



A product of Tulsa Gas Technologies

TULSA GAS TECHNOLOGIES, INC.

4809 South 101 East Avenue • Tulsa, Oklahoma 74146

Phone: 918-665-2641 • Fax: 918-665-2657

www.tulsagastech.com

Installation and Operation of

LMS P91-500VA

LIGHTING CONTROL

LMS SHOULD BE INSTALLED TO MEET
ALL LOCAL AND NATIONAL CODES.

WARNING

Disconnect external power before
installation to prevent electrical shock or
equipment damage.

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.

Scope:

This controller is designed to stage the lights on and off, based on the amount of ambient light that the photo sensor receives. The adjustable light level settings lets you tune the light levels, then you can have as much split between stage one and stage two as you need. This controller has a delay feature on stage one that will allow you to spit the load on stage one and allow you to put more PL breakers on the same controller. The delay relay (DR1A) has a knob on it that can be adjusted for the amount of delay, a minimum of 5 seconds is recommended. The manual on switch lets you service the lights and also give you an all-lights on if there is a problem with the system. The LMS has a delay switch (Set-Run) that will put a preset amount of delay on the photocell.

Input Voltage:

The LMS P91 requires a dedicated circuit.
120 volt 60Hz.-65VA.

Bring 120 V power to TB-1 using 1/2" knock outs provided, taking care not to pass through DC control side.

Mounting:

Remove back plate from enclosure. Mount to wall using the pre-drilled holes, then replace the back plate.

Installation of Power Link breakers to LMS:

Using the 1/2" knock outs provided, install Stage 1 output lead to Terminal Board 2, marked "Stage 1", taking care to match red to red, black to black, and white to white.

Install Stage 2 output lead to Terminal Board 2, marked "Stage 2", taking care to match red to red, black to black, and white to white.

Electrical Rating

INPUT VOLTAGE: 120 VAC 50/60 HZ dedicated circuit

POWER CONSUMPTION: 65 VA

OUTPUT VOLTAGE: 24 VAC 75 VA MAX - 25 PL breakers MAX

AMBIENT TEMPERATURE RANGE: - 40°F to 140°F or (-40°C to 60°C)

HUMIDITY: 0-95% RH

SET POINT RANGE: 2 foot-candles to 80 foot-candles

SENSOR: Hermetically sealed cadmium sulfide photocell, 1000ft.
maximum distance between sensor and LMS P91

Two independent, time of day inputs for off timer override.

Override switch provided for service.

Installation of Photo Sensor:

Run two 600 V, #16 AWG, wire to Photo Sensor on top of canopy or building, and aim Sensor to Northern sky. The photo sensor has no polarity, wire to Terminal Board 2 marked "Photo Sensor." This is a 5V DC circuit.

Calibration:

Set Service Switch to "Normal."

Remove cover from LMS Controller

Locate Power LED, Stage 1 Reference LED, Stage 2 Reference LED, and the Set-Run Switch.

1. Turn LMS Power On, verify Green Power LED.
2. Adjust both Light Level Potentiometers (Pot.) to their full clockwise position (set them at the #1 position).
3. Move Set-Run Switch to "SET" position.
4. At the desired outdoor light level slowly rotate the Stage 1 Light Level Pot. counterclockwise until Stage 1 LED lights up. Stage 1 is now calibrated to the light level at the Sensor and Stage 1 is now energized.
5. Return Set-Run switch to "RUN" position.
6. To calibrate stage 2, repeat steps 3, 4, 5 except adjust state 2's Light Level Pot.
7. IMPORTANT: Return "Set-Run Switch" to the "RUN" position. There is a 10-30 second delay in the "RUN" position. This is necessary to prevent an oversensitive response from the outdoor Light Level Sensor

Manual Control of Lights:

Set Service Switch to "MANUAL ON", this will disconnect the LMS Controller from the LMS, and drive the Stage 1 & Stage 2 output to the "ON" position.

