

**INSTRUCTION MANUAL**

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**AUTO CHARGE  
SD 150  
AUTOMATIC BATTERY CHARGER**



**MODEL # 091-168-12**

**INPUT: 115 VOLTS, 50/60 Hz  
OUTPUT: 50 AMPERES**

**3 YEAR WARRANTY**



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# INTRODUCTION

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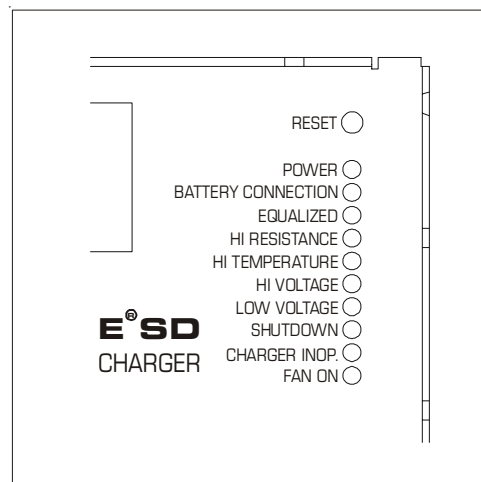
The Auto Charge SD 150, Model 091-168-12, is a state of the art, high output completely automatic single channel battery charger specifically designed for recharging and maintaining the multiple batteries as found in modern emergency vehicles. The charger contains many features that enhance performance and provide the vehicle user with self-diagnostics of the chargers operation.

1. The charging protocol is a modified 3-step configuration. Whenever the vehicle is powered from a shore line the charger charges the battery at a "boost" rate of 14.25 volts for approximately 1.5 hours. At the completion of the boost phase the output voltage switches to the float rate of 13.25 volts.
2. An external dual bar graph indicator displays the chargers actual output voltage and current.
3. An analog meter on the front of the charger also indicates charger output.
4. Output voltage of the charger is constant voltage, controlled by the patented "Sample and Hold" circuit that eliminates the voltage drop in the charging wires and current limited to protect the charger and the batteries.
5. Maximum charger output current is limited to 50 amperes.
6. The charger is reverse polarity protected to prevent damage if the output wires are inadvertently reversed.

# SELF DIAGNOSTIC DISPLAY

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The charger contains self diagnostic circuits whose outputs are displayed on a 10 LED display. These aid in charger installation, servicing, and troubleshooting and are as follows



# **SELF DIAGNOSTIC DISPLAY (cont.)**

- POWER:** Indicates that A.C. input power is present.
- BATTERY CONNECTION:** Indicates that a battery of proper polarity is connected to the charger output terminals.
- EQUALIZE:** Indicates that the charger is in the boost mode and is charging the battery at 14.25 volts. This is a temporary condition that lasts for approximately 1.5 hours after the start of charging. When EQUALIZE light is OFF, charger is in FLOAT mode and charging at 13.25 volts.
- HI RESISTANCE:** Indicates a high resistance in the D.C. output, either the positive or ground connection. This requires service - either clean the connections on the D.C. output terminal strip, or at the other end of those wires. If cleaning and tightening does not correct the problem, increase the wire size.
- HI TEMPERATURE:** Indicates a high temperature internal to the charger. Temperature sensors are located on the D.C. output wires close to the terminal strip. Hi Temperature will shut down the charger and sound an alarm. The alarm buzzer is periodic 10 seconds ON and 10 seconds OFF. A RESET switch is provided above the LED Display to restart the charger after cool down. Alternatively the shutdown is reset when the A.C. power is removed from the charger.
- HI VOLTAGE:** Indicates that the charger output has exceeded 15.0 volts. This will sound the alarm buzzer and shut the charger down. Pressing the RESET switch will reset the HI VOLTAGE alarm and restart the charger. If the high voltage was temporary, the charger will operate normally. If unable to reset an internal malfunction is indicated.

