

AUTO CHARGE 12 HO

AUTOMATIC SINGLE OUTPUT BATTERY CHARGER



MODEL # : 091-170-6
MODEL # : 091-170-12
MODEL # : 091-170-24

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Rev: D
Revised By: MFG
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3 YEAR WARRANTY



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IMPORTANT SAFETY INSTRUCTIONS

I. PERSONAL PRECAUTIONS:

1. Someone should be within range of your voice 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 and clothing protection. Avoid touching your eyes while working near a battery.
4. If battery acid contacts skin or clothing, wash immediately with soap and water. If battery acid enters the eye, immediately flood eye with cold running water for at least 10 minutes and get medical attention immediately.
5. **NEVER** smoke or allow a spark or flame in the vicinity of the battery or engine.
6. Be extra cautious to reduce the risk of dropping a metal tool onto the battery. It might spark or short-circuit the battery or other electrical part and cause a fire or an explosion.
7. Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid battery. A lead-acid battery, when shorted, can produce a current sufficient to weld a ring or the like metal causing a severe burn.
8. Use the battery charger for charging gel-cell, AGM and flooded lead-acid batteries only. Do not use the charger for charging dry-cell batteries that are commonly used with home applications. These batteries may burst and cause injury to persons and damage to property.
9. **WARNING – RISK OF EXPLOSIVE GASES:** Working in the vicinity of a lead-acid battery is dangerous. Batteries generate explosive gases during normal battery operation.

II. CHARGER PRECAUTIONS:

1. **NEVER** charge a frozen battery.
2. Make sure the cord is located so that it will not be stepped on, tripped over, or otherwise subjected to damage or stress.
3. Do not operate the charger with a damaged cord or plug; replace them immediately.
4. Do not operate the charger if it has received a sharp blow, been dropped, or otherwise damaged.
5. Do not disassemble the charger. Incorrect reassembly may result in a risk of electric shock and fire.
6. To reduce the risk of electric shock, disconnect the charger from the AC source before attempting any maintenance or cleaning.
7. **LOCATION OF CHARGER:** The charger should be mounted on a wall, vehicle floor, ventilated compartment or other suitable surface as close to the batteries to be charged as possible. Do not block the charger's fan or air intakes. Do not mount the charger directly over the batteries as fumes may cause excessive corrosion. The area should be well ventilated and free from excessive moisture, exhaust manifolds, and battery fumes. For maximum performance, the charger should not be located in an area of extreme high temperature. The charger is not waterproof. Do not mount the charger where there is a possibility of water entering the unit. Evidence of water entry into the charger will void the warranty.
8. **CAUTION:** Do not attempt to increase battery bank capacity by splitting the output of one of the banks with a diode-type battery isolator. The diode isolator lowers the charger voltage and results in under-charging the batteries connected to it. If additional capacity is required it is preferable to add another isolated or parallel battery.

III. GROUND AND AC POWER CORD CONNECTION:

1. The charger should be grounded via the AC power connection to reduce the risk of electrical shock.
2. The charger must be plugged into or wired to an outlet that is an over-current protected 3 prong outlet. Alternatively, it may be routed through a separate dedicated fuse or circuit breaker on an AC distribution panel with proper earth/safety ground. All wiring shall comply with UL recommendations, NEC or NFPA standards and local ordinances. Never alter the AC cord or plug if provided. Any modification of the cord must only be done by a qualified electrician. Improper cord/outlet connection may result in a risk of electrical shock.
3. Observe color coding of the AC wiring as follows:

Black.....	AC Hot or LINE (fused)
White.....	AC Neutral
Green.....	AC Ground (safety/earth)
4. **CAUTION:** (230 VAC applications only): If AC input is provide from a source consisting of two HOT or LINE leads (phase-to-phase 230 VAC input voltage); an external fuse or circuit breaker must be used to protect both hot leads.

