind the REV panel.)
- b. Pull the choke knob out.
- c. Flip the red ignition switch to the "ON" position.
- d. Press and hold the ignition switch to the "START" position. Release once the engine begins to roll over. If the engine fails to start within five seconds, release the switch and wait at least 10 seconds before attempting to start the engine again.
- e. Do not over-choke. As soon as the engine starts, push the choke knob in.
- f. With the engine running, find the 50-amp breaker switch on the right hand side of the control panel; then flip it to the UP position.
- g. At this time, the power indicator light on the monitor will illuminate GREEN and the Wi-Fi indicator light will illuminate FLASH GREEN. If the WIFI indicator starts red - a phone will need to be connected before flashing green.

7. Now you are ready to pair the mobile device with the REV charging system. See **Pairing Your Device** on the next page.

# Wireless & Bluetooth Connection

## Pairing Your Device

1. Make sure “Bluetooth” is enabled on your mobile device and remain within five feet of the REV while it is running.

2. Open the SafeAll App Powered by Emporia on your mobile device. Available on Apple App Store, Google Play, or online at [emporiaenergy.com/app](http://emporiaenergy.com/app).

3. Select “Emporia EV Chargers.” Then select “Emporia EV Charger.”

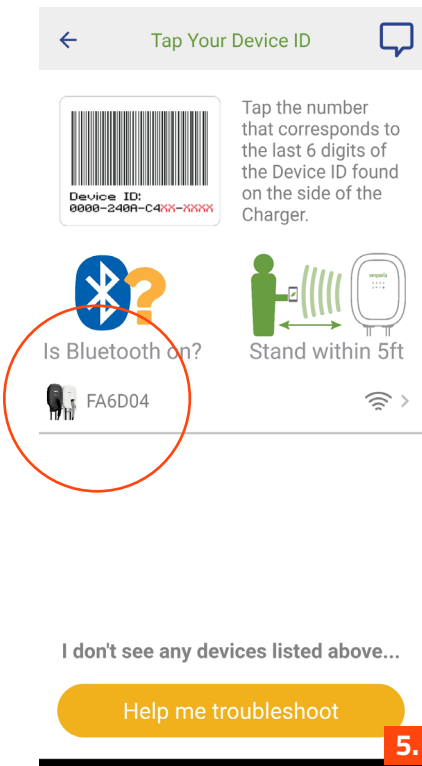
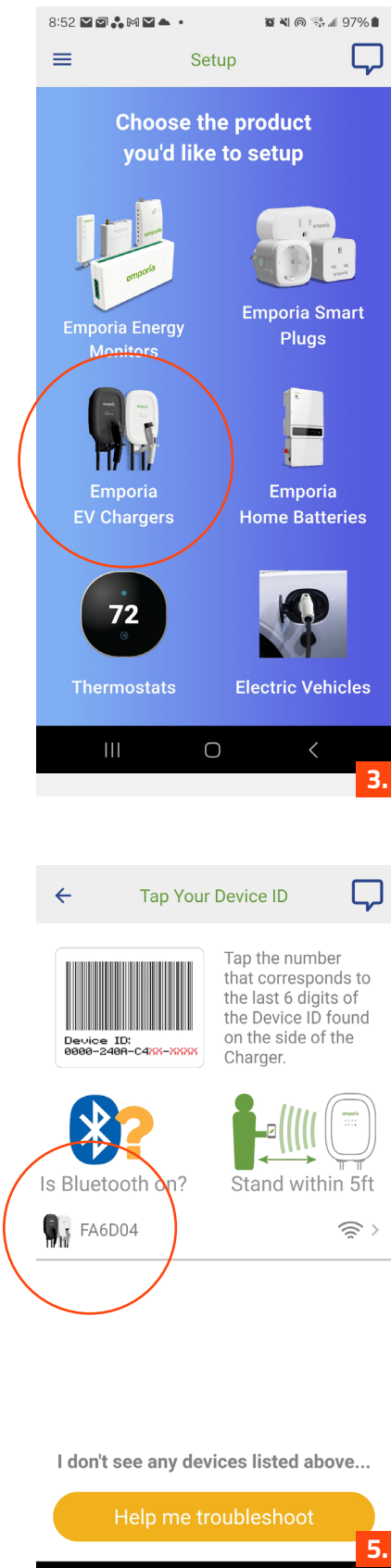
4. Select the “Go Directly to Setup” button.
- a. Tip 1: Do NOT select “Go Through the Installation Guide.” Once selected, the mobile device will begin actively searching for the REV signal.
  - b. Tip 2: If Wi-Fi will not connect, it is always best to power cycle and reset everything before troubleshooting Wi-Fi connection issues. Power cycle the device by turning off for 30 seconds and force-closing/opening the app.

5. A Device ID # will now appear on your mobile device. At this time, confirm the ID physically located on the side of the REV Monitor matches the ID displayed on the mobile device. This ID reflects the last six digits of the serial number.”

6. Select the corresponding Device ID and select “Allow.” This triggers the connection to the Emporia Energy Cloud. This may take a minute.

7. Once connected, name your REV charging system, i.e. “Truck #23.”

**NOTE:** Companies could have multiple REV systems, so this allows for proper identification of the respective REV unit being utilized.



