

TWR Lighting, Inc.

Enlightened TechnologySM

4300 WINDFERN RD SUITE 100 HOUSTON TX 77041-8943

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

WEB: www.twrlighting.com

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 # AA1MLED-230V

SERIAL # _____

PURCHASE DATE _____

PURCHASED FROM _____

AA1MLED-230V CONTROLLER

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WARRANTY & RETURN POLICY

RETURN MERCHANDISE AUTHORIZATION (RMA) FORM

AA1MLED-230V CONTROLLER

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(LED BEACON ASSEMBLY)	

AA1MLED-230V CONTROLLER

1.0 GENERAL INFORMATION

The TWR Model AA1MLED-230V Controller is for A1 lighting of towers 151' to 350' AGL in accordance with the FAA Advisory Circular 70/7460-1K. One (1) LED beacon should be placed at the top. Obstruction lights should be placed at mid-level with respect to overall tower height.

The flash rate of the LED beacon is 30 per minute. The LED sidelights burn steady.

A by-pass switch (SW1) allows the controller to be turned on during daylight hours without covering the photocell. This is particularly helpful since the controller can be mounted indoors while the photocell is outdoors. SW1 can be operated by flipping the switch up to "On" position.

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

Power supplied to the controller shall be 230V AC single phase.

The controller housing is rated at NEMA 4X. It is suitable for indoor or outdoor mounting.

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

POWER FAILURE	Monitors 230V AC to the controller. Alarms in the event of power failure or tripped circuit breaker.
LIGHTS "ON"	Gives an indication whenever the controller is activated.
LED BEACON	Will give an alarm in the event the LED beacon fails, along with visual indicator for that circuit.
FLASHER FAILURE	Will give an alarm in the event of failure of flasher.
OBSTRUCTION LIGHTS	Will give an alarm when one (1) of three (3) LED sidelights fail.

AA1MLED-230V CONTROLLER

2.0 INSTALLATION INSTRUCTIONS

2.1 MOUNTING THE CONTROL CABINET

(Refer to Drawing 1215-R)

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 1215-R. Power wiring to the control cabinet should be in accordance with local methods and National Electrical Codes (NEC).

2.1.1 If the control cabinet is mounted inside an equipment building, the photocell should be mounted vertically on ½" conduit outside the building above the 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." Care must be taken to assure that the photocell does not "see" any ambient light that would prevent it from switching into the nightmode.

2.1.2 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. As above, the photocell should be positioned so that it does not "see" ambient light, which would prevent it from switching to the nightmode. The photocell wiring is the same as in 2.1.1.

2.1.3 The wiring from the photocell, the service breaker, the red incandescent beacons, and the 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 EXTERNAL PHOTOCCELL WIRING

(Refer to Drawing 1215-R)

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

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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 1215-R)

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

2.3.2 Circuit breaker needs to be rated at 10 amps.

2.3.3 Connect incoming 230V AC "Hot" to terminal block TB1 marked "L."

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

2.3.5 Connect the AC ground to the grounding lug on the aluminum mounting plate.

2.4 LED BEACON AND LED SIDELIGHT WIRING

(Refer to Drawings 1215-R and 800-01)

2.4.1 Connect the YELLOW wire from the LED Beacon to the circuit breaker marked "B."

2.4.2 Connect the RED wire from the LED sidelight to the circuit breaker marked "S."

2.4.3 Connect the WHITE neutral wire(s) to one (1) or more of the terminals marked "N."

2.5 LED BEACON AND LED SIDELIGHT ALARM WIRING

(Refer to Drawings 1215-R and 1215-S)

2.5.1 Alarm relays K1-K3, and alarm Modules M2, M3, and M4, are provided for independent contact closures for: Power Failure, Lights "On," Flasher Failure, LED Beacon Burnout, and LED Sidelight Burnout.

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2.5.2 Alarm Wiring: To utilize all of the red light alarms, the customer will need five (5) pair of wires to interface with his alarm device. One (1) wire from each of the five (5) pair will terminate at the points marking common (C). The remaining wire from each pair will terminate as follows:

Power Failure Alarm: Connect to relay K1, terminal #3, for normally open (OR) terminal #6, for normally closed monitoring.

Lights “On” Alarm: Connect to relay K2, terminal #3, for normally open (OR) terminal #6, for normally closed monitoring.

Flasher Failure: Connect to relay K3, terminal #6, for normally open (OR) terminal #3, for normally closed monitoring.

“B” Burnout: Connect to Module M3, terminal #18 or #28, for normally open (OR) terminal #16 or #26, for normally closed monitoring.

“S” Lamp Burnout: Connect to Module M2, terminal #18 or #28, for normally open (OR) terminal #16 or #26, for normally closed monitoring.

2.5.3 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.

Lights “On”: Operate photocell by-pass switch SW1 or cover the photocell.

LED Beacon and LED Sidelights:
Trip breakers on the controller panel.

