TWR Lighting®, Inc. HARK®
Enlightened Technology®

10810 W. LITTLE YORK RD. STE 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 THE 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 # **E-1DB2**

SERIAL # _____

PURCHASE DATE _____

PURCHASED FROM _____

TWR Lighting® Inc. HARK

Enlightened Technology®

E-1DB2 CONTROLLER

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TWR Lighting® Inc. HARK

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E-1DB2 CONTROLLER

1.0 INTRODUCTION

The TWR Lighting®, Inc. (TWR®) Model E-1DB2, Type L-864/L-865, Controller has been designed and built to the Federal Aviation Administration's (FAA) Advisory Circular 150/5345-43F, with safety and reliability in mind. TWR® is committed to providing our customers with some of the best products and services available. TWR® welcomes you to our family of fine products, and we look forward to servicing your needs now and in the future.

1.1 APPLICATION

The E-1DB2 Controller is for use on lighting structures or towers 201' to 350' above ground level (AGL) that are approved to be lighted with Dual White/Red Flashing Medium Intensity Strobes, in accordance with the FAA's Advisory Circular 70/7460-1K.

1.2 SPECIFICATIONS OF EQUIPMENT

Dimensions:	
Controller (H X W X D) / Weight	22" x 17.5625" x 10.75" / 62.0 lbs
Mounting Dim (H X W)	21.25" x 10.0"
Beacon Height / Weight	28.0" / 36 lbs
Cable Diameter / Weight per 100 ft.	.625" +/- 10% 24 lbs
Electrical Voltage:	120V AC +/- 10% 60 Hz (Standard) 240V AC +/- 10% 60 Hz (Available)
Intensity:	
White Daymode	20,000 +/- 25% Effective Candelas
Red Nightmode	2,000 +/- 25% Effective Candelas
White Nightmode (Back-up mode)	2,000 +/- 25% Effective Candelas
Beam Spread:	
Horizontal	360°
Vertical	3° Minimum
Flash Rate:	
White Daymode	40 fpm +/- 2 fpm
Red Nightmode	22 fpm +/- 2 fpm
White Nightmode (Back-up mode)	40 fpm +/- 2 fpm
Wattage:	
Daymode	95 Watts
Red Nightmode	230 Watts
White Nightmode	35 Watts
Temperature:	+55°C / -55°C
Beacon Wind Load:	2.1 ft^2

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2.0 INSTALLATION

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 BREAKER PANEL!!

READ AND UNDERSTAND THE THEORY OF OPERATION AND ITS SAFETY MESSAGES BEFORE ATTEMPTING INSTALLATION/MAINTENANCE OF THIS SYSTEM. DO NOT ATTEMPT TO DEFEAT THE INTERNAL SAFETY SWITCHES IN THE CONTROLLER AND BEACON!!

2.1 POWER SUPPLY CONTROL CABINET MOUNTING

The power supply control cabinet can be located at the base of the structure or in an equipment building. Mounting Dimensions can be found in Section 1.2, on page 1. Pay particular attention when choosing your controller mounting location to ensure proper door opening and room for service personnel. Refer to installation drawings INS-329, and HD0-329, for ease of install.

2.2 PHOTOCELL HOUSING

The standard photocell housing is supplied with a 20' pigtail of 16 AWG TYPE TFFN wire. On occasion, in mounting of the photocell, an additional amount of wire may be required. Refer to drawing 100239, for proper assistance on determining gauge of wire for your specific needs.

2.3 PHOTOCELL WIRING (Refer to Drawings HD0-329, and H40-329)

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 housing 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 "Li," and the red wire is connected to the socket terminal marked "Lo." The photocell should be positioned so that it does not "see" ambient light, which would prevent it from switching to the nightmode. 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 the nightmode. The photocell housing socket wiring is the same as above.