INTRODUCTION

The Auto Charge 12 HO, Model 091-170, is a high output fully automatic battery charger for vehicles with a single battery system. A patented "Sample & Hold" circuit is utilized to detect the actual battery voltage. This eliminates the error due to the current flowing in the charging wires and assures that the battery is charged to the precise float voltage. A current limiter prevents overloading the charger when charging a deeply discharged battery or driving large parasitic loads. The charger is ruggedly constructed to assure reliable operation when mounted in a vehicle.

FEATURES

I. AUTO CHARGE 12 HO BATTERY CHARGER

- Electronic remote sensing of true battery voltage, eliminates the need for sensing wires
- Automatic current limiting
- Optional Remote Battery charge/condition indicator display
- Power "ON" LED status indicator

II. CHARGE CONTROLS & ELECTRONIC REMOTE SENSING

The Auto Charge 12 HO contains a precision voltage controller to maintain the battery's charge. Automatic electronic remote sensing measures the true battery voltage, eliminating the need for the additional sense wires. The output current of any charger is inherently a series of pulses whose frequency is determined by the power line frequency. Therefore, there are brief intervals during which no charging current flows. Since there is no charging current there is also no voltage drop between the charger and the battery. The Auto Charge 12 HO measures and stores the true battery voltage. This battery voltage is compared to a reference voltage, any error detected is then used to control the charger output at the desired level. There is no "trickle charge" and therefore no danger of overcharging and water boil-off.

III. AUTOMATIC CURRENT LIMITING

When batteries are severely discharged, some battery chargers can be overloaded due to the high charging current required. The Auto Charge 12 HO contains an automatic current limit. The current limit feature limits the output current to the max. amperes of the charger output when charging a deeply discharged battery or if the starter cranks the engine while charging. The current limiter thus eliminates the need for an ignition interlock circuit.

IV. LED STATUS INDICATOR

1. **POWER:** Indicates that AC voltage is present

WIRING

I. BATTERY CHARGER WIRING INSTRUCTIONS

1. Refer to Installation Wiring Diagram.
2. Refer to Wiring Specifications to determine the recommended wire size and maximum lengths. Using a smaller gauge may cause overheating of the terminal. Additional information is available upon request if longer, larger wiring is required.
3. Double check all wiring before applying AC power volts to input terminal.
4. Apply AC power (shoreline power) to input terminal and observe that the charger is operating.
5. Verify that the battery voltage appears at the charger output terminals.

II. WIRING SPECIFICATIONS

1. For Model #: 091-170-6

Length of Wire to Battery (feet)	0 - 5		< 5 - 10**		< 10 - 20*	
Battery Charger Connections	BAT +	COM	BAT +	COM	BAT +	COM
	12	12	10	10	8	8
* Consult factory if length of wire to battery is longer than 20 feet						

2. For Model #: 091-170-12

Length of Wire to Battery (feet)	0 - 5		< 5 - 10**		< 10 - 20*	
Battery Charger Connections	BAT +	COM	BAT +	COM	BAT +	COM
	12	12	10	10	8	8
* Consult factory if length of wire to battery is longer than 20 feet						

