

TWR Lighting, Inc. **MARK**

Enlightened Technology®

10810 W. LITTLE YORK RD., #130 HOUSTON, TX 77041-4051

VOICE (713) 973-6905 FAX (713) 973-9352

web: www.twrlighting.com

IMPORTANT !!!

PLEASE TAKE THE TIME TO FILL OUT FORM COMPLETELY. FILE 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 # AA3/5MLED

SERIAL # _____

PURCHASE DATE _____

PURCHASED FROM _____

TWR Lighting, Inc. **MARK**

Enlightened Technology®

AA3/5MLED CONTROLLER

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AA3/5MLED CONTROLLER

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TWR Lighting[®], Inc. **MARK[®]**

Enlightened Technology[®]

AA3/5MLED CONTROLLER

1.0 GENERAL INFORMATION

The TWR Lighting[®], Inc. (TWR[®]) Model AA3/5M-LED Controller is made for A3 lighting of towers 701' to 1,050' above ground level (AGL), in accordance with the FAA A/C 70/7460-1K. One (1) LED Beacon should be placed at the top of the structure, two (2) LED Beacons at the 2/3 interval, and two (2) LED Beacons at the 1/3 interval with respect to overall tower height. Obstruction LED Sidelights should be placed at the 5/6, 1/2, and 1/6 intervals.

The flash rate of the LED Beacons is thirty (30) per minute. The LED Beacons flash synchronized to one another. The LED Sidelights steady burn.

Power supplied to the controller shall be 120V AC single phase.

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

POWER FAILURE	Monitors 120V AC to the controller. Relay K1 alarms in the event of power failure or tripped circuit breaker.
"LIGHTS ON"	K2 relay will give an indication whenever the controller is activated.
LED BEACONS	Will give an alarm in the event one (1) LED BEACON fails on any level.
FLASHER FAILURE	K3 relay will give an alarm in the event of flasher failure.
OBSTRUCTION LIGHTS	Will give an alarm when one (1) of three (3) sidelights fails.

AA3/5MLED CONTROLLER

2.0 INSTALLATION INSTRUCTIONS

WARNING DANGER !!!!

THIS SYSTEM OPERATES AT HIGH VOLTAGE LEVELS THAT COULD BE LETHAL TO SERVICE PERSONNEL. ALL INSTALLATION AND MAINTENANCE WORK SHOULD BE DONE BY QUALIFIED SERVICE PERSONNEL ONLY. WHEN PERSONNEL IS INSTALLING SYSTEM OR PERFORMING MAINTENANCE ON THIS SYSTEM, MAKE SURE THE POWER IS TURNED OFF AT THE SERVICE BREAK PANEL!!

READ AND UNDERSTAND THE THEORY OF OPERATION AND ITS SAFETY MESSAGES BEFORE ATTEMPTING INSTALLATION/MAINTENANCE OF THIS SYSTEM.

2.1 POWER SUPPLY CONTROL CABINET MOUNTING (Refer to Drawing 1199-R)

- 2.1.1** 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 1199-R. Power wiring to the control cabinet should be in accordance with local methods and National Electrical Codes (NEC).
- 2.1.2** If the control cabinet is mounted inside an equipment building, the photocell should be mounted vertically on ½" conduit outside the building above the eaves facing north. Wiring from 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 "N," the black wire is connected to the socket terminal marked "L," and the red wire is connected to the socket terminal marked "LO." As above, the photocell should be positioned so that it does not "see" ambient light, which would prevent it from switching to the nightmode.

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2.1.3 If the control cabinet is mounted outside an equipment building, the photocell should be mounted vertically on 1/2" 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 the nightmode. The photocell wiring is the same as in 2.1.1.

2.1.4 The wiring from the photocell, the service breaker, the LED beacon, and the LED sidelights should enter the control cabinet through the watertight connectors in the bottom of the cabinet. Inside the cabinet, the connections will be made on the terminal strips and circuit breakers located at the bottom of the chassis. These connections are made as follows:

2.2 PHOTOCELL WIRING (Refer to Drawing 1199-R)

2.2.1 Connect the **BLACK** wire from the photocell to terminal block TB2 marked "L."

2.2.2 Connect the **RED** wire from the photocell to terminal block TB2 marked "SSR."

2.2.3 Connect the **WHITE** wire from the photocell to terminal block TB2 marked "N."

2.3 POWER WIRING (Refer to Drawing 1199-R)

2.3.1 Power wiring to the control cabinet should be in accordance with local methods and NEC.

2.3.2 Circuit breaker needs to be a one (1) pole rated at 15 amps.

2.3.3 Connect incoming 120V AC "Hot" to terminal block TB1 marked "L."

2.3.4 Connect neutral to one (1) of the terminal blocks TB1 marked "N."

2.3.5 Connect the AC ground to the aluminum mounting lug bolts on the panel.

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2.4 LED BEACON AND SIDELIGHT WIRING

(Refer to Drawings 1199-R, 802-01 or 802-02)

Install wiring between the controller and the LED Beacons utilizing either strobe cable or conduit method. Refer to drawings 1199-R, 802-01 or 802-02 for installation of light kits. Following these requirements, installing light kits will require lifting of the cable by the supplied cable grip or conduit to affix to the tower. Always work safely and adhere to all OSHA Safety Guidelines when lifting wiring or working on the structure or tower itself. It is the installer's responsibility to install the lighting kit in a safe manner. Installers can request from OSHA their requirements 29CFT 1926.21, and 20CFR 1926.105, to ensure compliance to regulations.

NOTE: On occasion, a set of custom lighting kit drawings may be specifically requested by a customer and installed in this manual. In cases such as these, the drawings will precede the manual if a conflict occurs.

- 2.4.1** Connect the **BLACK** wire from LED Beacon #1 to circuit breaker marked "BL1."
- 2.4.2** Connect the **BLUE** wire from LED Beacon #2 and LED Beacon #3 to circuit breaker marked "BL2."
- 2.4.3** Connect the **BROWN** wire from LED Beacon #4 and LED Beacon #5 to circuit breaker marked "BL3."
- 2.4.4** Connect the **RED** wire from LED Sidelight group #1 to circuit breaker marked "SL1."
- 2.4.5** Connect the **YELLOW** wire from LED Sidelight group #2 to circuit breaker marked "SL2."
- 2.4.6** Connect the **PURPLE** wire from LED Sidelight group #3 to circuit breaker marked "SL3."
- 2.4.7** Connect the **WHITE** neutral wire(s) to one (1) or more of the terminal blocks on TB1 marked "N."

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2.5 LED BEACON AND LED SIDELIGHT ALARM WIRING

(Refer to Drawings 1199-R and 1199-S)

- 2.5.1** Alarm relays K1 – K3, and alarm modules M2 – M7 are provided for independent contact closures for: Power Failure, Lights “ON,” Flasher Failure, LED Beacon Burnout, and LED Sidelight Burnout.
- 2.5.2** Alarm Wiring – To utilize all of the red light alarms, the customer will need nine (9) pairs of wires to interface with the alarm device. One (1) wire from each of the nine (9) pairs will terminate at the points marked common. The remaining wire from each pair will terminate as follows.
- 2.5.3** Power Failure Alarm – Connect to Relay K1, terminal #3, for normally open, or terminal #6, for normally closed monitoring.
- 2.5.4** Tower Lights "ON" – Connect to Relay K2, terminal #3, for normally open, or terminal #6, for normally closed monitoring.
- 2.5.5** Flasher Failure – Connect to Relay K3, terminal #6, for normally open, or terminal #3, for normally closed monitoring.
- 2.5.6** SL1 level Burnout – Connect to Module M5, terminal #18, for normally open, or terminal #16, for normally closed monitoring.
- 2.5.7** SL2 level Burnout – Connect to Module M6, terminal #18, for normally open, or terminal #16, for normally closed monitoring.
- 2.5.8** SL3 level Burnout – Connect to Module M7, terminal #18, for normally open, or terminal #16, for normally closed monitoring.
- 2.5.9** BL1 level Burnout – Connect to Module M2, terminal #18, for normally open, or terminal #16, for normally closed monitoring.
- 2.5.10** BL2 level Burnout – Connect to Module M3, terminal #18, for normally open, or terminal #16, for normally closed monitoring.
- 2.5.11** BL3 level Burnout – Connect to Module M4, terminal #18, for normally open, or terminal #16, for normally closed monitoring.

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2.6 ALARM TESTING

To test alarms, follow the procedures using an “ohm” meter between alarm common and alarm points.

POWER FAILURE Pull circuit breaker at electrical panel.

TOWER LIGHTS “ON” Operate photocell by-pass switch (SW1) or cover the photocell.

LED BEACONS and LED SIDELIGHTS
Pull circuit breakers on controller panel.

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3.0 THEORY OF OPERATION

3.1 POWER SUPPLY

120V AC enters the controller from the circuit breaker panel. Line (L) sits at the PRD waiting to be switched and also keeps the power failure Relay K1 energized. When the 6390-FAA photocell is activated, line (L) energizes the coil of the PRD and K2 "Lights On" Relay. This also can be accomplished by using the photocell by-pass switch (SW1).

3.2 LED SIDELIGHTS

Line LDS is sent to Modules M5, M6, and M7, which are current sensing modules for the LED Sidelights. Each RM4JA31MW monitors one (1) level of LED Sidelights, and will provide a contact closure along with a visual indication if one (1) or more fails.

3.3 LED BEACONS

Line LDB is sent to Modules M1, M2, M3, and M4. Module M1 is the primary flasher for the LED beacons. The output of Module M1 is sent through the current sensing Modules M2, M3, and M4, then to the circuit breaker outputs BL1, BL2, and BL3. If Modules M2, M3, or M4 detect a lamp burnout, then the module would provide a contact closure along with a visual indication for that lamp circuit.

