IMPORTANT!!!

PLEASE TAKE THE TIME TO FILL OUT THIS FORM COMPLETELY. FILE IT IN A SAFE PLACE. IN THE EVENT YOU EXPERIENCE PROBLEMS WITH OR HAVE QUESTIONS CONCERNING YOUR CONTROLLER, THE FOLLOWING INFORMATION IS NECESSARY TO OBTAIN PROPER SERVICE AND PARTS.

MODEL #     AA0XFMRM2OL2230V

SERIAL #     

PURCHASE DATE

PURCHASED FROM
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WARRANTY & RETURN POLICY

RETURN MERCHANDISE AUTHORIZATION (RMA) FORM
APPENDIX

1.0  CHASSIS LAYOUT .............................................................................................. 1233-R (REV A)

2.0  CHASIS SCHEMATIC ......................................................................................... 1233-S (REV A)

3.0  TOWER LIGHTING KIT 147’ ............................................................................. T1234

4.0  PHOTOCELL HOUSING DETAIL ....................................................................... 100239 (REV D)

5.0  L-810 OL-2 DOUBLE OBSTRUCTION LIGHT DETAIL ............................... FM10020 (REV D)

6.0  L-810 OL-2 DOUBLE OBSTRUCTION LIGHT ASSEMBLY DETAIL .... 310 (REV B)

7.0  L-810 OL-1 WIRING DETAIL ............................................................................. 274-S (REV A)

8.0  JUNCTION AND STRAIN RELIEF BOXES ........................................................ 100089 (REV A)
GENERAL INFORMATION

TWR Lighting®, Inc.’s Model AA0XFRM2OL2230V Controller is for application of AA0 lighting of a tower 147’ above ground level (AGL) in accordance with the Federal Advisory Circular 70/7460-1K with safety and reliability in mind. TWR® welcomes you to our family of fine products, and we look forward to servicing your needs now and in the future.

Two (2) L-810 double obstruction light fixtures will be at the top of the structure.

The first double obstruction light will burn steady. When a lamp failure occurs, it will transfer power to the secondary double obstruction light, and the first double obstruction light will shut down. Each fixture requires two (2) 116 Watt 230V AC bulbs (116A21TS230V).

A by-pass switch (SW1) allows the controller to turn on during daylight hours without covering the photocell.

The photocell is the 3 blade, twist to lock type.

Power supplied to the controller should be 230V AC 50 Hz.

Controller functions that are monitored by remote alarms in the form of dry contact closures are as follows:

FIRST DOUBLE OBSTRUCTION LIGHTS
Will give an alarm when one (1) of the two (2) lamps fails, and the secondary double obstruction light will activate.

NOTE – The second double obstruction light will not be monitored.
1.0 MOUNTING THE CONTROL CABINET  
(Refer to Drawing 1233-R)

1.1 The power supply control cabinet can be located at the base of the structure, or in an equipment building. Mounting footprints are shown on drawing 1233-R. Power wiring to the control cabinet should be in accordance with local methods and the National Electric Code (NEC).

1.1.1 If the control cabinet is mounted inside an equipment building, the photocell should be mounted vertically on ½” conduit outside the building above the eyes facing north. Wiring the photocell socket to the control cabinet should consist of one (1) each; red, black and white wires. The white wire is connected to the socket terminal marked “Com.” The black wire is connected to the terminal marked “B,” and the red wire is connected to the socket terminal marked “R.” As above, the photocell shall be positioned so that it does not “see” ambient light, which would prevent it from switching to the nightmode.

1.1.2 If the control cabinet is mounted outside an equipment building, the photocell should be mounted vertically on ½” conduit so the photocell is above the control cabinet. Care must be taken to assure that the photocell does not “see” any ambient light that would prevent it from switching into nightmode. The photocell wiring is the same as in 1.1.1.