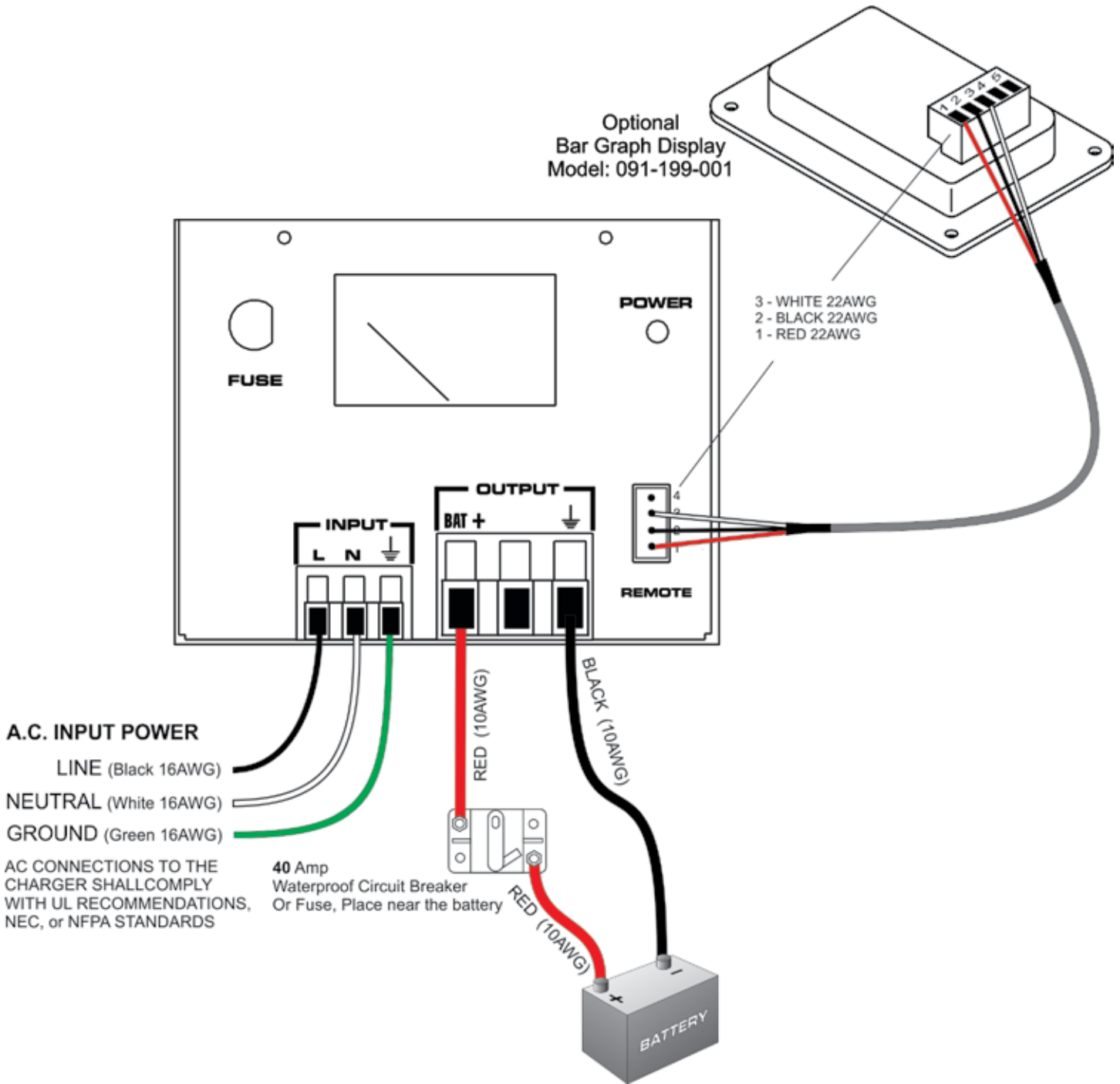
3. For Model #: 091-170-24

Length of Wire to Battery (feet)	0 - 5		< 5 - 10**		< 10 - 20*	
Battery Charger Connections	BAT +	COM	BAT +	COM	BAT +	COM
	14	14	12	12	10	10
* Consult factory if length of wire to battery is longer than 20 feet						