Returning the switch to "NORMAL" will reinstate the LMS Controller and return light to automatic control.

Trouble Shooting and Repair:

SYMPTOM: No reaction from LMS at darkness.

1. Cover Photo Sensor
2. Check Power Link Breakers, they must be in the "ON" position
3. Check for power LED light
4. Check 250 V 3 amp fuse on transformer
5. Check for proper wiring of power link breakers
6. Service switch must be in the normal position
7. Check for Red indicator LED lights on stage 1 and 2

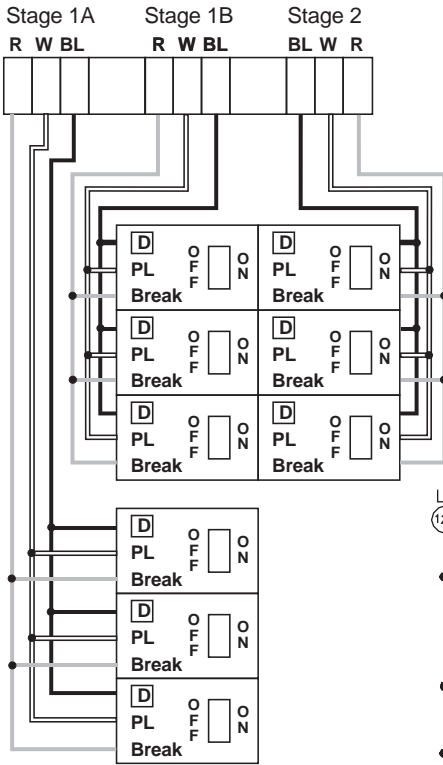
IF LED INDICATOR LIGHTS ARE OFF

1. Re-calibrate control, if no results, continue to next step.
2. Open one lead from photo sensor, if lights come on, replace photo sensor with LMS part #C7057A1000 photo sensor.
3. If lights stay off after photo sensor test replace LMS part #CR7075A1000

IF LED INDICATOR LIGHTS ARE ON

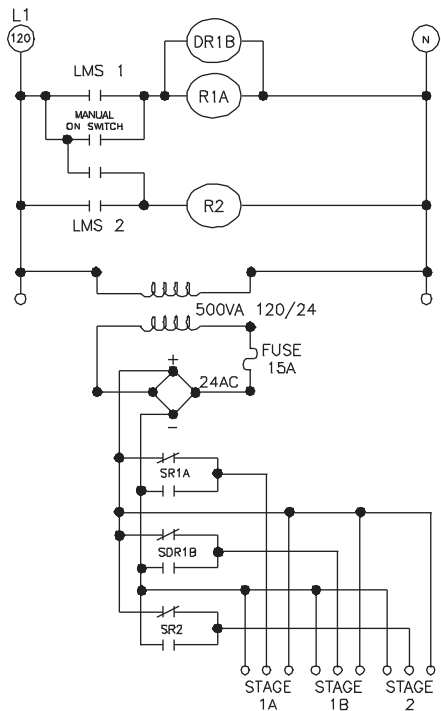
1. Check 24 v power supply at any red (+) and black (-) wire on Terminal Board 2. Meter should read 24 v DC. If no 24 v DC, check load side of transformer for 24 v AC. if 24 v AC is read at transformer, check bridge rectifier for open circuit.
2. To check operation of Power link Breakers, move Service Switch to "MANUAL" position, replace Power Link Breakers as necessary.

