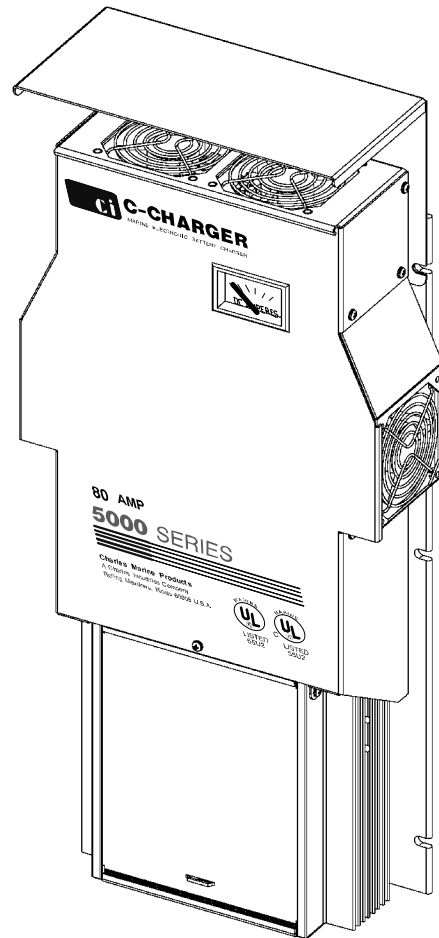
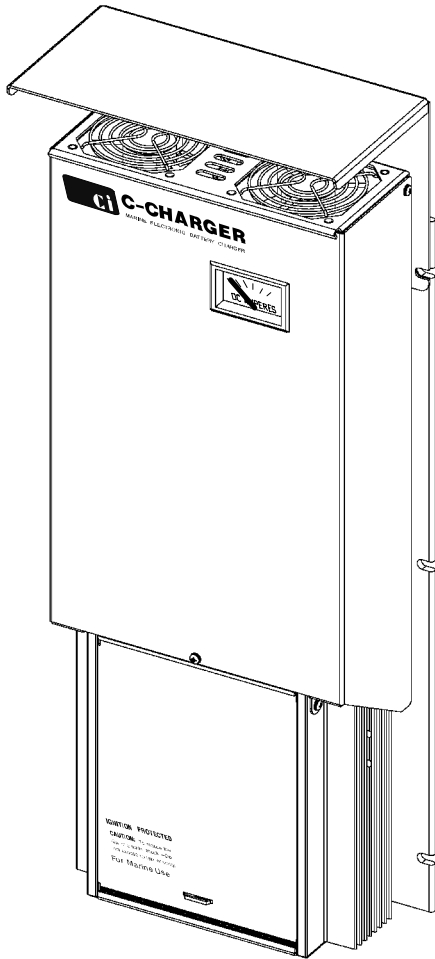


C-CHARGER[®]
MARINE ELECTRONIC BATTERY CHARGER

**INSTALLATION INSTRUCTIONS
& OWNER'S MANUAL**
24 Volt 50, 60, & 80 Amp 5000 Series



Contents

- INTRODUCING... THE C-CHARGER** 3
 - Manual Purpose 3
- IMPORTANT SAFETY INSTRUCTIONS** 4
 - Environmental Precaution 4
 - C-Charger Application Precaution 4
 - Damaged C-Charger Precaution 4
 - Disassembly Precaution 4
 - Maintenance/Cleaning Precaution 4
 - Personal Safety Precautions 4
 - Preparing to Charge Precautions 5
 - Connecting to the Battery Outside the Boat Precaution 5
 - Grounding Precautions 5
- MISES EN GARDE IMPORTANTES (safety instructions in French)** 5
- INSTALLING THE C-CHARGER** 7
 - Verifying Proper Battery/Charger Type 7
 - Choosing Mounting Location 7
 - Choosing Mounting Hardware 7
 - Mounting the C-Charger 7
 - Choosing Electrical Wiring Hardware 8
 - Choosing Wire Gauge 8
 - Making AC Connections on Terminal Block 1 (TB1) 9
 - Making DC Connections to Output Posts 9
 - Installing External Fuse (not supplied) 10
 - Closing the Cover 10
 - Applying Power 11
- OPERATING THE C-CHARGER** 11
 - Proper Operation 11
 - Changing Internal Fuses 11
- MAINTAINING THE C-CHARGER** 11
- TROUBLESHOOTING THE C-CHARGER** 12
- WARRANTY & CUSTOMER SERVICE** 12
 - Warranty 12
 - Service Center and Repair Correspondence 13
- SPECIFICATIONS** 13