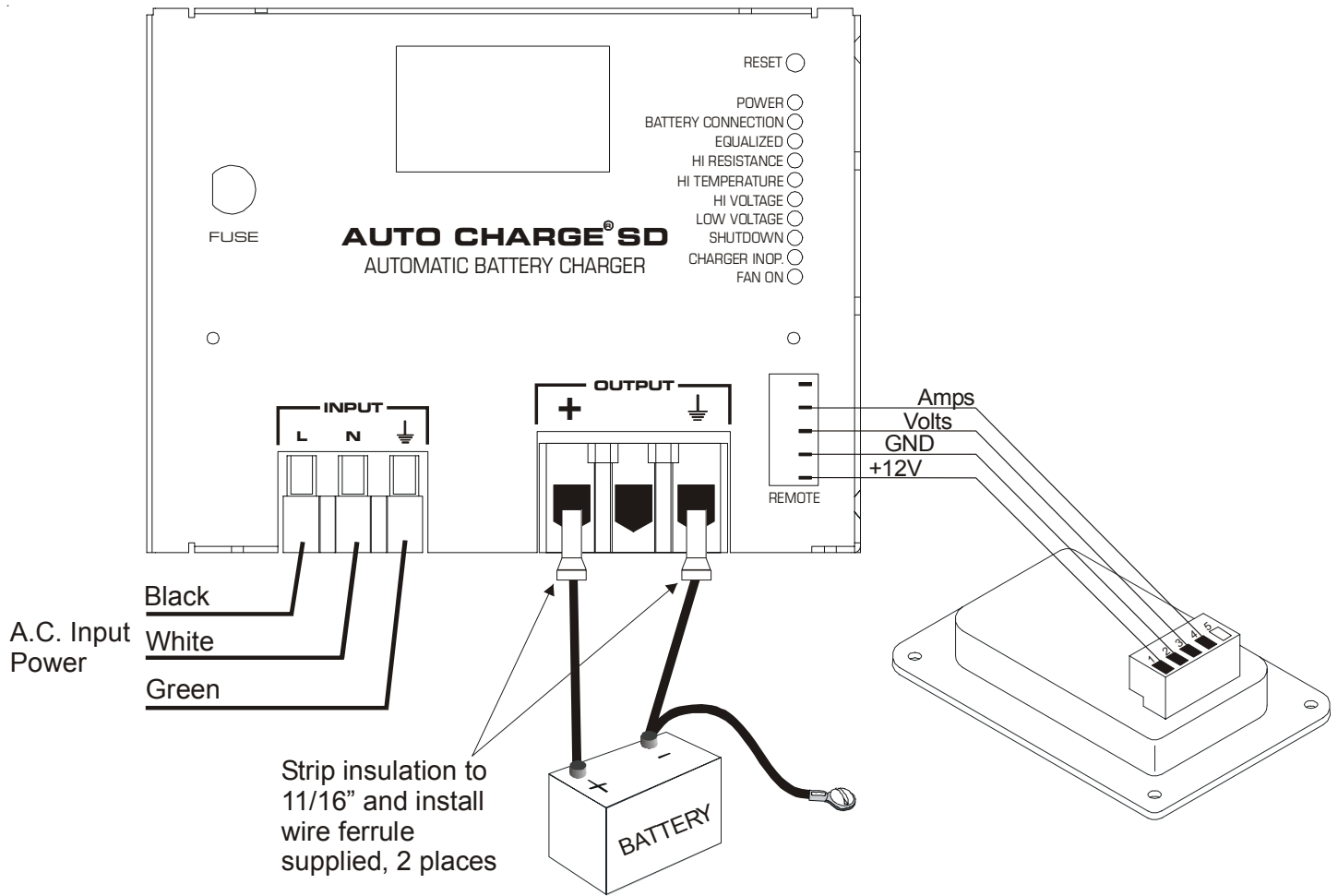
## **SELF DIAGNOSTIC DISPLAY (cont.)**

LOW VOLTAGE:	Indicates that a low output voltage has been detected. This may be due to excessive load on the charger - Check ammeter indication. If due to discharged battery, charger output current will be high and LOW VOLTAGE indicator will be extinguished when battery is recharged. If indicator is due to high parasitic loads then these must be reduced to permit the charger to recharge the batteries.
SHUTDOWN:	Indicates that the charger is shutdown either due to HI VOLTAGE or to HI TEMPERATURE. This indicator illuminates simultaneously with the alarm buzzer.
CHARGER INOP.:	Indicates an inoperative charger creating a low output current and a low output voltage. Probably requires charger servicing.
FAN ON:	Indicates that the fan is operating. Fan operates whenever output current exceeds 8 amperes.

## **INSTALLATION**

1. The Auto Charge SD 150 should be installed in an area with adequate ventilation.
2. Mount the charger with the four holes provided.
3. Wire the charger in accordance with figure 1.
4. Double check all wiring. Verify that the battery voltage appears at the charger output terminals - see figure 1. Battery voltage must appear at the charger output terminals, a minimum of 6 volts is required to start the charger.
5. Apply 115 volts to input terminal and observe that the charger is operating. The Bar Graph need not be connected for the charger to operate.

# INSTALLATION WIRING DIAGRAM



**IMPORTANT:** Minimum wire size on charger output and ground is #6 AWG for a maximum length of 25 feet. If wiring is to be longer, #4 AWG wire is required. Smaller gauge wire may cause overheating of terminal. Additional information is available upon request.

**NOTE:** Use two(2) TERFEB612 Wire Ferrules over wire to simplify insertion of wire into terminal strip and improve connection.