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3.0 THEORY OF OPERATION

3.1 POWER SUPPLY

230V 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 104FAA photocell is activated, Line “SSR” 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 Module M2, which is a current sensing module for LED sidelights. The RM4JA32MW monitors one (1) level of LED sidelights, and will provide a contact closure along a visual indication if one (1) or more lamps fail.

3.3 LED BEACON

Line LDB is sent to Modules M1 and M3. M1 is the primary flasher for the LED beacon. It is then sent through the current sensing Module M3, then to the breaker output marked “B.” If Module M3 detects an LED beacon burnout, then that module would provide a contact closure along with a visual indication for that circuit.

Module M4 is a 10 second time delay module for flasher failure of the LED beacon. If Module M4 detects a flasher failure, it would then send voltage (230V AC) to Relay K3, which then will provide a contact closure for the flasher circuit.

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4.0 MAINTENANCE

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-864 CONTROLLER

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

4.4 PHOTOCELL

The photocell is a sealed unit. No maintenance is needed or required other than replacement as necessary.

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5.0 MAJOR COMPONENTS PARTS LIST

QUANTITY	PART NUMBER	DESCRIPTION
1	104-FAA	Photocell
1	FS165-30T	Solid State Flasher (M1) 230V
1	B12J2K5	2,500 ohm 12 watt Resistor (R1)
1	PRD7AY0-240V	Mechanical Load Contactor (PRD)
3	PB27E122	Octal Sockets
3	9KE240V	SPDT Relay (K1 & K2)
1	STJ01002	Switch (SW1)
1	VJ1210HWPL2	Enclosure
6	8WA1204	Terminal Block (TB1 & TB2)
2	8WA1802	Rail Link
2	8WA1808	Terminal Block End Stop
2	S261D3	6 amp Circuit (B & S)
2	RM4JA32MW	LED sidelight and LED beacon Current sensors (M2 & M3)

AA1MLED-230V CONTROLLER

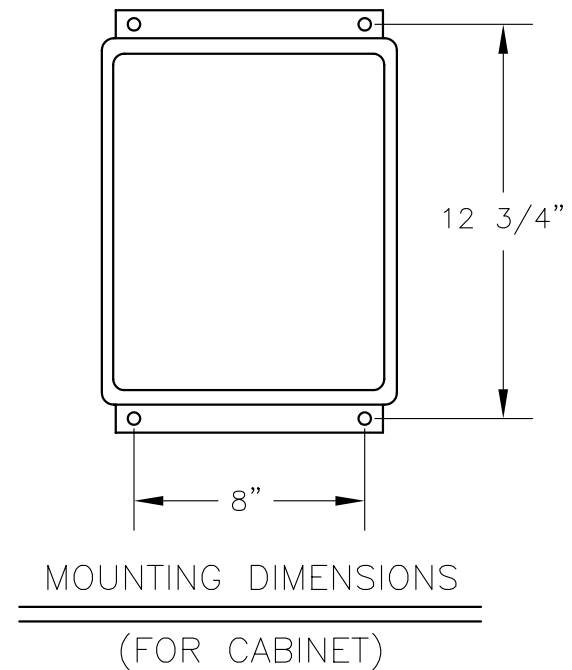
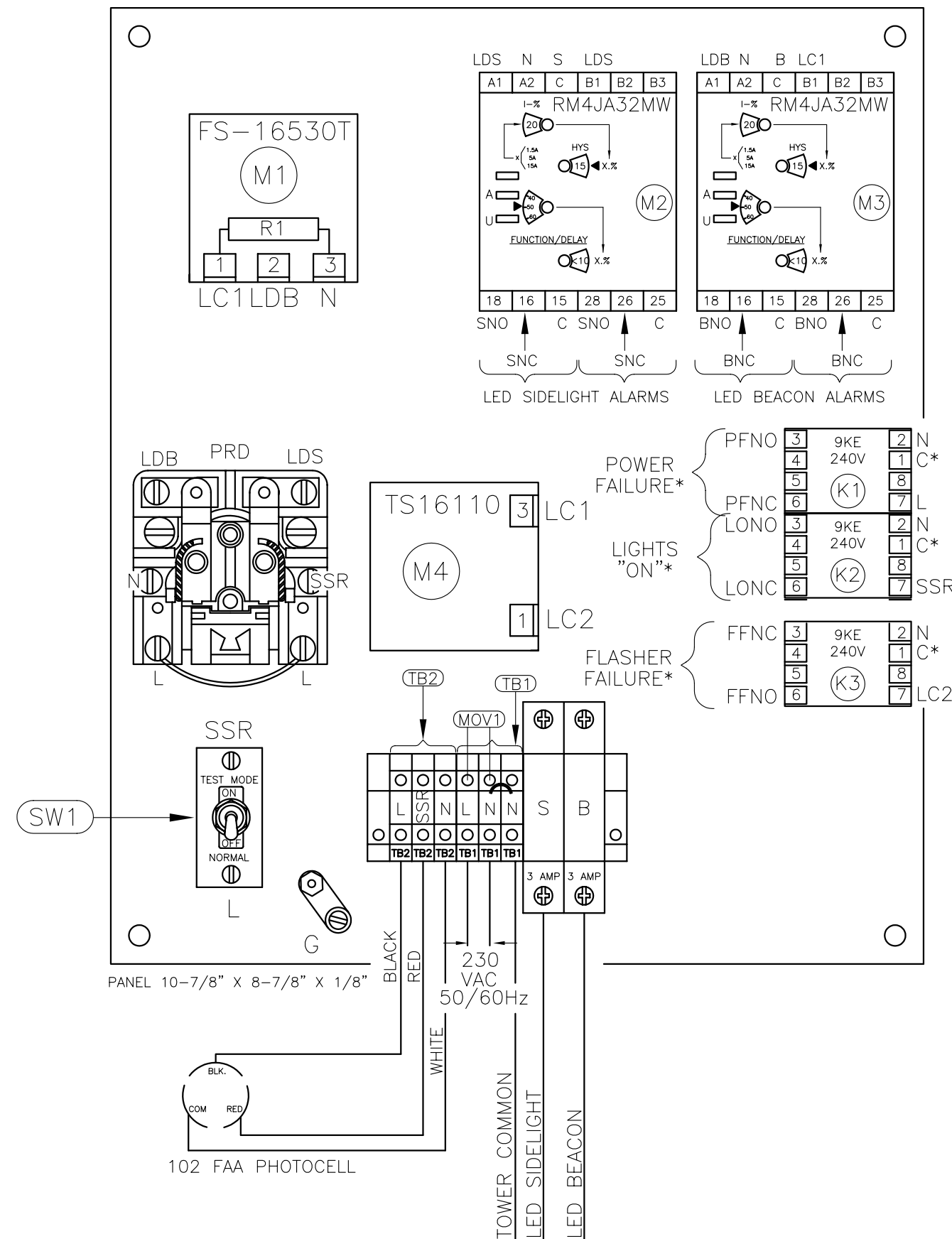
6.0 SUGGESTED SPARE PARTS LIST