Relay K3 is a Flasher Failure Relay for the LED Beacons. If Relay K3 detects a Flasher Failure, it would then provide a contact closure for the flasher circuit.

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4.0 MAINTENANCE GUIDE

4.1 RED OBSTRUCTION LIGHTING

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

TOOLS REQUIRED: NONE

4.2 L-864 LED BEACON REPLACEMENT

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

4.3 L-810 LED SIDELIGHT REPLACEMENT

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

4.4 L-864 CONTROLLER

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

4.5 PHOTOCELL

The photocell is a sealed unit. No maintenance is needed nor required other than replacement as necessary.

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5.0 MAJOR COMPONENTS PARTS LIST

QTY	PART NUMBER	DESCRIPTION
1	PF-250 (This replaces the FS155-30T Module)	SOLID STATE FLASHER (M1)
1	PRD 7AGO	120V AC LOAD CONTACTOR (PRD)
2	KRPA5AG120V	S.P.S.T. RELAY (K1 & K2)
1	6390-FAA (This replaces the 102FAA Photocell)	120 - 240V PHOTOCCELL
2	MOV524V15	MOV1, MOV2 VARISTOR
1	SPEC 224	TIME DELAY RELAY (K3)
1	STJ01002	SWITCH (SW1)
2	S261D1.5	1.5 amp CIRCUIT BREAKERS (BL2 and BL3)
8	8WA1204	TERMINAL BLOCK (TB1 & TB2)
2	8WA1808	TERMINAL BLOCK END STOP
6	RM4JA31MW	LED BEACONS and LED SIDELIGHTS CURRENT SENSORS (M2 – M7)
4	S261D1	1 amp CIRCUIT BREAKERS (BL1, SL1-SL3)
1	STA40007	1200 ohm 20W RESISTOR

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6.0 SUGGESTED SPARE PARTS LIST

QTY	PART NUMBER	DESCRIPTION
1	6390-FAA (This replaces the 102FAA Photocell)	120 - 240V PHOTOCCELL
1	PF-250 (This replaces the FS155-30T Module)	SOLID STATE FLASHER (M1)
1	SPEC 224	TIME DELAY RELAY (K3)
1	KRPA5AG120V	SPST RELAY (K1 or K2)
2	RM4JA31MW	LED BEACONS and LED SIDELIGHTS CURRENT SENSORS (M2 – M7)

TWR Lighting, Inc.

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Warranty & Return Policy

TWR Lighting®, Inc. (“TWR®”) warrants its products (other than “LED Product”) against defects in design, material (excluding incandescent bulbs) and workmanship for a period ending on the earlier of two (2) years from the date of shipment or one (1) year from the date of installation.

TWR Lighting®, Inc. (“TWR®”) warrants its “LED Product” against defects in design, material and workmanship for a period of five (5) years from the date of shipment. TWR®, at its sole option, will, itself, or through others, repair, replace or refund the purchase price paid for “LED Product” that TWR® verifies as being inoperable due to original design, material, or workmanship. All warranty replacement “LED Product” is warranted only for the remainder of the original warranty of the “LED Product” replaced. Replacement “LED Product” will be equivalent in function, but not necessarily identical, to the replaced “LED Product.”

TWR Lighting®, Inc. (“TWR®”) warrants its “LED Product” against light degradation for a period of five (5) years from the date of installation. TWR®, at its sole option, will, itself, or through others, repair, replace, or refund the purchase price paid for “LED Product” that TWR® verifies as failing to meet 75% of the minimum intensity requirements as defined in the FAA Advisory Circular 150/5345-43G dated 09/26/12. All warranty replacement “LED Product” is warranted only for the remainder of the original warranty of the “LED Product” replaced. Replacement “LED Product” will be equivalent in function, but not necessarily identical, to the replaced “LED Product.”

Replacement parts (other than “LED Product”) are warranted for 90 days from the date of shipment.

Conditions not covered by this Warranty, or which might **void** this Warranty are as follows:

- x Improper Installation or Operation
- x Misuse
- x Abuse
- x Unauthorized or Improper Repair or Alteration
- x Accident or Negligence in Use, Storage, Transportation, or Handling
- x Any Acts of God or Nature
- x **Non-OEM Parts**

The use of Non-OEM parts or modifications to original equipment design will void the manufacturer warranty and could invalidate the assurance of complying with FAA requirements as published in Advisory Circular 150/5345-43.



AA3/5MLED CONTROLLER

Warranty & Return Policy (continued)

Field Service – Labor, Travel, and Tower Climb are not covered under warranty. Customer shall be obligated to pay for all incurred charges. An extensive network of certified and insured Service Representatives is available if requested.

Repair, Replacement or Product Return RMA Terms – You must first contact our Customer Service Department at **713-973-6905** to acquire a Return Merchandise Authorization (RMA) number in order to return the product(s). Please have the following information available when requesting an RMA number:

- x The contact name and phone number of the tower owner or
- x The contact name and phone number of the contractor
- x The site name and number
- x The part number(s)
- x The serial number(s) (if any)
- x A description of the problem
- x The billing information
- x The Ship To address

This RMA number must be clearly visible on the outside of the box. If the RMA number is not clearly labeled on the outside of the box, your shipment will be refused. Please ensure the material you are returning is packaged carefully. **The warranty is null and void if the product(s) are damaged in the return shipment.**

All RMAs must be received by TWR LIGHTING®, INC., 10810 W. LITTLE YORK RD., #130, HOUSTON, TX 77041-4051, within 30 days of issuance.

Upon full compliance with the Return Terms, TWR® will replace, repair and return, or credit product(s) returned by the customer. It is TWR®'s sole discretion to determine the disposition of the returned item(s).

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Warranty & Return Policy (continued)

RMA Replacements – Replacement part(s) will be shipped and billed to the customer for product(s) considered as Warranty, pending return of defective product(s). When available, a certified reconditioned part is shipped as warranty replacement with a Return Merchandise Authorization (RMA) number attached. Upon receipt of returned product(s), inspection, testing, and evaluation will be performed to determine the cause of defect. The customer is then notified of the determination of the testing.

- x Product(s) that is deemed defective and/or unrepairable and covered under warranty - a credit will be issued to the customer's account.
- x Product(s) found to have no defect will be subject to a **\$75.00 per hour testing charge (1 hour minimum), which will be invoiced to the customer.** At this time the customer may decide to have the tested part(s) returned and is responsible for the return charges.
- x Product(s) under warranty, which the customer does not wish returned, the customer will be issued a credit against the replacement invoice.

RMA Repair & Return – A Return Merchandise Authorization (RMA) will be issued for all part(s) returned to TWR® for repair. Upon receipt of returned product(s), inspection, testing, and evaluation will be performed to determine the cause of defect. The customer is then notified of the determination of the testing. If the returned part(s) is deemed unrepairable, or the returned part(s) is found to have no defect, the customer will be subject to a **\$75.00 per hour testing charge (1 hour minimum), which will be invoiced to the customer.** Should the returned parts be determined to be repairable, a written estimated cost of repair will be sent to the customer for their written approval prior to any work being performed. In order to have the tested part(s) repaired and/or returned, the customer must issue a purchase order and is responsible for the return shipping charges.

RMA Return to Stock – Any product order that is returned to TWR® for part(s) ordered incorrectly or found to be unneeded upon receipt by the customer, the customer may be required to pay a minimum **20% restocking fee.** Product returned for credit must be returned within 60-days of original purchase, be in new and resalable condition, and in original packaging. Once the product is received by TWR it's condition will be evaluated and a credit will be issued only once it is determined that the RMA Return Terms have been met.

Credits – Credits are issued once it is determined that all of the Warranty and Return Terms are met. All credits are processed on Fridays. In the event a Friday falls on a Holiday, the credit will be issued on the following Friday.



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Warranty & Return Policy (continued)

Freight – All warranty replacement part(s) will be shipped via ground delivery and paid for by TWR®. Delivery other than ground is the responsibility of the customer.

REMEDIES UNDER THIS WARRANTY ARE LIMITED TO PROVISIONS OF REPLACEMENT PARTS AND REPAIRS AS SPECIFICALLY PROVIDED. IN NO EVENT SHALL TWR® BE LIABLE FOR ANY OTHER LOSSES, DAMAGES, COSTS, OR EXPENSES INCURRED BY THE CUSTOMER, INCLUDING, BUT NOT LIMITED TO, LOSS FROM FAILURE OF THE PRODUCT(S) TO OPERATE FOR ANY TIME, AND ALL OTHER DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING ALL PERSONAL INJURY OR PROPERTY DAMAGE DUE TO ALLEGED NEGLIGENCE, OR ANY OTHER LEGAL THEORY WHATSOEVER. THIS WARRANTY IS MADE BY TWR® EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESSED OR IMPLIED. WITHOUT LIMITING THE GENERALITY OF THE FORGOING, TWR® MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS OF THE PRODUCT(S) FOR ANY PARTICULAR PURPOSE. TWR® EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES.