INTRODUCING... THE C-CHARGER®

Thank you for purchasing the C-CHARGER®. Your C-Charger represents the latest in electronic, pulse-modulated switching chargers. It is designed for hard-wired, on-board applications only, and converts AC shore power to DC charging current to maintain a 24 volt marine battery. The 5000 Series models charge up to three battery banks simultaneously. All of the 5000 Series C-Charger units operate under a wide range of input voltages yet maintain a constant output, avoiding any danger of overcharging marine batteries. The 5000 Series units are equipped with cooling fans and internal and external (the external temperature probe is an optional accessory) temperature compensation circuits that automatically adjust to temperature variations, extending the life of batteries.

This manual covers the following models, listed by model number:

Table 1. 24 VDC 50-, 60- & 80-Amp 5000 Series C-Charger Model Numbers

Model Number	Battery Type	Input Voltage	Frequency	4 Hour Bulk Rate Output Voltage†	Float Rate Output Voltage	Banks	Marine UL Approved	Canadian UL
24505E	LEAD ACID (Wet/Flooded)	120VAC*	60 Hz*	29 VDC‡‡	27.3 VDC‡‡	3	✓	✓
24505EG	GEL (Sealed Recombinant)	120VAC*	60 Hz*	28.4 VDC‡‡	27.3 VDC‡‡	3	✓	✓
24505EI	LEAD ACID (Wet/Flooded)	220VAC**	50/60 Hz**	29 VDC‡‡	27.3 VDC‡‡	3	✓	✓
24505EIG	GEL (Sealed Recombinant)	220VAC**	50/60 Hz**	28.4 VDC‡‡	27.3 VDC‡‡	3	✓	✓
24605E	LEAD ACID (Wet/Flooded)	120VAC*	60 Hz*	29 VDC‡‡	27.3 VDC‡‡	3	✓	✓
24605EG	GEL (Sealed Recombinant)	120VAC*	60 Hz*	28.4 VDC‡‡	27.3 VDC‡‡	3	✓	✓
24605EI	LEAD ACID (Wet/Flooded)	220VAC**	50/60 Hz**	29 VDC‡‡	27.3 VDC‡‡	3	✓	✓
24605EIG	GEL (Sealed Recombinant)	220VAC**	50/60 Hz**	28.4 VDC‡‡	27.3 VDC‡‡	3	✓	✓
24805EI	LEAD ACID (Wet/Flooded)	220VAC**	50/60 Hz**	29 VDC‡‡	27.3 VDC‡‡	3	✓	✓
24805EIG	GEL (Sealed Recombinant)	220VAC**	50/60 Hz**	28.4 VDC‡‡	27.3 VDC‡‡	3	✓	✓

* Will accept variances in input voltage from 90 to 135 VAC and variances in frequency from 45 to 65 Hz with no degradation of output

** Will accept variances in input voltage from 180 to 270 VAC and variances in frequency from 45 to 65 Hz with no degradation of output

† Timer starts at 60% of rated output current

‡‡ At 25° C, output voltage is compensated at $-.04 \text{ VDC}/^{\circ}\text{C}$

Manual Purpose

With your personal safety in mind, this manual lists important safety precautions first, then covers installation, operation, maintenance, troubleshooting and warranty and customer service information.

WARNING

RISK OF EXPLOSIVE GASES! WORKING IN THE VICINITY OF A LEAD ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. THEREFORE IT IS OF UTMOST IMPORTANCE THAT EACH TIME BEFORE USING YOUR C-CHARGER YOU READ THIS MANUAL AND FOLLOW THE INSTRUCTIONS EXACTLY.

To reduce risk of battery explosion, follow these instructions, those of the battery manufacturer, and the manufacturer of any equipment you use in the vicinity of the battery. Review cautionary markings on these products and on the engine.

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS. This manual contains important safety and operating instructions for the C-Charger. Read the entire manual before usage. Also read all instructions and cautions for and on the C-Charger and batteries.

Environmental Precaution

Do not expose the C-Charger to rain, snow, or excessive moisture.

C-Charger Application Precaution

These units are intended for hard-wired applications. Use of attachments not recommended or sold by Charles Marine Products may result in risk of fire, electrical shock or personal injury.

Damaged C-Charger Precaution

Do not operate the C-Charger if it has received a sharp blow, been dropped, or otherwise damaged. See the section in this manual on *Warranty & Customer Service*.

