FILE: 091-106-250-XX-120
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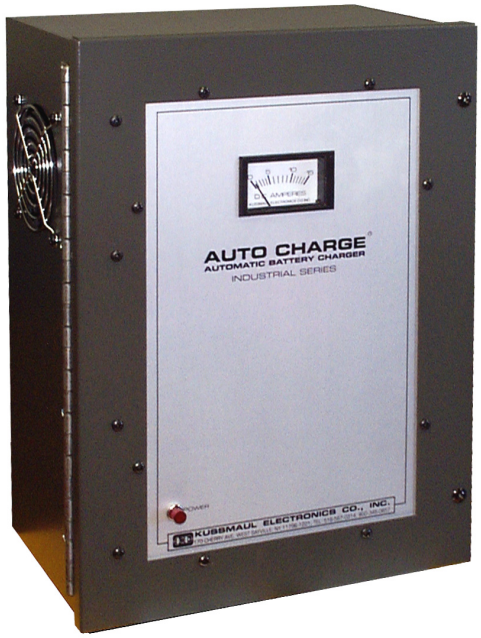
INSTRUCTION MANUAL

INDUSTRIAL CHARGER

AUTOMATIC BATTERY CHARGER

SERIES 250



MODEL # 091-106-250-XX-120

3 YEAR WARRANTY

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INTRODUCTION

The Auto Charge 250 Series of chargers are precise float chargers packaged in a powder coated steel industrial enclosure which utilizes control concepts and circuitry proven over many years and tens of thousands of installations in fire trucks, ambulances, and emergency vehicles. The charger is designed to be connected to the battery to continuously charge the battery, pick up any electrical loads and by precise voltage control, assure that the battery is not overcharged.

SYSTEM DESCRIPTION

The charger contains a power transformer, control circuit assembly, SCR rectifier, current sensing resistor, and ammeter. The Power transformer lowers the A.C. Input Line Voltage to the level as required by the particular model. The transformer secondary is applied to the rectifier assembly in which the A.C. Voltage is rectified in D.C. Voltage to charge the battery. A block diagram appears in Figure 1.

The rectifier assembly contains 2 diodes and 2 silicon controlled rectifiers. Voltage control of the rectifier assembly is obtained by varying the trigger angle at which the SCR's are fired. Delaying the trigger angle decreases the voltage while advancing it increases the voltage.

The control circuit board contains circuits which detect the charger output voltage, compare it to a precise reference voltage to generate an error signal. This error signal is amplified and converted to a variable phase signal to trigger the output SCR's. Charger output current is detected with a current sense resistor. The current sense signal is used to over-ride the voltage commands to limit the maximum charger output to its' rated value. This protects the charger when recharging a deeply discharged battery or when a load in excess of the charger's current rating is applied to the battery. The current signal is also utilized in the Auto-Equalize circuit. When recharging a battery composed of a number of cells in series, it is important to fully charge each of the cells. This is accomplished by raising the charger output voltage. Many chargers have a Float/Equalize switch. In the float position the output voltage is the desired battery float voltage. When the switch is placed in the equalize position, the output voltage is raised 8 to 10%. After recharging at the equalize voltage for a period of time an operator must manually switch back to the float position. ***If this is not done and the battery is held at the equalize level for a period of time, there is danger of water boil-off.*** Other chargers contain a timer which permits the operator to select the time period for which equalize charging will occur.

The Auto-Equalize circuit as incorporated in the Auto Charge's controller solves the equalize problem. Whenever the charger output is limited by the current limit circuits, a signal is fed back to increase the voltage setpoint. The charger is then in the equalize mode. As the battery is charged up to the equalize voltage, the output current starts to decrease. When this occurs, the voltage set-point is reset to the float voltage and the battery is maintained at the float level.