1.2 The wiring from the photocell, the service breaker, and the sidelights should enter the control cabinet through the water tight connectors in the bottom of the cabinet. Inside the cabinet, the connections will be made on the terminal strip and circuit breakers located at the bottom of the chassis. These connections are made as follows:
2.0 EXTERNAL PHOTOCELL WIRING
(Refer to Drawing 1233-R)

2.1 Connect the **BLACK** wire from the photocell to terminal block (TB2) marked “L.”
2.2 Connect the **RED** wire from the photocell to terminal block (TB2) marked “SSR.”
2.3 Connect the **WHITE** wire from the photocell to terminal block (TB2) marked “N.”

3.0 POWER WIRING
(Refer to Drawing 1233-R)

3.1 Power wiring to the control cabinet should be in accordance with local methods and the NEC.
3.2 Circuit breaker needs to be rated at 5 amps.
3.3 Connect incoming 230V AC “HOT” to terminal block (TB1) marked “L.”
3.4 Connect neutral to one (1) of the terminal blocks (TB1) marked “N.”
3.5 Connect the AC ground to the grounding lug on plate.

4.0 1st and 2nd DOUBLE OBSTRUCTION LIGHT WIRING
(Refer to Drawing 1233-R)

4.1 Connect the **BLACK** wire from the first OL2 fixture to the circuit breaker marked “S1.”
4.2 Connect the **BLACK** wire from the second OL2 fixture to the circuit breaker marked "S2."
4.3 Connect the **NEUTRAL** wires to one (1) of the terminal blocks on (TB1) marked “N.”
INSTALLATION INSTRUCTIONS

5.0 1st DOUBLE OBSTRUCTION AND MID-LEVEL SIDELIGHTS ALARM WIRING
(Refer to Drawings 1233-R and 1233-S)

5.1 Dry contacts are provided for alarm monitoring of the 1st OL2 fixture. Alarm will occur in the event of one (1) lamp failure. The contact points for this fixture can be found on Module M1.

5.2 Alarm Wiring: To utilize the dry contacts, the customer will need one (1) pair of wires to interface with the alarm device. One (1) wire (common) will terminate on Module M1, terminal T4. The remaining wire will terminate as follows:

5.2.1 1st OL2 Alarm – Connect to Module M1, terminal T5, for normally open operations or terminal T6, for normally closed operations.

5.3 Alarm Testing: To test alarm, follow the procedures using an “OHM” meter between alarm common and alarm points.

5.3.1 1st OL2 fixture – Turn on switch SW1, or cover the photocell. Trip breaker S1 on the controller panel. A delay of a couple of seconds will be notified from the time of failure until the alarm pulls in as well as transfer occurs. At this time the standby condition red indicator on Module M1 will be illuminated, along with a change in status on the alarm contacts.
6.0 RED OBSTRUCTION LIGHTING

The only required maintenance needed to be performed is replacements of the lamps in the L-810 fixture. Lamps should be replaced after being operated for not more than 75% of the rated life, or immediately upon failure as per Federal Aviation Advisory Circular 70/7460-1K. By following these instructions, maximum safety and performance can be achieved.

TOOLS REQUIRED: NONE

6.1 L-810 LAMP REPLACEMENT

6.1.1 Unclasp the two (2) latches and allow the bail to recline backward.

6.1.2 Lift the lens up and over the lamp letting the lens hang from the safety cable.

6.1.3 Unscrew the lamp counter – clockwise and remove.

6.1.4 Install the new lamp by screwing the lamp clockwise.

6.1.5 Reinstall the lens, making sure it is seated properly on the base.

6.1.6 Reclasp the two (2) latches.

6.2 CONTROLLER

No scheduled maintenance is required. Perform on an as needed basis only.

6.3 PHOTOCELL

The photocell is a sealed unit. No maintenance is needed or required, other than replacement as needed.
7.0 POWER SUPPLY

230V AC enters the controller from the service breaker panel. Line sits at the 6390-FAA photocell waiting to be switched. When the 6390-FAA photocell is activated, line (SSR) energizes the rest of the controller. This can also be accomplished by using the photocell by-pass switch (SW1).