Disassembly Precaution

Do not disassemble the C-Charger. See the sections in this manual on *Maintaining the C-Charger*, *Troubleshooting the C-Charger* and *Warranty & Customer Service*.

Maintenance/Cleaning Precaution

To reduce risk of electrical shock, disconnect the C-Charger from AC power and batteries before attempting any maintenance or cleaning.

Personal Safety Precautions

Adhere to the following personal safety precautions when installing or working with any of the 5000 Series C-Chargers:

1. Someone should be within voice range or close enough to come to your aid when you work near a lead acid battery.
2. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
3. Wear complete eye protection and clothing protection. Avoid touching eyes while working near a battery.
4. If battery acid contacts skin or clothing, wash them immediately with soap and water. If acid enters the eye, flood the eye with cold, running water for at least ten minutes and get medical attention immediately.
5. Never smoke or allow a spark or flame in the vicinity of the battery or engine.
6. Do not drop a metal tool onto the battery. It might spark or short circuit the battery or other electrical parts that may cause an explosion.
7. Remove all personal metal items such as rings, bracelets, necklaces and watches when working near a lead acid battery. A battery can produce short circuit currents high enough to weld a ring or the like to metal, causing a severe burn.
8. The C-Charger is not intended to supply power to a low voltage electrical system other than in a marine application. Do not use the C-Charger for charging dry cell batteries that are commonly used with home appliances. These batteries may burst causing personal injury and property damage.
9. **NEVER** charge a frozen battery.

Preparing to Charge Precautions

CAUTION

To reduce risk of injury, charge only lead acid or gel cell type rechargeable batteries. Other types of batteries may burst, causing personal injury and damage.

Before charging a battery with the C-Charger, read the following precautions:

1. Make sure all accessories in the boat are off.
2. If the battery must be removed from the boat, always remove the grounded terminal from the battery first.
3. Be sure the area around the battery is well ventilated while the battery is being charged. Gas can be forcefully blown away using a piece of cardboard or other non-metallic material as a “hand fan”.
4. Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes.
5. Add distilled water in each cell until battery acid reaches levels specified by the battery manufacturer. This helps purge excessive gas from cells. Do not overfill. For a battery without cell caps, carefully follow the manufacturer’s recharging instructions.
6. Study all battery manufacturer’s precautions, such as removing or not removing cell caps while charging and recommended rates of charge.

Connecting to the Battery Outside the Boat Precaution

The 5000 Series C-Chargers have been specifically designed for hard-wired marine use inside a boat. They are not designed or equipped for charging batteries on shore or outside a boat.

Grounding Precautions

When the C-Charger is permanently mounted inside the boat, it must have a grounding conductor.

1. The C-Charger should be connected to a metal, grounded, permanent wiring system. An equipment grounding conductor should be run with circuit wiring and connected through the C-Charger housing grommets to the equipment grounding (GRN) terminal on the C-Charger.
2. Connections to the C-Charger should comply with all local codes and ordinances.

French

MISE EN GARDE

Français

DES GAZ EXPLOSIFS PEUVENT ÊTRE PRÉSENTS. IL EST DANGEREUX DE TRAVAILLER À PROXIMITÉ DE BATTERIES AU PLOMB, QUI LIBÈRENT DES GAZ EXPLOSIFS DURANT LEUR UTILISATION NORMALE. AINSI, IL EST TRÈS IMPORTANT QUE VOUS LISIEZ CE GUIDE CHAQUE FOIS QUE VOUS UTILISEZ VOTRE C-CHARGER, ET QUE VOUS EN SUIVIEZ SOIGNEUSEMENT LES INSTRUCTIONS.

Afin de réduire le risque d'explosion des batteries, suivez ces instructions, celles du fabricant de vos batteries, et celles du fabricant de tout autre équipement utilisé près des batteries. Consultez les mises en garde inscrites sur ces produits et sur le moteur.

MISES EN GARDE IMPORTANTES

CONSERVEZ CES INSTRUCTIONS. Ce guide contient d'importantes instructions sur la sécurité et l'utilisation du C-Charger. Lisez le guide en entier avant d'utiliser le chargeur. Lisez également les instructions et mises en garde inscrites sur le C-Charger et celles relatives aux batteries.

Exposition du C-Charger aux Intempéries

N'exposez pas le C-Charger à la pluie, à la neige, ou à l'humidité excessive.