QUANTITY	PART NUMBER	DESCRIPTION
1	104-FAA	Photocell, 240V
1	FS165-30T	Solid State Flasher (M1)
2	9KE240V	SPDT Relay (K1 & K2)
1	RM4JA32MW	LED sidelight and LED beacon Current sensors (M2 & M3)

***CUSTOMER ALARM POINTS**

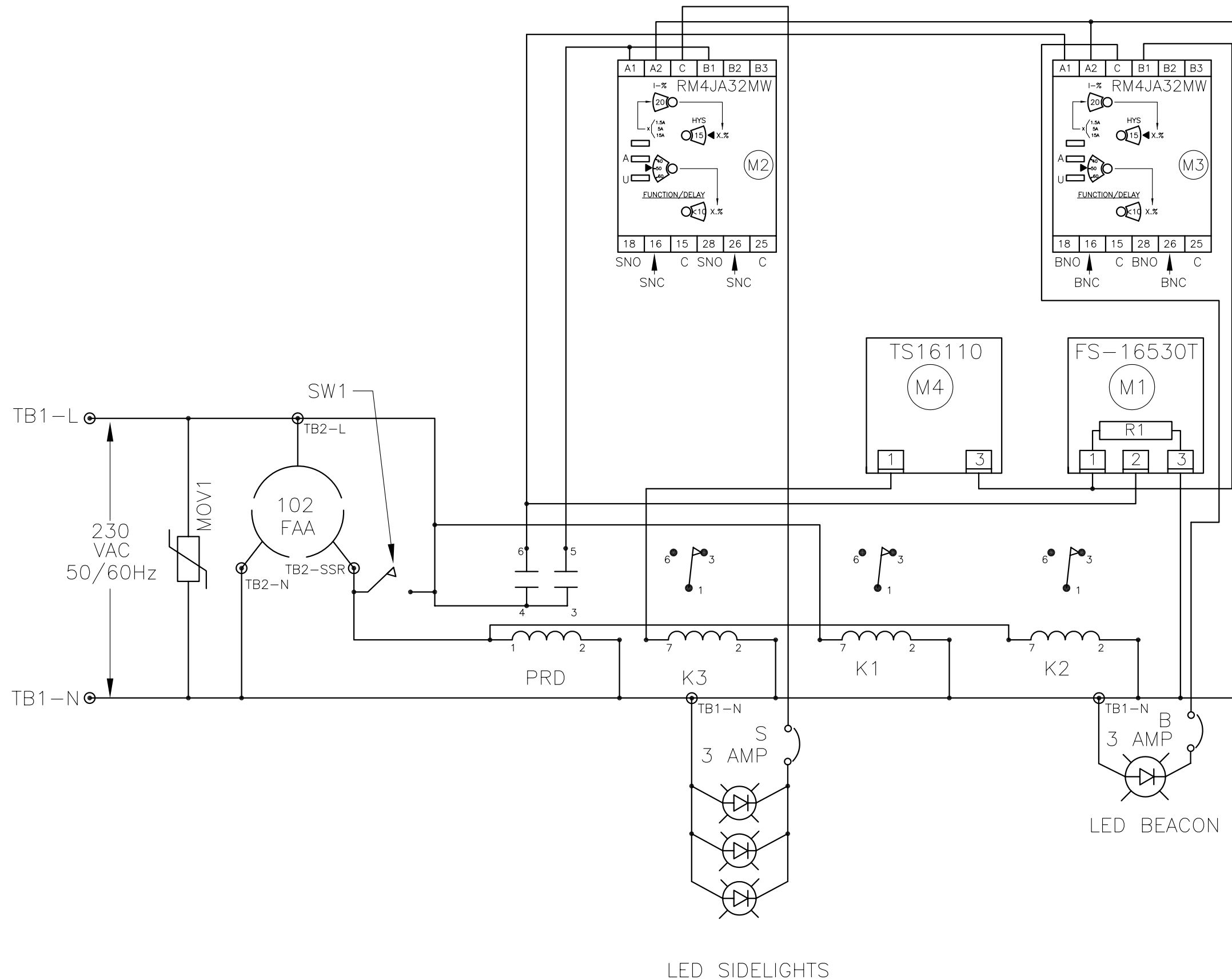
C = ALARM COMMON
 PFNO/PFNC = POWER FAILURE
 LONO/LONC = LIGHTS "ON"
 SNO/SNC = SIDELIGHT BURNOUT
 FFNO/FFNC = FLASHER FAILURE
 BNO/BNC = BEACON BURNOUT