# SPECIFICATIONS & OUTLINE

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**Specifications:**

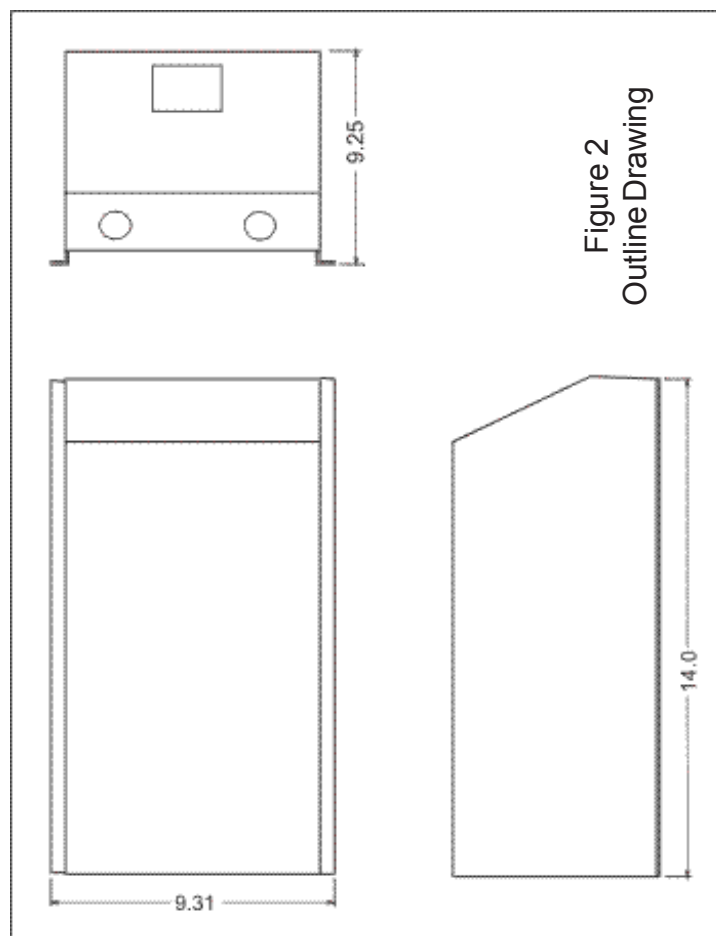
**Input Power:** 115 VAC, 50/60 Hz, 15 Amps