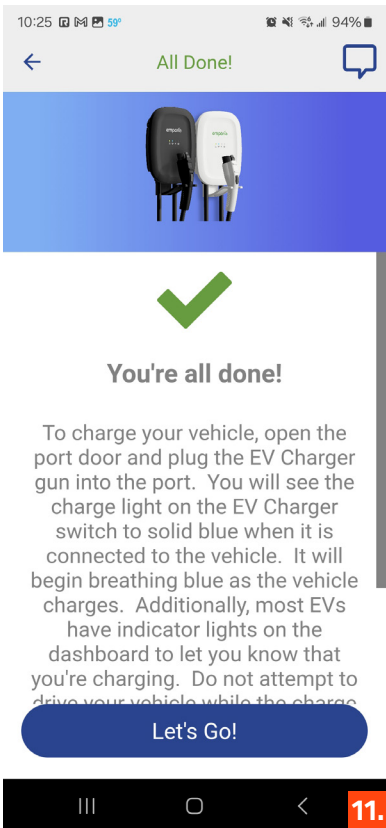
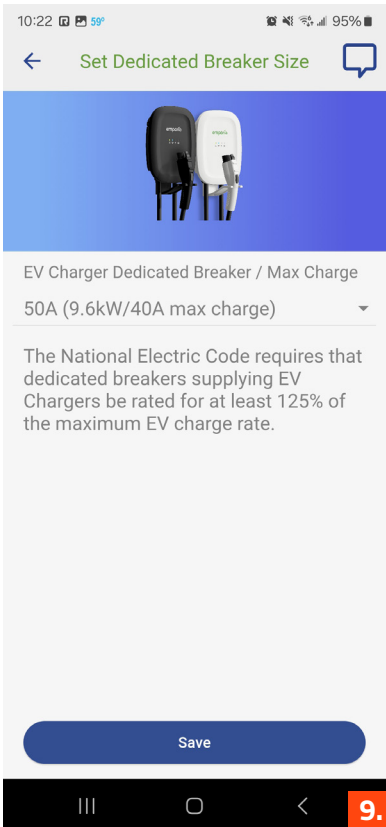
8. Next, it will ask to select the “Primary Vehicle.” Disregard this request as the REV is designed to charge numerous makes and models of vehicles.

9. Set your dedicated breaker/max charge. The REV charging system has a maximum amperage output of 48 amps. To maximize charging speed, it is recommended to select the 60/70/80A (11.5 kW/48A max charge); however, some vehicles require less. Please reference the respective electric vehicle owner’s manual to understand the optimal amperage the vehicle accepts. Tip: The SafeAll app allows the operator to adjust the amperage while charging. (See the details of the features on the app under the section, “SafeAll App Powered by Emporia.”)

10. At this time, if there’s firmware to be updated on the app, it will automatically take place. This should take no longer than three minutes. NOTE: The REV should be turned on and connected to Wi-Fi periodically to maintain the most recent firmware updates (preferably every 90 days).

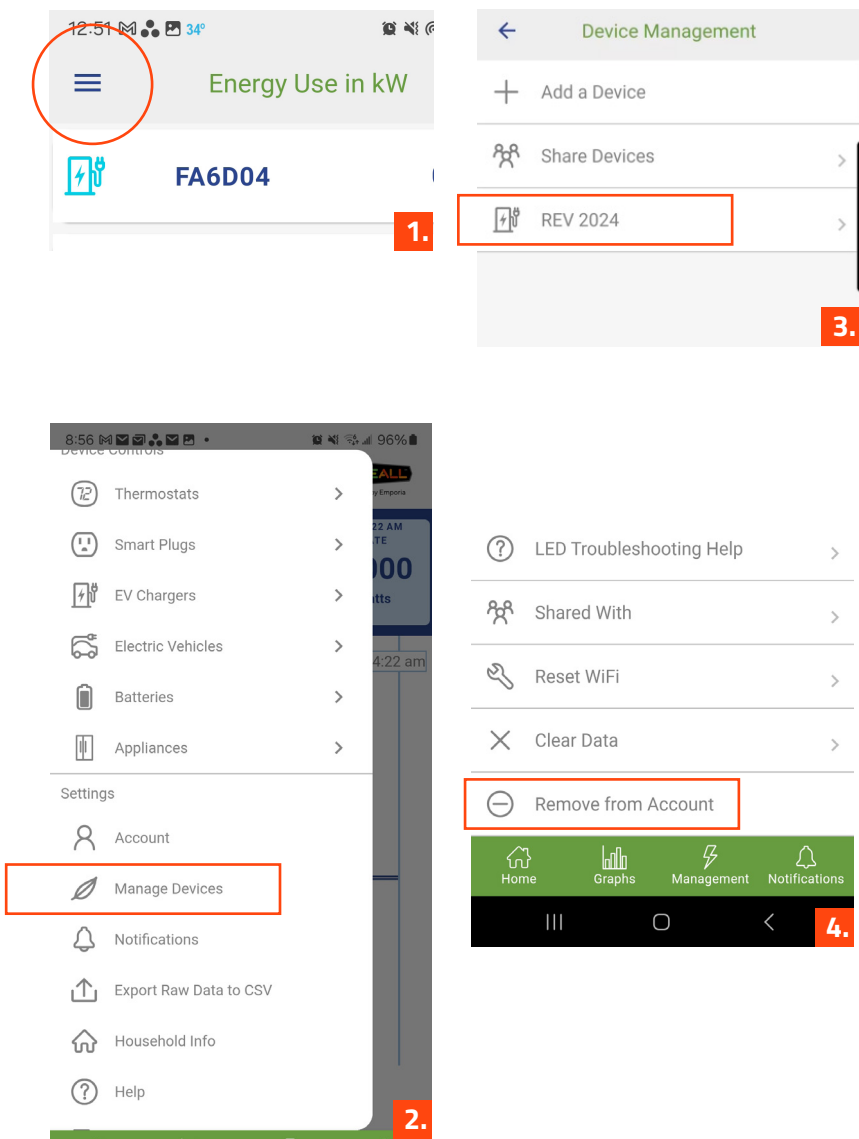
11. Your REV charging system is paired and now ready to go to work!

**NOTE:** If not prepared to move forward with the app usage or the charging of a vehicle (do not have a vehicle on location), please skip to Vehicle Charging Shutdown Procedure Step 1.



## Removing a Mobile Device from the REV

- 1. On the mobile app, go to the lists icon on the top left.
- 2. Under "Settings," select "Manage Devices."
- 3. Select the device to be removed.
- 4. On the bottom of the next page, select "Remove from Account."



## Connectivity Troubleshooting

### Wi-Fi Not Connecting:

This article is meant mostly for new device setups or devices being reset for a new Wi-Fi network where the connection is not working. If your device has simply dropped offline (but has worked in the past on this particular Wi-Fi network), then attempting a Wi-Fi reset for your device is all that should be needed.

Wi-Fi can be particularly problematic for some device setups. Here's our general approach to troubleshooting Wi-Fi issues as seen from the Customer Support desk. The suggestions and tips shown here are in order of their ease of action as well as success rate for getting devices connected. After changing any settings or environment variables related to Wi-Fi, it is recommended to try the setup again before changing any other settings.