Applications Recommandées

Ces appareils sont conçus pour les applications locales permanentes. L'utilisation d'accessoires non recommandés ni vendus par Charles Marine Products présente des risques d'incendie, de chocs électriques ou de blessures.

C-Charger Endommagé

N'utilisez pas le C-Charger s'il a reçu un coup brusque, s'il est tombé ou s'il est endommagé.

Démontage

Ne démontez pas le C-Charger.

Entretien et Nettoyage

Afin de réduire le risque de chocs électriques, débranchez le C-Charger de la source de courant CA avant d'effectuer tout entretien ou nettoyage.

Précautions Personnelles

1. Demeurez à portée de voix ou près d'une autre personne pouvant vous venir en aide lorsque vous travaillez à proximité d'une batterie au plomb.
2. Prévoyez une bonne quantité d'eau fraîche et du savon en cas de contact des yeux, de la peau ou des vêtements avec l'acide de la batterie.
3. Portez un équipement de protection complet pour les yeux et les vêtements. Évitez de toucher vos yeux lorsque vous travaillez près d'une batterie.
4. Si l'acide de la batterie entre en contact avec la peau ou les vêtements, lavez-les immédiatement avec de l'eau et du savon. En cas de contact oculaire, rincez aussitôt les yeux à l'eau courante pendant au moins dix minutes et consultez le médecin immédiatement.
5. Ne fumez jamais et ne tolérez jamais les flammes ou les étincelles à proximité de la batterie ou du moteur.
6. Évitez de laisser tomber des objets métalliques sur la batterie. Cela peut produire une étincelle ou provoquer un court-circuit dans la pile ou dans tout autre élément électrique pouvant causer une explosion.
7. Retirez tout objet personnel de métal comme les bagues, bracelets, colliers et montres lorsque vous travaillez près d'une batterie au plomb. Une batterie au plomb peut produire un court-circuit suffisamment fort pour faire fondre ces articles et provoquer des brûlures graves.
8. Le C-Charger n'est pas conçu pour alimenter un système électrique de basse tension autre que celui d'une application marine. N'utilisez pas le C-Charger pour charger les batteries à anode sèche employées dans les appareils ménagers. Ces batteries peuvent exploser et causer des blessures et des dommages.
9. **NE CHARGEZ JAMAIS** une batterie gelée.

Préparation du Chargeur

French

ATTENTION

Français

Afin de réduire les risques de blessures, ne chargez que des batteries rechargeables au plomb. Les autres types de batteries peuvent exploser et causer des blessures et des dommages.

1. Si la batterie doit être d'abord retirée de l'embarcation, débranchez toujours la mise à la terre de la batterie en premier lieu. Éteignez tous les accessoires de l'embarcation, afin d'éviter de produire un arc électrique.
2. Assurez-vous que l'endroit où se trouve la batterie soit bien aéré lorsque la batterie est chargée. Les gaz peuvent être éloignés à l'aide d'un éventail fait de carton ou de tout autre matériau non-métallique.
3. Nettoyez les bornes de la batterie. Évitez le contact de la corrosion avec les yeux.
4. Ajoutez de l'eau distillée dans chaque cellule jusqu'à ce que l'acide atteigne le niveau spécifié par le fabricant. Ceci contribue à éliminer les excès de gaz dans les cellules. N'ajoutez pas trop de liquide.

Si les cellules ne possèdent pas de couvercle, suivez les instructions du fabricant pour charger la batterie.

- Étudiez toutes les mises en garde du fabricant de la batterie. Par exemple, vérifiez s'il faut retirer les couvercles des cellules pendant la charge, et prenez connaissance des taux de charge recommandés.

Branchement de la Batterie à L'extérieur de L'embarcation

Les C-Charger de la série 5000 ont été spécialement conçus pour les applications marines permanentes à bord d'une embarcation. Ils ne sont pas conçus pour charger les batteries au quai ou à l'extérieur de l'embarcation.

Mise à la Terre

- Votre C-Charger doit être relié à une canalisation électrique mise à la terre, métallique et permanente. Un conducteur de protection doit être relié au circuit de branchement, et branché à la borne de mise à la terre (GRN) du C-Charger, à l'aide des passe-fils.
- Les connections au C-Charger doivent être conformes à tous les codes et ordonnances locaux.