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AA3/5MLED CONTROLLER

RETURN MERCHANDISE 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: 10810 W. LITTLE YORK RD., #130 HOUSTON, TX 77041-4051

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AA3/5MLED CONTROLLER

RETURN MERCHANDISE 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: _____

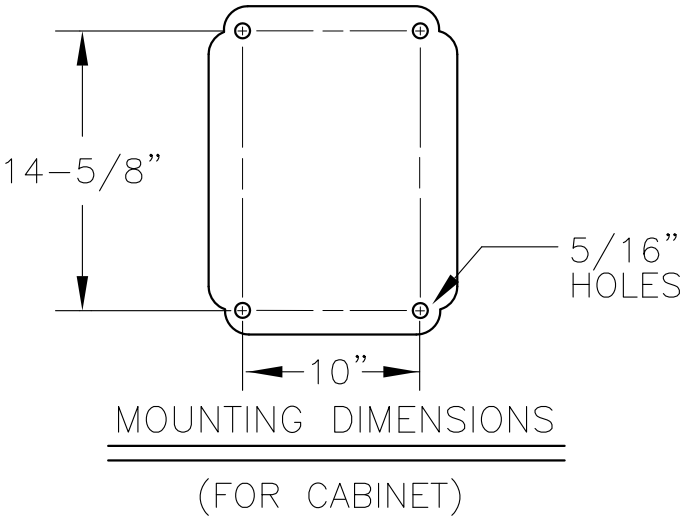
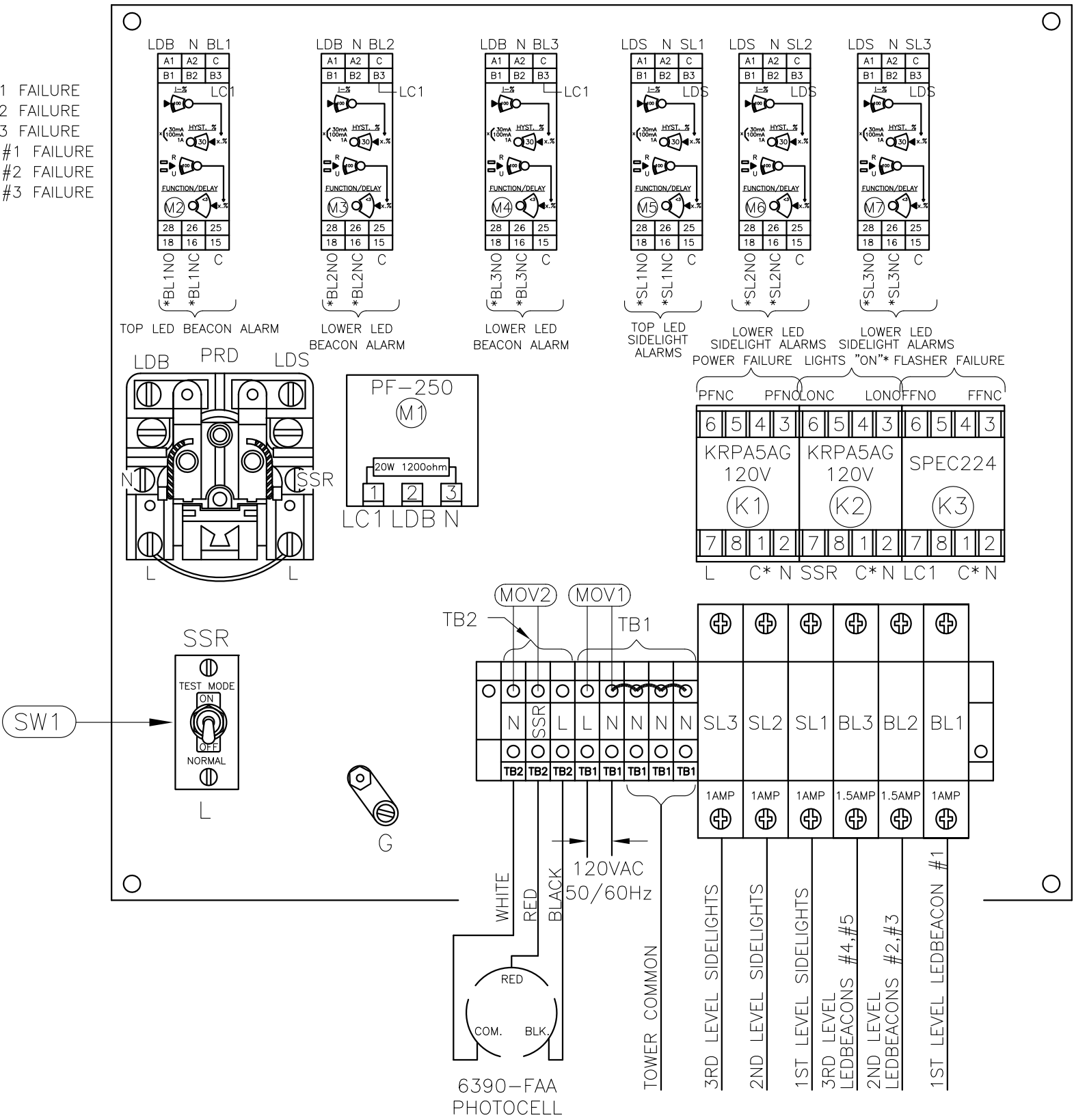
PLEASE RETURN PRODUCT TO: 10810 W. LITTLE YORK RD., #130 HOUSTON, TX 77041-4051

*CUSTOMER ALARM POINTS

C = ALARM COMMON
NC = NORMALLY CLOSE
NO = NORMALLY OPEN
PFNO/PFNC = POWER FAILURE
LONO/LONC = LIGHTS "ON"
BL1NO/BL1NC = LED BEACON LEVEL #1 FAILURE
BL2NO/BL2NC = LED BEACON LEVEL #2 FAILURE
BL3NO/BL3NC = LED BEACON LEVEL #3 FAILURE
SL1NO/SL1NC = LED SIDELIGHT LEVEL #1 FAILURE
SL2NO/SL2NC = LED SIDELIGHT LEVEL #2 FAILURE
SL3NO/SL3NC = LED SIDELIGHT LEVEL #3 FAILURE

* ALARM OUTPUTS ARE FORM C.

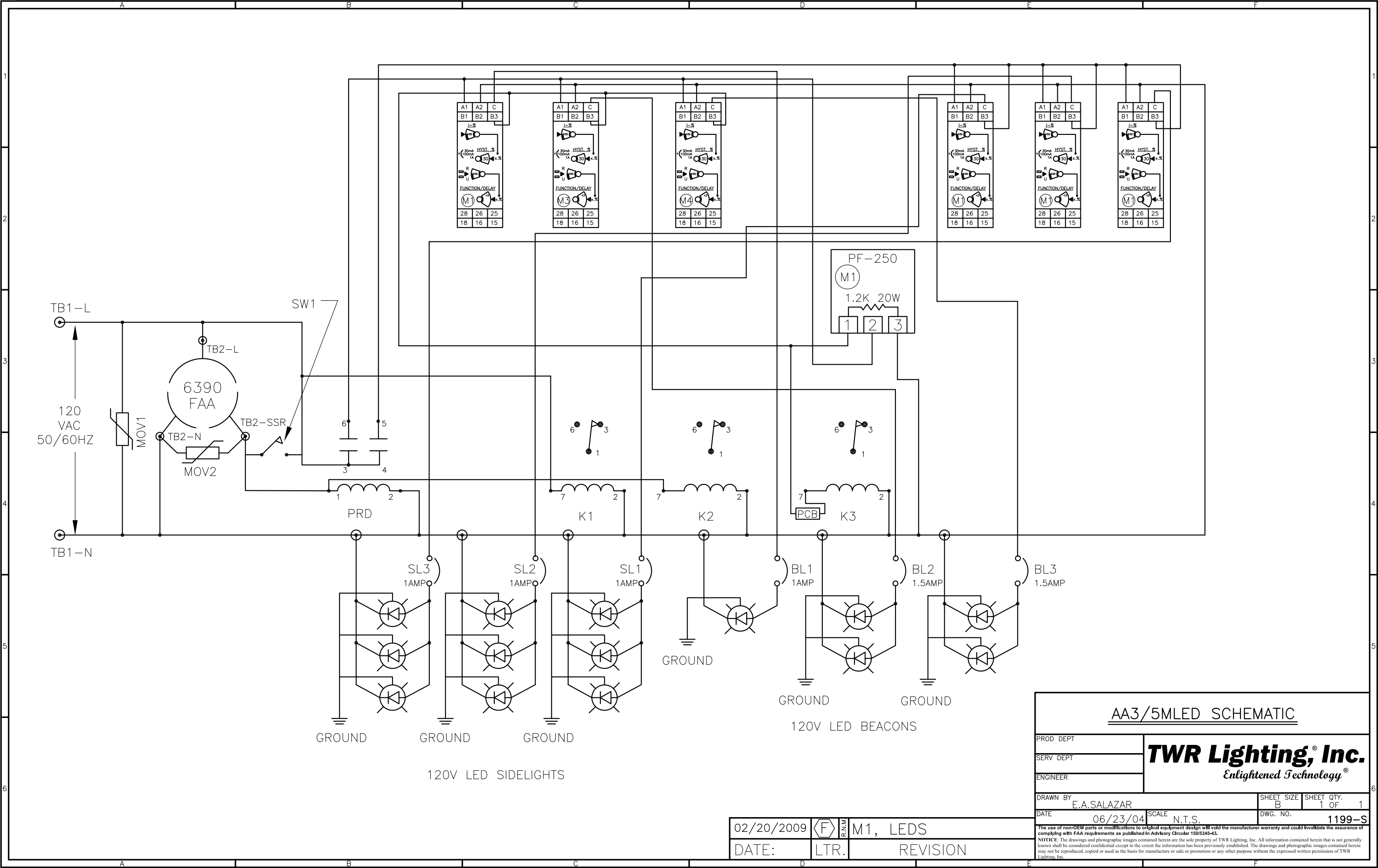
PANEL SIZE - 10-7/8" X 12-7/8" x 1/8"



- NOTES:
1. WHEN REPLACING METAL BASE MODULES USE HEAT SINK COMPOUND BETWEEN MODULE AND ALUMINUM PLATE.
 2. WIRES ARE CONNECTED LETTER TO LETTER. (EXAMPLE) LDB TO LDB TO LDB.