INSTALLATION WIRING DIAGRAM

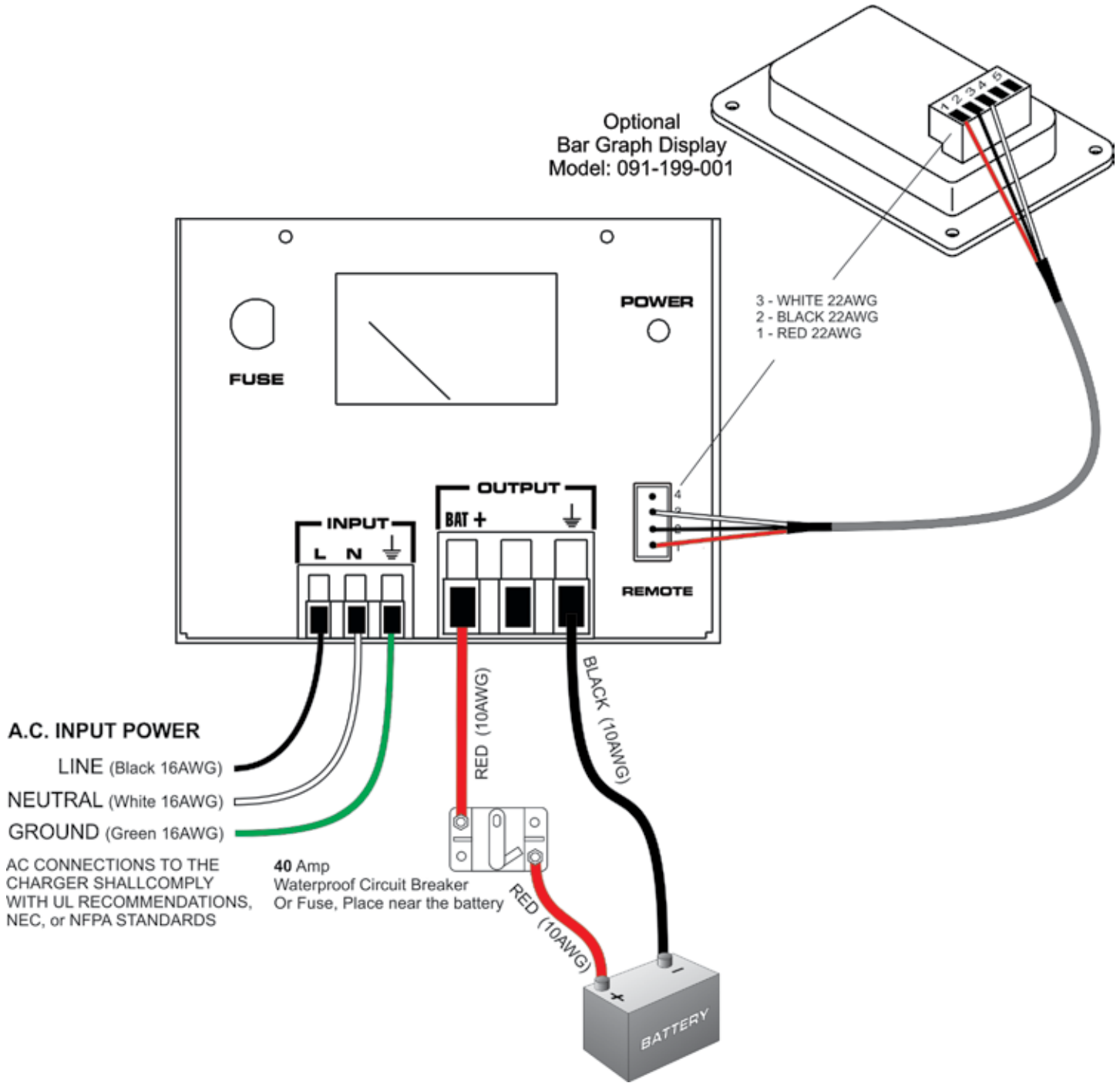
I. FOR MODEL #: 091-170-6, SHOWN WITH OPTIONAL BAR GRAPH DISPLAY, 091-199-001

