

**CHICAGO POWER  
ELECTRIC® SYSTEMS**

# BATTERY CHARGER/STARTER

Model 03418

## ASSEMBLY and OPERATING INSTRUCTIONS



3491 Mission Oaks Blvd., Camarillo, CA 93011  
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For technical questions and replacement parts, please call 1-800-444-3353

## Specifications

Input Power	120V AC, 60 Hz, 2.2 Amps	Battery Leads	6' 7" Long x 16 AWG
Output Power	12 Volts DC - 10* Amps 12 Volts DC - 2* Amps 6 Volts DC - 10* Amps Engine Start - 55 Amps	Power Cord	6' 5" x 18 AWG (3-Prong Grounded Plug)
		Weight	10 Lbs.

**\*Amperage is only present when the unit is connected to a battery or in START mode.**

## Save This Manual

You will need the manual for the safety warnings and precautions, assembly instructions, operating and maintenance procedures, parts list and diagram. Keep your invoice with this manual. Write the invoice number on the inside of the front cover. Keep the manual and invoice in a safe and dry place for future reference.

## Basic Safety Warnings and Precautions

**WARNING: When using Charger, basic safety precautions should always be followed to reduce the risk of personal injury and damage to equipment.**

**Read all instructions before using this Charger!**

1. **Keep work area clean.** Cluttered areas invite injuries.
2. **Observe work area conditions.** Do not use Charger in damp or wet locations. Don't expose to rain. Keep work area well lighted. Do not use Charger in the presence of flammable gases or liquids.
3. **Keep children away.** Children must never be allowed in the work area. Do not let them handle the Charger.
4. **Store idle equipment.** When not in use, Charger must be stored in a dry location to inhibit rust. Always lock up Charger and keep out of reach of children.
5. **Use the right tool for the job.** Do not attempt to force a small Charger to do the work of a larger industrial Charger. There are certain applications for which this Charger was designed. It will do the job better and more safely at the rate for which it was intended. Do not modify this Charger and do not use this Charger for a purpose for which it was not intended.
6. **Dress properly.** Do not wear loose clothing or jewelry as they can be caught in moving parts. Protective, electrically nonconductive clothes and nonskid footwear are recommended when working. Wear restrictive hair covering to contain long hair.
7. **Use eye protection.** Always wear ANSI approved impact safety goggles.
8. **Do not overreach.** Keep proper footing and balance at all times. Do not reach over or across running machines.
9. **Maintain Charger with care.** Keep Charger clean for better and safer performance. Inspect tool cords periodically, and if damaged, have them repaired by a qualified technician. The clamps must be kept clean, dry, and free from oil and grease at all times.

10. **Disconnect power.** Unplug charger when not in use.
11. **Stay alert.** Watch what you are doing, use common sense. Do not operate the Charger when you are tired.
12. **Check for damaged parts.** Before using any tool, any part that appears damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment and binding of moving parts; any broken parts or mounting fixtures; and any other condition that may affect proper operation. Any part that is damaged should be properly repaired or replaced by a qualified technician. Do not use the tool if any switch does not turn On and Off properly.
13. **Guard against electric shock.** Prevent body contact with grounded surfaces such as pipes, radiators, ranges, and refrigerator enclosures.
14. **Replacement parts and accessories.** When servicing, use only identical replacement parts. Use of any other parts will void the warranty. Only use accessories intended for use with this tool. Approved accessories are available from Harbor Freight Tools.
15. **Do not operate tool is under the influence of alcohol or drugs.** Read warning labels if taking prescription medicine to determine if your judgement or reflexes are impaired while taking drugs. If there is any doubt, do not operate the Charger.
16. **Use proper size and type extension cord.** If an extension cord is required, it must be of the proper size and type to supply the correct current to the tool without heating up. Otherwise, the extension cord could melt and catch fire, or cause electrical damage to the tool. This tool requires use of an extension cord of **0 to 10 amps** capability (up to 50 feet), with wire size rated at **18 AWG**. Longer extension cords require larger size wire. If you are using the tool outdoors, use an extension cord rated for outdoor use (signified by “WA” on the jacket).

**Note: More on extension cords on page 6.**

20. **Maintenance.** For your safety, maintenance should be performed regularly by a qualified technician.