2.3.1 Connect the **BLACK** wire from the photocell to TB1-8.

2.3.2 Connect the **RED** wire from the photocell to TB1-9.

2.3.3 Connect the **WHITE** wire from the photocell to TB1-10.

2.3.4 Install the photocell into the receptacle and twist to the right while depressing to lock into place.

2.4 POWER WIRING
(Refer to Drawing H40-329)

Power wiring to the control cabinet should be in accordance with local methods and the National Electric Code (NEC).

2.4.1 A 15 amp circuit breaker is recommended at service panel.

2.4.2 Connect the "HOT" side of the 120V AC line to TB1-11.

2.4.3 Connect the "NEUTRAL" side of the 120V AC line to TB1-12.

2.4.4 Connect the AC ground to the ground stud to the lower right of the terminal block TB1.

2.4.5 Controller panel should be connected to the tower and/or building grounding system with the exception of installations on AM RF Applications where controller grounding to earth ground is prohibited. Ground the controller only to the tower itself using a suitable RF ground.

2.5 TOWER LIGHTING KIT

When installing this system, the customer will need to use strobe cable wiring method to wire the strobe beacon. Refer to drawing 600-04 for cable installations.

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READ AND UNDERSTAND THE THEORY OF OPERATION AND ITS SAFETY MESSAGES BEFORE ATTEMPTING INSTALLATION/MAINTENANCE OF THIS SYSTEM. DO NOT ATTEMPT TO DEFEAT THE INTERNAL SAFETY SWITCHES IN THE CONTROLLER AND BEACON!!

2.5.1 Beacon Mounting and Wiring (Refer to Drawings HD0-329, and INS-329)

2.5.1.1 Bolt the beacon to the mounting plate using four (4) 5/8" X 1 1/4" galvanized bolts that are supplied. Installer should make sure to check for full thread engagement on Anco locknut. Allow 16" clearance in back of the hinge (25" from the center of the base) to tilt lens back without hitting an obstruction.

2.5.1.2 Level the beacon using the spirit level at the base of the lens. Shims may be used under beacon base or triple nutting each bolt with palnuts on all four (4) nuts.

2.5.1.3 Slip the electrical cable for the dual beacon through the watertight connector (cable gland bushing), and tighten the gland nut to make a watertight seal. Attach the wires to the terminal strip as follows:

Connect Cable Wire Color	To Match	Lamp platform Wire Color	Terminal Block Number
10 Gauge Red/Black		12 Gauge Red/Black	2
10 Gauge Red		12 Gauge Red	3
14 Gauge Green		16 Gauge Green	4
10 Gauge Black		16 Gauge Black	5
14 Gauge White		16 Gauge White	6
14 Gauge White/Green		16 Gauge White/Green	7
16 Gauge Blue		16 Gauge Blue	8
16 Gauge Brown		16 Gauge Brown	9
16 Gauge Bare Wire		Beacon Base	

2.5.2 Lighting Kit Wiring

Install wiring from the controller to the beacon utilizing strobe cable method. **(TWR LIGHTING CAN NOT WARRANTY SYSTEMS THAT EMPLOY SPLICING CABLE.)** Refer to drawings HD0-329, 600-04, and T1369, for install of light kits. Following these minimum guidelines as well as any local or end user additional 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 29CFR 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 this, the drawings will precede the manual if a conflict occurs.

All the necessary information for wiring the dual beacon and sidelights is contained on the tower kit drawings 600-04, and T1369. The connections for the dual beacon and sidelights in the controller are as follows:

2.5.2.1 Connect the 10 gauge ***Red/Black*** wire from beacon wiring to *TB1-1.*

2.5.2.2 Connect the 10 gauge ***Red*** wire from beacon wiring to *TB1-2.*

2.5.2.3 Connect the 10 gauge ***Black*** wire from beacon wiring to *TB1-3.*

2.5.2.4 Connect the 14 gauge ***White*** wire from beacon wiring to *TB1-4.*

2.5.2.5 Connect the 14 gauge ***White/Green*** wire from beacon wiring to *TB1-5.*

2.5.2.6 Connect the 14 gauge ***Green*** wire from beacon wiring to the ground screw left of *TB1.*

2.5.2.7 Connect the 16 gauge ***Brown*** wire from beacon wiring to *TB1-6.*

2.5.2.8 Connect the 16 gauge ***Blue*** wire from beacon wiring to *TB1-7.*

2.5.2.9 Connect the ***Neutral*** wire from sidelight wiring to *TB1-12.*

2.5.2.10 Connect the ***Red*** wire from sidelight wiring to *TB1-13*.

2.5.2.11 Connect the ground wire (if cable is used) from sidelight wiring to ground screw right of TB1.

2.6 ALARM WIRING

Individual alarm contacts (Form C) are provided for strobe failures, power failure, and photocell on. It is left up to the customer or installer on how they choose to utilize these contacts with their monitoring equipment. External monitoring equipment is available. Please inquire within the sales staff at the factory for models available and pricing. Alarm configurations are shown on drawings H40-329, and M01-329.

2.6.1 White Strobe Failure (SF)

Connect the customer's alarm common to plug J3, terminal #5. Connect the customer's alarm wire to plug J3, terminal #4, for normally open (or) terminal #6, for normally closed monitoring.

2.6.2 Red Strobe Failure (RF)

Connect the customer's alarm common to plug J3, terminal #11. Connect the customer's alarm wire to plug J3, terminal #10, for normally open (or) terminal #12, for normally closed monitoring.

2.6.3 Power Failure (PF)

Connect the customer's alarm common to plug J3, terminal #14. Connect the customer's alarm wire to plug J3, terminal #15, for normally open (or) terminal #13, for normally closed monitoring.

2.6.4 Photocell (PC)

Connect the customer's alarm common to plug J3, terminal #8. Connect the customer's alarm wire to plug J3, terminal #7, for "off" operation (or) terminal #9, for "on" operation monitoring.

2.6.5 Sidelight Alarm (SA)

Connect the customer's alarm common to plug J3, terminal #2. Connect the customer's alarm wire to plug J3, terminal #1, for normally open (or) terminal #3, for normally closed monitoring.

2.7 ALARM TESTING

To test alarms, follow these procedures using an "ohm" meter between alarm common and alarm points.

2.7.1 White Strobe Failure (SF)

White strobe failure testing can be performed in the daymode operation. Check for status of strobe beacon. Turn "on" switch S1 on PCB #1, and status will change after a nine (9) second delay. After test, turn switch “S1” to the normal operating position (down position).

2.7.2 Red Strobe Failure (RF)

Red strobe failure testing can be performed in the nightmode operation. Check for status of strobe beacon. Turn "off" switch SW2 on controller panel and status will change after a ten (10) second delay. This testing will cause the unit to go into the back-up white strobe operation. To clear this situation, turn “on” switch SW2, and reset the breaker.

2.7.3 Power Failure (PF)

While the controller is in normal operation, shut off power to the controller at the breaker panel. Alarm should be prompt. Reset the breaker to resume normal operation.

2.7.4 Photocell (PC)

Controller should be in the daymode of operation when performing this test. Check status of operation. Turn “on” switch SW1, (or) cover the photocell and operation status should change state. After test, turn switch SW1 to the normal operating position.

2.7.5 Sidelight Alarm (SA)

Controller should be in the nightmode of operation. Check status of operation. Pull fuse switch “S1” open. Alarm shall occur within 30 seconds. After test, re-engage fuse switch ”S1.”

2.8 CONTROLLER CONFIGURATION

(Refer to Drawings H01-329, and H40-329)

This unit is factory setup to be a master controller. If this unit is to be used in conjunction with an additional unit, change dip-switch settings as drawing indicates. The following connections will need to be interfaced between systems.

2.8.1 Connect at least an 18-gauge wire from PCB #1, connector P1-15, from unit setup to be the master unit to PCB #1, connector P1-15, of unit setup to be the slave unit.