**Input Over Current Protection:** Fuse; 20 Amp, Slow-Blow

**Output Power:** 12 to 14.25 VDC, 50 Amperes Current Limited

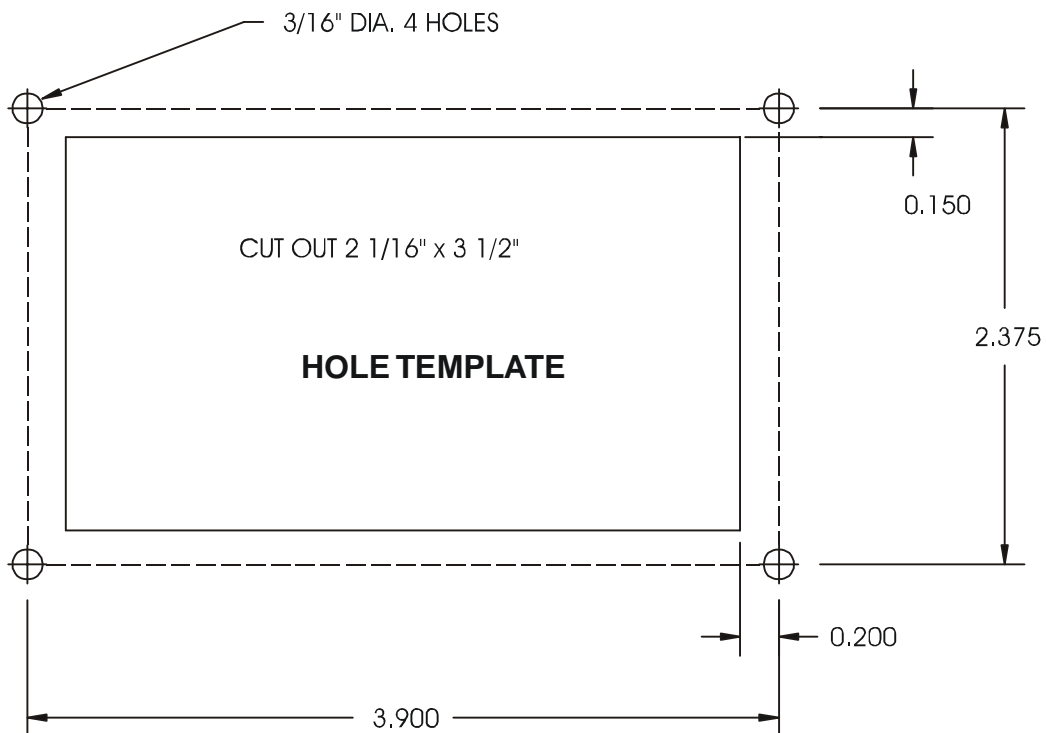
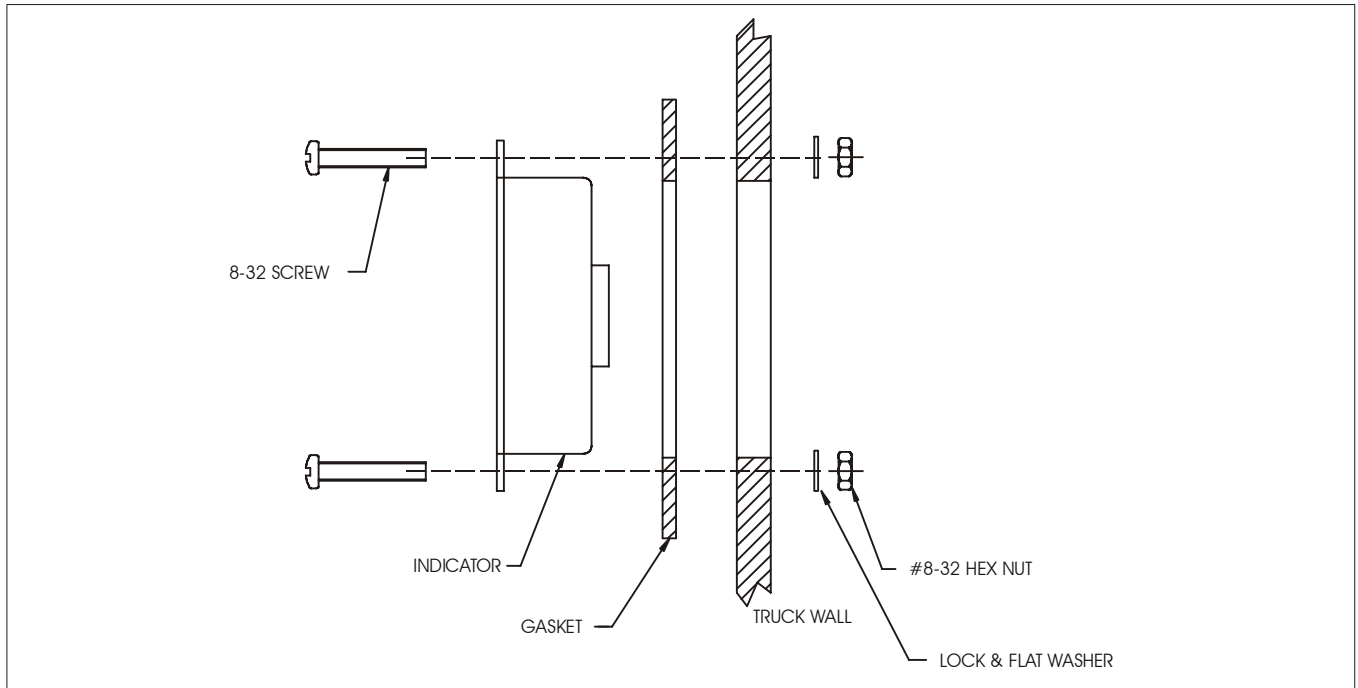
**Charge Indicator:** 75 Amperes

**Weight:** 28 Pounds



## INDICATOR INSTALLATION

1. Locate Indicator in a convenient place on the vehicle.
2. Place the template in position and center punch in 4 places.
3. Drill holes as shown.
4. Cut out square hole.
5. Connect wiring to charger in accordance with the instructions in the charger installation instructions.
6. Install as shown.
7. Insert (4) #8-32 screws supplied and tighten. (**CAUTION: Do not over tighten because you will bend the plastic bezel and break the watertight seal).**



# **INSTALLATION RECORD & WARRANTY**

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**Date Installed** \_\_\_\_\_

**Installed By** \_\_\_\_\_

**Vehicle Identification** \_\_\_\_\_

**Vehicle Owner** \_\_\_\_\_

## ***WARRANTY***

All product 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.

Kussmaul Electronics Company, Inc. shall have no liability for damages of any kind to associated equipment arising from the installation and /or use of the Kussmaul Electronics Company, Inc. products. The purchaser, by the acceptance of the equipment, assumes all liability for any damages which may result from its installation, use or misuse, by the purchaser, his or its employees or others.