**Note: Performance of this tool (if powered by line voltage) may vary depending on variations in local line voltage. Extension cord usage may also affect tool performance.**

**Warning: The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.**

## Unpacking

When unpacking, check to make sure the parts listed on page 11 are included. If any parts are missing or broken, please call Harbor Freight Tools at the number on the cover of this manual as soon as possible.

## Battery Charger Specific Warnings

**Read all of the warnings below before operation. A failure to read and follow each of the warnings may result in electric shock, causing serious injury or death.**

**Warning!! While charging, lead-acid batteries produce hydrogen gas which is extremely flammable.** They generate this gas during normal operation and, at a high level, during charging. If any spark causes the gas to ignite, the battery could explode, sending out shrapnel-like pieces of battery casing and extremely caustic battery acids in every direction, with extreme force and speed. **Even the slightest spark will suffice to ignite hydrogen gas.** Pay strict attention to, and follow all of the warnings, each time you use the battery charger.

1. Only use this charger indoors on dry, flat, stable surfaces. Any contact with water will create an electric shock hazard resulting in serious injury or death. Never expose the battery or charger to wet conditions. Do not stand in water or have wet hands when contacting the battery or the charger. For water avoidance, locate all non-wheeled chargers at least 18" off of the floor.
2. If charging a marine battery, do not charge on a boat or near the water. Do not charge on a pier or a dock. The boat must be indoors, on a trailer, or you should remove the battery from the boat and take it indoors. For marine charging, do not connect the charger cables to the battery in the bilge or engine compartment of the boat. Follow the boat manufacturer's battery charging guidelines.
3. If the charger has defective or damaged wires, power cord, plug, or clamps, do not plug it in and operate it. Have any damaged or defective parts repaired by a qualified technician.
4. Do not alter power cord, plug, or clamps.
5. If the charger has been dropped or suffered a sharp blow, do not use it until it has been checked out by a qualified service technician.
6. Never attempt to disassemble the battery charger. When service is needed, go to a qualified service technician.
7. When wiping down or cleaning the charger, make sure the unit is unplugged from the power outlet and not connected to a battery.
8. When unplugging the unit, grasp the power plug, not the power cord.
9. Always operate the charger in a well ventilated area.
10. Never operate the charger in close proximity to fuel tanks or gas cylinders.
11. Do not smoke anywhere near the charger. Do not operate the charger near any open flame or a heat source of any kind.
12. Do not permanently mount the battery charger to any vehicle or boat.
13. Never charge a frozen battery.
14. Never connect both charger clamps to the same post.
15. Do not allow the two output battery clamps to come in contact with each other.
16. Unless the manufacturer's directions state otherwise, always charge the battery with the cell caps on.
17. Always unplug the battery charger before connecting or disconnecting battery clamps from a battery.

## Battery Charger Specific Warnings (continued)

18. Be extra careful about dropping tools or anything metal near a charging battery as sparks from the object may ignite the lead acid gasses.
19. Only charge lead acid batteries with this charger. Do not attempt to charge dry cell household batteries as they may explode.
20. Position the battery charger as far away from the battery as possible. Use the full extension length of the DC charging cables.
21. It is okay to rock or twist a clamp on a battery post at the time of connection. Once you have set a clamp on a battery post, do not rock it. Rocking a clamp (other than at original connection time) may cause sparking resulting in an explosion.
22. Check wire and cable connections for tightness before starting a charge (before plugging in the power cord). Loose connections cause sparks.

**Reminder: Never charge in a closed compartment. The charging location must be well-ventilated.**

### Battery Acid Hazards

1. Always wear eye protection and adequate clothing (long sleeves and long pants) including gloves when working near battery acids.
2. When working with lead acid batteries, have someone in close voice proximity in case you should need some help due to battery acid contact.
3. Keep a lot of fresh water and soap close by to use immediately if battery acid contacts your skin, eyes, or clothing.

**Note:** If any contact with battery acid is made, you must act quickly. Immediately wash the affected areas with soap and water. If eye contact is made, flush the eyes with running cold water for ten minutes and then **immediately get medical attention.**

### Fire Hazards

1. Use of attachments not designed for this specific model may cause a fire.
2. Disassembling the battery charger may cause a fire. Always have a qualified service technician work on the battery charger.
3. Arcing flames and sparks are possible if you plug in the battery charger before connecting to the battery. Always unplug the charger before battery hookup.