* ALARM OUTPUTS ARE FORM C.



- NOTES:**
1. WHEN REPLACING METAL BASE MODULES USE HEAT SINK COMPOUND BETWEEN MODULE AND ALUMINUM PLATE.
 2. PLUG 102 FAA PHOTOCELL INTO 43109 TWIST LOCK RECEPTACLE AND TWIST TO LOCK.
 3. WIRES ARE CONNECTED LETTER TO LETTER. (EXAMPLE) LDB TO LDB TO LDB.

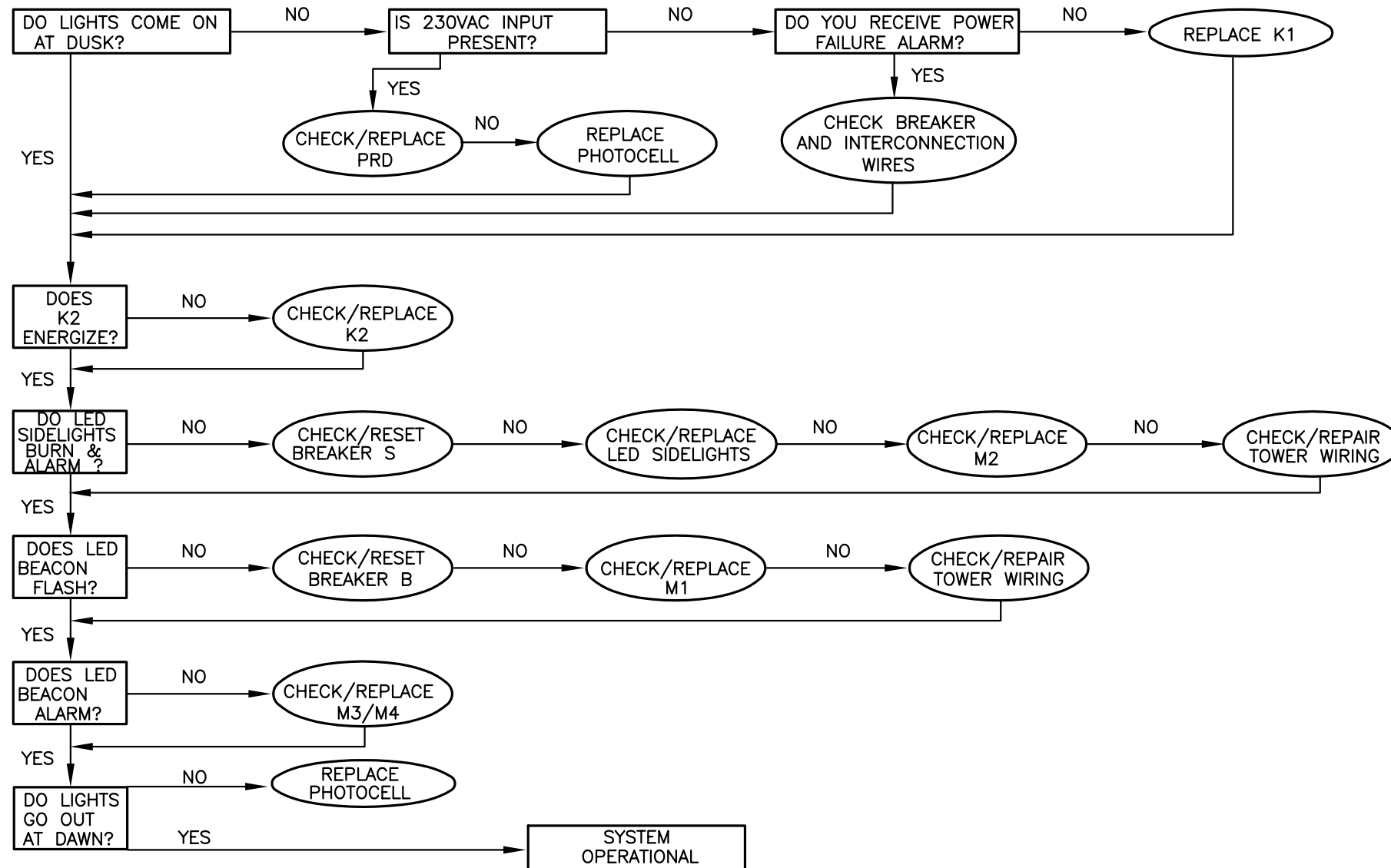
AA1MLED-230V CONTROLLER CHASSIS LAYOUT			
230V 50/60 Hz			
APP'D	TWR Lighting, Inc. Enlightened Technology		
CHK'D BY			
ENGINEER			
DRAWN BY E.A.SALAZAR	SHEET SIZE B	SHEET QTY. 1 OF 1	
DATE 08/01/05	SCALE N.T.S.	DWG. NO. 1215-R	
<small>The use of non-OEM parts or modifications to original equipment 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>			