AA3/5MLED CONTROLLER			
CHASSIS LAYOUT			
PROD DEPT	TWR Lighting, Inc. <i>Enlightened Technology®</i> WARK®		
SERV DEPT			
ENGINEER			
DRAWN BY E.A.SALAZAR		SHEET SIZE B	SHEET QTY. 1 OF 1
DATE 06/22/04	SCALE N.T.S.	DWG. NO. 1199-R	
The use of non-OEM parts or modifications to original equipment design will void the manufacturer warranty and could invalidate the assurance of complying with FAA requirements as published in Advisory Circular 150/5345-43.			
NOTICE: The drawings and photographic images contained herein are the sole property of TWR Lighting, Inc. All information contained herein that is not generally known shall be considered confidential except to the extent the information has been previously established. The drawings and photographic images contained herein may not be reproduced, copied or used as the basis for manufacture or sale or promotion or any other purpose without the expressed written permission of TWR Lighting, Inc.			

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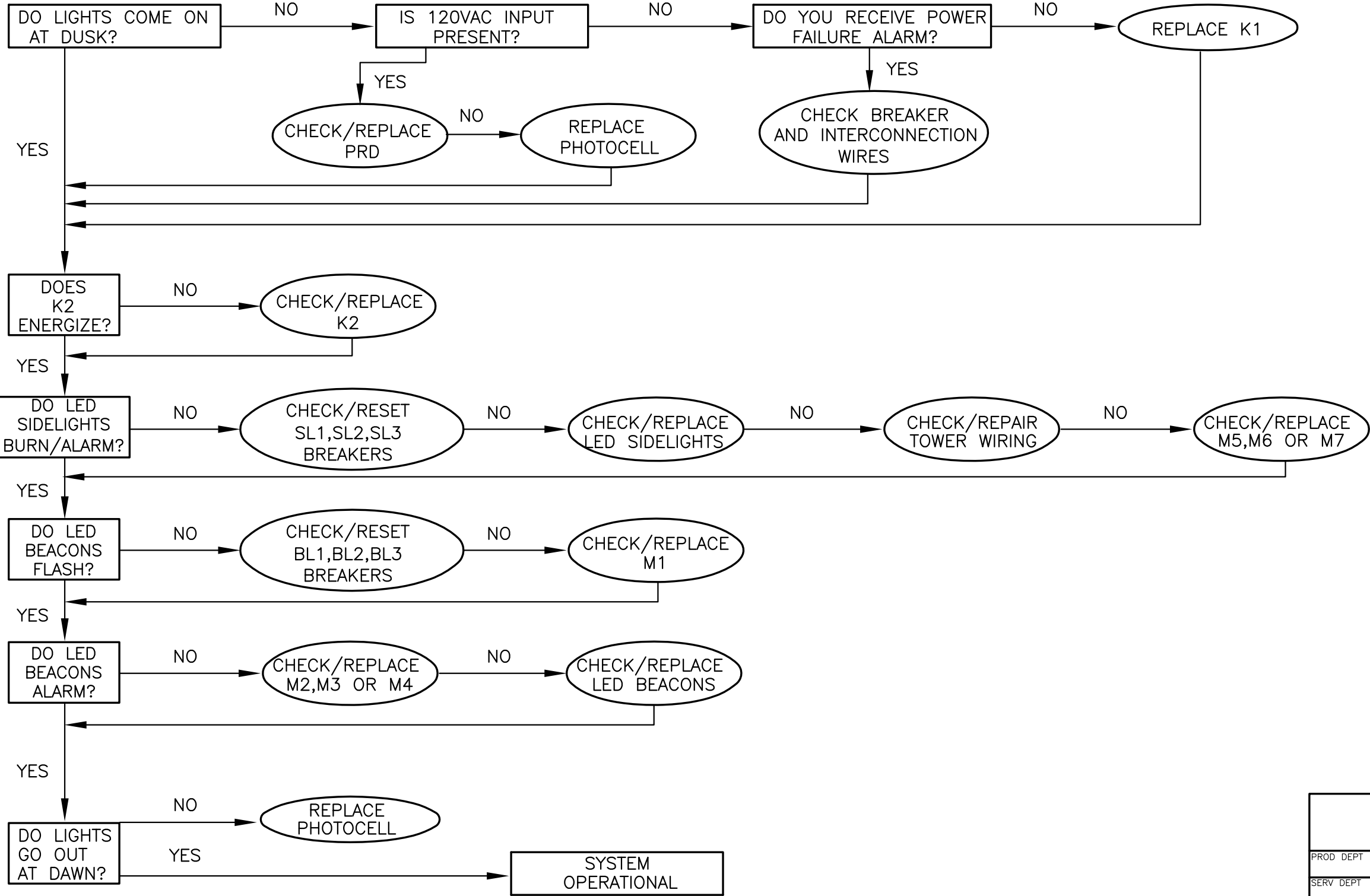
AA3/5MLED SCHEMATIC

PROD DEPT	TWR Lighting, Inc. Enlightened Technology®	
SERV DEPT		
ENGINEER		
DRAWN BY E.A.SALAZAR	SHEET SIZE B	SHEET QTY. 1 OF 1
DATE 06/23/04	SCALE N.T.S.	DWG. NO. 1199-S

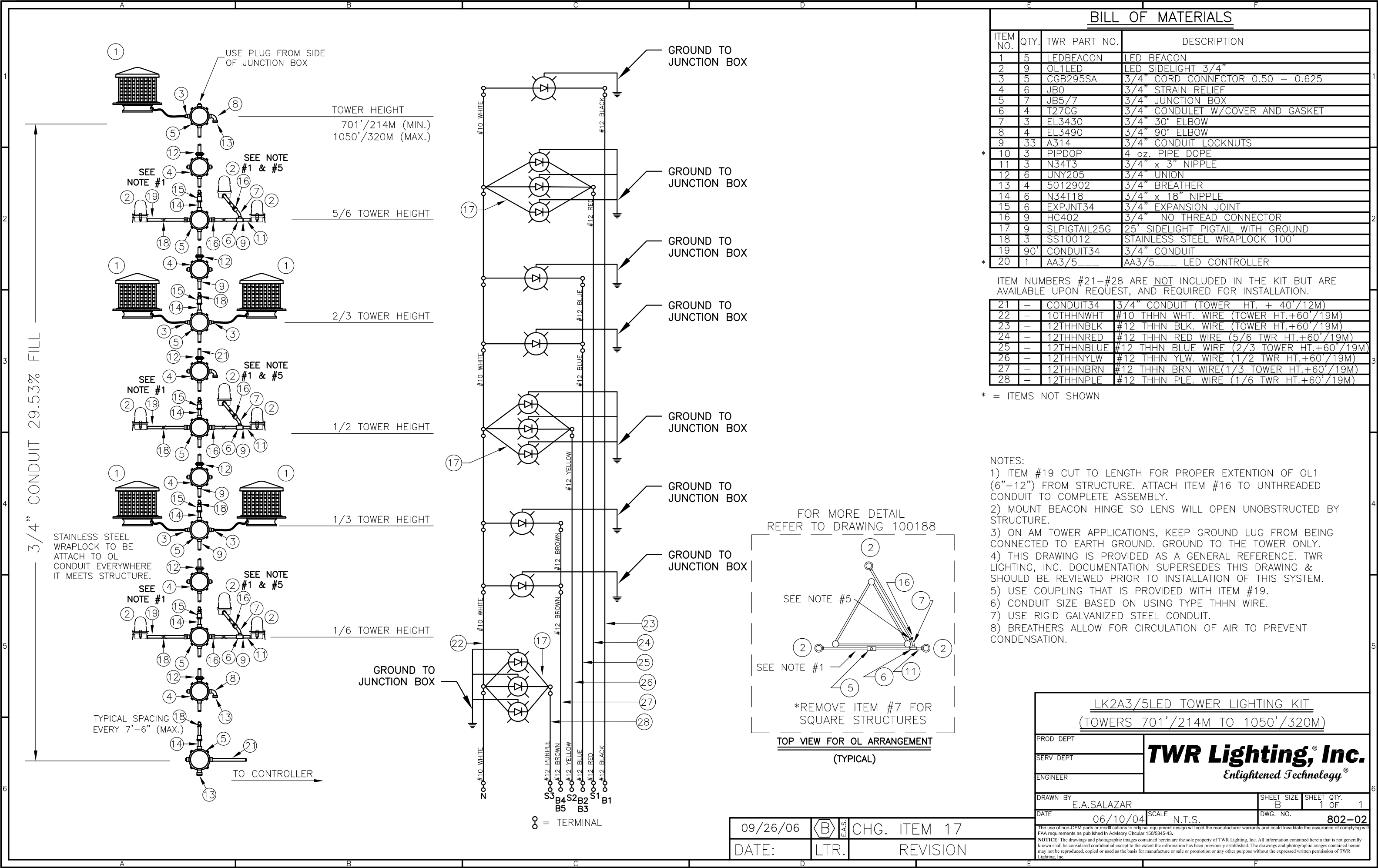
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02/20/2009	F	M1, LEDS
DATE:	LTR.	REVISION