### More Charger Warnings

1. Short circuits can deliver enough heat to weld a piece of metal (ie: jewelry) to your skin. Always remove any metal or jewelry from your body or pockets before charging a battery.
2. Do not connect charger clamps to a battery in a vehicle when the engine is running. Do not work on or near any vehicle when the engine is running. Moving engine parts can cause serious injury or death.
3. Do not position the charger above the battery being charged or battery gases will corrode the charger.
4. Do not set a battery on top of a charger.
5. Do not allow battery acids to come in contact with the charger.

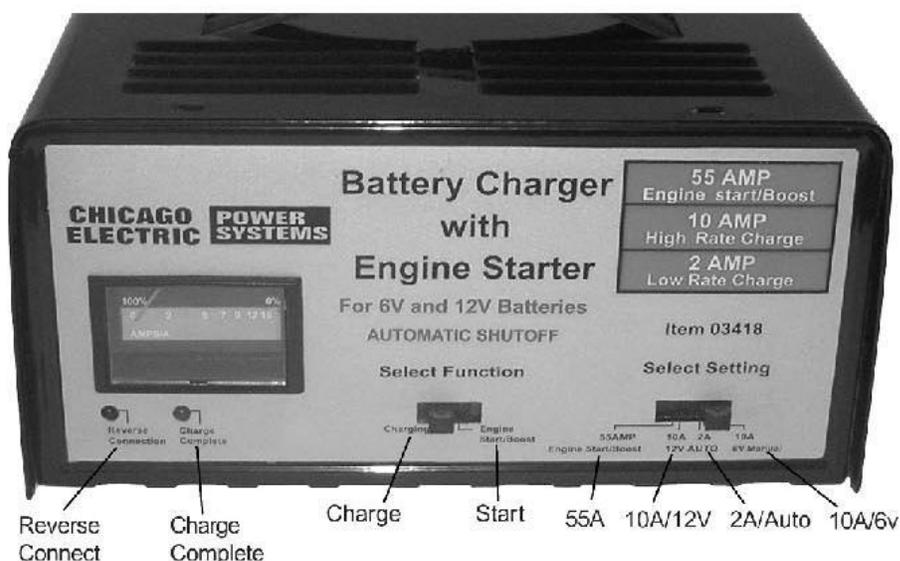
**Note:** This charger is not recommended for batteries with a built in Hydrometer eye. The reading of the built in eye will conflict with the ammeter readings.

## Operation

### About Charging Batteries

Batteries draw as much power as they need from the charger. The charger does not force current into the battery. When a battery is close to dead or very low charged, it will want to draw more current. When a dead or low battery is charged, the charger's ammeter will register at the high end. As the battery charges, the reading will move down toward the low end, resting on zero, when the battery is fully charged. See **FIGURE 1** below.

**FIGURE 1**



**Note:** The ammeter shows the amount of current being drawn from the charger. It does not show what the charger is capable of delivering. When the battery is fully charged and registering zero on the ammeter, a small trickle charge will continue to move from the charger to the battery. If you do not disconnect the charger from the battery, eventually the heat build up from the trickle charge will cause the battery acid to boil and overcharge the battery causing damage to the battery. You must constantly monitor battery charging progress.

### Power Requirements

This charger must have a 120 volt, 60 Hertz AC (alternating current) power source fused at an amperage greater than or equal to the input rating of this charger. **Do not plug this charger in until directed to do so in the following pages of this manual.**

This charger has a 3-prong plug. The power outlet/receptacle must be grounded. If you use an adapter (3-prong to 2-prong) to connect the plug from the charger to the outlet, the adapter must be a properly grounded adapter and must only be used temporarily, until a qualified electrician can install a properly grounded receptacle.

**Extension cord use** is determined by the input amp rating (2.2 amps) of the charger.

Minimum size (AWG rating) of a 25 foot cord is 18 gauge.

Minimum size (AWG rating) of a 50 foot cord is 18 gauge.

Minimum size (AWG rating) of a 100 foot cord is 14 gauge.

Minimum size (AWG rating) of a 150 foot cord is 12 gauge.