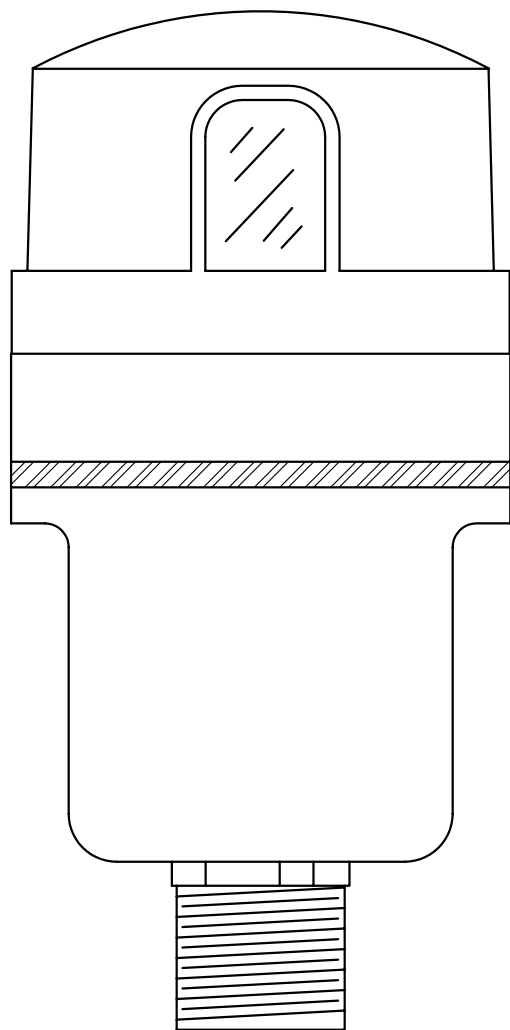
**AA1MLED-230V CONTROLLER
SCHEMATIC LAYOUT**

APP'D	TWR Lighting, Inc. <i>Enlightened Technology</i>		
CHK'D BY			
ENGINEER			
DRAWN BY E.A.SALAZAR	SHEET SIZE B	SHEET QTY. 1 OF 1	
DATE 08/01/05	SCALE N.T.S.	DWG. NO. 1215-S	