7.1 1st OBSTRUCTION LIGHTS – OL2

Line (SSR) is sent to Module M1, then to the breaker S1, and then on to the lamps. If the one (1) lamp from the OL2 extinguishes, then the transfer to the second OL2 will occur on that particular circuit as will a change in state on the alarm contacts.
# Major Components Parts List

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6390-FAA</td>
<td>120 – 230V Photocell</td>
</tr>
<tr>
<td>1</td>
<td>CM-250</td>
<td>Sidelight Burnout Current Sensor</td>
</tr>
<tr>
<td>1</td>
<td>VJ1008HWPL1X004</td>
<td>Enclosure</td>
</tr>
<tr>
<td>7</td>
<td>8WA1204</td>
<td>Terminal Block (TB1), (TB2)</td>
</tr>
<tr>
<td>2</td>
<td>S261D2</td>
<td>2 amp Breaker</td>
</tr>
<tr>
<td>2</td>
<td>8W1808</td>
<td>End Section</td>
</tr>
<tr>
<td>1</td>
<td>SSPIGTAIL</td>
<td>20’ Photocell Socket Pigtail</td>
</tr>
<tr>
<td>2</td>
<td>MOV1V250</td>
<td>Metal Oxide Varistor</td>
</tr>
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</table>
9.0 RECOMMENDED SPARE PARTS LIST

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6390-FAA</td>
<td>120 – 240V PHOTOCELL</td>
</tr>
<tr>
<td>1</td>
<td>CM-250</td>
<td>SIDELIGHT BURNOUT CURRENT SENSOR</td>
</tr>
<tr>
<td>1</td>
<td>S261D2</td>
<td>2 amp BREAKER</td>
</tr>
</tbody>
</table>
RETURN MATERIAL AUTHORIZATION (RMA) FORM

RMA#:_________________________ DATE:_________________________

CUSTOMER:____________________________________________________

______________________________________________________________

CONTACT:____________________ PHONE NO.:_____________________

ITEM DESCRIPTION (PART NO.):___________________________________

_________________________________________________________________

MODEL NO.:____________________ SERIAL NO.:____________________

ORIGINAL TWR INVOICE NO.:_________ DATED:____________________

DESCRIPTION OF PROBLEM:_____________________________________

_________________________________________________________________

_________________________________________________________________

SIGNED____________________ DATE NEEDED____________________

RETURN ADDRESS:________________________________________________

_________________________________________________________________

PLEASE RETURN PRODUCT TO: 4300 WINDFERN RD #100 HOUSTON TX 77041-8943
RETURN MATERIAL AUTHORIZATION (RMA) FORM

RMA#: ___________________________ DATE: ___________________________

CUSTOMER: ______________________________________________________

_______________________________________________________________

CONTACT: ___________________________ PHONE NO.: __________________

ITEM DESCRIPTION (PART NO.): ______________________________________

___________________________________________________________________

MODEL NO.: _______________ SERIAL NO.: ____________________________

ORIGINAL TWR INVOICE NO.: ___________________ DATED: __________

DESCRIPTION OF PROBLEM: ______________________________________

___________________________________________________________________

___________________________________________________________________

SIGNED ___________________________ DATE NEEDED ___________________

RETURN ADDRESS: ___________________________________________________

PLEASE RETURN PRODUCT TO: 4300 WINDFERN RD #100 HOUSTON TX 77041-8943
1. Plug 6390-FAA PHOTOCCELL into 43109 TWIST LOCK RECEPTACLE and twist to lock.
2. Wires are connected letter to letter. (Example) S1 to S1...