**Never alter extension cords.**

## Operation (continued)

### Preparing the Battery

1. If necessary, remove the battery from the vehicle to charge it. When removing the battery, always remove the grounded battery cable first.

**Reminder:** The vehicle's engine must be **OFF** when removing, replacing, or charging a battery.

2. If necessary, add distilled water to the battery cells before charging. Read and follow the battery manufacturer's instruction manual. Never add water to a battery while attached to a charger, or in close proximity to the charger. **Do not overfill.**
3. Clean battery terminals.
4. Check the battery manufacturer's instructions on whether or not to have the cell caps on when charging. If not stated, leave the cell caps on.
5. Determine the battery voltage from the battery or the manufacturer's manual.

### Operation Instructions

**Warning!** Read and understand all of the safety instructions in this manual before operating the charger.

**Warning!!** If the Reverse Connect light (See **FIGURE 1** on page 6) ever lights, **immediately unplug the charger** and reconnect the clamps to the battery to alleviate the problem.

### Connection to a battery installed in a vehicle.

**Warning!** The vehicle's engine must be **OFF** during the entire charging process. Always read and adhere to all the safety warnings and instructions provided in the vehicle's manual.

1. Make sure the AC **Power Cord (#3)** is not plugged in.
2. Set up the charger on a flat, dry surface that allows you to position the **Power Cord (#3)** and the clamp cords where they won't be damaged by the vehicle doors, hood, or sharp engine parts.

**Note:** **Most vehicles are negative-grounded vehicles.** Number 3 below instructs setup for the most common negative-grounded vehicles. Number 4 below addresses the less common positive-grounded vehicles. If you are not sure about your vehicle, check the vehicle's instruction manual or talk to a qualified service technician.

3. **Negative-grounded vehicles:** The battery will have two terminals. One should be marked POSITIVE, POS, P, OR +. The Negative terminal should be marked NEGATIVE, NEG, N, OR -. Connect the red **Clamp (#2)** to the positive (ungrounded) terminal of the battery. Connect the black **Clamp (#2)** to a heavy gauge metal part of your vehicle chassis or engine block away from the battery. Do not connect to the black **Clamp (#2)** to the Negative (black) terminal on the battery, fuel lines, the carburetor, or sheet metal body parts.
4. **Positive-grounded vehicles:** The battery will have two terminals. Connect the NEGATIVE black charger **Clamp (#2)** to the negative ungrounded terminal of the battery. Connect the POSITIVE red **Clamp (#2)** to a heavy gauge metal part of your vehicle chassis or engine block away from the battery. Do not connect to the NEGATIVE (black) terminal on the battery, fuel lines, the carburetor, or sheet metal body parts.

## Operation (continued)

### Connection to a battery outside a vehicle.

1. Make sure the AC **Power Cord (#3)** is not plugged in.
2. The battery will have two terminals. One should be marked POSITIVE, POS, P, OR +. The Negative terminal should be marked NEGATIVE, NEG, N, OR -. To protect you by keeping you further away from the battery, connect a battery cable (not included) that is at least 24" long and #6 AWG (American Wire Gauge) to the NEGATIVE terminal of the battery.
3. Connect the POSITIVE (red) **Clamp (#2)** from the charger to the POSITIVE terminal of the battery.
4. Position yourself and the free end of the battery cable (not included) that is attached to the NEGATIVE battery terminal, as far away as possible from the battery. While facing away from the battery, connect the NEGATIVE (black) charger **Clamp (#2)** to the free end of the battery cable (not included).

### Charging

1. The charger must be set to the same voltage as the battery.

Settings:

The six volt setting (**10A/6V**) on the select switch is for charging medium to large 6 volt batteries. It is a manual setting. After the battery is fully charged, the charger must be disconnected to avoid damage. Charging time is 6 to 8 hours, and must be monitored throughout the operation.

The two amp, 12 volt setting (**2A/Auto**) on the select switch is for charging small 12 volt batteries or warming larger automotive batteries overnight to assist in cold weather starting. It will not fully charge larger or deep cycle batteries. This setting is automatic. It will slow down the charging rate when the battery reaches full charge. Charging time is a little longer on the automatic setting as the unit tapers off slowly. It takes approximately 6-8 hours and it isn't as critical to monitor.