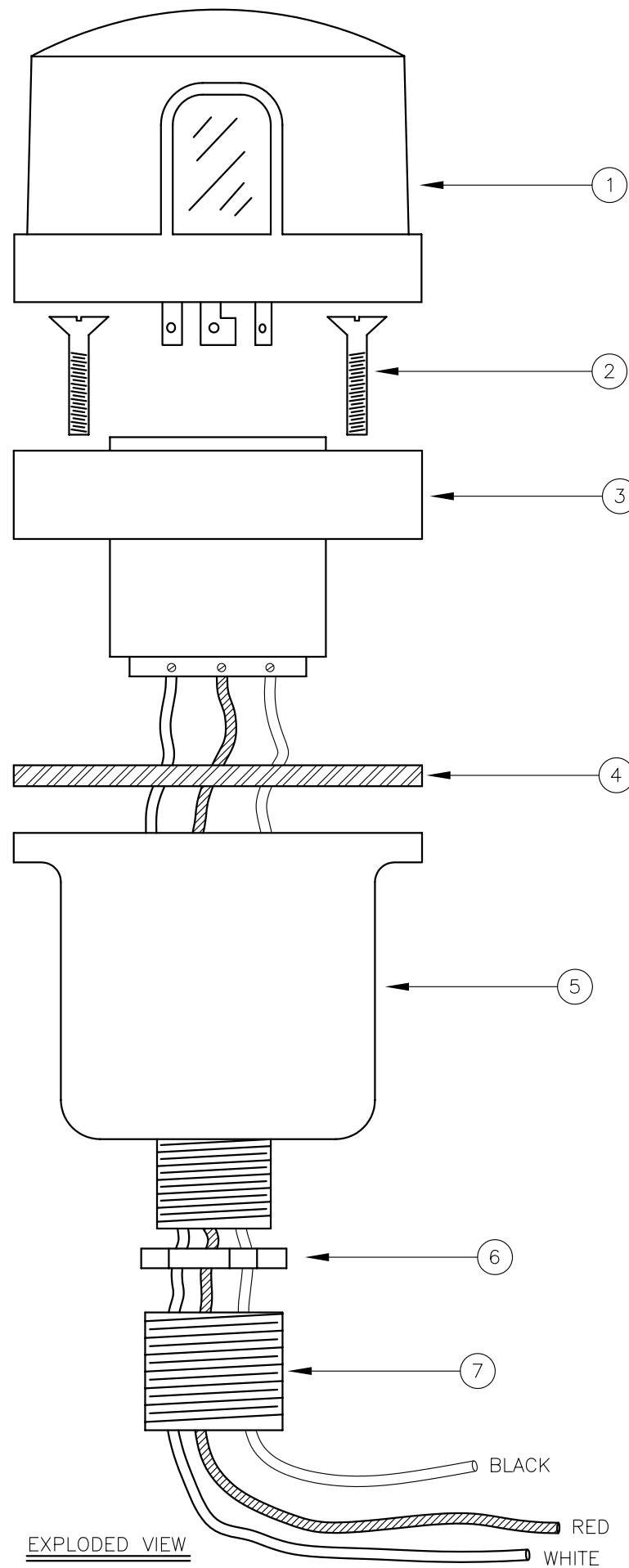
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TROUBLESHOOTING FLOW CHART			
AA1MLED230V 50/60HZ DWG.#1215-R			
APP'D	TWR Lighting, Inc. <i>Enlightened Technology</i>		
CHK'D BY			
ENGINEER			
DRAWN BY E.A.SALAZAR	SHEET SIZE B	SHEET QTY. 1 OF 1	
DATE 08/01/05	SCALE N.T.S.	DWG. NO. 1215-F	
<small>The use of non-TWR 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>			



ASSEMBLY



EXPLODED VIEW

ITEM	QTY.	DESCRIPTION
1	1	PHOTOCELL
2	2	6-32 x 1/2" 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