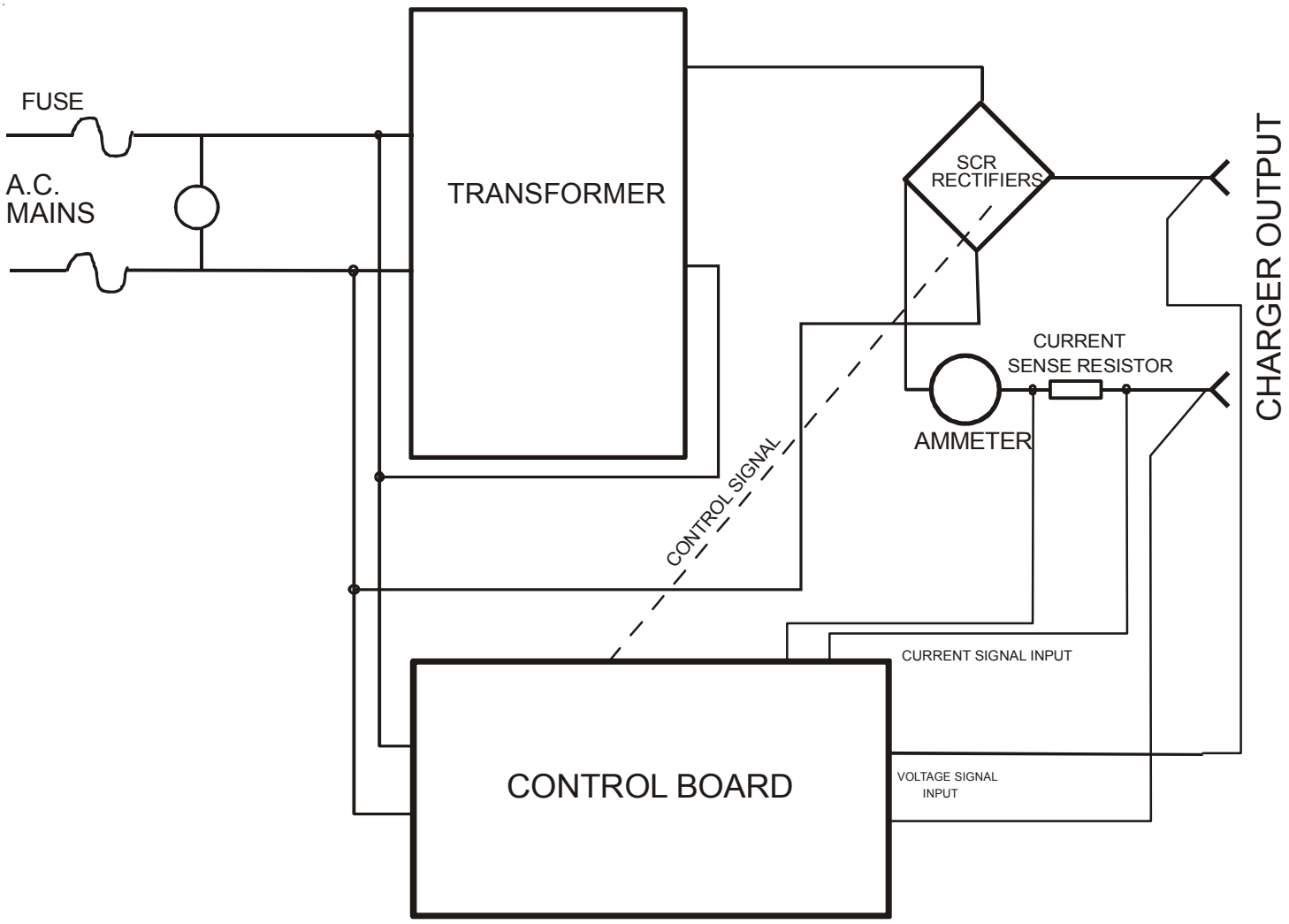


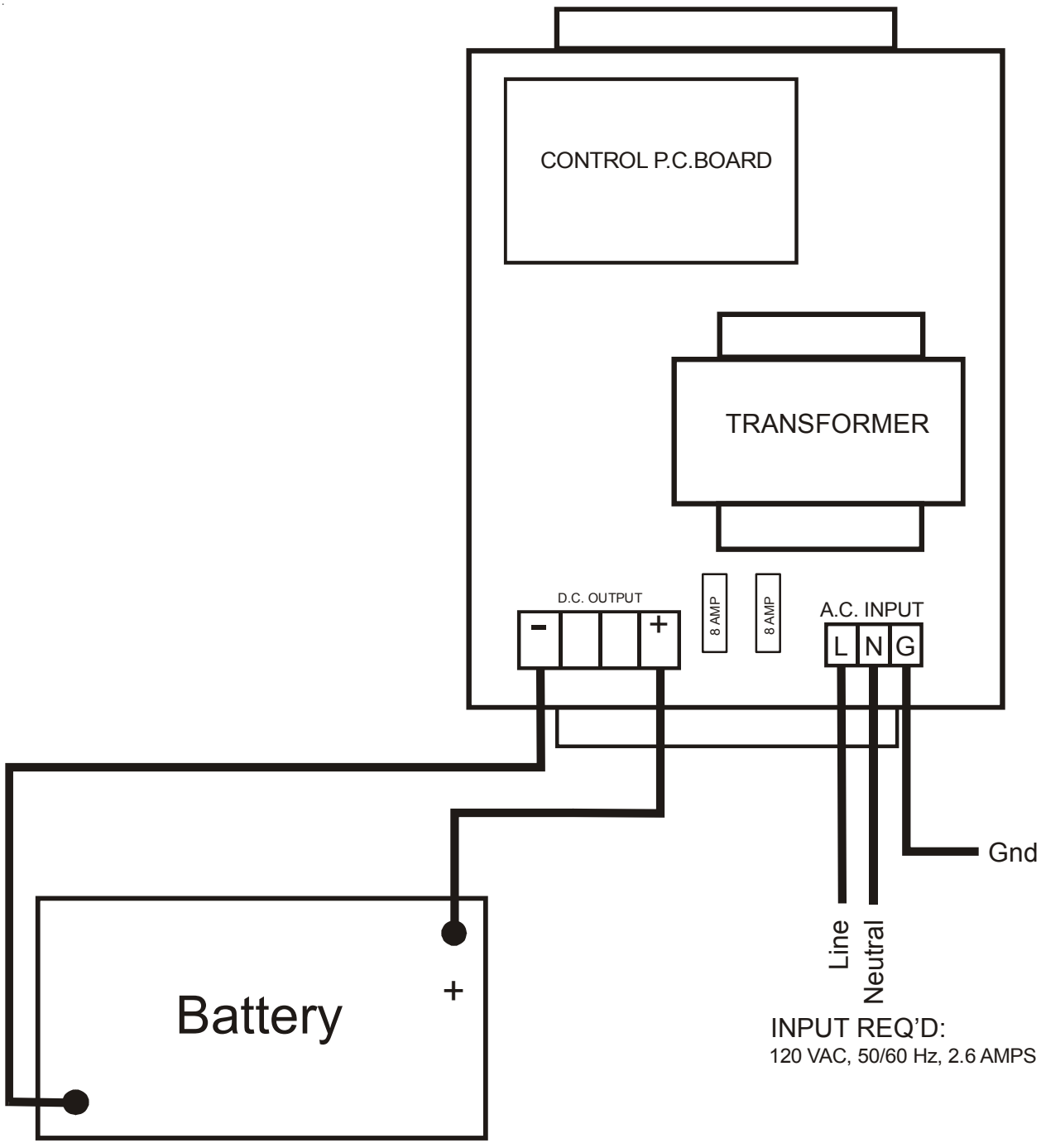
Figure 1

Block Diagram, Auto Charge

With Isolation Transformer

INSTALLATION & WIRING DIAGRAM

Mount the charger in a suitable location to provide adequate air to the ventilation inlet and outlet. In the float charge state very little heat is generated by the charger. Under high output current condition, however, the rectifier becomes warm. If this continues for a sufficient time a thermostatic switch will turn on the fan.