NOTES:
BILL OF MATERIALS

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>QTY.</th>
<th>TWR PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>OL2</td>
<td>DOUBLE OBSTRUCTION LIGHT</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>116A21TS250V</td>
<td>116 WATT 250 VOLT LAMP</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>CGB295SA</td>
<td>3/4&quot; CORD CONNECTOR 0.5-0.625</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>JR8</td>
<td>3/4&quot; JUNCTION BOX</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>TZ7CG</td>
<td>3/4&quot; CONDUIT W/COVER AND GASKET</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>EL34890</td>
<td>3/4&quot; x 90° SHORT ELBOW</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>SDS2902</td>
<td>BREATHER</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>SS5012</td>
<td>WRAPLOCK 50'</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>PIPDOP</td>
<td>4 oz. PIPE DOP</td>
</tr>
<tr>
<td>11</td>
<td>4</td>
<td>A314</td>
<td>3/4&quot; CONDUIT LOCKNUTS</td>
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<tr>
<td>12</td>
<td>2</td>
<td>HE482</td>
<td>3/4&quot; NO THREAD CONNECTOR</td>
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<tr>
<td>13</td>
<td>1</td>
<td>N34T3</td>
<td>3/4&quot; x 3&quot; NIPPLE</td>
</tr>
<tr>
<td>14</td>
<td>2</td>
<td>NMT12</td>
<td>3/4&quot; x 1/2&quot; NIPPLE</td>
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<tr>
<td>15</td>
<td>1</td>
<td>TAPET</td>
<td>BLACK ELECTRICAL TAPE</td>
</tr>
<tr>
<td>16</td>
<td>4</td>
<td>WIRENUTRED</td>
<td>RED WIRE NUT</td>
</tr>
<tr>
<td>17</td>
<td>2'</td>
<td>12THN5RRN</td>
<td>#12 THHN GREEN WIRE</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>2</td>
<td>OL2PIGTAILE</td>
<td>18&quot; OL2 PIGTAIL</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>STCAPIE</td>
<td>CABLE TIES (TWR. HT. = 5)</td>
</tr>
<tr>
<td>21</td>
<td>1</td>
<td>CABLEGRIP1</td>
<td>SINGLE EYE LACE MESH 0.5 - 0.62</td>
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<tr>
<td>22</td>
<td>1</td>
<td>AAO-230V CONTROLLER</td>
<td>AAO-230V CONTROLLER</td>
</tr>
<tr>
<td>23</td>
<td>10'</td>
<td>CONDUIT34</td>
<td>3/4&quot; CONDUIT (FOR OLS)</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>STCAPIE8OB</td>
<td>OBSTRUCTION LIGHT CABLE(TWR. HT. +30')</td>
</tr>
</tbody>
</table>

= NOT SHOWN

NOTES:
1) USE TWR PART #WIRENUTRED AND TAPET TO CONNECT STAINLESS STEEL WIRE TO OL2PIGTAILE.
2) PHOTOCELL AND PIGTAIL PROVIDED WITH CONTROLLER. PHOTOCELL IS TO BE MOUNTED OUTDOORS.
3) BREATHERS ALLOW FOR CIRCULATION OF AIR TO PREVENT CONDENSATION.
4) STAINLESS STEEL WRAPLOCK TO BE ATTACH TO OL CONDUIT EVERYWHERE IT MEETS STRUCTURE.

STRUCTURE HEIGHT 45M/147’

TOWER WIRING AND ASSEMBLY

AAO LIGHTING KIT W/ TOP OL2 XFER
1. Item #7 can be used to reduce 3/4" conduit to 1/2" conduit at the housing or at the controller itself.

2. If additional wire is required over the factory 20', use the following chart:
   - 21' to 300' = 16 AWG TFFN
   - 301' to 500' = 14 AWG TFFN

3. Wire connections are to be tinned at item 3.
For use as an obstruction light on towers, buildings, etc. ETL approved to meet or exceed all FAA specifications as found in AC 150/5345-43 Type L-810.

When used with our AOXFR controller, when one bulb burns out, the unit automatically switches to backup bulb.

High temperature ultra pure FAA approved aviation red, blue yellow and clear lenses.

High quality porcelain receptacle.

Neoprene gaskets for weatherproofing.

Stainless steel safety cable.