**STOP! If you haven't already tried,** it is always best to power cycle and reset everything before troubleshooting Wi-Fi connection issues. Power cycling the device, force-closing/opening the SafeAll Monitoring App Powered by Emporia app and even power cycling/resetting the router can fix small issues without having to troubleshoot any further. You can try the setup from within the app afterwards, and it should have a decent chance of connecting. Also, it is also helpful to try this every once in a while if you've been changing/adjusting things over time.

"Power Cycling" is simply a method of de-energizing the device for approximately 15 seconds and then powering back up. This can happen by disconnecting the device from its power supply by flipping the 50-amp breaker.

### Signal Strength:

Although the REV does not need much bandwidth to operate successfully (speed of network not so much an issue), they do need a reliable signal strength for best performance. If possible, moving the REV closer to the Wi-Fi access point is always a good starting point to at least eliminate signal strength as an issue. If the device is not able to be moved closer, you might want to try using a Wi-Fi extender or similar to bring the Wi-Fi signal closer to the device – or using a Wi-Fi hotspot temporarily to see if that'd help.

### Phone Hotspot:

One thing to try that can be super helpful would be to connect your REV to your phone's Wi-Fi hotspot as a connection rather than the local Wi-Fi network. That usually has a good success rate and would help the REV download updated firmware which can help it reconnect to the local network.

**Please note the REV can still be used in an area without a Wi-Fi signal** or without cellular service coverage to create a mobile hotspot. You just need to plan ahead on the Emporia app. Prior to entering a no-signal area, start the REV, open the app and slide the amperage to 48 amps. Leave the app in a "Ready" state and then shut the unit off. Once you reach the remote area, restart the engine and allow the EV to control the charge rate.

**Router Settings:**

Double check your Wi-Fi/router settings to make sure the following settings are set correctly:

- 1. Security protocol set to WPA, WPA2, WEP
- 2. Wi-Fi/802.11 protocol set to B, G and/or N
- 3. Channel Assignment set to Automatic
- 4. No firewall settings preventing the communications. This can include programs/devices like VPNs, anti-virus software, PiHole and more.
- 5. Ensure there are no “connected device” limitations on the router/network settings.

You can reach out to your ISP for more details/help if needing support related to your Wi-Fi router behavior and settings.

**Port and Domain Information (if needed for router/networking):**

**Ports:**

- 80 (outbound)
- 443 (outbound)
- 8883 (inbound/outbound)

**Target Domain(s):**

- mqtt://a2poo8btpqc3gs-ats.iot.us-east-2.amazonaws.com
- mqtt://prod-mqtt.emporiaenergy.com/

**Problematic Situations:**

- 1. **No 2.4GHz network available.** The REV will not work on 5.0GHz network. 2.4GHz must be present for the device to be able to connect successfully.
- 2. **Mesh Networks, Networks with multiple Access Points.** We’ve included a firmware update to work better in situations like these. If your device is not on updated firmware, then disabling as many access points as possible to reduce the number of connection options to the network can help.
- 3. **Shared 2.4GHz/5.0GHz networks.** In general, the device should be able to connect to these types of networks, but sometimes, the router will attempt to re-assign the REV to a 5.0GHz network instead of the 2.4GHz network. If this situation is occurring, it is best to attempt to try and setup an exclusive 2.4GHz network if possible.

**Problem:** The SafeAll App Powered by Emporia is not finding my EV Charger after I’ve installed it. My vehicle is not responding or charging.

**Solution:** Ensure the charger has power: Check for a green power light. Check the REV is wired properly. Check that the breaker powering the REV is turned on. Ensure your phone can connect to the REV. Check your phone’s Bluetooth is on. If you’re using an Android, turn on Location Services for your phone to properly scan for Bluetooth devices. Try power cycling the breaker to which the REV is connected. Try restarting the Emporia App. Try rebooting your phone. Ensure that the latch on the REV charging cable handle is locked into place. If the handle is not latched securely, the vehicle will not charge. If the latch is pressed down during charging, charging automatically stops. Ensure that the vehicle is not set up to begin charging at a specific time of day.

**Not connecting to Bluetooth**

When setting up the REV, you will be prompted to select your Device ID (last six digits of the serial number) from the device list after going through the installation guide or going directly to set up.

If no devices are listed on this part of the setup (regardless of your phone’s settings), then here are the areas to check/try:

- 1. Make sure your monitor is powered on (LED illuminated on front of device) and you’re positioned within five feet of the phone/tablet you are using for set up.
- 2. Ensure you have all app permissions allowed for the Safeall App Powered by Emporia through your phone’s settings:
  - **iOS:** Go to your phone/tablet’s settings, scroll down to select “Emporia Energy” and toggle on all app permissions for device setup.
  - **Android:** Go to you phone/tablet’s settings, scroll down and tap “Apps,” scroll down to “Emporia Energy” and toggle on all app permissions for device setup.
- 3. Force close the SafeAll App Powered by Emporia, power cycle the device for 30 seconds, reopen the app all while staying within five feet of the device, go through the setup process again and select your Device ID from the device list.

# Operating Your REV

## Starting the REV Engine

WARNING! Before starting, DISCONNECT all electrical loads and NEVER start or stop the REV with electrical devices plugged in or turned on.

1. Check the gas tank. Use clean, fresh, regular unleaded gasoline with a minimum octane rating of 87 and an ethanol content of 10% or less by volume. DO NOT mix oil with gasoline.
  - a) To fill, remove the gasoline cap located on top of the REV and slowly add gasoline to the tank. The tank is full when gasoline reaches the red circle on the screen.

**WARNING!** Do NOT overfill. Gasoline can expand after filling. A minimum of 1/4" (6.4 mm) of space left in the tank is required for gasoline expansion, although more than 1/4" (6.4 mm) is recommended. Gasoline can be forced out of the tank as a result of expansion if overfilled and can affect the stable running condition of the REV.
2. Check for proper oil levels. If low, 10W-30 automotive oil is required.
3. Turn the fuel valve to the "ON" position. (Locate the valve below the fuel tank. See diagram on the fuel tank behind the REV panel.)
4. Pull the choke knob out.
5. Flip the red ignition switch to the "ON" position.
6. Press and hold the ignition switch to the "START" position. Release once the engine begins to roll over. If the engine fails to start within five seconds, release the switch and wait at least 10 seconds before attempting to start the engine again.
7. Do not over-choke. As soon as the engine starts, push the choke knob in.
8. With the engine running, find the 50-amp breaker switch on the right hand side of the control panel; then flip it to the UP position.
9. At this time, the power indicator light on the monitor will illuminate SOLID GREEN and the Wi-Fi indicator light will FLASH GREEN.