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

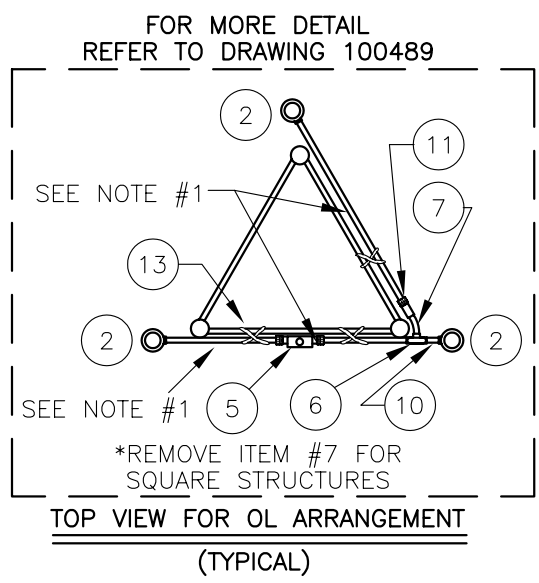
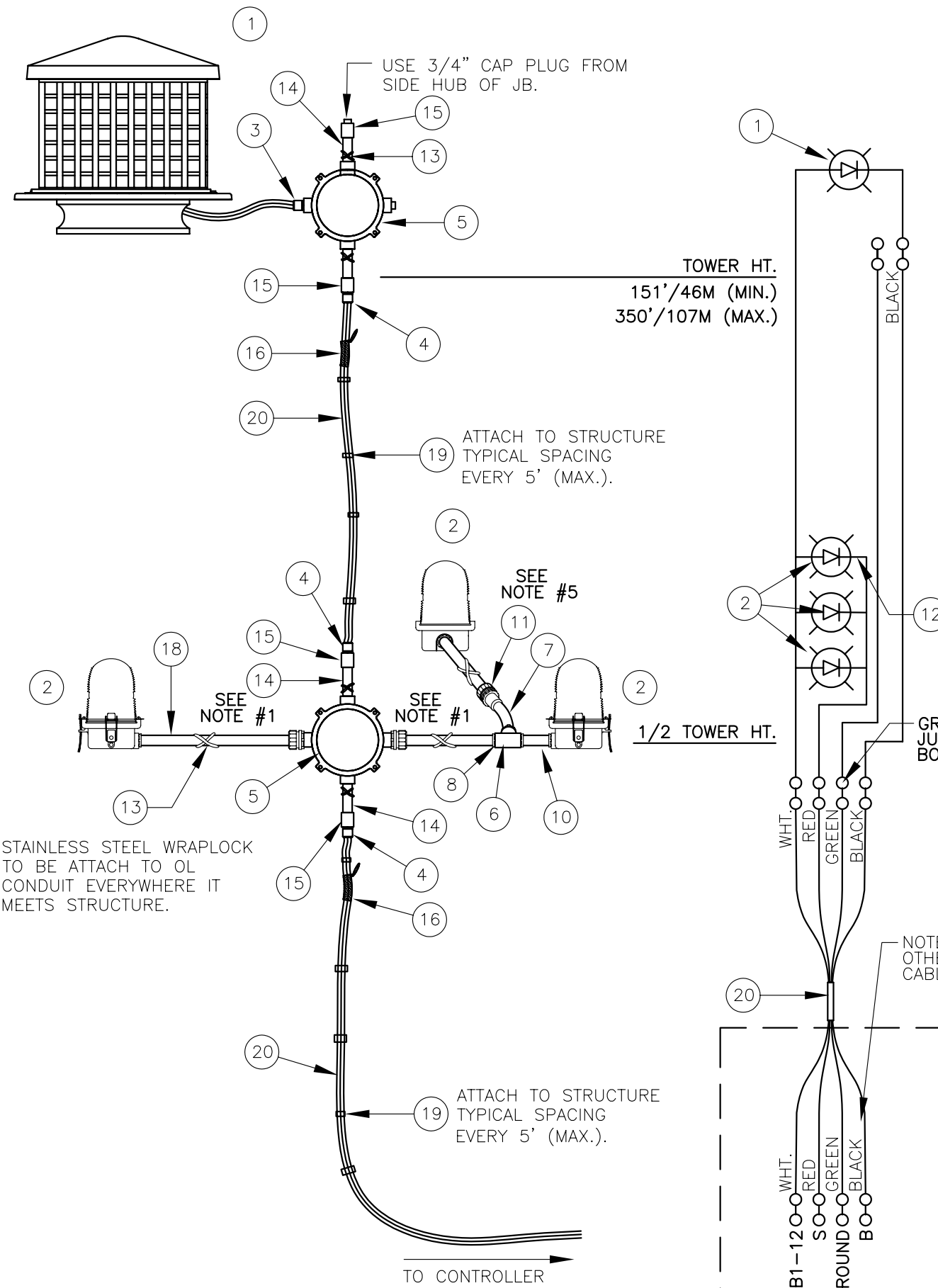
PHOTOCELL HOUSING DETAIL

TWR Lighting, Inc.

APP'D	ENGINEER	CHK'D BY
DRAWN BY E.A.SALAZAR	SHEET SIZE B	SHEET QTY. 1 OF 1
DATE 10/18/95	SCALE N.T.S.	DRAWING NO. 100239

10/04/04	(A)	UPDATE BOM
DATE:	LTR.	REVISION

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BILL OF MATERIALS			
ITEM NO.	QTY.	TWR PART NO.	DESCRIPTION
1	1	LED BEACON	LED BEACON
2	3	OL1LED	LED SIDELIGHT 3/4"
3	1	CG2575	3/4" CORD CONNECTOR 0.25 - 0.37
4	4	CGB296SA	3/4" CORD CONNECTOR 0.625 - 0.750
5	2	JB5	3/4" JUNCTION BOX
6	1	T27CG	3/4" CONDULET W/COVER AND GASKET
7	1	EL3430	3/4" 30° ELBOW
8	3	A314	3/4" CONDUIT LOCKNUTS
* 9	1	PIPDOP	4 oz. PIPE DOPE
10	1	N34T3	3/4" x 3" NIPPLE
11	3	HC402	3/4" NO THREAD CONNECTOR
12	3	SLPIGTAIL25	25' SIDELIGHT PIGTAIL
13	1	SS5012	STAINLESS STEEL WRAPLOCK 50'
14	4	N34T6	3/4" x 6" NIPPLE (FOR JB MOUNTING)
15	4	CPLG34	3/4" CONDUIT COUPLING
16	2	CABLEGRIP3	SINGLE EYE LACE MESH 0.63 - 0.74
* 17	1	AA1	AA1 CONTROLLER
18	30'	CONDUIT34	3/4" CONDUIT

ITEM NUMBERS #19-#20 ARE NOT INCLUDED IN THE KIT BUT ARE AVAILABLE UPON REQUEST, AND REQUIRED FOR INSTALLATION.

