



## CHARGING SYSTEMS INTERNATIONAL

### INSTALLATION AND OPERATING INSTRUCTIONS FOR THE FOLLOWING BATTERY CHARGING SYSTEMS:

MODELS	MAX AMPS/BANK	NO. OF BANKS	BATTERY SYSTEM
Lil Pro 1	4	1	12
Lil Pro 2	4	2	12/24
Lil Pro 3	4	3	12/24/36

#### IMPORTANT NOTICE

Please save and read all safety, operating and installation instructions before installing or applying AC power to your Charging Systems International on-board battery charging system.

Please contact Charging Systems International with any product, installation, or service questions at 1-800-742-2740.

#### Introduction

Charging Systems International has been manufacturing waterproof, on-board battery charging systems since 1989. Our systems are designed and built tough to withstand intense vibration, extreme temperature variations and, if needed, be submerged without damaging the unit. Our systems use temperature compensation in order to fully charge a battery in hot or cold environments and are controlled by microprocessors in order to assure precise control over each totally independent charging bank. All of our chargers have true reverse polarity protection and shut off completely after each charge cycle.

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**IMPORTANT SAFETY INSTRUCTIONS**

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SAVE THESE INTRUCTIONS-This manual contains important safety and operating instructions for battery charger Models: **Lil Pro 1, Lil Pro 2, Lil Pro 3.**

Use of attachments not recommended or sold by Charging Systems International may result in a risk of fire, electrical shock, or injury to persons.

To reduce risk of damage to electric plug and cord, pull by plug rather than cord when disconnecting charger.

When using an extension cord, make sure:

That pins on plug of extension cord are the same number, size, and shape as those of plug and charger;

That extension cord is properly wired and in good electrical condition;

That wire size is large enough for ac ampere rating of charger.

Do not operate charger with damaged cord or plug-replace the cord or plug immediately.

Do not operate charger if it has received a sharp blow, been dropped, or otherwise damaged in any way; contact Charging Systems International.

Do not disassemble charger; contact the factory when service or repair is required. Incorrect reassembly may result in risk of electrical shock or fire.

To reduce risk of electric shock, unplug charger from outlet before attempting any maintenance or cleaning.

## WARNING-RISK OF EXPLOSIVE GASES.

**WORKING IN THE VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS.** Batteries generate explosive gases during normal battery operation. For this reason, it is of utmost importance that each time before using your charger, you read this manual and follow the instructions exactly.

To reduce risk of battery explosion, follow these, instructions and those published by battery manufacturer and manufacturer of any equipment you intend to use in vicinity of battery. Review cautionary marking on these products and on engine.

## **PERSONAL PRECAUTIONS**

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Someone should be within range of your voice or close enough to come to your aid when you work near a lead-acid battery.

Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.

Wear complete eye protection and clothing protection. Avoid touching eyes while working near battery.

If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with running cold water for at least 10 minutes and get medical attention immediately.

NEVER smoke or allow a spark or flame in vicinity of battery or engine.

Be extra cautious to reduce risk of dropping a metal tool onto battery. It might spark or short-circuit battery or other electrical part that may cause explosion.

Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid battery. A lead-acid battery can produce a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn.

Use charger for charging a LEAD-ACID (lead acid, sealed lead acid, gel cell and AGM) battery only. It is not intended to supply power to a low voltage electrical system other than in a starter-motor application. Do not use battery charger for charging dry-cell batteries that are commonly used with home appliances. These batteries may burst and cause injury to persons and damage to property.

NEVER charge a frozen battery.

## **PREPARING TO CHARGE**

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If necessary to remove battery from boat to charge, always remove grounded terminal from battery first. Make sure all accessories in the boat are off, so as not to cause an arc.

Be sure area around battery is well ventilated while batteries are being charged. Gas can be forcefully blown away by using a piece of cardboard or other nonmetallic material as a fan.

Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes.

Add distilled water in each cell until battery acid reaches level specified by battery manufacturer. This helps purge excessive gas from cells. Do not overfill. For a battery without cell caps, carefully follow manufacturer's recharging instructions.

Study all battery manufacturers' specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.

Extension cords should be industrial grade/heavy duty U.L. approved and grounded. Check extension cord before use for damage, bent prongs, and cuts. Replace if damaged.