Field Connection Diagram for LMS P91-500VA

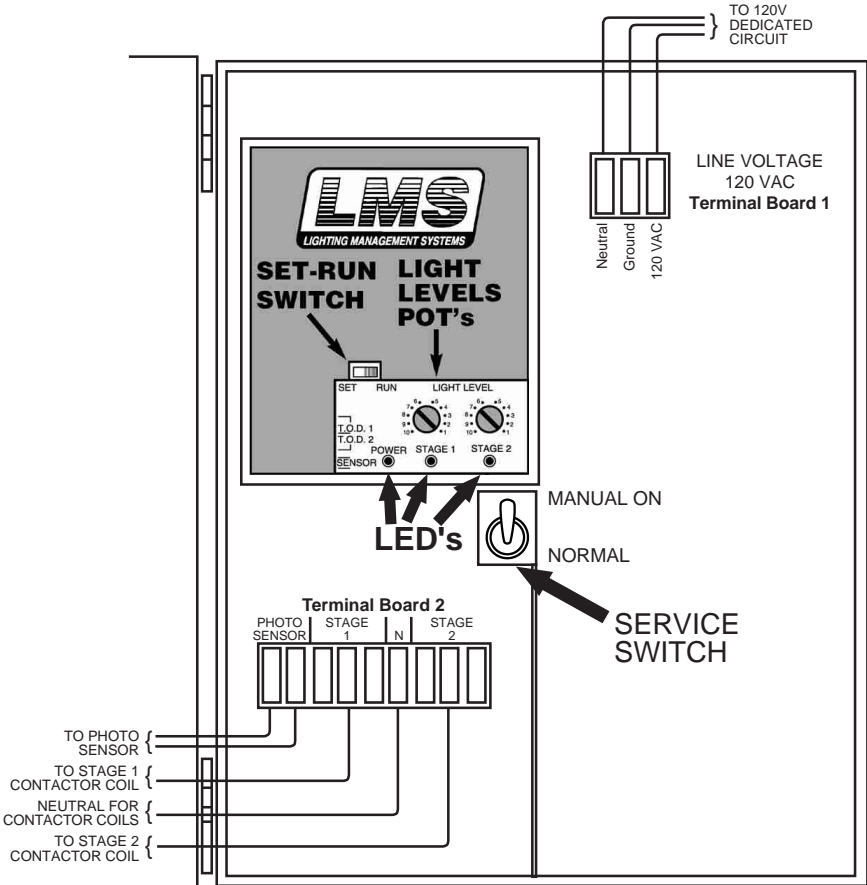


All Stage 1A, 1B & 2 – R, W and BL connect to each other.

P91-500VA Wiring



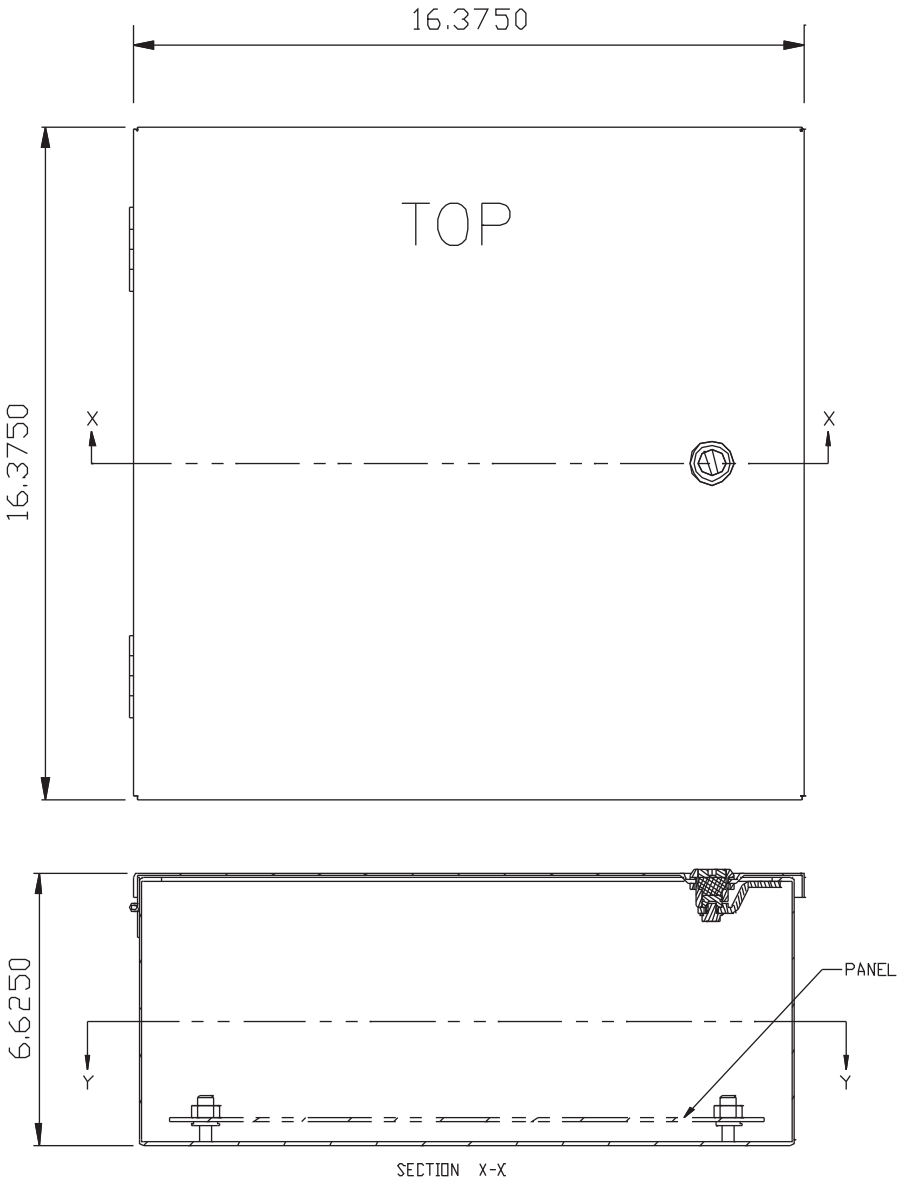
Field Connection Diagram for LMS P91-500VA