## How to Charge a Vehicle

Every make and model of electric vehicle is designed differently. Please refer to the owner's manual of the respective vehicle manufacturer to understand its charging procedure and recommended amperage acceptance.

1. Access the electric vehicle. Confirm its low-power auxiliary battery's state of charge. This is normally a 12V, but some models vary.
  - a. If the auxiliary battery has sufficient voltage, proceed to charge the primary battery.
  - b. If the auxiliary battery is dead, for the vehicle to accept a charge, the low-power auxiliary battery will need to be recovered to an adequate level. This can be achieved in most cases by connecting a jump pack to the low power battery.
2. Open the charging port door to the electric vehicle and plug the REV charging connector into the port. Once received, the charge indicator light on the REV monitor will switch to **solid blue**. **Note:** With Tesla models, attach the provided adaptor (J1772) to the standard connector.
3. Once the electric vehicle begins to accept the charge, the charge indicator light on the REV monitor will begin **pulsating blue**. Additionally, most electric vehicles have indicator lights on the in-car infotainment system to let you know when the vehicle is charging. **WARNING!** Do not attempt to drive the electric vehicle while the REV charge cable is connected.
4. Continue with charging. Determine how much range is requested and maintain monitoring of the electric vehicle charge levels and acceptance. Typically, once the electric vehicle begins accepting a charge, the REV charges up to one mile per minute.



## Vehicle Charging Shutdown Procedure

**WARNING!** Never attempt to remove the REV charging cable from the vehicle while charging is in progress. When shutting down the charging systems, both the electric vehicle AND the REV require special shutdown procedures.

1. Per the respective manufacturer’s recommendations, shut down charging within the electric vehicle. Generally, most electric vehicles have their specific systems in place to stop a charge, whether it’s holding the unlock button on the key fob, navigating to the charging menu on the in-car infotainment system or using the vehicle app.
2. To properly shut down the charging function of the REV charging system, turn the 50-amp breaker to the “OFF” position. **IMPORTANT!** DO NOT unplug the REV charge cable from the electric vehicle until the 50-amp breaker is turned off.
3. To completely turn the REV off, simply flip the **red** ignition switch to the “OFF” position. **Note:** Make sure to let the REV run at no load for several minutes to stabilize the internal temperatures of the REV engine.
4. Turn the fuel valve to the “OFF” position. **IMPORTANT!** Always ensure that the fuel valve and the ignition switch are in the “OFF” position when the engine is not in use.

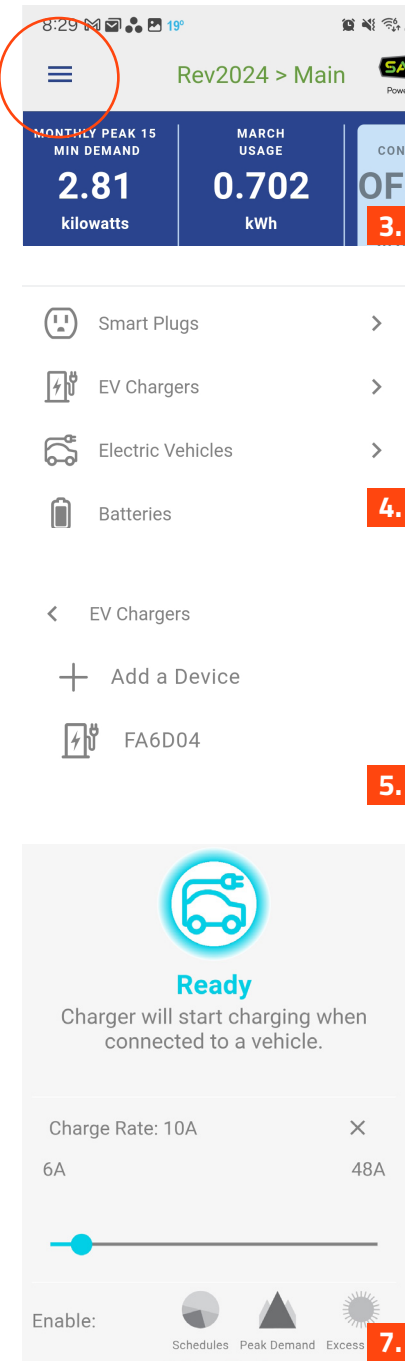


## SafeAll App Powered by Emporia User Interface Operation Guide

The provided application allows operators additional features and benefits while charging. Below are the steps on how to utilize the SafeAll App Powered by Emporia.

1. On your paired mobile device, open the SafeAll App Powered by Emporia.
2. Select “EV Charger.”
3. From the top left of the app, select “List Icon” (three stacked lines).
4. From the “List Icon” drop-down menu, select “EV Charger” again.
5. Select the respective REV named device to be utilized.
6. Pairing Secondary Devices. The original paired device must allow permission for a secondary device. This can be done under the Device Management>Share Devices. The app will prompt unauthorized secondary users to ask permission.
7. Once the proper REV is selected, the “Device Control” function will appear. This is where you can do the following:
  - Turn the monitor charging control on or off.
  - Manually control the rate of charge by swiping your finger along the slide bar function. Pencil icon is where slide bar is found.
  - Understand what amperage rate the REV is sending and what amperage rate the respective vehicle is accepting. You will see numbers like the following example: 32/40. The first number indicates the vehicle’s acceptance amp rate and the second number indicates the REV’s sending amp rate.
  - Access Graphs, Management and Notifications.

Without a Wi-Fi/cloud connection, the EV Charger cannot be managed from within the app itself. Will need to reconnect it to the Emporia cloud to manage EV Charger behavior. If your ISP or local network is unavailable, you might try to connect the EV Charger to your phone’s Wi-Fi Hotspot temporarily to provide app-based control again. The EV Charger should still be able to charge if the EV Charger was left in a “Ready” state from within the app before the outage occurred. If the EV Charger was left in a “Paused” state, you would need to reconnect it to the Emporia cloud to adjust its charging state.