Stainless steel latches and hardware for corrosion protection.

Standard 3/4” NPT

No special tools required for maintenance.

General Specifications

Height 7 inches (38.1 cm)
Weight 10 lbs. (4.5 kg)
Power 120 to 240V AC, 50 or 60Hz
Uses 116W, 120 or 240V bulbs
Bulbs sold separately
### PARTS LIST

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QTY</th>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>AP35222</td>
<td>RED SIDELIGHT GLASS</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>OL2C</td>
<td>DOUBLE SIDELIGHT BODY</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>106C</td>
<td>LENS HOLDER RING</td>
</tr>
<tr>
<td>4</td>
<td>12V245</td>
<td>OL LEN CLIP</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>832X14PH</td>
<td>8-32 X 1/4 PH SS SLOT SCREW</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>HC255SS</td>
<td>SIDELIGHT LATCHES</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>7X7SS</td>
<td>1/16 HOL 7X7 S.S. WI'RE</td>
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<tr>
<td>8</td>
<td>A1A</td>
<td>STAKON CRIMP</td>
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</tr>
<tr>
<td>9</td>
<td>2</td>
<td>OLG</td>
<td>OL GASKET</td>
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<td>10</td>
<td>TWR19062</td>
<td>SIDELIGHT RECEPTACLE</td>
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<tr>
<td>11</td>
<td>100324</td>
<td>OL2 SERIAL NUMBER LABEL</td>
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<tr>
<td>12</td>
<td>18P155</td>
<td>1/8 X .40 SS POP RIVET</td>
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<td>13</td>
<td>A314</td>
<td>3/4&quot; CONDUIT LOCKNUT GALV.</td>
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<tr>
<td>14</td>
<td>4</td>
<td>104G</td>
<td>WHITE TEFLOM WASHER</td>
</tr>
<tr>
<td>15</td>
<td>832X34PH</td>
<td>8-32 X 3/4&quot; S.S. PH SLOT</td>
<td></td>
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<tr>
<td>16</td>
<td>2</td>
<td>116A21TS</td>
<td>116W-120V LAMP (TYP.)</td>
</tr>
</tbody>
</table>

* = PART NOT SHOWN  
~ = PART SOLD SEPARATELY

**NOTE:**  
1. FAA APPROVED LIGHT USES THE 116A21TS LAMP. OTHER LAMPS ARE AVAILABLE TO MEET YOUR APPLICATION.
NOTES:

1) DRAWING ILLUSTRATES METHOD OF STRAIN RELIEVING WIRE. USE THIS METHOD ON ALL JUNCTION BOXES.

2) THE NATIONAL ELECTRICAL CODE—ARTICLE 300-19-83 REQUIRES CONDUCTORS IN A VERTICAL CONDUIT BE SUPPORTED TO RELIEVE STRAIN ON TERMINAL BLOCK CONNECTIONS.

3) SKETCH ILLUSTRATES METHOD OF STRAIN RELIEVING A SINGLE CONDUCTOR. SEVERAL CONDUCTORS MAY BE GROUPED TOGETHER.

4) CONDUCTORS MAY BE MIXED BUT SHOULD NOT TAKE UP MORE THAN 40% OF CONDUIT’S INSIDE AREA.

<table>
<thead>
<tr>
<th>AWG</th>
<th>MAX. NUMBER WIRE SIZE</th>
<th>MAX. NUMBER WIRE</th>
<th>WIRE AREA</th>
<th>WEIGHT PER 100 FEET</th>
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<tr>
<td>12 THHN</td>
<td>16</td>
<td>26</td>
<td>0.0117</td>
<td>2.50</td>
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<tr>
<td>10 THHN</td>
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<td>17</td>
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<td>4.10</td>
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<td>8 THHN</td>
<td>6</td>
<td>9</td>
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<td>6.70</td>
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<tr>
<td>6 THHN</td>
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<td>7</td>
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</tr>
<tr>
<td>4 THHN</td>
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