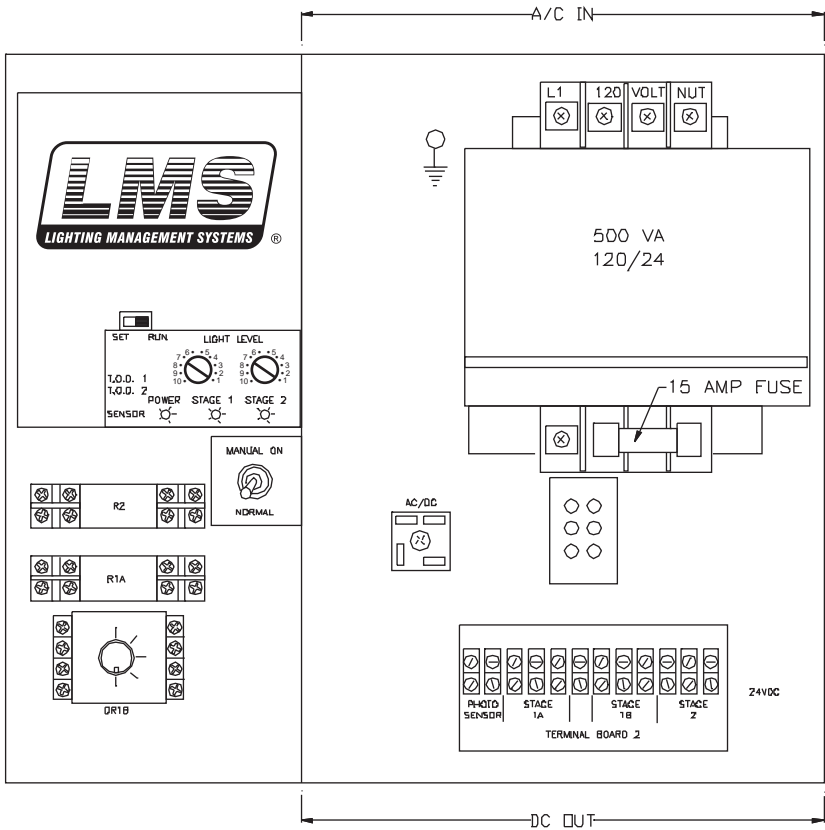
All (hook-up) field connected control wires should be 16 AWG, 600V.