2.8.2 Connect at least an 18-gauge wire from J1-5 (item 10) of master unit to slave unit J1-5 (item 10).

2.8.3 Connect at least an 18-gauge wire (ground) from one chassis to the other chassis.

2.8.4 Connect at lease an 18-gauge wire from PCB#1, J3 (by LED1) of master unit to slave unit PCB #1, J3 (by LED1).

2.8.5 Use a single breaker for supply power to all controllers.

2.8.6 Use only one (1) photocell for one (1) system.

2.8.7 Follow standard instructions provided in the manual supplied with the controller.

3.0 THEORY OF OPERATION

3.1 THE POWER SUPPLY

The AC line is sent to transformers T1, and T2, through fuse F2, MOVMOD1, and relay K1. In order for K1 to energize and complete the circuit to T1, the safety interlock switch CSS, BSS, must be closed. The BSS switch is located in the beacon. In order for the system to operate, the beacon and the power supply must be closed and secured.

Transformer T1 secondary output is around 1,100V AC. These outputs are sent to the high voltage rectifier PCB (PCB #2) and converts the 1,100V AC to around +550V DC and -550V DC in daymode, and +750V DC and -550V DC in nightmode. This high voltage is then used to charge the energy storage capacitor C102 through current limiting resistors R31, T3 and steering diode D5 for nightmode operation.

Energy storage capacitors bank C103-110 is used for the daymode operation and are connected to the high voltage through the normally closed contacts of relay K5. When the light level drops below 3 foot candles the photocell supplies 120V AC to relay K5, which removes C103-110 from the discharge path leaving capacitor C102 in the circuit for nightmode operation. The energy storage capacitor banks are connected to the flashtube through the interconnecting tower wiring.

3.2 THE FLASHTUBE

The flashtubes FT1 (daymode) and FT2 (nightmode) are quartz tubes containing two (2) electrodes each. The electrode at the positive (+) end is called the anode and is connected to the positive side of the storage capacitors through inductor L1, and L2. The electrode at the negative (-) end of the tube is called the Cathode and is connected to the negative side of the energy storage capacitors banks.

The flashtube contains a gas called Xenon. When the high voltage energy in the storage capacitors is connected to the flashtube, nothing will happen since Xenon in its natural state is not a conductor of electricity. However, when a very short duration high voltage pulse is impressed on the trigger element of the tube (via the power supply and trigger transformers T4 and T5), the Xenon gas is ionized and thereby becomes a good conductor of electricity. This allows the electrical energy in the storage capacitors to discharge rapidly through the flashtube, which converts this energy to light energy and heat energy. When the voltage stored in the capacitors discharges to a low level, the Xenon gas can no longer sustain conduction and since the short trigger pulse is gone by this time, it deonizes returning to its nonconducting state until another trigger pulse arrives to repeat the process. Meanwhile, the storage capacitor is being recharged by the transformer and the high voltage rectifiers.

3.3 TIMING CIRCUIT

The timing circuit is contained entirely on PCB #1. The timing circuit has its own power supply. This circuit converts the AC voltage to approximately 12V DC, which is used to supply all of the components in this circuit. It uses this low voltage DC to generate pulses that control the flash rate of the flashtube. It actually generates two (2) groups of pulses. The first is a pulse approximately once every 1.5 seconds to operate the flashtube during daylight hours. The second is a burst at 50 Hz to elongate the apparent flash during the night time hours at reduced flash energy.

3.4 TRIGGER CIRCUIT

The trigger circuit is supplied by transformer T2 secondary windings. The 250V AC is converted to DC, which is stored in a storage capacitor much like the action of the high voltage circuit. The main difference is that the storage capacitor is much smaller. The trigger circuit receives the pulses generated by the timing circuit. It releases its stored energy with each pulse and delivers it to the flashtube's trigger element to initiate each flash.

3.5 ALARM CIRCUITS

3.5.1 White Strobe Failure (SF)

White Strobe Failure alarm circuit monitors each flash of the daymode flashtube within the beacon. If the flashtube fails to flash (for any reason), the alarm circuit operates relay K7 (on PCB #3) that the customer can connect to their alarm transmitting devices. The alarm point can be accessed on J3, of PCB #3.