~ 19	-	STCABLIE	STROBE CABLE TIES (TWR. HEIGHT + 5')
~ 20	-	CSO12/4	4 - #12 WIRE CABLE (TWR. HT. + 30')

* = ITEMS NOT SHOWN
~ = ITEMS QUANTITY CALCULATED ACCORDING TO STRUCTURE HEIGHT.

NOTES:

- ITEM #18 CUT TO LENGTH FOR PROPER EXTENSION OF OL1 (6"-12") FROM STRUCTURE. ATTACH ITEM #11 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 #18.

LK1A1LED TOWER LIGHTING KIT CABLE RUN
(TOWERS 151'/46M TO 350'/107M/10' FACE WIDTH MAX)

TWR Lighting, Inc.

APP'D	ENGINEER	CHK'D BY
DRAWN BY	E.A.SALAZAR	SHEET SIZE B SHEET QTY. 1 OF 1
DATE	10/29/03	SCALE N.T.S. DRAWING NO. 800-01

11/11/04 (A) 1/2 UPDATED BOM
DATE: LTR. REVISION

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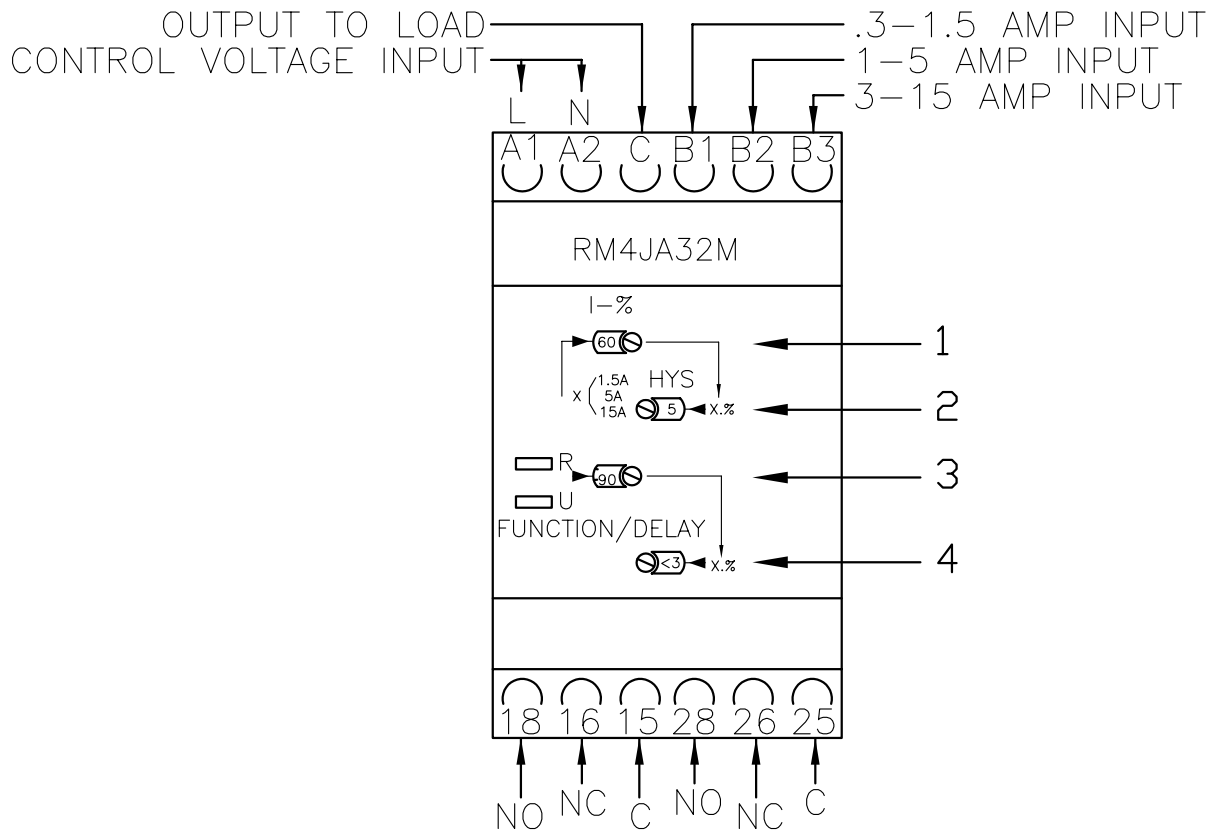
○ = TERMINAL

WHT. 12 0 0
RED 3 0 0
GREEN 0 0 0
BLACK 0 0 0
GROUND 0 0 0

TERMINAL NUMBERS

CONTROLLER WIRING

CURRENT MEASUREMENT RELAY



FUNCTIONS

- 1 Adjustment of current threshold as % of setting range max. value.
- 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	Overcurrentor Undercurrent Control ■	Measuring Range
Yes	Yes	0.3 A-15 A

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).

