

## INSTRUCTION MANUAL

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# LOW VOLTAGE ALARM 1901

A LOW VOLTAGE DETECTOR WITH  
TIME DELAY TO MEET THE REQUIREMENTS  
OF NFPA 1901



**MODEL(s)**  
**091-85-12**  
**091-85-24**  
**091-85-24-VER**

3 YEAR WARRANTY

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## INTRODUCTION:

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NFPA 1901, Standard for Automotive Fire Apparatus, 1996 Edition, paragraph 9.3.3 requires a low voltage alarm to detect whenever the battery voltage of a vehicle drops below a threshold for a 2 minute interval. The Model 091-85-XX, Low Voltage Alarm/1901 is a voltage sensing device which is designed to fulfill the requirements of referenced NFPA 1901 Standard.

The Model 091-85-XX contains voltage sensing circuits, a 2 minute timer, an output relay as well as RED and GREEN colored LEDs to indicate status.

In operation the Model 091-85-XX continually monitors a system voltage present at J1-1 (+ VDC) with respect to J1-2 ( VDC Return). When the system voltage is equal to or greater than the following “Low Voltage Thresholds” the GREEN LED is illuminated indicating a normal system voltage.

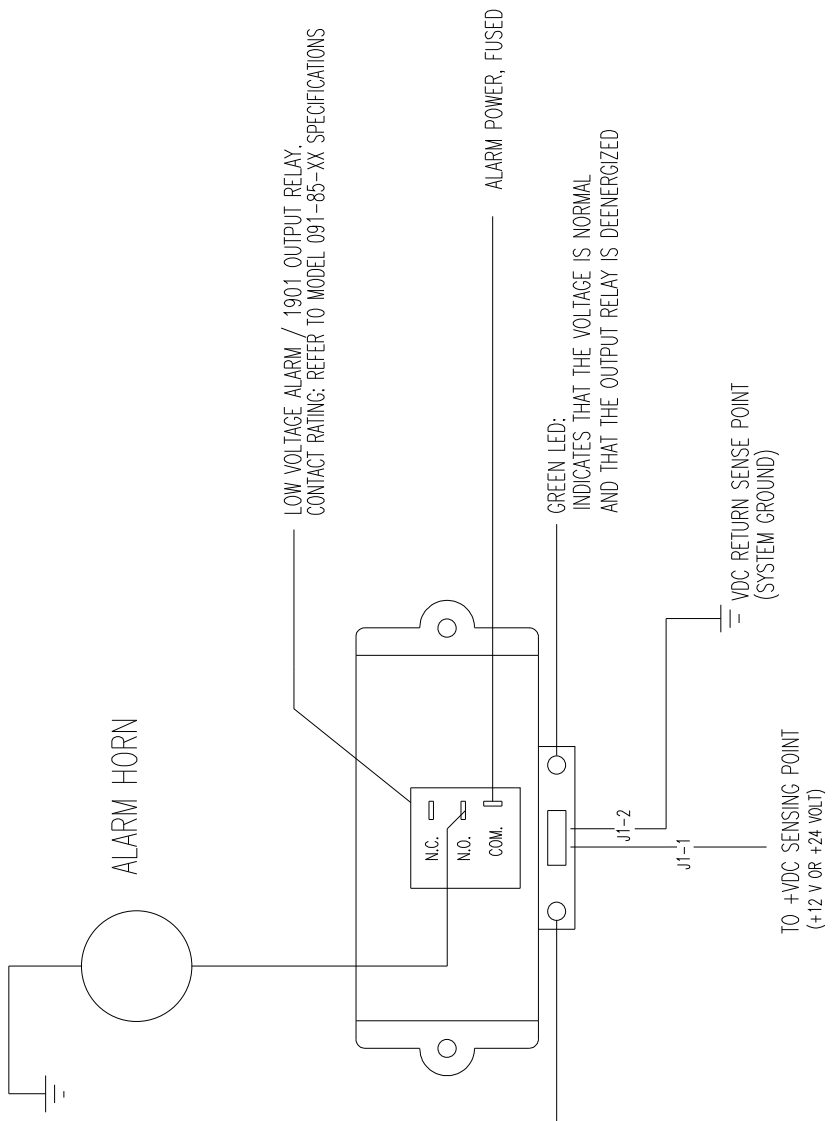
<u>Model Type</u>	<u>Nominal System Voltage</u>	<u>Low Voltage Threshold</u>
091-85-12	12.0VDC	11.8VDC
091-85-24	24.0VDC	23.6VDC
091-85-24-VER	24.0VDC	23.0VDC

Whenever the monitored system voltage drops below the Model Type “Low Voltage Threshold” a timer internal to the Model 091-85-XX is started. If the Low Voltage condition continues for more than 2 minutes the Model 091-85-XX output RELAY is energized, the GREEN LED will extinguish and the RED LED will illuminate. The output RELAY will remain energized (COM makes NO) until the sensed system voltage rises above;

12.8VDC for Model 091-82-12  
25.6VDC for Model 091-85-24  
24.8VDC for Model 091-85-24-VER

The output relay has both normally open (NO) and normally closed (NC) contacts available providing the installer with complete flexibility in wiring the alarm circuit. Any external alarm indicator or alarm horn must be provided by the installer consistent with the output relay contact ratings provided in Model specifications. The Model 091-85-XX is NOT waterproof so it is suggested that it be mounted in a suitable location. Care should be taken to wire the +VDC **AND** VDC Return sense lines to an electrical point representative of system voltage monitoring requirements so that an accurate indication of system voltage may be obtained. Fuse +VDC sense line as required using ONLY an ultra low resistance/voltage drop device.