Monitor Indicator Lights

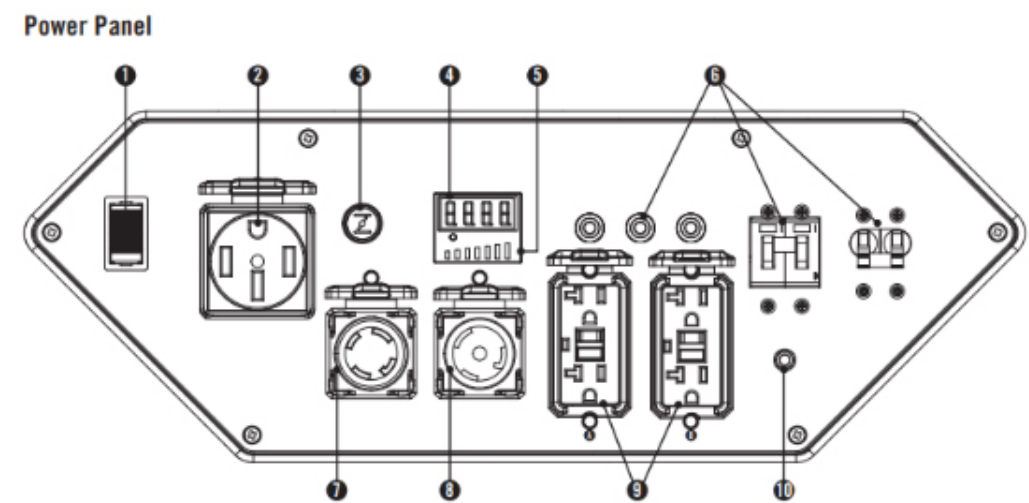
⏻ Power	
Off	Charger does not have power
Solid Green	Charger has power
⚡ Charge	
Off	No vehicle connected
Solid Blue	Vehicle connected
Flashing Blue	Offering charge
Breathing Blue	Vehicle charging
📶 Wi-Fi	
Solid Red	Not connected to router
Flashing Red	Lost connection to router
Flashing Green	Connecting to router
Solid Green	Connected to router, but not the internet
! Fault	
Flashing Orange 1 slow/1 fast	Abnormal control pilot circuit. Unplug and plug in Emporia EV charger. If issue persists, contact support.
Flashing Orange 1 slow/2 fast	Charger has exceeded operating temperature lower bound. Ensure the charger is installed where temperatures do not drop below -22F (-30C)
Flashing Orange 1 slow/3 fast	Input voltage is too low. If issue persists, contact Support.
Flashing Orange 1 slow/4 fast	Input voltage is too high. If issue persists, contact Support.
Flashing Orange 1 slow/5 fast	Charger has exceeded nominal temperature. Ensure the REV is not used where ambient temperatures will not exceed 122°F (50°C). If issue persists, contact Support.

Fault (cont.)	
Flashing Orange 1 slow/6 fast	Output surge current. Unplug from car. Turn off 50-amp breaker. Confirm there is no visible damage of foreign material in the EV gun. Return power to charger. If issue persists, contact support.
Flashing Orange 1 slow/7 fast	Current leakage. Unplug from vehicle. Disconnect charger from power. Confirm there is no visible damage or foreign material in the EV connector. Return power to charger. If issue persists, contact support.
Flashing Orange 1 slow/8 fast	Output short circuit. Unplug from vehicle. Disconnect charger from power. Confirm there is no visible damage or foreign material in the EV connector. Return power to charger. If issue persists, contact support.
Flashing Orange 1 slow/9 fast	Output over current. Unplug from vehicle. Disconnect charger from power. Confirm there is no visible damage or foreign material in the EV connector. Return power to charger. If issue persists, contact support.
Flashing Orange 2 slow/1 fast	Vehicle not responding. Ensure that the latch on the EV charging cable handle is locked into place. If the handle is not latched securely, the vehicle will not charge. If the latch is pressed down during charging, charging automatically stops. Ensure that the vehicle is not set up to begin charging at a specific time of day.
Flashing Orange 2 slow/2 fast	Vehicle interface issue. Ensure that the latch on the EV charging cable handle is locked into place. If the handle is not latched securely, the vehicle will not charge. If the latch is pressed down during charging, charging automatically stops. Ensure that the vehicle is not set up to begin charging at a specific time of day.
Flashing Orange 2 slow/3 fast	Relay fused in position. Disconnect from power immediately. Contact Support.
Flashing Orange 2 slow/5 fast	Charger is not grounded. Check ground behind REV control panel. If issue persists, contact Support.
Flashing Orange 3 slow/1 fast	The electric vehicle is requesting ventilation during charging. Contact Support.
Flashing Orange 3 slow/2 fast	The electric vehicle is requesting charge but the charger is not ready. Unplug the connector from the port and plug back in again. If issue persists, contact Support.

# REV Used as Conventional Generator

Yes, the REV can also be used as a conventional generator!

The SafeAll REV has a primary functionality of charging electric vehicles. However, as an additional benefit, the REV offers the ability to be used as a conventional power generator. Please follow the instructions below on how to properly operate the REV generator function. **IMPORTANT!** The REV is NOT designed to be used simultaneously as an EV charger and a generator. When using the generator function, DO NOT also charge an electric vehicle.