AA3/5MLED TROUBLESHOOTING FLOW CHART DWG# 1199-R			
PROD DEPT		TWR Lighting, Inc. <i>Enlightened Technology®</i>	
SERV DEPT			
ENGINEER			
DRAWN BY E.A.SALAZAR		SHEET SIZE B	SHEET QTY. 1 OF 1
DATE 06/23/04		SCALE N.T.S.	DWG. NO. 1199-F
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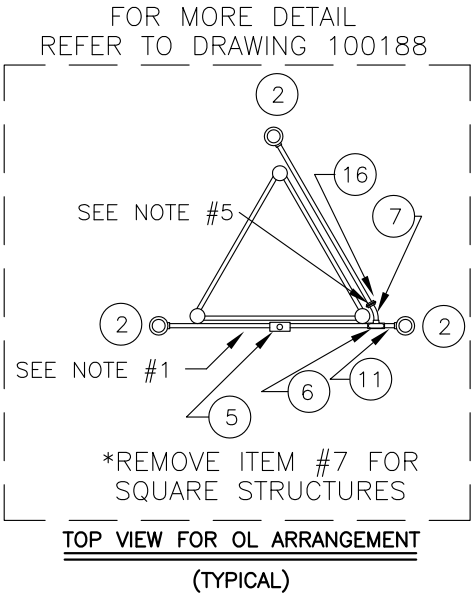
BILL OF MATERIALS			
ITEM NO.	QTY.	TWR PART NO.	DESCRIPTION
1	5	LED BEACON	LED BEACON
2	9	OL1LED	LED SIDELIGHT 3/4"
3	5	CGB295SA	3/4" CORD CONNECTOR 0.50 - 0.625
4	6	JB0	3/4" STRAIN RELIEF
5	7	JB5/7	3/4" JUNCTION BOX
6	4	T27CG	3/4" CONDULET W/COVER AND GASKET
7	3	EL3430	3/4" 30° ELBOW
8	4	EL3490	3/4" 90° ELBOW
9	33	A314	3/4" CONDUIT LOCKNUTS
* 10	3	PIPDOP	4 oz. PIPE DOPE
11	3	N34T3	3/4" x 3" NIPPLE
12	6	UNY205	3/4" UNION
13	4	5012902	3/4" BREATHER
14	6	N34T18	3/4" x 18" NIPPLE
15	6	EXPJNT34	3/4" EXPANSION JOINT
16	9	HC402	3/4" NO THREAD CONNECTOR
17	9	SLPIGTAIL25G	25' SIDELIGHT PIGTAIL WITH GROUND
18	3	SS10012	STAINLESS STEEL WRAPLOCK 100'
19	90'	CONDUIT34	3/4" CONDUIT
* 20	1	AA3/5	AA3/5 LED CONTROLLER

ITEM NUMBERS #21-#28 ARE NOT INCLUDED IN THE KIT BUT ARE AVAILABLE UPON REQUEST, AND REQUIRED FOR INSTALLATION.

21	-	CONDUIT34	3/4" CONDUIT (TOWER HT. + 40'/12M)
22	-	10THHNWHT	#10 THHN WHT. WIRE (TOWER HT.+60'/19M)
23	-	12THHNBLK	#12 THHN BLK. WIRE (TOWER HT.+60'/19M)
24	-	12THHNRED	#12 THHN RED WIRE (5/6 TWR HT.+60'/19M)
25	-	12THHNBLUE	#12 THHN BLUE WIRE (2/3 TOWER HT.+60'/19M)
26	-	12THHNYLW	#12 THHN YLW. WIRE (1/2 TWR HT.+60'/19M)
27	-	12THHNB RN	#12 THHN BRN WIRE(1/3 TOWER HT.+60'/19M)
28	-	12THHNP LE	#12 THHN PLE. WIRE (1/6 TWR HT.+60'/19M)

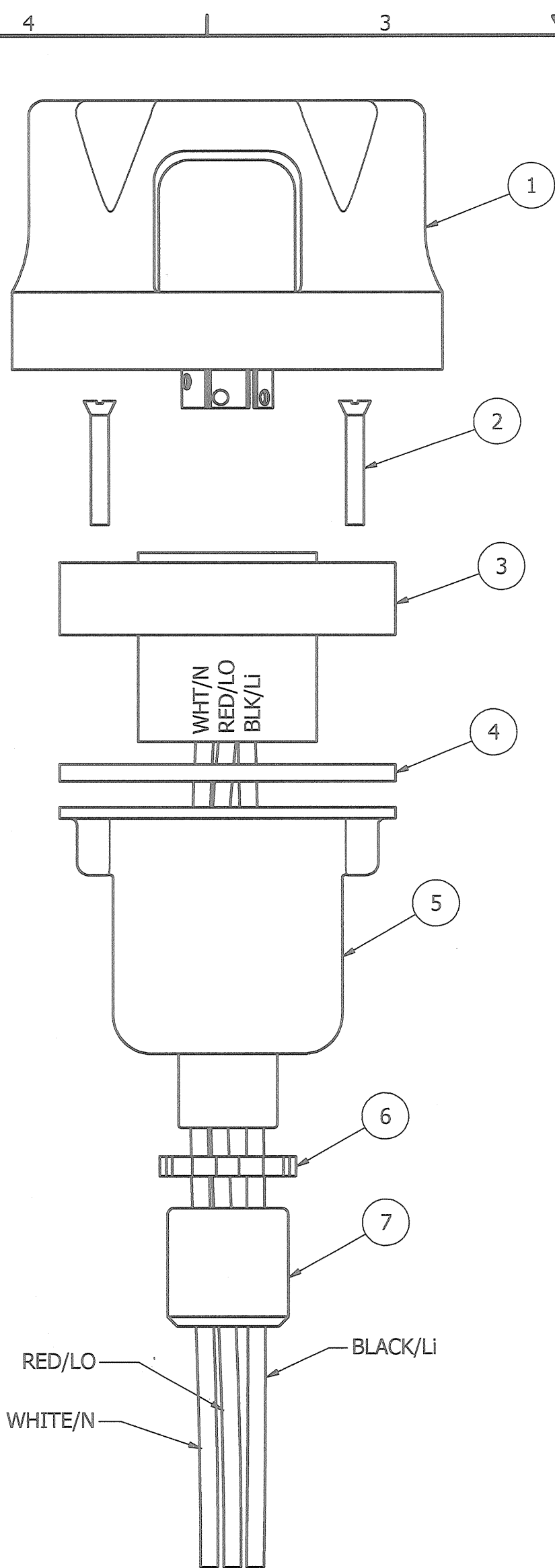
* = ITEMS NOT SHOWN

- NOTES:
- ITEM #19 CUT TO LENGTH FOR PROPER EXTENTION OF OL1 (6"-12") FROM STRUCTURE. ATTACH ITEM #16 TO UNTHREADED CONDUIT TO COMPLETE ASSEMBLY.
 - MOUNT BEACON HINGE SO LENS WILL OPEN UNOBSTRUCTED BY STRUCTURE.
 - ON AM TOWER APPLICATIONS, KEEP GROUND LUG FROM BEING CONNECTED TO EARTH GROUND. GROUND TO THE TOWER ONLY.
 - THIS DRAWING IS PROVIDED AS A GENERAL REFERENCE. TWR LIGHTING, INC. DOCUMENTATION SUPERSEDES THIS DRAWING & SHOULD BE REVIEWED PRIOR TO INSTALLATION OF THIS SYSTEM.
 - USE COUPLING THAT IS PROVIDED WITH ITEM #19.
 - CONDUIT SIZE BASED ON USING TYPE THHN WIRE.
 - USE RIGID GALVANIZED STEEL CONDUIT.
 - BREATHERS ALLOW FOR CIRCULATION OF AIR TO PREVENT CONDENSATION.



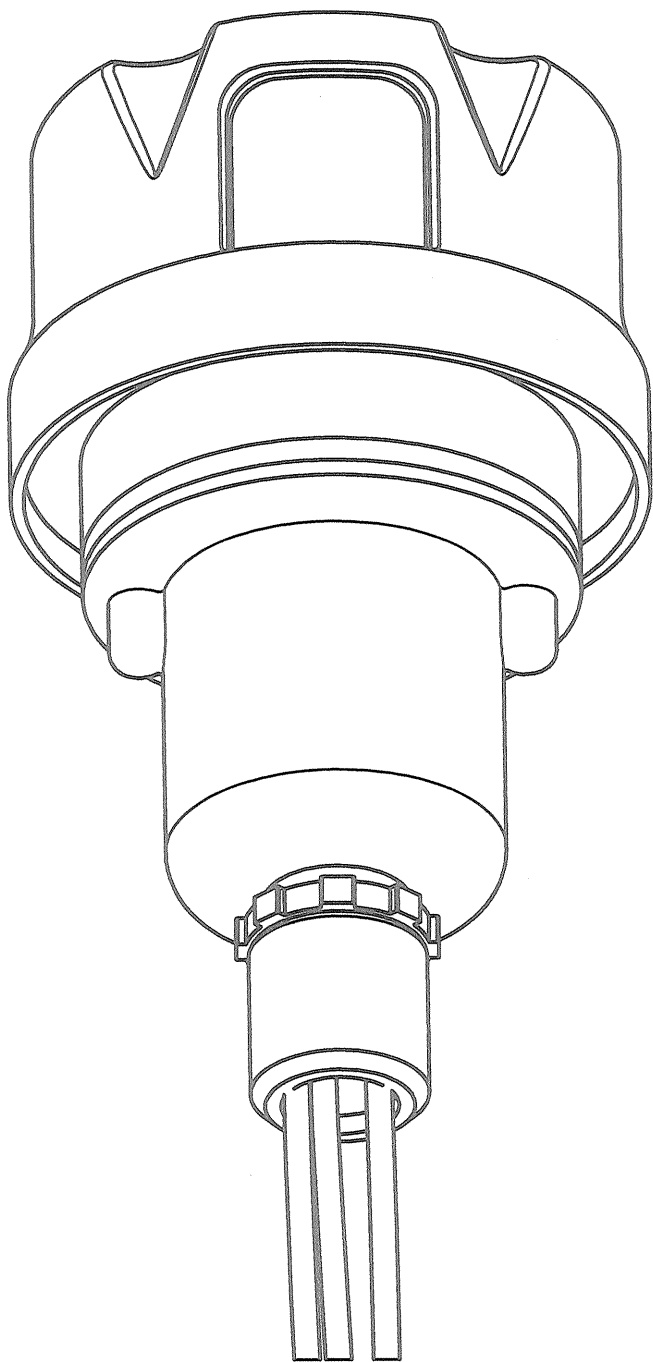
LK2A3/5LED TOWER LIGHTING KIT (TOWERS 701'/214M TO 1050'/320M)			
PROD DEPT		TWR Lighting, Inc. Enlightened Technology®	
SERV DEPT			
ENGINEER			
DRAWN BY E.A.SALAZAR		SHEET SIZE B	SHEET QTY. 1 OF 1
DATE 06/10/04		SCALE N.T.S.	DWG. NO. 802-02
<small>The use of non-OEM parts or modifications to original equipment design will void the manufacturer warranty and could invalidate the assurance of complying with FAA requirements as published in Advisory Circular 150/5345-43. NOTICE: The drawings and photographic images contained herein are the sole property of TWR Lighting, Inc. All information contained herein that is not generally known shall be considered confidential except to the extent the information has been previously established. The drawings and photographic images contained herein may not be reproduced, copied or used as the basis for manufacture or sale or promotion or any other purpose without the expressed written permission of TWR Lighting, Inc.</small>			

