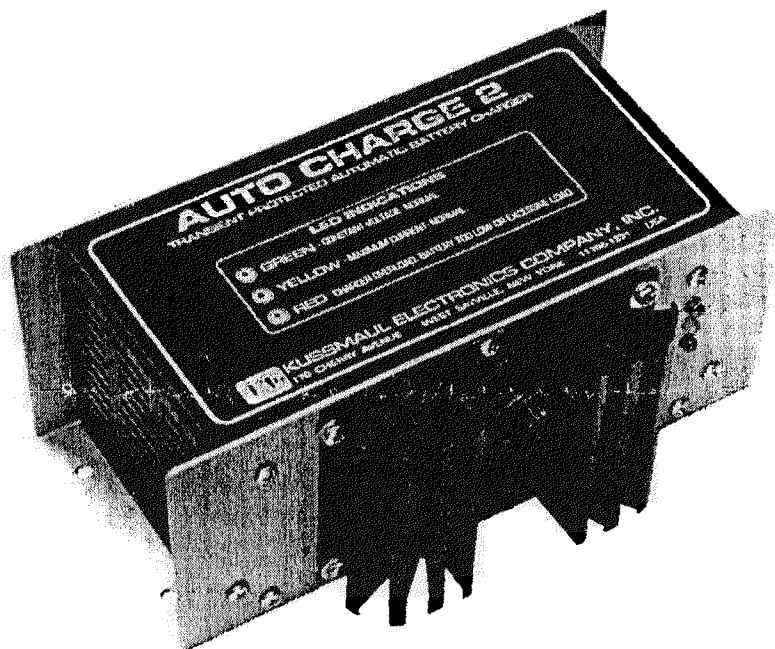


**INSTRUCTION MANUAL**

**AUTO CHARGE 2  
AUTOMATIC BATTERY CHARGER**



**MODEL # 091-29-XX**

**3 YEAR WARRANTY**



**KUSSMAUL ELECTRONICS CO., INC.**  
170 CHERRY AVE., WEST SAYVILLE, N.Y. 11796

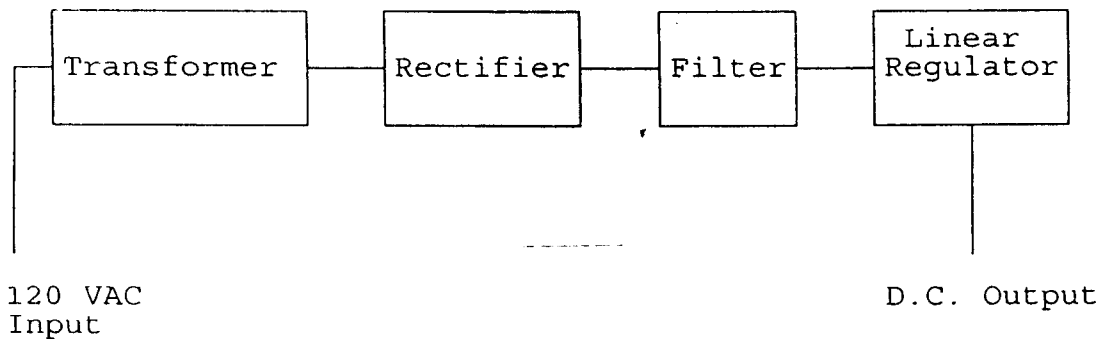
The Model 091-29 series of automatic battery chargers are completely automatic chargers designed to charge small sealed lead-acid batteries of 12, 24 and 48 Volts D.C. The charging rates are 3 Amperes or less for the 12 and 24 Volt Models, and 1 Ampere or less for the 48 Volt Model.

These Units have 3 Modes of operation as follows:

**Overload Mode** - In this Mode of operation, the charger is being overloaded with either a battery of too low a voltage (eg. a 12V battery on a 24 volt charger), or an excessive fixed load (eg. a fixed load of less than 35 ohms on a 48 Volt charger). In this mode of operation, the **Red LED** will either be **constantly lit** or **flashing**.