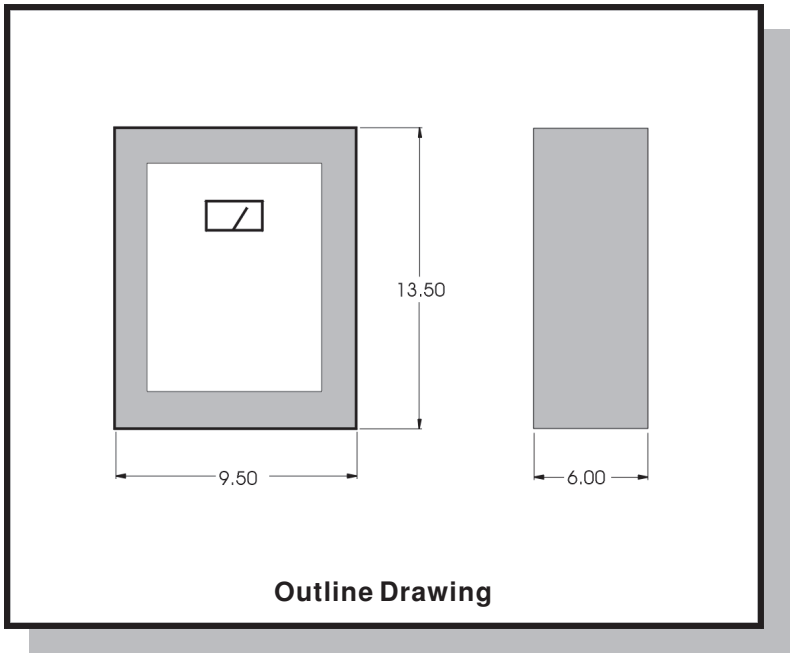
SPECIFICATIONS

MECHANICAL:

Enclosure: 18AWG Steel, Powder Coated
Cooling: Convection, Screen Inlet and Outlet
Size: 13.62 x 9.62 x 6.0 Inches
Weight: 28 Lbs.
Ambient Temperature: -40 to +132 Deg. F

ELECTRICAL:

Model Number	Input Power	Input Fuse	Output	Charge Indicator
091-106-250-6-120	120 VAC, 50/60 Hz, 2.6 Amps	8 Amp	6 VDC, 20 Amps	25 Ampere
091-106-250-12-120	120 VAC, 50/60 Hz, 2.6 Amps	8 Amp	12 VDC, 20 Amps	25 Ampere
091-106-250-24-120	120 VAC, 50/60 Hz, 2.6 Amps	8 Amp	24 VDC, 12 Amps	15 Ampere
091-106-250-32-120	120 VAC, 50/60 Hz, 2.6 Amps	8 Amp	32 VDC, 10 Amps	15 Ampere
091-106-250-36-120	120 VAC, 50/60 Hz, 2.6 Amps	8 Amp	36 VDC, 8 Amps	15 Ampere
091-106-250-48-120	120 VAC, 50/60 Hz, 2.6 Amps	8 Amp	48 VDC, 6 Amps	15 Ampere
091-106-250-60-120	120 VAC, 50/60 Hz, 2.6 Amps	8 Amp	60 VDC, 3 Amps	15 Ampere
091-106-250-72-120	120 VAC, 50/60 Hz, 2.6 Amps	8 Amp	72 VDC, 3 Amps	15 Ampere
091-106-250-120-120	120 VAC, 50/60 Hz, 2.6 Amps	8 Amp	120 VDC, 2 Amps	15 Ampere



Outline Drawing

INSTALLATION RECORD & WARRANTY

Date Installed _____

Installed By _____

Vehicle Identification _____

Vehicle Owner _____

WARRANTY

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.

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.