09/26/06	B	CHG. ITEM 17
DATE:	LTR.	REVISION



EXPLODED VIEW

PARTS LIST		
ITEM	QTY	PART NUMBER
1	1	PHOTOCELL
2	2	6-32 x 1" SCREW
3	1	RECEPTACLE SOCKET
4	1	RECEPTACLE GASKET
5	1	RECEPTACLE HOUSING
6	1	1/2" CONDUIT LOCKNUT
7	1	3/4" TO 1/2" REDUCER



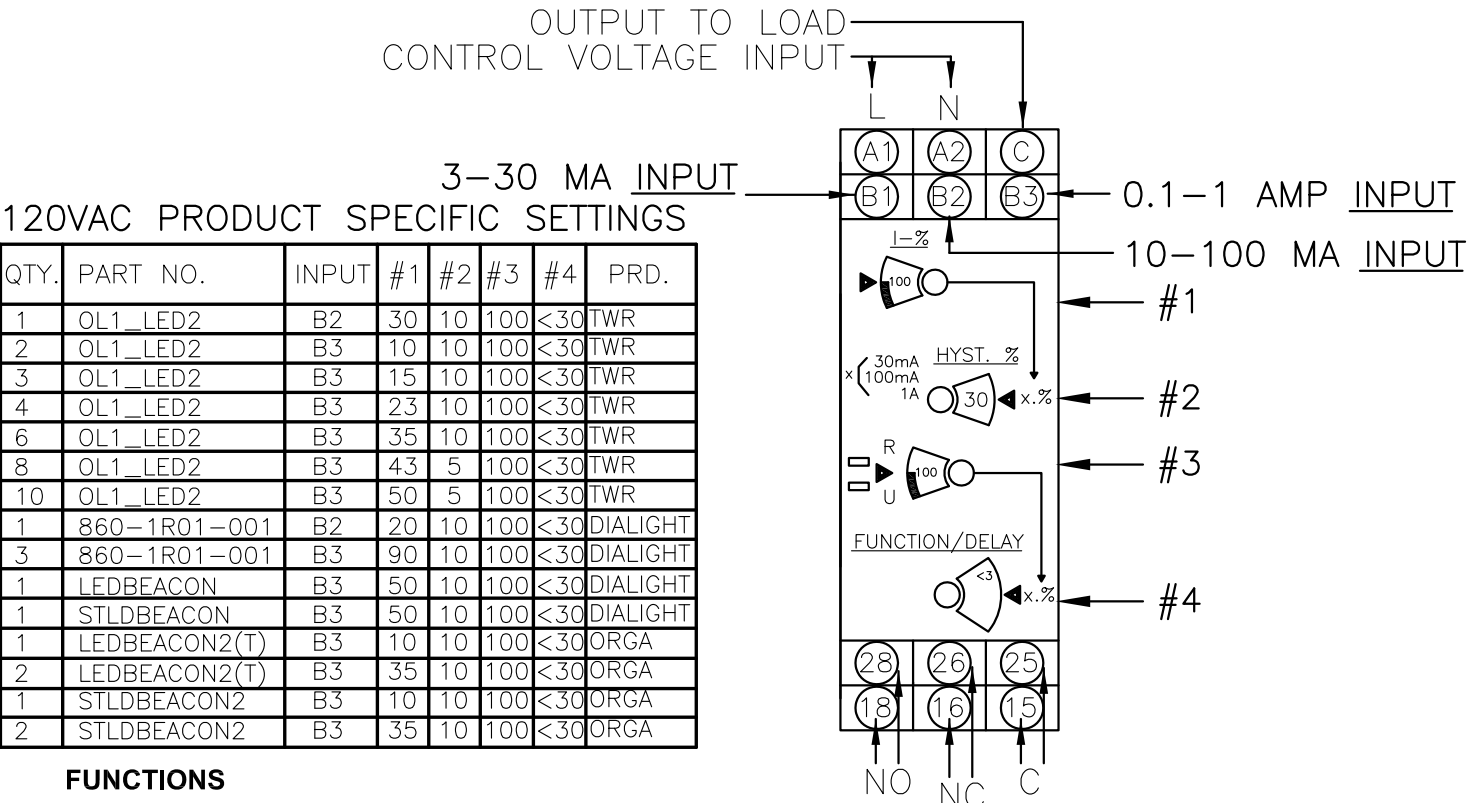
ASSEMBLY

- NOTES:
- ITEM #7 CAN BE USED TO REDUCE 3/4" CONDUIT TO 1/2" CONDUIT AT THE HOUSING OR AT THE CONTROLLER ITSELF.
 - 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

PHOTOCELL HOUSING DETAIL			
PROD. DEPT <i>[Signature]</i>		TWR Lighting, Inc. HARK <i>Enlightened Technology®</i>	
SERV. DEPT			
ENGINEER			
DRAWN BY vhernandez		SHEET SIZE B	SHEET QTY. 1 OF 1
DATE 10/18/1995		SCALE 1/1	DWG. NO. 100239i
<small>The use of non-OEM parts or modifications to original equipment design will void the manufacturer warranty and could invalidate the assurance of complying with FAA requirements as published in Advisory Circular 150/5345-43.</small>			
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DATE	REV	AUTHOR	DESCRIPTION
02/03/2015	H	JZAMORANO	UPDATED NOTES

AC UNITS CURRENT MEASUREMENT—RM4JA31M



120VAC PRODUCT SPECIFIC SETTINGS

QTY.	PART NO.	INPUT	#1	#2	#3	#4	PRD.
1	OL1_LED2	B2	30	10	100	<30	TWR
2	OL1_LED2	B3	10	10	100	<30	TWR
3	OL1_LED2	B3	15	10	100	<30	TWR
4	OL1_LED2	B3	23	10	100	<30	TWR
6	OL1_LED2	B3	35	10	100	<30	TWR
8	OL1_LED2	B3	43	5	100	<30	TWR
10	OL1_LED2	B3	50	5	100	<30	TWR
1	860-1R01-001	B2	20	10	100	<30	DIALIGHT
3	860-1R01-001	B3	90	10	100	<30	DIALIGHT
1	LED Beacon	B3	50	10	100	<30	DIALIGHT
1	STLDBEACON	B3	50	10	100	<30	DIALIGHT
1	LED Beacon2(T)	B3	10	10	100	<30	ORGA
2	LED Beacon2(T)	B3	35	10	100	<30	ORGA
1	STLDBEACON2	B3	10	10	100	<30	ORGA
2	STLDBEACON2	B3	35	10	100	<30	ORGA

FUNCTIONS

- 1 Adjustment of current threshold as % of setting range.±5%
- 2 Hysteresis adjustment from 5 to 30 % ▲.
- 3 Fine adjustment of time delay as % of setting range max. value.
- 4 10-position switch combining
 - selection of the timing range: 1 s, 3 s, 10 s, 30 s, no time delay.
 - selection of overcurrent (>) or undercurrent (<) detection. See table below.
- R Yellow LED: indicates relay state (Off for de-energized relay, On for energized).
- U Green LED: indicates that supply to the RM4 is present.

Overcurrent Control	Overcurrent or Undercurrent Control ■	Measuring Range
Yes	Yes	3 MA - 1,000 MA