- 1 **Ignition Switch** – Press the switch to the “START” position to start the generator. Flip to the “OFF” position to turn off the generator.
- 2 **120/240 Volt AC / 50-Amp Receptacle (NEMA 14-50R)** – May be used to supply electrical power for the operation of 120 and/or 240 Volt AC, single phase 60 Hz electrical loads.
- 3 **Choke** – Used to start the engine.
- 4 **Intelligauge** – Cycles through four modes displaying voltage, frequency, running time and total time for approximately five seconds each. If an over-voltage condition occurs, the display will only show the voltage and will be blinking. If the voltage continues to rise, the display will blink “EEEE.” The generator is to be shut off immediately in an over-voltage condition.
- 5 **Power Meter** – Displays the generator’s output in reference to its rated wattage. The greater the output the more LEDs illuminate. The LED bars will light up from green to orange. If the orange LEDs light up, the generator is overloaded. Stop use of equipment and disconnect immediately to stop overloading. **DO NOT OVERLOAD THE GENERATOR.**

- 6 **Circuit Breakers** – Protects the generator against electrical overloads.
- 7 **120/240 Volt AC / 30-Amp Twist-Lock Receptacle (NEMA L14-30R)** – May be used to supply electrical power for the operation of 120 and/or 240 Volt AC, single phase 60 Hz electrical loads.
- 8 **120 Volt AC / 30-Amp Twist-Lock Receptacle (NEMA L5-30R)** – May be used to supply electrical power for the operation of 120 Volt AC, single phase 60 Hz electrical loads.
- 9 **120 Volt AC / 20-Amp Duplex (2) (GFCI 5-20R)** – May be used to supply electrical power for the operation of 120 Volt AC, single phase 60 Hz electrical loads.
- 10 **Ground Terminal** – Consult an electrician for local grounding regulations.

## Restrictions

- Use 90°C wire, 6 AWG copper for setting 48-amp rating intended for field wiring connection.

### Locations

Never operate the generator inside any building, including garages, basements, crawl spaces, sheds, enclosure or compartment, like the generator compartment of a recreational vehicle. Please consult your local authority. In some areas, generators must be registered with the local utility. Generators used at construction sites may be subject to additional rules and regulations.

Generators should be on a flat, level surface at all times, even while not in operation. Generators must have at least five feet (1.5 m) of clearance from all combustible material. In addition to clearance from all combustible material, generators must also have at least three feet (91.4 cm) of clearance on all sides to allow for adequate cooling, maintenance and servicing.

Generators should never be started or operated in the back of a SUV, camper, trailer, under staircases/ stairwells, next to walls or buildings or in any other location that will not allow for adequate cooling of the generator and/or the muffler. DO NOT contain generators during operation. Allow generators to properly cool before transport or storage.

Place the generator in a well-ventilated area. **DO NOT** place the generator near vents or intakes where exhaust fumes could be drawn into occupied or confined spaces. Carefully consider wind and air currents when positioning generator. Failure to follow proper safety precautions may void manufacturer’s warranty.

### Surge Protection

Electronic devices, including computers and many programmable appliances use components that are designed to operate within a narrow voltage range and may be affected by momentary voltage fluctuations. While there is no way to prevent voltage fluctuations, you can take steps to protect sensitive electronic equipment.

- 1. Install UL1449, CSA-listed, plug-in surge suppressors on the outlets feeding your sensitive equipment. Surge suppressors come in single- or multi-outlet styles. They’re designed to protect against virtually all short-duration voltage fluctuations.

### Connecting Electrical Loads

- 1. Let the engine stabilize and warm up for a few minutes after starting.
- 2. Plug in and turn on the desired 120/240 Volt AC single phase, 60 Hz electrical loads.
  - **DO NOT** connect three-phase loads to the generator.
  - **DO NOT** connect 50 Hz loads to the generator.
  - **DO NOT** overload the generator.

### Electrical Capacity

Follow these simple steps to calculate the running and starting watts necessary for your purposes. Do not overload the generator. Never exceed the specified capacity when adding loads to the generator.

- 1. Select the electrical devices you plan on running at the same time.

- 2. Total the running watts of these items. This is the amount of power you need to keep your items running.
- 3. Identify the highest starting wattage of all devices identified in Step 1. Add this number to the number calculated in Step 2. Surge wattage is the extra burst of power needed to start some electric driven equipment. Following the steps listed under “Power Management” will guarantee that only one device will be starting at a time.

### Capacity

Follow these simple steps to calculate the running and starting watts necessary for your purposes. Do not overload generator. Never exceed the specified capacity when adding loads to the generator.

- 1. Select the electrical devices you plan on running at the same time.
- 2. Total the running watts of these items. This is the amount of power you need to keep your items running.
- 3. Identify the highest starting wattage of all devices identified in Step 1. Add this number to the number calculated in Step 2. Surge wattage is the extra burst of power needed to start some electric driven equipment. Following the steps listed under “Power Management” will guarantee that only one device will be starting at a time.

### GFCI

Your generator is equipped with two (2) Ground Fault Circuit Interrupter (GFCI) duplexes. In the event of a ground fault, a GFCI trips automatically to stop the flow of electricity and prevent serious injury. The green indicating light on the receptacle will also turn off. Press the reset button located on the front of the receptacle to restore flow of electricity. The green indicating light will also turn back on. GFCI does not protect against circuit overloads.

**To ensure proper operation of the GFCI duplex, perform this test monthly:**

- 1. With the generator running, plug a lamp into the GFCI receptacle. Turn the lamp on.
- 2. Press the “Test” button located on the front of the receptacle to trip the device. This should immediately stop the flow of electricity and shut off the lamp. If the electricity is not stopped, do not use this receptacle until is has been serviced or replaced.
- 3. Press the “Reset” button located on the front of the receptacle to restore the flow of electricity. If the indicator light does not go out and come back on or if the GFCI cannot be reset then it must be replaced.

# Service and Maintenance

## REV Maintenance

The owner/operator of the REV is responsible for all periodic maintenance. Complete all scheduled maintenance on time. Correct any issue before operating the REV. Make certain that the unit is kept clean and stored properly. Only operate the unit on a flat, level surface in a clean, dry operating environment. DO NOT expose the unit to extreme conditions, excessive dust, dirt, moisture or corrosive vapors. **IMPORTANT!** To prevent accidental starting, remove and ground the spark plug wire before performing any service.

## Maintenance Schedule

Every 8 hours or daily
Check oil level
Clean around air intake and muffler
First 5 hours
Change oil and oil filter
Every 50 hours or every season
Clean air filter
Change oil if operating under heavy load or in hot environments
Every 1,000 hours or every season
Change oil and oil filter
Clean/Adjust spark plug
Check/Adjust valve clearance*
Clean spark arrester
Clean fuel tank and filter*
Every 250 hours
Clean combustion chamber*
Every 3 years
Replace fuel line

\* To be performed by qualified technician.

## Oil and Oil Filter Change

Always change the oil when the engine is warm. Refer to the oil specifications to select the proper grade of oil for your operating environment.