INSTALLING THE C-CHARGER

Verifying Proper Battery/Charger Type

C-Charger models may be used for charging LEAD ACID (wet/flooded) or GEL CELL (sealed recombinant) batteries. Confirm the intended battery type with the model number on the product identification label located on the C-Charger (refer to Table 1). All C-Chargers have been factory preset. If your C-Charger model does not match your intended battery type, contact Charles Marine Customer Service at 847/806-6300 for assistance.

Choosing Mounting Location

The C-Charger should be mounted vertically flush on a bulkhead in a protected area away from rain or spray and as close to the batteries as possible. The C-Charger is designed to operate in high ambient temperatures, with the proper ventilation. Six inches of unobstructed area on all sides of the unit should be allowed for air circulation and cooling.

Note: The 5000 Series C-Chargers are equipped with cooling fans. The fans will automatically turn on when the load is approximately 50% of the maximum rated output current. Also, a temperature compensation circuit exists to automatically adjust to room temperature variations. A temperature coefficient of $-0.04\text{VDC}/^{\circ}\text{C}$ causes the output voltage of the C-Charger to change inversely with the change in room temperature. The purpose of this circuit is to extend the life of the batteries.

Choosing Mounting Hardware

As with any marine equipment, secure mounting is of utmost importance. The bolts or screws used to secure the C-Charger must be 1/4-inch in diameter, backed with a flat washer, and kept vibration-free with a split-ring lock washer. If using bolts, they must be long enough to be secured on both sides of the bulkhead. If using screws, they should be at least 1 inch long. All hardware should be corrosion-resistant.

Mounting the C-Charger

All corrosion-resistant mounting hardware should be readily available. Follow the steps below to mount the C-Charger to the bulkhead.

Step	Action
1.	Hold the C-Charger vertically flush on the bulkhead.
2.	Mark the mounting holes.
3.	Remove the C-Charger.
4.	Drill the mounting holes.

Step	Action
5.	Insert one side of the mounting hardware half-way into the drilled mounting holes.
6.	Align the mounting slots on the C-Charger with the inserted hardware and slide the C-Charger's mounting flange under the washers.
7.	Insert the mounting hardware for the other side.
8.	Secure all mounting hardware.



Do not operate this unit without the green wire connected to the C-Charger and to suitable ground at shore connection.

French



Français

N'utilisez pas cet appareil si le fil vert n'est pas branché au C-Charger et à une mise à la terre adéquate au quai.

Note: Read this manual and all precautions before installing or making connections!

Choosing Electrical Wiring Hardware

The C-Charger is intended for hard-wiring in a permanent application. Conduit or other appropriate marine electrical installation hardware should be used.

Choosing Wire Gauge

Use Table 2 and Table 3 to determine the appropriate wire gauges. Avoid unnecessarily long runs of either AC or DC power lines.



Before working on electrical equipment, first determine there is no live power! Double check power connections and all battery terminations.

French



Français

Avant de manipuler les équipements électriques, veillez à ce que le courant soit interrompu. Vérifiez soigneusement les branchements à la source de courant et aux bornes de la batterie.

Table 2. Minimum Wire Size to Input of C-Charger

120 VAC SHORE POWER INPUT TO C-CHARGER				
Model Number	AC Amp Max	25' Length	50' Length	100' Length
24505E, 24505EG	21	12 AWG	12 AWG	10 AWG
24605E, 24605EG	26	12 AWG	12 AWG	10 AWG
220 VAC SHORE POWER INPUT TO C-CHARGER				
24505EI, 24505EIG	11	16 AWG	14 AWG	10 AWG
24605EI, 24605EIG	13	16 AWG	14 AWG	10 AWG
24805EI, 24805EIG	18	14 AWG	12 AWG	10 AWG

Table 3. Minimum Wire Size from Output of C-Charger to Battery

Model Number	DC Amp Max	15' Length	25' Length
24505E, 24505EG, 24505EI, 24505EIG	50	8 AWG	6 AWG
24605E, 24605EG, 24605EI, 24605EIG	60	8 AWG	6 AWG
24805EI, 24805EIG	80	6 AWG	4 AWG

WARNING

External connections to the C-Charger shall comply with the U.S. Coast Guard Electrical Regulations (33CFR183 subpart I).

French

MISE EN GARDE

Français

Les branchements externes du C-Charger doivent être conformes aux réglementations de la garde côtière américaine en matière d'électricité (no 33CFR183 section I).