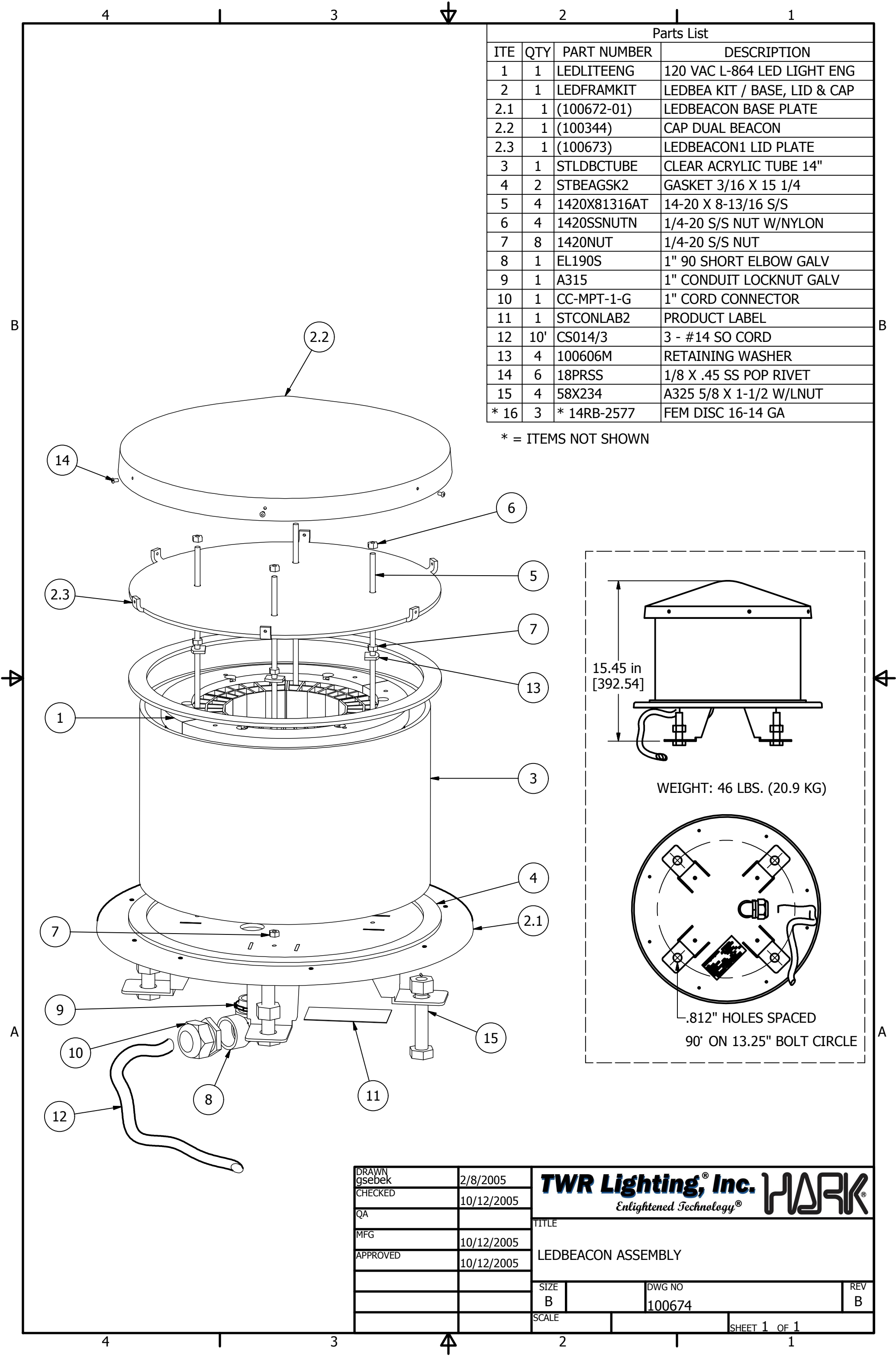
Detailed Positions for Switch 4

Switch Position	Function	Time Delay (t)
< 0	Undercurrent detection	No time delay
< 1	Undercurrent detection	0.05 to 1 s
< 3	Undercurrent detection	0.15 to 3 s
< 10	Undercurrent detection	0.5 to 10 s
< 30	Undercurrent detection	1.5 to 30 s
> 0	Overcurrent detection	No time delay
> 1	Overcurrent detection	0.05 to 1 s
> 3	Overcurrent detection	0.15 to 3 s
> 10	Overcurrent detection	0.5 to 10 s
> 30	Overcurrent detection	1.5 to 30 s

■ = Selection by switch on front face
▲ = Value of current between energization and de-energization of the output relay (% of the current threshold to be measured).

*Due to current draw tolerances slight adjustments to setting #1 may be needed for proper alarming.

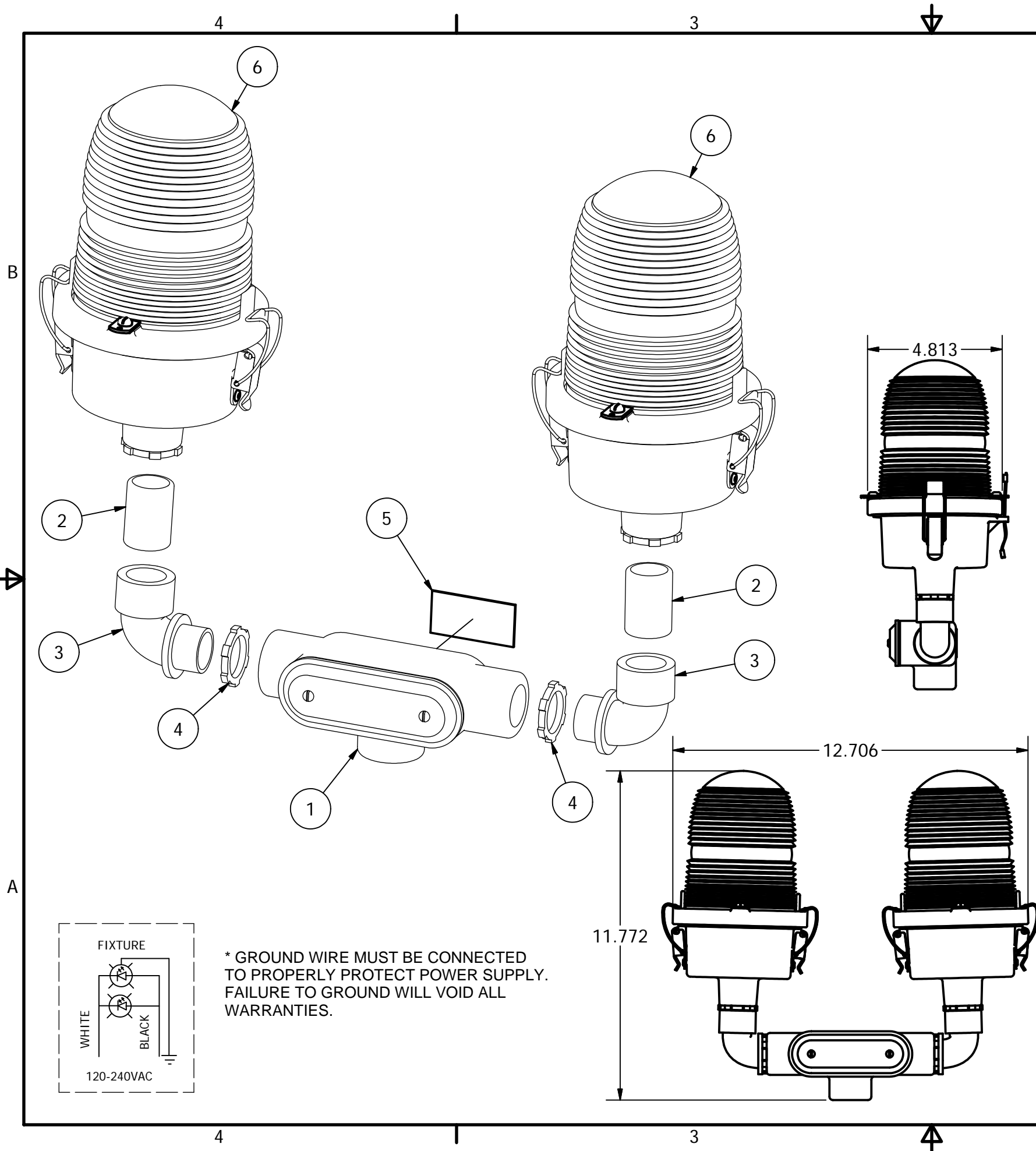
Sign:_____



Parts List			
ITE	QTY	PART NUMBER	DESCRIPTION
1	1	LEDLITEENG	120 VAC L-864 LED LIGHT ENG
2	1	LEDFRAMKIT	LEDBEA KIT / BASE, LID & CAP
2.1	1	(100672-01)	LEDBEACON BASE PLATE
2.2	1	(100344)	CAP DUAL BEACON
2.3	1	(100673)	LEDBEACON1 LID PLATE
3	1	STLDBCTUBE	CLEAR ACRYLIC TUBE 14"
4	2	STBEAGSK2	GASKET 3/16 X 15 1/4
5	4	1420X81316AT	14-20 X 8-13/16 S/S
6	4	1420SSNUTN	1/4-20 S/S NUT W/NYLON
7	8	1420NUT	1/4-20 S/S NUT
8	1	EL190S	1" 90 SHORT ELBOW GALV
9	1	A315	1" CONDUIT LOCKNUT GALV
10	1	CC-MPT-1-G	1" CORD CONNECTOR
11	1	STCONLAB2	PRODUCT LABEL
12	10'	CS014/3	3 - #14 SO CORD
13	4	100606M	RETAINING WASHER
14	6	18PRSS	1/8 X .45 SS POP RIVET
15	4	58X234	A325 5/8 X 1-1/2 W/LNUT
* 16	3	* 14RB-2577	FEM DISC 16-14 GA

* = ITEMS NOT SHOWN

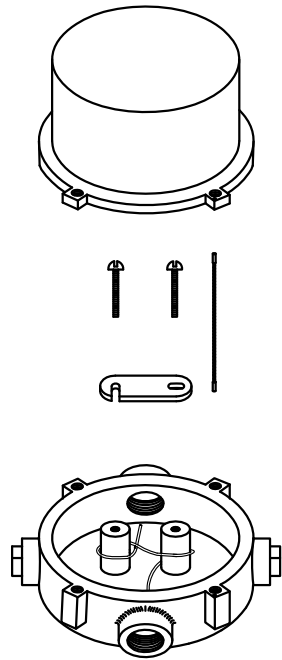
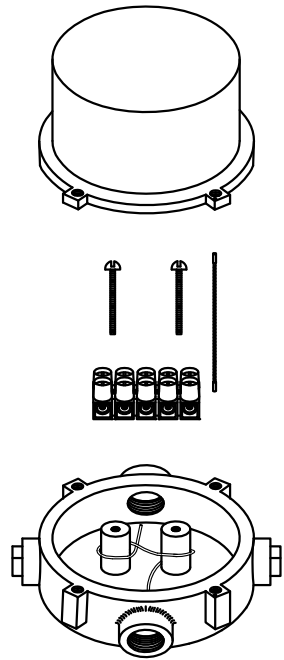
DRAWN	gsebek	2/8/2005	TWR Lighting, Inc. WARK <i>Enlightened Technology®</i>		
CHECKED		10/12/2005			
QA			TITLE LEDBEACON ASSEMBLY		
MFG		10/12/2005			
APPROVED		10/12/2005	SIZE B		
			SCALE	DWG NO 100674	REV B
				SHEET 1 OF 1	