1. Remove the oil drain bolt with a 15mm socket or wrench (not included) and drain into the appropriate container.
2. After the oil has completely drained, replace the drain bolt.
3. With the oil drained, remove the oil filter by turning counterclockwise.
4. Apply a light coat of clean engine oil to the gasket of the new oil filter.
5. Screw the new oil filter on (turning clockwise) by hand until the gasket contacts the engine block.
6. Screw the filter an additional three-quarter turn.
7. Open engine access cover.
8. Using funnel, fill to full mark on dipstick. DO NOT OVERFILL. Volume for first use or oil change without oil filter change: 1.1 qt. (1 L). Volume after oil and oil filter change: 1.4 qt.(1.3L).
9. Check engine oil level on dipstick. Add oil as needed. DO NOT OVERFILL.
10. Replace oil fill cap.
11. Close engine access cover.
12. Dispose of used oil and filter at an appropriate waste management facility.

## Spark Plugs

1. Remove the spark plug wire from the spark plug.
2. Use a spark plug socket tool (not included) or a 13/16" or 21mm socket (not included) to remove the plug.
3. Inspect the electrode on the plug. It must be clean and not worn to produce the spark required for ignition.
4. Make certain the spark plug gap is 0.7 - 0.8 mm or 0.028 - 0.031".
5. Refer to the spark plug recommendation chart when replacing the plug.
6. Carefully thread the plug into the engine.
7. Use the spark plug socket (not included) to firmly install the plug.
8. Attach the spark plug wire to the plug.

### Air Filter

1. Open engine access cover.
- 2 Remove the air filter cover by turning the two fasteners quarter-turn counterclockwise.
3. Pull the air filter straight out away from the engine.
4. Install new air filter.
5. Replace air filter cover and turn the two fasteners quarter-turn clockwise.
6. Close engine access cover.

### Spark Arrestor

**IMPORTANT!** Federal and local laws and administrative requirements indicate when and where spark arrestors are required. When ordered, spark arrestors are required for operation of this engine in National Forest lands. In California, this engine must not be used on any forest-covered land, brush-covered land or grass-covered land unless the engine is equipped with a spark arrestor.

1. Allow the engine to cool completely before servicing the spark arrester.
2. Remove the two screws holding the cover plate which retains the end of the spark arrester to the muffler.
3. Remove the spark arrester.
4. Carefully remove the carbon deposits from the spark arrester with a wire brush.
5. Replace the spark arrester if it is damaged.
6. Position the spark arrester in the muffler and attach with the two screws.

### Cleaning

- Use a damp cloth to clean exterior surfaces of the engine.
- Use a soft bristle brush to remove dirt and oil.
- Use an air compressor (25 PSI) to clear dirt and debris from the engine.
- Inspect all air vents and cooling slots to ensure they are clean and unobstructed.

### Engine Adjustments

The air-fuel mixture is not adjustable. Tampering with the governor can damage your REV and your electrical devices and will void your warranty. It is recommended that you contact Customer Support for all other service and/or adjustment needs.

### REV Battery Maintenance

The REV is equipped with an automatic battery charging circuit, and proper battery maintenance and storage should be followed. The battery will receive charging voltage when the engine is running. The battery will maintain a proper charge if the unit is used on a regular basis (about once every two weeks). If it is used less frequently, the battery should be connected to a trickle charger or battery maintainer to keep the battery properly charged. If the battery voltage is extremely low, the charging circuit may not be able to recharge the battery. In this case, the battery must be connected to a standard automotive-style battery charger for recharging before it can be used.

### Charging the REV Battery

To charge the battery, an automatic battery charger (not included) should be used with automatic trickle-charging capabilities. The maximum charging rate should not exceed 1.5 amps. Please follow the instructions included with the respective battery charger. The REV battery should be fully charged at least once per month.

### Disconnecting the REV Battery

1. Remove the protective cover from the black (-) battery lead.
2. Disconnect the black (-) lead from the black (-) terminal on the battery and store the cap screw (M5x12) and lock washer (M5).
3. Repeat steps 1-2 for the red (+) battery lead.
4. Store the battery in a cool, dry place.

## Troubleshooting

**NOTE:** Please read and follow the “Important Safety Information” section before performing troubleshooting procedures.

If you are experiencing issues with the REV and none of the troubleshooting prompts help, do the following before contacting the SafeAll Master Distributor:

- Turn the power to the REV off and back on following the proper steps.
- Return to the beginning of the entire installation process and review the steps.

Be sure that you followed all the instructions provided. If your REV continues to present a problem, contact Customer Support to talk with their product technicians.

## Customer Support

Zip’s AW Direct serves as the Master Distributor for SafeAll Products and, as such, provides technical support and information for our products. If you have questions regarding the REV and this instruction manual, please contact **SafeAll Customer Support at Zip’s AW Direct at 800-222-6047**.

## Vehicle not charging

1. Ensure your REV is set to a “Ready” state in the SafeAll Powered by Emporia app. **This is the most common reason for the REV not charging when desired.**
2. Ensure your REV is powered on (LED is illuminated on the monitor) and no faults or errors are being thrown within the SafeAll App Powered by Emporia nor on the respective vehicle’s infotainment center.
3. Ensure the respective vehicle is properly connected to the charging plug and does not have any restrictive settings preventing charging. Things like on-vehicle schedules or lock status of the vehicle can affect the charging ability. Some vehicles require the car to be “awake” before charging can occur. Checking the ability to lock or unlock the vehicle can be a good test. Reaching out to the vehicle manufacturer’s customer support team may be required to confirm if any prohibitive settings may be present on the vehicle.
4. Ensure there is no “Energy Management” or “Schedule” on the SafeAll app preventing the charging.
5. Inspect the REV charging connector to confirm it’s clean of any debris. Also look for any damage or fitment issues. Make sure the black latch on top of the connector is locked into place when fully inserted into the vehicle. It should not wiggle.

## Not charging at full rate

Most common reason for the REV not reaching the maximum amount of charge (as set by the app) would be limitations from the vehicle itself. Although the REV is rated to provide up to 48 amps, the vehicle will request the amount it needs and will always listen to the charge rate as requested by the vehicle unless that rate is higher than the specified settings within the app.