3.5.2 Red Strobe Failure (RF)

Red Strobe Failure alarm circuit monitors each flash of the nightmode flashtube within the beacon. If the flashtube fails to flash (for any reason), the alarm circuit operates relay K8 (on PCB #3) that the customer can connect to their alarm transmitting devices. The alarm point can be accessed on J3, of PCB #3.

3.5.3 Power Failure (PF)

The power failure alarm relay is energized during normal operation. Should the power be removed for any reason, then relay K1 would drop, creating an alarm for the customer alarm-transmitting device. The alarm point can be accessed on J3, of PCB #3.

3.5.4 Photocell (PC)

The photocell alarm relay K4 is energized whenever the photocell or SW1 is on. This relay will allow the customer to monitor the modes of operation to determine if switch from day to nightmode has occurred. The monitor point can be accessed on J3, of PCB #3.

3.5.4.1 To test daymode operation in night time, set SW1 switch in the middle position. Make sure to switch downward to "NORMAL" position after testing.

3.5.5 Sidelight Alarm (SA)

Module M1 monitors the current to the sidelights. This module can monitor one (1) to five (5) 116W lamps. Factory setting is generally for three (3) lamps. When the current falls to two (2) lamps (1 lamp less than the factory setting), then the onboard relay will engage, creating an alarm that is then sent to PCB #3.

3.6 BLEEDER CIRCUIT

The bleeder circuit is the most important safety item in this system. It consists of resistor R32 connected to the high voltage storage capacitor through relay K2. When the AC line voltage is turned off, the relay will close, allowing the resistors to discharge the high voltage stored in the capacitor banks below 50V in 30 seconds. It also has auxiliary bleeder resistor R33 connecting day capacitors directly.

CAUTION

NEVER RELY ON THIS CIRCUIT TO RENDER THIS SYSTEM HARMLESS. ANY DEFECT IN THIS CIRCUIT COULD ALLOW A HAZARDOUS HIGH VOLTAGE CHARGE TO REMAIN ON THE STORAGE CAPACITORS. ALWAYS WAIT AT LEAST 30 SECONDS AFTER POWER HAS BEEN TURNED OFF BEFORE STARTING ANY WORK ON THIS SYSTEM. ALWAYS MEASURE THE VOLTAGE ON THE STORAGE CAPACITORS WITH A VOLTMETER BEFORE STARTING ANY OTHER WORK ON THIS SYSTEM. NEVER ATTEMPT TO DEFEAT THE SAFETY INTERLOCKS.

3.7 STROBE DIAGNOSTIC CIRCUITS

The diagnostic circuit is provided as a means of making system checks and maintenance more convenient. This circuit is entirely contained on PCB #1, and PCB #2. The circuits that are contained on PCB #1, and PCB #2 are as follows:

3.7.1 Control Power On

Line from the 120V AC input is sent through F2, safety switches CSS, BSS, isolation transformer T2, and fuse f1 on PCB #1. Once this low voltage is at PCB #1, it is rectified, and then sent to LED4 (D5). If, for any reason, power is interrupted, (beacon opened, controller door open, blown fuses, failed relay, etc.) LED4 would be extinguished.

3.7.2 High Voltage

The Cathode side of the high voltage HV is routed through a current limiting resistor (R201). When the unit is in daymode, D14 will be at full brightness when the capacitors are at full charge, but dims with the discharging of the storage capacitors. A constant intensity indicates that high voltage is present but capacitors are not discharging (check other indicators for fault). When the red LED fails to glow, then the high voltage is no longer present.

3.7.3 Trigger Voltage

The trigger voltage from fuse F3 is sent to PCB #2, current limiting resistor R1, and PCB #1's, LED6 (D11). Under normal circumstances, the LED should be at full brightness when the trigger capacitor is at full charge and indicating voltage to be normal, but dims with trigger capacitor discharge (light flashing). An absence of this indication means that the voltage is no longer present.