Making AC Connections on Terminal Block 1 (TB1)

After determining the wire lengths and gauges, make the AC wiring connections to TB1. (Refer to the Block Diagram in Figure 1.) Use spade terminals, and torque the screws to 8 +/-1 inch/pounds. To make connections to the terminal blocks:

Step	Action
1.	Gently slide the cover off.
2.	Bring the AC input wire in through the left side access hole on the bottom of the C-Charger.
3.	Connect the WHT terminal to the white (neutral) input.
4.	Connect the BLK terminal to the black (hot) AC input.
5.	Connect the GRN terminal to the green (ground) input.

Making DC Connections to Output Posts

After the appropriate wire lengths and gauges have been determined, make the DC connections to E2-E4 and E7. (Route the DC wire through the right-side access hole on the bottom of the C-Charger.) Output has three positive (+) terminals for up to three battery banks. One negative (-) terminal is provided that is common for all battery banks.

WARNING

In accordance with ABYC E-11, a fuse or circuit breaker must be placed within 72-inches of the point of connection to the batteries or its bus on all positive output conductors. Also see Coast Guard Reg. 33CFR183 subpart I.

French

MISE EN GARDE

Français

Selon la norme américaine ABYC E-11, un fusible ou un disjoncteur doit être placé à moins de 1,8 m (72 po) du point de branchement des batteries ou de ses bus sur tous les conducteurs de sortie positifs. Consultez les réglementations de la garde côtière américaine (no 33CFR183 section I).

Installing External Fuse (not supplied)

A fuse or circuit breaker (not provided) *must be* installed within 72-inches of the C-Charger on each positive (+) DC output wire that is connected to a battery bank. See Table 4 for correct fuse sizes.

Table 4. External Fuse Replacement Sizes

Model Number	Fuse Size
24505E, 24505EG, 24505EI, 24505EIG	60-Amp
245305E, 24605EG, 24605EI, 24605EIG	70-Amp
24805EI, 24805EIG	90-Amp

Note: The C-Charger comes equipped with two internal fuses: F1 and F2. F1 is a 30-amp slow-blow input fuse. F2 is a 100-amp fast-acting output fuse. See Table 5.