If that doesn’t solve the low-charging issue, you’ll want to double-check two things:

1. Ensure your real-time charge rate in the app is set as high as possible.
2. Ensure you don’t have an Energy Management feature limiting charge.

## Cannot disconnect the charger from my EV

If the REV charging connector is locked into the vehicle’s charging port, first check the owner’s manual for your vehicle. Many cars need to be unlocked (with the key fob or similar) to allow the charger to be released or may have other vehicle settings preventing the connector from being released from the vehicle port.

There are no settings related to disconnecting the charger in the SafeAll App Powered by Emporia nor from the REV.

All electric vehicles manufactured after 2002 are also required to have a connector release mechanism located nearby the connector port. This mechanism is sometimes located inside the trunk compartment. If you cannot find a way to release the connector from the vehicle’s charging port using the key fob, you might want to take a look at your vehicle’s user’s manual and check this option.

One final step would be to double-check that the connector latch is not broken. If broken (and latch is unable to release the connector), then it’s possible to remove the connector latch from the connector itself. In this situation, you will want to ensure there is no power provided to the EV charger. This should be turned off at the breaker to ensure safety before attempting a release of the connector latch. Removing this screw requires a T-10 (Torx) screwdriver as shown in the picture below.



Generator Troubleshooting

Problem	Cause	Solution
Generator will not start	No fuel	Add fuel
	Faulty spark plug(s)	Replace spark plug(s)
	Unit loaded during startup	Remove load from unit
	Generator battery is dead	Recharge or replace generator battery
Generator will not start; Generator starts but runs roughly	Low oil level	Fill crankcase to the proper level
		Place generator on flat, level surface
	Choke in the wrong position	Adjust choke
	Spark plug wire loose	Attach wire to spark plug
Generator shuts down during operation	Out of fuel	Fill fuel tank
	Low oil level	Fill crankcase to the proper level. Place generator on a flat, level surface
Generator cannot supply enough power or overheating	Generator is overloading	Review load and adjust. See "Power Management"
	Insufficient ventilation	Check for air restriction. Move to a well ventilated area
No AC output	Cable not properly connected	Check all connections
	Connected device is defective	Replace defective device
	Circuit breaker is open	Reset circuit breaker
	Faulty brush assembly	Replace brush assembly (Service Center)
	Faulty AVR (auto voltage regulator)	Replace AVR (Service Center)
	Loose wiriing	Inspect and tighten wiring connections
	Other	Contact Support
Generator gallops	Engine governor defective	Contact Support
Repeated circuit breaker tripping	Overload	Review load and adjust. See "Power Management"
	Faulty cords or device	Check for damaged, bare or frayed wires. Replace defective device

REV Storage

The REV’s engine should be started at least once every 14 days and allowed to run for at least 20 minutes. For longer term storage, please follow these guidelines.




1. Add a properly formulated fuel stabilizer to the tank.
2. Be sure all appliances are disconnected from the device.
3. Run the engine for a few minutes so the treated fuel cycles through the fuel system and carburetor.
4. Turn the fuel valve to the “Off” position.
5. Let the engine run until fuel starvation has stopped the engine. This usually takes a few minutes.
6. The engine needs to cool completely before cleaning and storage.
7. Clean the engine according to the maintenance section.
8. Change the oil.
9. Remove the spark plug and pour about 1/2 oz. ounce (14.8 mL) of oil into the cylinder. Crank the engine slowly to distribute the oil and lubricate the cylinder.
10. Reattach the spark plug.
11. Store the unit in a clean, dry place out of direct sunlight.

# Important Safety Information

**Notice:** Do not attempt to operate the REV until you have thoroughly read all safety, operation and service instructions in this manual. Failure to comply may result in personal injury and/or property damage. Please keep this manual available and review it often to ensure safe operation.

## Safety Notices

Important safety information is used throughout this section to warn of hazards to you and the REV. A safety notice identifies a hazard and then explains what may happen if the hazard is not avoided. The safety notices are flagged by use of the triangular safety icon. A description of each safety notice follows:

<b>Caution!</b> 	<b>A Caution</b> notice describes situations that may cause minor personal injury or damage to equipment or data, and it explains how to avoid such situations.
<b>Warning!</b> 	<b>A Warning</b> notice describes situations that may cause serious personal injury or damage to equipment or data, and it explains how to avoid such situations.
<b>Danger!</b> 	<b>A Danger</b> notice describes situations that will cause serious personal injury or death or severe damage to equipment, and it explains how to avoid such situations.

## Safety Precautions

To avoid injury or even death, read all instructions before using this product.

- **RISK OF FIRE OR ELECTRIC SHOCK!** This device should be supervised when used around children. Do not put your fingers into the electric vehicle connector. The REV is intended for use with electric vehicles only. Specifically, it is intended only for electric vehicles not requiring ventilation during charging.
- **Do not** attempt to disassemble or repair any of the components of the REV Monitor. There are no user-serviceable parts inside this module.
- **Do not** use the REV if the flexible power cord or EV cable is frayed, has broken insulation or any other signs of damage.
- **Do not** use the REV if the enclosure or the electric vehicle connector is broken, cracked, open or shows any other indication of damage.
- **Do not** operate this product in environments where temperatures are outside its operating range of -22°F to 122°F (-30°C to 50°C)
- The REV is manufactured to meet the safety criteria defined by these international standards:
  - NEC 625 - Electric Vehicle Charging System Equipment
  - SAE J1772 - Electric Vehicle Conductive Charge Coupler Standard
  - UL 817 - Cord Sets and Power-Supply Cords
  - UL 991 - Safety Tests for Safety-Related Controls Employing Solid-State Devices
  - UL 2231 - Standard for Personnel Protection Systems for Electric Vehicle Supply Circuit
  - UL 2251- Standard for Plugs, Receptacles and Couplers for Electric Vehicles
  - UL 2594 - Standard for Electric Vehicle Supply Equipment.
- The REV Charging System contains FCC ID: 2AS6P-EMEVSE1. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
  - (1) This device may not cause harmful interference
  - (2) This device must accept any interference received, including interference that may cause undesired operation. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.



Learn more at [SafeAllProducts.com](https://SafeAllProducts.com)