3.7.4 Nightmode

Output voltage from the photocell (SSR1) is connected to the coil of relay K4 on PCB #3. Whenever the photocell senses the darkness or switch SW1 is on, relay K4 will energize, thereby sending 120V to relay K2, on PCB #1. Relay K2 will supply 12V DC to the timing circuit as well as LED7 (D7). LED7 will glow a constant red when in the nightmode.

3.7.5 Operation Timing

The operation timing pulses are received at LED8 (D12). LED8 will flash according to the pulses received from the timing circuit. If LED8 fails to flash, then check LED9 (D28) for timing operation. The strobe unit should produce 40 (+/- 2) pulses per minute in daymode or nightmode back-up operation. The strobe unit in nightmode operation should produce 22 (+/- 2) pulses per minute.

3.7.6 Timing Signal Verify

Timing pulses (either primary or secondary) are received at LED9 (D28). The LED will flash according to the pulses received from the timing circuit. In the unlikely event that this LED is out, then total timing failure has occurred.

3.7.7 Flash Verified

Current from the Cathode side of the flashtube (FTC) is sent through the current sensing transformer T4 on PCB #1. T4 will send a pulse to the gate of the SCR's Q13, and turn it on. Capacitor C15, via Q13, will send voltage to LED1 (D20). After each confirmed flash, LED1 will blink. Absence of a blinking LED signifies that strobe beacon has ceased to flash.

3.7.8 Strobe Fail Test

On PCB #1, switch S1, when turned up, cuts off the timing signal to the trigger circuit and extinguishes LED8 (D12). At this time a strobe alarm should be received at J3. The normal position of switch S1 is off (switch downward).

4.0 TROUBLESHOOTING

Much of the troubleshooting of this system will consist of correcting a "beacon out" situation. There may also be a failure mode where the flashtube is still flashing, but at the wrong rate or the wrong intensity.

You must study and understand the safety messages and the theory of operation before attempting any service on this system. Servicing this system must be done by qualified personnel only.

4.1 TOOL REQUIREMENTS

In order to be prepared to trouble shoot or repair this system, a minimum amount of tools and equipment will be required. A recommendation list includes:

1) 5/16 Flat Electrician's Screwdriver
1) #2 Phillips Screwdriver
1) Nut Driver or Socket Set
1) 5/32 Allen Wrench
1) Needle Nose Pliers
1) Precision Flat Screwdriver
1) Multi meter - Analog or Digital 600V AC / 1,000V DC Minimum

4.2 DIAGNOSTIC EVALUATION

The first step in troubleshooting of this system or performing annual maintenance will require the technician to open the controller door. With the power off to the controller, the technician should look over the controller circuit, and repair or replace any apparent problems such as loose wire connections, corroded terminations, or burnt parts. After the initial visual checks have been completed, restore power to the controller and pull out on the plunger of the cabinet safety switch (CSS) located at the right edge of the enclosure. Observe at this time the LEDs located on PCB #1, and PCB #2. Determine, by observation of these LED indicators, if the controller is performing to normal operation.

LEDs on PCB #1 are numbered from top to bottom, 1-9. LEDs on PCB #2 are numbered from top to bottom, D14 - D16. (See drawings H02-329, and H01-329.)

4.3 TROUBLESHOOTING ASSISTANCE

4.3.1 Flash Verify LED (LED 1) - Out

4.3.1.1 Observe high voltage LED (D14) on the same beacon circuit to determine if it is available. If the LED is dim or out completely, then check the high voltage capacitor bank (C103 - C110 daymode, C102 nightmode) for a short. If no capacitor is found to be shorted, check the resonant cap (C101) for a short. Disconnect strobe cable to see if D14 illuminates. Need to verify if bleeder relay is operating properly. If the LED is at full illumination, go to the next step.

4.3.1.2 Check the status of trigger LED6. If LED is dim or off, check fuse F3. If blown, replace with exact type of fuse. If the fuse blows again, check PCB #1, and PCB #2. Replace as necessary. If LED is okay, go to the next step.