Refer to Figure 1 for illustration of a typical wiring configuration and output relay contact rating(s).



LOW VOLTAGE ALARM / 1901 OUTPUT RELAY.  
CONTACT RATING: REFER TO MODEL 091-85-XX SPECIFICATIONS

ALARM POWER, FUSED

RED LED:  
INDICATES THAT LOW VOLTAGE HAS BEEN DETECTED.  
2 MINUTE TIMER HAS TIMED OUT AND RELAY IS ENERGIZED

GREEN LED:  
INDICATES THAT THE VOLTAGE IS NORMAL  
AND THAT THE OUTPUT RELAY IS DEENERGIZED

VDC RETURN SENSE POINT  
(SYSTEM GROUND)

TO +VDC SENSING POINT  
(+12 V OR +24 VOLT)

REV.B: 10-03-03, GENERAL UPDATE  
REV.A: 10/24/00 ADDED 24 VOLT DATA

KUSSMAUL ELECTRONICS CO. INC.  
TYPICAL INSTALLATION, LOW VOLTAGE ALARM / 1901

USE MODEL 091-85-12 FOR 12 VOLT SYSTEMS  
USE MODEL 091-85-24 FOR 24 VOLT SYSTEMS

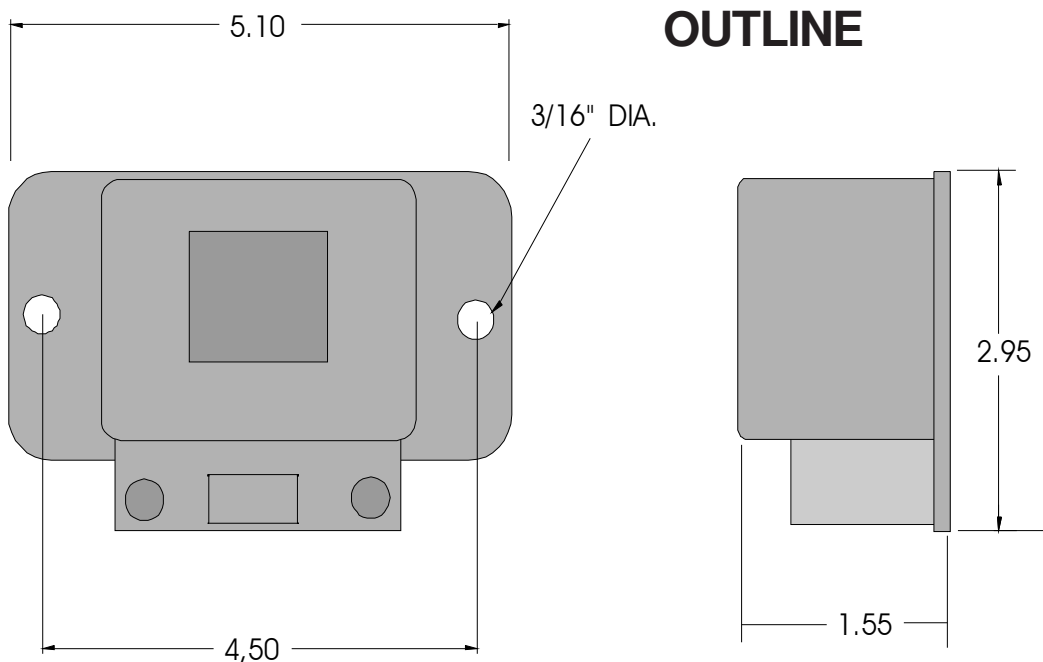
A Figure 1

Rev	B
Date	10-03-03
Drawn by	EWK
Sheet	1 of 1
Filename	P/c: M/91-85-24-VER

# SPECIFICATION AND OUTLINE

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- Temperature Environment:** Model 091-85-12, -24; 0 to 50 deg C.  
Model 091-85-24-VER; 0 to 100 deg C
- Main Input Power:** Model 091-85-12; 12VDC Nominal  
Model 091-85-24-XX; 24VDC Nominal
- Input Current:** Model 091-85-12: 120 ma, relay ON, 50 ma relay OFF  
Model 091-85-24: 75 ma, relay ON, 30 ma relay OFF
- Output Relay Rating:** Model 091-85-12:  
30A/240VAC/14VDC NO  
20A/240VAC/14VDC NC  
Model 091-85-24-XX:  
30A/240VAC/14VDC
- Low Voltage Alarm Threshold:** Model 091-85-12; 11.8VDC  
Model 091-85-24; 23.6VDC  
Model 091-85-24-VER: 23.0VDC
- Restoration Voltage Threshold:** Model 091-85-12; 12.8VDC  
Model 091-85-24; 25.6VDC  
Model 091-85-24-VER: 24.8VDC
- Low Voltage Duration for Alarm:** Fixed: Two (2) minutes +/- .5 minutes.
- Weight:** 0.5 lbs



# **INSTALLATION RECORD & WARRANTY**

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**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.