Always make your extension cord connection on the charger side first. After connecting the extension cord to the charger then proceed to plug the extension cord to a nearby 120VAC GFCI protected (Ground Fault Circuit Interrupt) outlet.

Always remove the extension cord from the 120VAC outlet first when charging is completed followed by unplugging the charger.

## **PRODUCT SUMMARY**

### **General Operation**

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Use the following guidelines in this manual to install your fully automatic Charging Systems International battery charging system.

Assure that your charger and batteries are properly vented. Connect your extension cord with no AC Power present to the battery charger and proceed to plug your extension cord in at a nearby 120 VAC outlet.

Once you plug in your Charging Systems International battery charging system, your batteries will be simultaneously and independently charged to 100%. Unlike systems that utilize one large charger to attempt to charge multiple batteries, your system utilizes a totally independent battery charger for each battery. Each charging bank will turn itself completely off once the battery is charged and then monitor and maintain the battery indefinitely.

We recommend that you leave your system plugged in to reduce sulfate build-up and to allow your Charging Systems International charging system to keep your batteries fully maintained and ready to perform at their best.

## **Independent Charging Bank Indications**

When your battery charging system is activated, each bank provides charging information utilizing one red LED indicator and one green LED indicator.

**The red LED will illuminate and remain on during the charging process.**

**When, the charge cycle is complete the red LED will extinguish and the green LED will illuminate. At this point, this indicates that the battery fully charged is being maintained at full charge by the charger circuitry.**

## **Installation Instructions**

All Charging Systems International battery charging systems are designed to be permanently mounted and have no mounting restrictions.

Do not make any electrical connections to the power supply (AC) or to a battery (DC) until the mounting process has been completed.

Check for fit and appropriate thickness of mounting area. It is recommended that you choose a flat surface. If a compartment wall is chosen, make certain its strength is adequate.

Use the mounting flanges of the charger to mark locations for starter holes. Drill a 1/16" inch hole at each marked location. Then, utilize all stainless steel screws which have been provided and install the charger securely being cautious not to over tighten the screws. Silicon sealer should be used to secure and waterproof the screw holes.

Before making any connections, prepare batteries as follows:

- (a) With caps securely in place, thoroughly clean the case and posts with a solution of baking soda and water. Be careful not to allow any soda to get inside the case.
- (b) All posts, terminal and connections should be cleaned to a shiny bright finish, using a wire brush or sand paper. This should be done periodically to assure maximum conductivity.

Attempts to lengthen or shorten the cables could partially disable the charger. Therefore, we recommend that you do not make any adjustments without first consulting the factory.

Route your cables from the charger to your batteries, being cautious to avoid sharp objects and use the supplied wire ties to hold them neatly in place.

Securely connect the red charger ring terminals to the positive battery posts and the black charger ring terminals to the negative posts.

If the unit is equipped with a standard AC plug on the power cord, a plug receptacle is also provided to hold the power cord plug when it is not being used. Locate a convenient site for the receptacle and attach it using the four smaller stainless steel screws.

Connect a heavy duty U.L. Approved extension cord to the power cord of your charger and then plug the extension cord in to a nearby 120VAC GFI protected (Ground Fault Circuit) outlet.

You should now observe red LED indications on each bank of the charger representing each individual battery being charged. The voltage of each battery will reflect the number of LED indicators illuminated. (See product summary)

When charging is complete, remove the extension cord from the 120VAC outlet first and then unplug the charger.

## **TROUBLESHOOTING**

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**PROBLEM: No LED indicators illuminate in any of the charger banks.**

Solution Sequence:

Check the AC power supply from its source through all connecting points up to the charger by using a meter or test light to confirm that current is being delivered to the charger.

**PROBLEM: Red LED flashing.**

Solution Sequence:

With the AC power supply cord unplugged, check the ring terminals for correct polarity (Red to positive or +) and (Black to negative or -). Also check for corrosion free secure connections to the batteries. Call the factory for further assistance.

**PROBLEM: A green LED was illuminated before disconnecting the power from the charger, but upon reconnection, red LED appears and remains on.**

This is normal operating procedure for the system and simply indicates that a re-analysis of the battery status has been initiated and after a series of steps, the green LED will illuminate.

**WARRANTY INFORMATION:**

**Please call Charging Systems International at 1-800-742-2740 for full warranty information and/or service.**