**Current Limit Mode** - This is a normal mode of operation and it occurs when the battery is heavily discharged. At this time the charger will provide a constant current charge to the battery at the rated output current shown in Table 1 (eg. 2 Amps for the 12 and 24 Volt models). In this mode of operation, the **Yellow LED** is lit. As the battery builds up in voltage, the charger will automatically switch to the Constant Float Voltage Mode.

**Constant Float Voltage Mode** - This is a normal mode of operation, and it occurs when the battery charge has built up to a point where it requires less charge current than the charger rating (eg. for the 12 volt model, the battery requires less than 2 amperes). The charge current will taper to zero in this mode, and the **Green LED** will be lit when the battery is **near full charge**.



**Figure 1**  
Block Diagram of Model 091-29 Automatic Battery Charger

# SPECIFICATION & OUTLINE

## SPECIFICATIONS:

Input: see chart

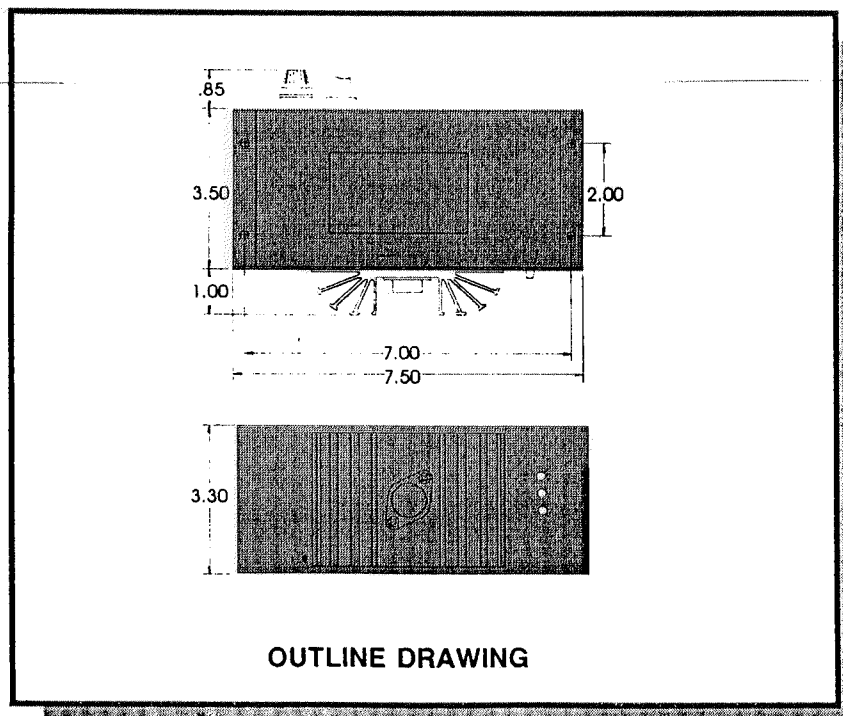
Output: see chart

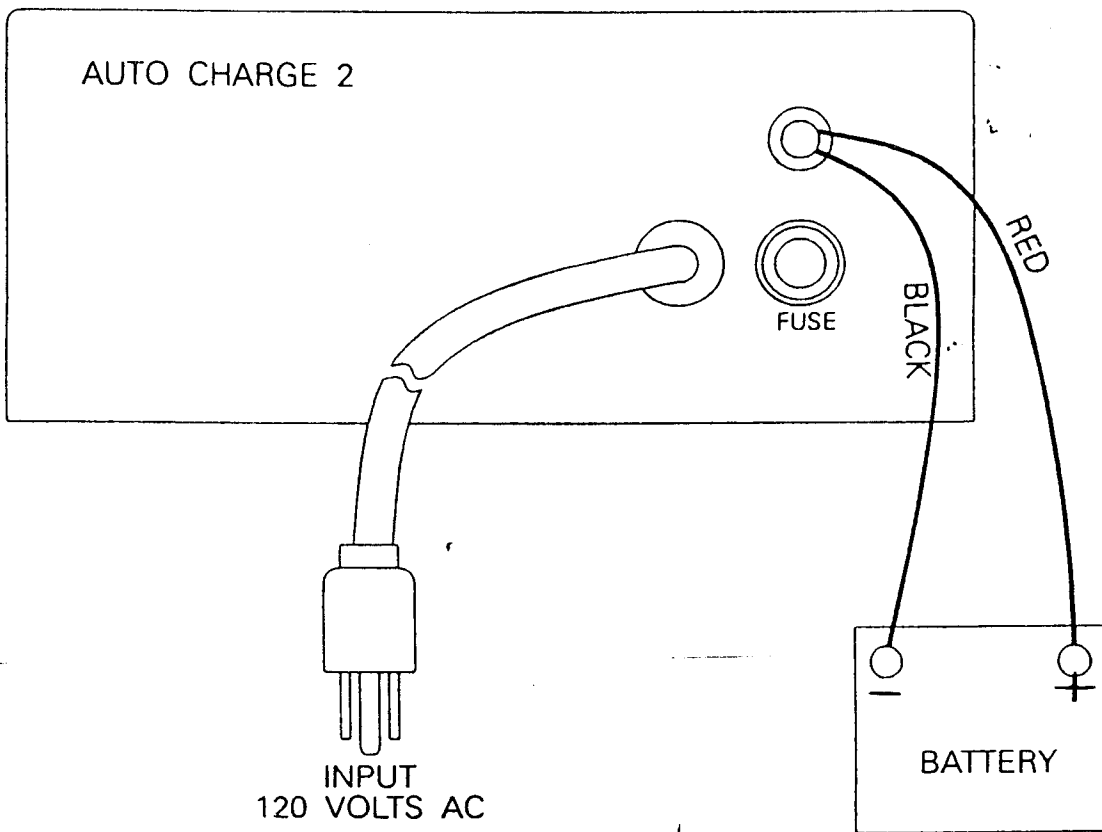