Wiring Diagram shown is for a 10 foot installation



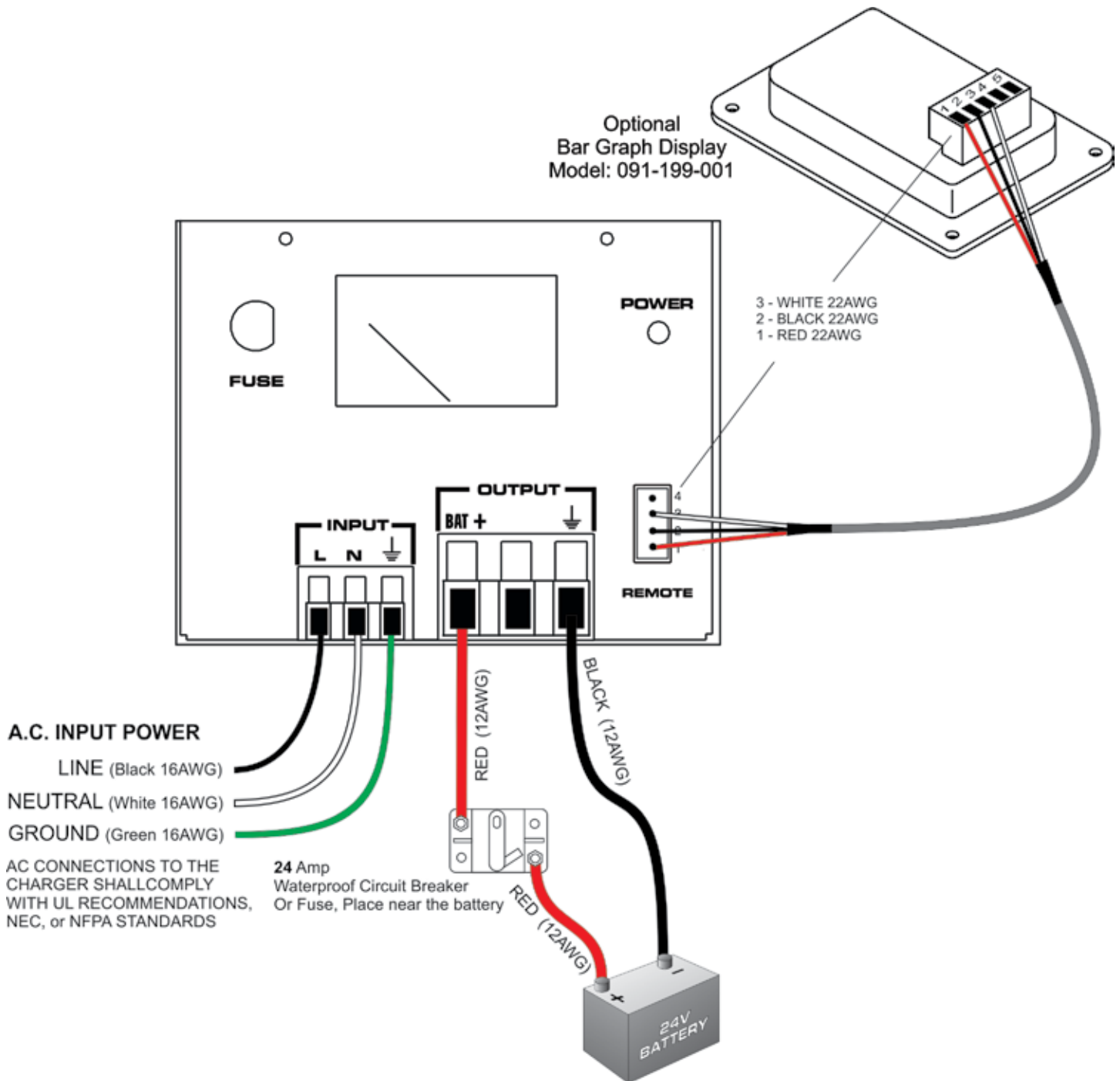
II. FOR MODEL #: 091-170-12, SHOWN WITH OPTIONAL BAR GRAPH DISPLAY, 091-199-001