4.3.1.3 If steps 4.3.1.1, and 4.3.1.2 check out okay, check or re-lamp the beacon.

4.3.2 Control Power on LED (LED 4) - Out

4.3.2.2 Check interlock circuit for an open circuit. If open, make the necessary repairs. If okay, check fuse F2 in the cabinet. Replace if bad.

4.3.3 Timing LED (LED 9) – Out

4.3.3.1 Observe the status of the timing LED8. If the LED is dim or out completely, check LED9, and if dim or out, check 18V AC between P1-13, 14 (Item 12). If yes, replace PCB #1. If one (1) or both are lit, you should have timing.

4.3.4 False or Nonexistent Beacon Alarm (SF)

4.3.4.1 If alarm trips when the system appears to be working normally or fails to show an alarm when there is an obvious failure, check PCB #1, P1-4, and P1 – 10, for 120V AC output. If voltage is okay, go to the next step.

4.3.4.2 Check relay K7 coil for an open condition. Normal resistance should be around 2K ohm. If coil is open, replace K7.

4.3.4.3 The time delay between an actual failure and the point where the relay trips is pre-set at the factory or about nine (9) seconds. This delay period can be tested by placing the control board (PCB #1) test switch to “ON.”

4.3.5 False or Nonexistent Beacon Alarm (RF)

If alarm trips when the system appears to be working normally or fails to show an alarm when there is an obvious failure, check relay K8 coil for an open condition. Normal resistance should be around 2K ohm. If coil is open, replace K8.

4.3.6 No Red Strobe Operation

4.3.6.1 Check if switch SW2 is on. If switch is off, turn switch to the on position *(upward)*. If okay, go to the next step.

4.3.6.2 Turn switch SW1 to the on position *(upward)*. On the breaker at the service panel to the lights, turn off then back on. If the beacon comes on then the unit fail-safes back to the white back-up mode of operation, then replace the red mode flashtube.

5.0 MAINTENANCE GUIDE

WARNING - HIGH - VOLTAGE

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Tools Required: #2 Phillips Screwdriver
3/16 Flat Blade Screwdriver

5.1 FLASHTUBE REPLACEMENT

The only required maintenance needed to be performed is the replacement of the flashtubes every four (4) years. By following these instructions, maximum safety and performance can be achieved.

5.1.1 Loosen the single quick open bolt located on upper hinge assembly.

5.1.2 Open the lens and tilt it back.

ALWAYS WAIT AT LEAST 30 SECONDS AFTER OPENING THE BEACON BEFORE STARTING ANY WORK ON THE BEACON.

5.1.3 Loosen the three (3) socket screws with a #2 Phillips screwdriver to remove lamp.

5.1.4 Install the new nightmode flashtube making sure that the pins are aligned with the socket. Make sure tube is flush on the socket.

5.1.5 Tighten the socket screws snug, then 1/4 turn more.

5.1.6 Open the internal hatch plate latch and let it recline open.

5.1.7 Disconnect the cable running through the tube from the 10 position terminal block located at the base of the fixture.

5.1.8 Loosen the three (3) socket screws with a #2 Phillips screwdriver.

5.1.9 To remove the flashtube, slide the lamp down to the cable.

5.1.10 To install a flashtube, slide the lamp over the connector on to the cable with lamp in the base up position.

5.1.11 Insert the flashtube with the pins aligned with the socket.

5.1.12 Tighten the socket screws snug, then 1/4 turn more.

5.1.13 Reconnect cable connection. Make sure to follow the color codes on the cable to the terminal block.

5.1.14 Close the hatch and latch securely.

5.1.15 Close the upper hinge assembly and latch securely.

5.2 RED OBSTRUCTION LIGHTING

The only required maintenance needed to be performed is replacement 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 FAA Advisory Circular 70/7460-1K. By following these instructions, maximum safety and performance can be achieved.