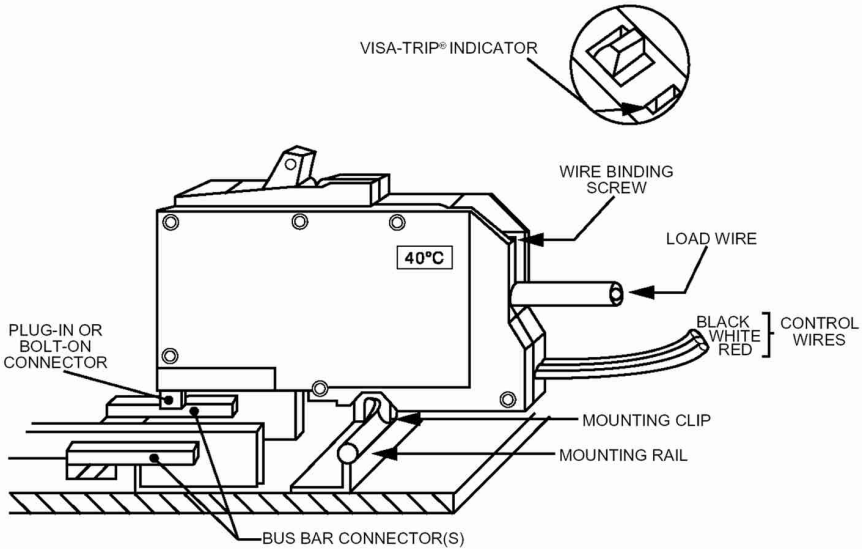
REFER TO INSTALLATION AND OPERATION OF
LMS P91-500VA LIGHTING CONTROL SHEET

P91-500VA ENCLOSURE



P91-500VA CONTROL BOARD





See chart below to order square D breakers

**FULL YEAR WARRANTY
ON ALL PARTS**

For use on specific equipment and lighting to manufacturer's design. Warranty does not cover damage from misuse, neglect or damage from power surges and transient spikes. Warranty does not cover unauthorized modifications to original design.

When ordering Square D breakers for P-91 lighting control, use suffix 5394 after the catalog number.

Ampere Rating	One-Pole 120/240Vac - 10,000A/C		Two-Pole 120/240Vac - 10,000A/C		Three-Pole 240Vac - 10,000A/C		Wire Size
	Plug-on Catalog No.	Bolt-on Catalog No.	Plug-on Catalog No.	Bolt-on Catalog No.	Plug-on Catalog No.	Bolt-on Catalog No.	
10	QO110PL	QOB110PL	QO210PL	QOB210PL			All Lugs Rated For AL/CU #14-#2
15	#*QO115PL	#*QOB115PL	*QO215PL	*QOB215PL	*QO315PL	*QOB315PL	
20	#*QO120PL	#*QOB120PL	*QO220PL	*QOB220PL	QO320PL	*QOB320PL	
25			*QO225PL	*QOB225PL	*QO325PL	*QOB325PL	
30	*QO130PL	*QOB130PL	*QO230PL	*QOB230PL	*QO330PL	*QOB330PL	
35			*QO235PL	*QOB235PL	*QO335PL	*QOB335PL	
40			*QO240PL	*QOB240PL	*QO340PL	*QOB340PL	
45			*QO245PL	*QOB245PL	*QO345PL	*QOB345PL	
50			*QO250PL	*QOB250PL	*QO350PL	*QOB350PL	
60			*QO260PL	*QOB260PL	*QO360PL	*QOB360PL	

UL listed as SWD (switching duty) rated. Suitable for switching 120Vac fluorescent lighting loads.
 * UL listed as HACR type for use with air conditioning, heating and refrigeration equipment having motor group combinations and marked for use with HACR type circuit breakers.
 All rated for HID Lighting