Wiring Diagram shown is for a 10 foot installation



III. FOR MODEL #: 091-170-24, SHOWN WITH OPTIONAL BAR GRAPH DISPLAY, 091-199-001

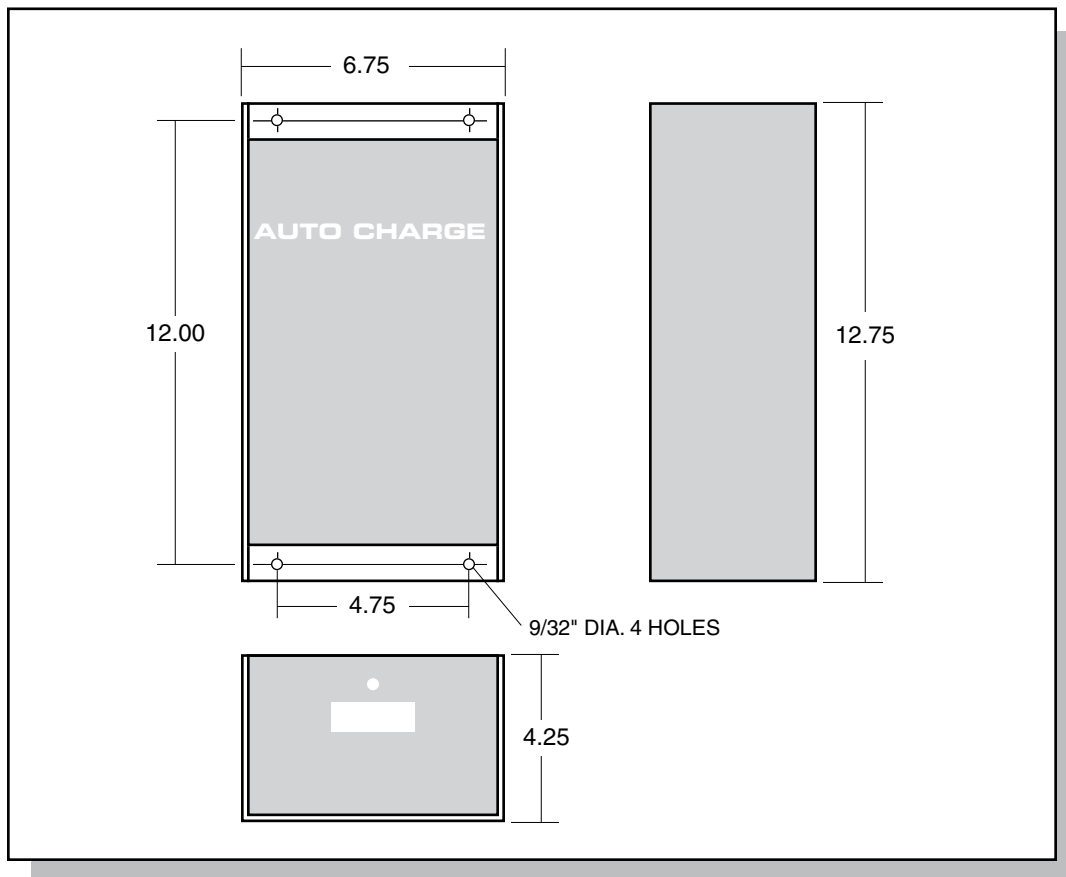
Wiring Diagram shown is for a 10 foot installation



SPECIFICATIONS

Model Number	Output Float Voltage (Vdc)	Output Current (Amps)	Input Voltage (Vac)	Input Frequency (Hz)	Input Current (Amps)	Current Meter (Amps)	Input Fuse (Amps)	Output Fuse (Amps)	Weight (lbs.)
091-170-6	6.62	20	115	50/60	2	25	4	40	16
091-170-12	13.25	20	115	50/60	2	25	8	40	16
091-170-24	26.50	12	115	50/60	2.5	15	5	24	16

OUTLINE DRAWING



INSTALLATION RECORD

DATE INSTALLED _____

INSTALLED BY _____

VEHICLE IDENTIFICATION _____

VEHICLE OWNER _____

WARRANTY POLICY

All products of Kussmaul Electronics Company Inc. are warranted to be free of defects of material or workmanship. Liability is limited to repairing or replacing at our factory, without charge, any material or defects which become apparent in normal use within 3 years from the date the equipment was shipped. Equipment is to be returned, shipping charges prepaid and will be returned, after repair, shipping charges paid.

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