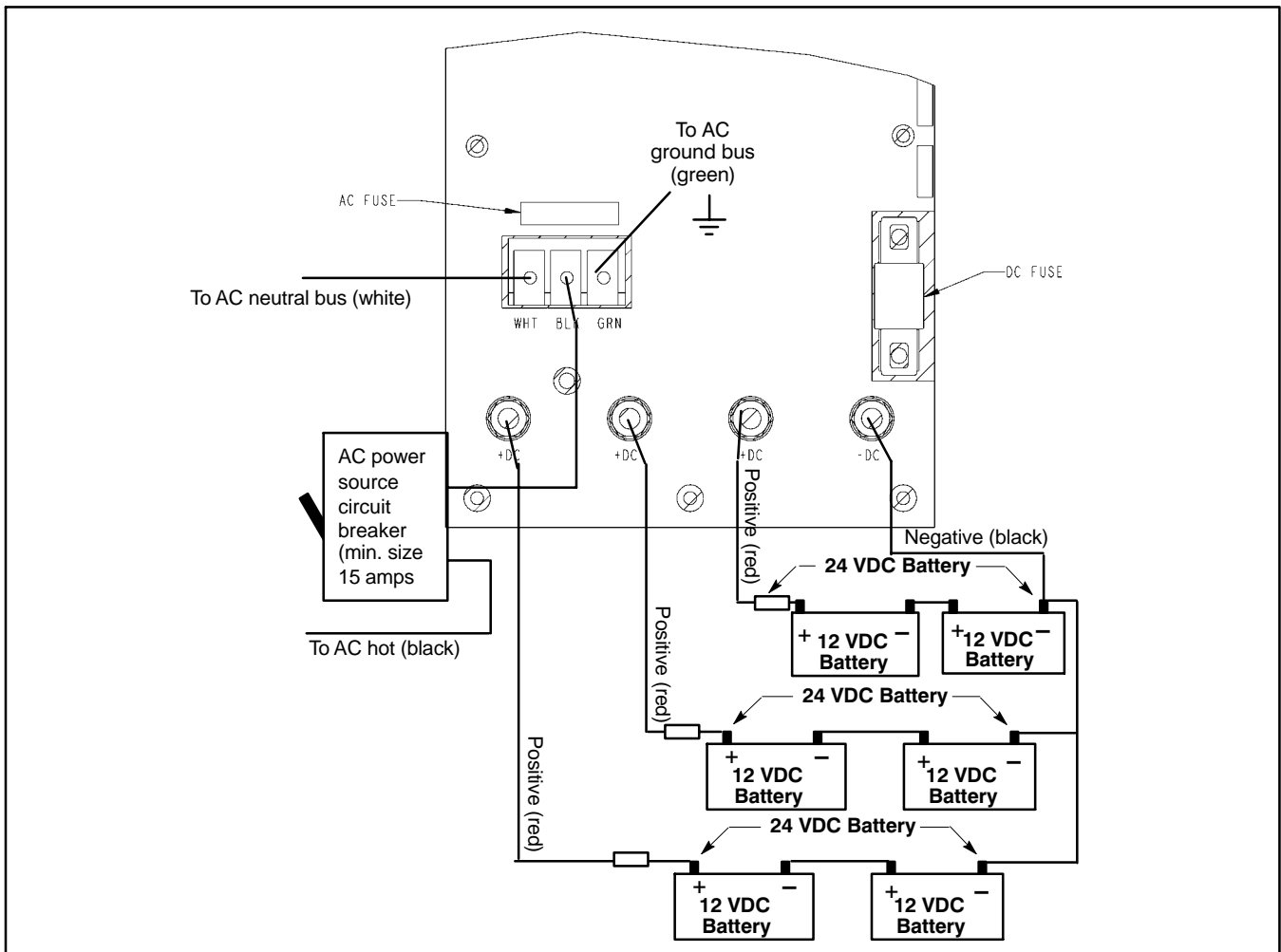


Figure 1. 24 VDC 50-, 60- & 80-Amp 5000 Series Block Diagram

Closing the Cover

Before closing the cover, make sure that all electrical connections have been properly made at all the battery banks (most important) and at the C-Charger. Also check that all wiring is properly dressed with no exposed, bare wires.

Applying Power

Step	Action
1.	Apply shore power to the unit and turn on the AC power source circuit breaker.
2.	Check the front-panel ammeter for movement. A substantial movement in a clockwise direction indicates the batteries need a charge (there should be a slight movement even if the batteries are charged). If a counterclockwise movement occurs, turn off power immediately and refer to Table 6, Item 4.

If the C-Charger does not charge batteries or perform as described, refer to the section in this manual on *Troubleshooting the C-Charger*.

OPERATING THE C-CHARGER

Always follow all precautions in the *IMPORTANT SAFETY INSTRUCTIONS* section in this manual.

Proper Operation

When properly installed and connected, the C-Charger will automatically charge and maintain the batteries. When power is applied, the C-Charger will enter a bulk or "constant current" mode, during which a higher rate of charge is achieved to fully replenish the batteries. When the batteries near a full charge, the output current will decrease and the charger will enter a timed absorption mode. After four hours in absorption mode, the output will drop to a float rate to maintain the batteries at a temperature compensated finishing voltage (27.3 VDC @ 25°C for lead acid).

Changing Internal Fuses

Irregular conditions or loads may cause one or more of the internal fuses to blow. ALWAYS determine there is no live power before replacing a fuse.

Step	Action
1.	Remove the cover.
2.	The AC fuse (F1) is located just above the AC terminal block (TB1). The DC fuse (F2) is located above the DC post (see Figure 1). When replacing fuses, use only fuses of the exact type and rating (See Table 5).
3.	Before reapplying power, close and secure the cover.

Table 5. Internal Fuse Replacement Sizes

Model Number	AC Input (F1)	DC Output (F2)
24505E, 24505EG	30-Amp/125 Volt SLO-BLO	100-Amp/32 Volt FAST ACTING
24605E, 24605EG	30-Amp/125 Volt SLO-BLO	100-Amp/32 Volt FAST ACTING
24805EI, 24805EIG, 24505EI, 24505EIG, 24605EI, 24605EIG	20-Amp/250 Volt SLO-BLO	100-Amp/32 Volt FAST ACTING

MAINTAINING THE C-CHARGER

There are no adjustment or maintenance requirements for the C-Charger other than cleaning the outside cabinet with a dry cloth. Periodically have all connections checked by a qualified service person, especially if the boat is operated in heavy, pounding seas.

CAUTION

Check battery water levels frequently, especially if the boat is at dock for extended periods of time. Low water levels will damage batteries!

French

ATTENTION

Français

Vérifiez fréquemment le niveau des liquides de la batterie, surtout si l'embarcation demeure à quai pendant de longues périodes. Des niveaux trop bas peuvent endommager les batteries.