Output Current: see chart

Charge Indicator: LED

Weight: 3.5 lbs

Model #	Output Current	Output Voltage	Output Ripple	Input Voltage	Input Current
091-29-6	3.0 Amps	6	60 MV	120, 50/60 Hz	1 Amps
091-29-12	3.0 Amps	12	60 MV	120, 50/60 Hz	1 Amps
091-29-24	2.0 Amps	24	100 MV	120, 50/60 Hz	1 Amps
091-29-36	1.5 Amps	36	150 MV	120, 50/60 Hz	1 Amps
091-29-48	1.0 Amps	48	200 MV	120, 50/60 Hz	1 Amps
091-29-72	0.75 Amps	72	300 MV	120, 50/60 Hz	1 Amps
091-29-96	0.50 Amps	96	400 MV	120, 50/60 Hz	1 Amps
091-29-120	0.40 Amps	120	500 MV	120, 50/60 Hz	1 Amps
091-29-6-230	3.0 Amps	6	60 MV	230, 50/60 Hz	0.6 Amps
091-29-12-230	3.0 Amps	12	60 MV	230, 50/60 Hz	0.6 Amps
091-29-24-230	2.0 Amps	24	100 MV	230, 50/60 Hz	0.6 Amps
091-29-36-230	1.5 Amps	36	150 MV	230, 50/60 Hz	0.6 Amps
091-29-48-230	1.0 Amps	48	200 MV	230, 50/60 Hz	0.6 Amps
091-29-72-230	0.75 Amps	72	300 MV	230, 50/60 Hz	0.6 Amps
091-29-96-230	0.50 Amps	96	400 MV	230, 50/60 Hz	0.6 Amps
091-29-120-230	0.40 Amps	120	500 MV	230, 50/60 Hz	0.6 Amps





**AUTO CHARGE 2, WIRING**

# **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.