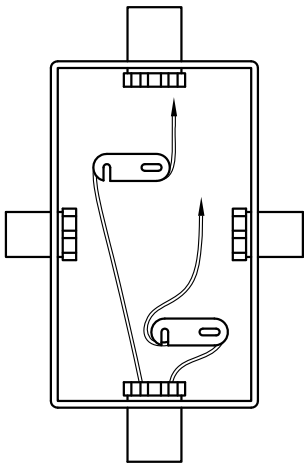
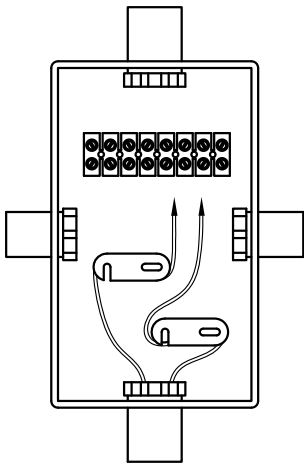
Parts List			
ITEM	QTY	STOCK NUMBER	DESCRIPTION
1	1	T27CG	T27 CONDULET W/COVER & GSKT
2	2	34CLNP	3/4" GALV CLOSE NIPPLE
3	2	EL3490	3/4" 90 DEGREE SHORT ELBOW GALV
4	5	A314	3/4" CONDUIT LOCKNUT GALV.
5	1	100680	OL1/2 LED SERIAL # LABEL
6	2	OL1VBH34LED2	FAA OL16LED 120/240VAC VALOX LED BH SL 3/4
* 6.1	1	105RV	VALOX SINGLE SIDELIGHT BODY
* 6.2	1	106V	VALOX LENS HOLDER RING
* 6.3	2	HC255SS	SIDELIGHT LATCH
* 6.4	1	OLG2	OL1 6 LED GASKET
* 6.5	16	18PRSS	1/8 X .45 SS POP RIVET
* 6.6	.5	7X7SS	1/16 HOL 7X7 S.S. WIRE
* 6.7	2	A1A	STAKON CRIMP
* 6.8	1	A314	3/4" CONDUIT LOCKNUT GALV.
* 6.9	3	12V245	OL LENS CLIP
* 6.10	3	832X14PH	8-32 X 1/4" PH SS SLOT SCREW
* 6.11	1	AP100846	SIDELIGHT LENS CLEAR ACYRLIC
* 6.12	1	PS90-260/24	POWER SUPPLY
* 6.13	6	STE01-047	LED VERTICAL PCB
* 6.14	1	100588	OL 6LED BASE PLATE
* 6.15	1	100591	OL 6LED STAR DISK
* 6.16	6	STD05008	LED EMITTER
* 6.17	1	A10290	5/32" X 11/32" RUBBER GROMMET
* 6.18	3	632X14PHH	6-32 X 1/4" PH PH SCREW
* 6.19	.3	20RED	#20AWG RED BELDON WIRE
* 6.20	1	14GREEN	#14AWG GREEN BELDON WIRE
* 6.21	1	14RB6R	RING TERMINAL (GROUND WIRE)
* 6.22	3	WIRENUTRED	RED WIRE NUT FOR #8 TO #12 WIRE

* = ITEMS NOT SHOWN

DRAWN gsebek	6/9/2005	TWR Lighting, Inc. <i>Enlightened Technology®</i> WARK®			
CHECKED					
QA		TITLE			
MFG		OL2VLED2 FAA-OL16LED 120-240VAC DOUBLE VALOX LED SL (L810 LED DOUBLE OBSTRUCTION LIGHT)			
APPROVED		SIZE B	DWG NO 100658	REV F	
REVISION JZAMORANO	11/07/14	SCALE	SHEET 1 OF 1		



JB-5 AND JB-0
3/4" JUNCTION BOX



JB-8 AND JB-8SR
1" JUNCTION BOX

USING THIS JUNCTION BOX METHOD SPACING IS 100 FEET MAXIMUM.

AWG WIRE SIZE	MAX. NUMBER WIRES IN 3/4" CONDUIT	MAX. NUMBER WIRES IN 1" CONDUIT	WIRE AREA SQ. INCHES	WEIGHT PER 100 FEET
12 THHN	16	26	0.0117	2.50
10 THHN	10	17	0.0184	4.10
8 THHN	6	9	0.0373	6.70
6 THHN	4	7	0.0519	10.30
4 THHN	2	4	0.0845	16.20

NOTES:

- 1) DRAWING ILLUSTRATES METHOD OF STRAIN RELIEVING WIRE. USE THIS METHOD ON ALL JUNCTION BOXES.
- 2) THE NATIONAL ELECTRICAL CODE-ARTICLE 300-19-B3 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.

JUNCTION AND STRAIN RELIEF BOXES

PROD DEPT

SERV DEPT

ENGINEER

TWR Lighting, Inc.
Enlightened Technology®

DRAWN BY
G.D. SEBEK

DATE
07/26/93

SCALE
N.T.S.

SHEET SIZE
B

SHEET QTY.
1 OF 1

DWG. NO.
100089

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9/29/00

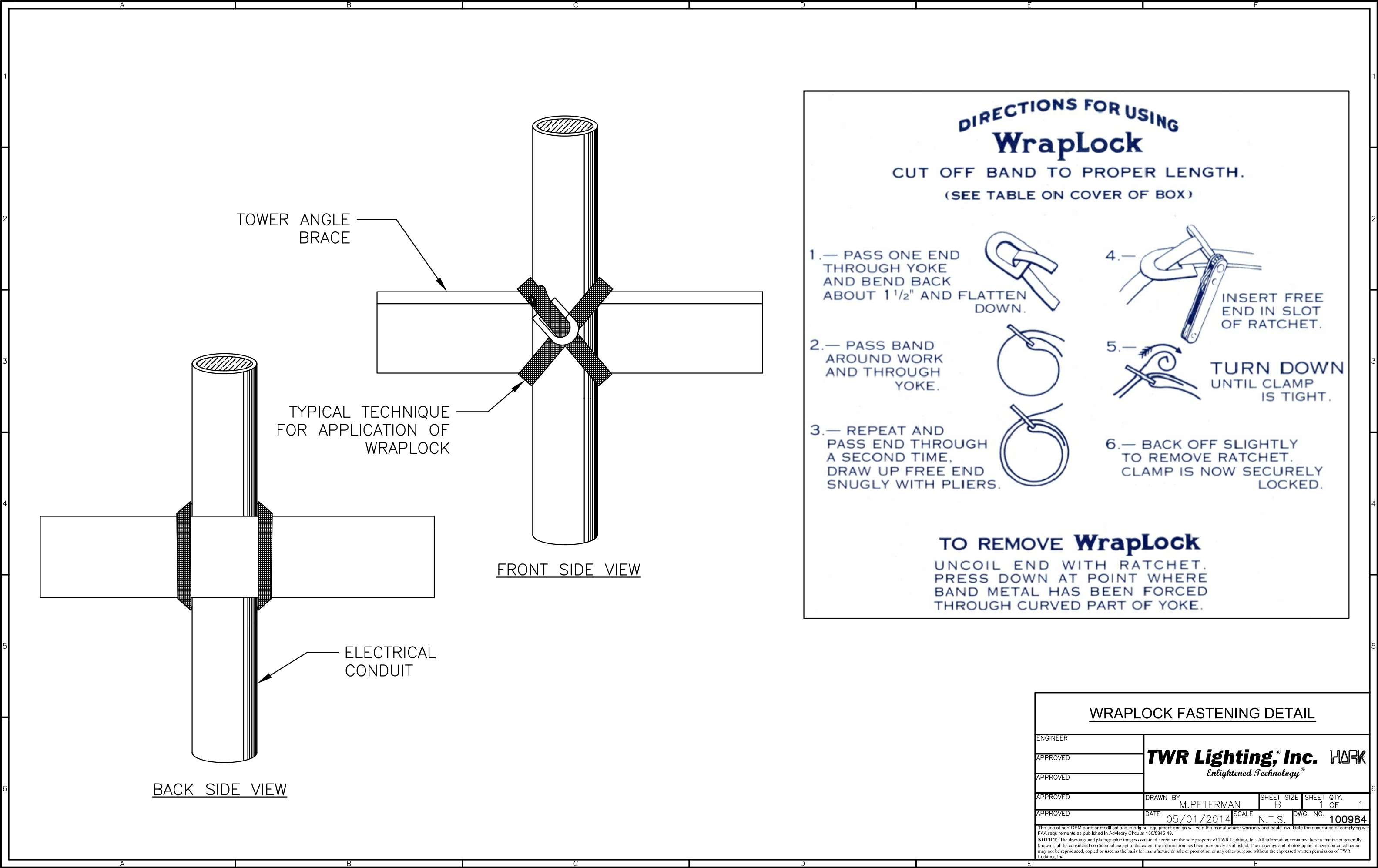
(A)

3 UPDATED NOTES

DATE:

LTR.

REVISION



WRAPLOCK FASTENING DETAIL				
ENGINEER	<div>TWR Lighting, Inc. <i>Enlightened Technology®</i></div> <div>HARK</div>			
APPROVED				
APPROVED				
APPROVED	DRAWN BY	SHEET SIZE	SHEET QTY.	
	M.PETERMAN	B	1 OF	1
APPROVED	DATE	SCALE	DWG. NO.	100984
	05/01/2014	N.T.S.		
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