The ten amp, 12 volt setting (**10A/12V**) on the select switch is for charging medium to large 12 volt batteries. This setting is automatic. It will slow down the charging rate when the battery reaches full charge. Charging time is a little longer on the automatic setting as the unit tapers off slowly. It takes approximately 6-8 hours and it isn't as critical to monitor.

**Small batteries:** Lawn mower, motorcycle, or snowmobile type batteries have charge rate limits. Always charge them on the two amp, 12 volt setting (**2A/Auto**) on the select switch. Do not use this charger for charging small 6 volt batteries unless the manufacturer of the battery states that the battery will withstand a 10 amp charge rate.

**Note:** More on manual charging times discussed on page 10.

**Warning!!** If the Reverse Connect light (see **FIGURE 1**) ever lights, **immediately unplug the charger** and reconnect the clamps to the battery to alleviate the problem.

**Note:** Engine starting settings are covered on page 9.

2. When ready, set the select function switch (see **FIGURE 1**) to **Charge** and plug in the charger to begin charging.
3. During charging, whether using the manual or automatic modes, it is important to monitor the operation by checking the ammeter (see **FIGURE 1**).

**Note:** When the battery is charged the green charge complete light will turn on.

## Operation (continued)

### Disconnecting after charging.

First, disconnect the charger clamp that is not attached directly to the battery. At this stage, don't let anything come in contact with the clamp. Then, disconnect the clamp that is in contact with the battery terminal. Do not let the clamps touch each other while you unplug the charger.

### Ammeter Readings

The ammeter shows how much charging current is drawn from the charger (to the battery). When a dead or low battery is charged the charger's ammeter will register at the high end. As the battery charges, the reading will move down toward the low end, resting on zero, when the battery is fully charged. When using the battery in engine starting mode (discussed further down this page) the needle on the ammeter will peg toward the high end of the ammeter.

**Do not depend** on reading the ammeter to approximate how long charging will take. Even at full charge the ammeter will still be providing as much as 50 percent of the charger's output rating. It's best to follow the charging times listed on page 8. Sometimes, certain conditions such as a cold battery, a sulfated battery, or a deeply discharged Lead Calcium battery (on many newer cars) may cause the ammeter to read near a full charge, when the charging process is only beginning.

**Note:** Cold batteries (at or below 32 degrees Fahrenheit) begin charging at a low rate and then increase as the battery warms. When the battery charges up, the rate will decrease at a normal rate.

DEEPLY DISCHARGED LEAD-CALCIUM batteries will read out differently as they need an activation procedure covered on page 10 of this manual.

SHORTED BATTERIES will read on the ammeter as a high end peg at the beginning of the charging process. If after 5-10 minutes the needle does not move off of the high end, the battery probably has a short circuit. Unplug the charger and discontinue use. Have the battery checked by a qualified technician.

### Engine Starting

**Note:** This charger's high-current output can help start vehicles with weak batteries. Please note that some of the newer vehicles with onboard computers may be damaged from this process. Thoroughly read the vehicle owner's manual before using this procedure.

1. Connect the charger to the battery as discussed in the previous operating instructions on page 7 and 8.
2. Set the charger to charge the battery for 5-10 minutes according to the appropriate charge rate for the size of the battery as explained on the previous 2 pages.
3. Set the select function switch (See **FIGURE 1** on page 6) to **Start** and the select switch (see **FIGURE 1** on page 6) to **55A**.
4. Try to start the vehicle. If it doesn't start in 2-3 minutes, stop and wait for the vehicle to charge for 5-10 minutes more and try again. Repeat this process until successful.

**Note:** If the engine continues to spin but will not start after several tries, than you may have another problem unrelated to charging. Stop attempting to start/charge the battery until the problem is found and corrected. **Continued engine cranking may damage the vehicle's starter motor.**

## Operation (continued)

### More on charging times.

1. When using a manual mode for charging, you can check the present level of a battery by using a hydrometer or electronic percent-of-charge tester (not included). Be sure to read and follow all of the instructions in the manual for these testing tools.

**Note:** Batteries that are only 25% charged or lower can easily freeze.

2. When you determine the percent of charge needed, you can determine the batteries needed charging time by using the formula below. First you will need to know the AMPERE HOURS or RESERVE CAPACITY. If it is not listed on the battery, check with the manufacturer of the battery.