TROUBLESHOOTING THE C-CHARGER

If there is a problem with the C-Charger, first check all connections and retest. If all connections are good, see if the problem is covered in Table 6. If the problem is not covered in Table 6, or if the C-Charger still malfunctions after performing the solution given, contact Charles Marine Products for technical assistance.

Table 6. Troubleshooting Suggestions

Item	Condition	Solution
1.	Not clear if batteries are fully charged.	As the batteries charge, the ammeter gradually falls. When it reads zero, the batteries are fully charged.
2.	It takes too long to charge batteries.	The C-Charger brings a discharged battery voltage level up slowly to avoid shortening the life of the battery. The recharge time depends on the degree of discharge.
3.	Unable to identify if lack of battery charge is due to a battery problem or a C-Charger problem.	When the ammeter reads zero, test the condition of a battery by first turning off the AC power source to the C-Charger, and disconnecting the battery from the C-Charger for at least one hour. Connect battery to an ohm-volt meter. A reading of 25.2 VDC or more is desirable. A reading between 24.8 and 25.2 indicates a charge between 75 and 100%. A reading between 24.4 and 24.8 VDC indicates a charge between 50 and 75%. Consult the battery manufacturer's Owner's Manual for instructions. If it appears the battery is operating properly, proceed to check the following only after reading and fully understanding all safety instructions regarding input voltage, the C-Charger's AC fuse and DC fuse, the battery fuse/AC circuit breaker (Figure 1, Note 3), and all associated wiring connections. If these appear to be working, the C-Charger's DC output can be tested by turning off all AC power to the unit and then disconnecting all DC outputs from the charger. Upon reapplying AC power, the DC voltage between any (+) and (-) output posts should be between 27 and 30 volts DC. Should the unit still be inoperable after all tests have been completed in sequence, refer to <i>Warranty & Customer Service</i> .
4.	The ammeter deflects in a counterclockwise direction.	Disconnect the unit immediately. Examine wiring instructions again to assure proper connections. A movement in a counterclockwise direction or a full-scale movement indicates excessive current. A wiring error is suspected. A voltmeter can monitor the voltage at the battery when the C-Charger is turned on. An increase in voltage should occur as power is applied.
5.	Internal red LED on.	The unit is at half-power because the ambient air is too hot. The unit may be at half-power because the fans are not working. Full power will be restored when the temperature returns to normal.

WARRANTY & CUSTOMER SERVICE

Warranty

The CHARLES Marine & Industrial Group warrants the unit will be free from defects in materials and workmanship that cause mechanical failure for five (5) years, as set forth in the Limited Warranty. Notice of any alleged defect in material or workmanship must be provided within thirty (30) days of discovering the problem, and within the warranty period. Follow the procedure outlined below to obtain warranty service.

Service Center and Repair Correspondence

Note: Do not attempt to service the unit. Contact the Service Center.

To contact the Service Center via telephone directly:

- 800-830-6523 (Toll Free)
- 217-932-2317 (Voice)
- 217-932-2473 (FAX)

Call to obtain a Returned Materials Authorization (RMA) number prior to returning any unit to Charles Industries.

Return the unit for repairs to the Service & Repair Center address below:

Charles Industries, Ltd.
 Marine & Industrial Group
 503 NE 15th Street
 Casey, IL 62420-2054
 USA

Correspondence can be sent to Corporate Headquarters via the address below:

Note: Do not return the unit to this address.

Charles Industries, Ltd.
 Marine & Industrial Group
 5600 Apollo Drive
 Rolling Meadows, IL 60008-4049
 USA
 847-806-6300
 www.charlesindustries.com

SPECIFICATIONS

The specifications for the 24 VDC 50-, 60- and 80-amp 5000 Series C-Chargers are listed in Table 7.

Table 7. 24 VDC 50- 60- & 80-Amp 5000 Series C-Charger Specifications

Feature	50- & 60-Amp Models		80-Amp Models	
	U.S.	Metric	U.S.	Metric
Weight	16 pounds	7.3 kilograms	17 pounds	7.7 kilograms
Height (without drip shield)	21.5 inches	54.6 centimeters	21.5 inches	54.6 centimeters
Width	9.5 inches	24.1 centimeters	10.75 inches	27.3 centimeters
Depth	4.0 inches	centimeters	4.0 inches	10.1 centimeters
AC Input*	120 VAC nom 220 VAC nom	120 VAC nom 220 VAC nom	220 VAC nom	220 VAC nom

*See the label on the side of the C-Charger for the operating voltage.