Formula: 
$$\frac{\text{Amp Hour Rating} \times \text{Percent of Charge Needed}}{\text{Amp Setting Selected on Charger}} \times 1.25 = \text{hours to charge}$$

Example:

Battery state of charge = 25%

Battery needs = 75% or .75

Amp setting on charger = 10

Amp hour rating of battery = 60

60 times .75 divided by 10 = 4.5

4.5 times 1.25 = 5.6 hours needed to charge.

**DEEPLY DISCHARGED LEAD-CALCIUM** batteries on many of the newer vehicles may require an activation period when deeply discharged. This period may last from 4-8 hours. If you notice that the ammeter needle is at or near zero at the beginning of the charging process, your battery is less than 25% charged and needs to be activated or pre-charged.

You know it needs **pre-charge activation** when the ammeter reads zero and neither the Charge Complete or the Reverse Connect lights are lit. Pre-charge activation is needed if the battery is already known to be dead and the Charge Complete light is on. **If the Charge complete light is lit, do not attempt pre-charge activation until the battery is tested with a hydrometer or other testing methods and found to be low or dead.** If you determine that the battery needs pre-charge activation, take it to a qualified service technician.

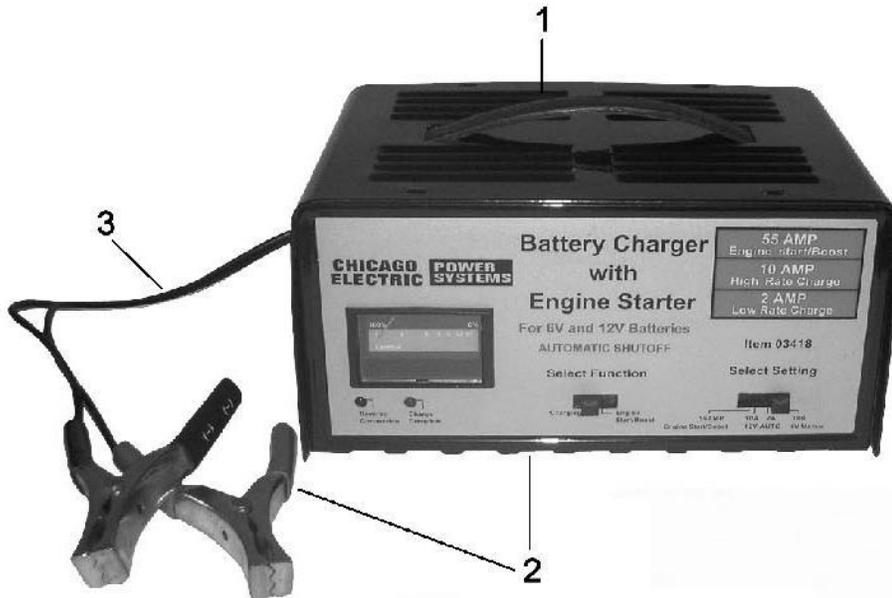
### Troubleshooting

No Ammeter Reading:

1. Make sure the charger is plugged in.
2. Unplug the unit and check all of the connections making sure clean contact is made.
3. Check that the battery isn't damaged and incapable of being charged.
4. Double check that you have selected the correct settings.
5. Make sure you allow enough charging time.

## Parts List and Assembly Drawing

Part No.	Description
1	Charger
2	Clamps (2)
3	Power Cord



## Maintenance

Always unplug the unit before attempting any maintenance.

1. Clean the clamps after each use and remove any battery fluid with a solution of water and baking soda.
2. To prevent damage to the cable wires and the power cord, coil them after each use.
3. Wipe the case down with a soft cloth.

### PLEASE READ THE FOLLOWING CAREFULLY

THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER NOR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT OR THAT HE OR SHE IS QUALIFIED TO REPLACE ANY PARTS OF THE PRODUCT. IN FACT, THE MANUFACTURER AND/OR DISTRIBUTOR EXPRESSLY STATES THAT ALL REPAIRS AND PARTS REPLACEMENTS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.

**NOTE:** Some parts are listed and shown for illustration purposes only and are not available individually as replacement parts.