Tools Required: None

5.2.1 LAMP REPLACEMENT

5.2.1.1 Unclasp the two (2) latches and let the bail recline back.

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

5.2.1.3 Unscrew the lamp counter-clockwise and remove.

5.2.1.4 Install the new lamp by screwing the lamp clockwise.

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

5.2.1.6 Reclasp the two (2) latches.

5.3 PHOTOCELL

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

6.0 MAJOR COMPONENTS LIST

SCHEMATIC TAG #	DESCRIPTION	PART NUMBER
BSS	BEACON SAFETY SWITCH	STJ02003
C101, and C102	3 uf 660V AC	STB99008csi
C103 - C110	40 uf 1.1KV CAP	STB99006
CSS	CABINET SAFETY SWITCH	STJ02001
F1	0.5 amp FUSE	FUSE.5
F2	10 amp FUSE	FNQ10
F1	1 amp FUSE	KTK1
F3	1/8 amp FUSE	FLQ18
FT1	DAYMODE FLASHTUBE	STFLSHTB6
FT2	NIGHTMODE FLASHTUBE	STFLSHTB7
K1, K4, K5, K6, K8	DPDT OCTAL RELAY	KRPA11AG120V
K2, K3	HV RELAY	STJ10006
K7	SPDT OCTAL RELAY	KRPA5AG120V
K9	TIME DELAY RELAY	SPEC224
L1	INDUCTOR	INDCTR3001
L2	INDUCTOR	100453
M1	CURRENT SENSOR	RM35JA32MRSP01
MOVMOD1	SURGE SUPPRESSOR	SPM-120 (This replaces the DTK-120HW)
MOV 2	METAL OXIDE VARISTOR	MOV524V15
MOV5, 6	METAL OXIDE VARISTOR	V275LA20A
P1, P2, J1	15 POSITION PLUG	STT60021
PCB1	CONTROL PCB	STH01329
PCB2	RECTIFIER PCB	STH02329
PCB3	RELAY PCB w/ALARM LOCKOUT ELIMINATION MODIFICATION	STH03269A

6.0 MAJOR COMPONENTS LIST (continued)

SCHEMATIC TAG #	DESCRIPTION	PART NUMBER
PHOTOCELL	PHOTOCELL 120 - 240V AC	6390 – FAA2
R31	50 ohm 50W	STA22012
R32	25K ohm 20W	STA08020
R33	2.4 MEG 2W	STA08010
S1	5 amp FUSE	KTK5
SW2	SPST 15 amp SWITCH	STJ01002
SW1	SPDT 15 amp SWITCH	STJ01004
T1	FERRORESONANT TRANSFORMER	STC30018
T2	ISOLATION TRANSFORMER	100272
T3	BURSTING CHOKE	100273
T4, T5	TRIGGER TRANSFORMER	STC05005
TB1	13 PART TERM BLK	TERMBLK-13
TB2	12 PART TERM BLK	TERMBLK 141-12
TLS	THERMAL LIMITING SW OA210 QCV	STJ10008
	FLASHTUBE SOCKET	100319
	HINGE GASKET	STBEAGSKT
	LENS GASKET	STBEAGSKT2
	CLEAR LENS	STDBCLENS
	DB STROBE BEACON FIXTURE	STDBEACON
	STROBE BEACON CABLE	STROBCABLE-3
	SIDELIGHT CABLE	STCABLE0B
	RED LENS	STDBRLENS
	DUAL BEACON UPPER TERMINAL BLOCK KIT	DBTERMBLK8KIT
	DUAL BEACON LOWER TERMINAL BLOCK KIT	DBTERMBLK10KIT
	STROBE CABLE TIE	STCABLETIE
	STDBEACON HATCH LATCH ASSEMBLY	STDBHATPLT

6.0 MAJOR COMPONENTS LIST (continued)

SCHEMATIC TAG #	DESCRIPTION	PART NUMBER
	SINGLE EYE LACE MESH .50 - .74	CABLEGRIP1
	SINGLE EYE LACE MESH .63 - .74	CABLEGRIP3
	116W, 120V SIDELIGHT BULB	116A21TS

7.0 SUGGESTED SPARE PARTS LIST

QTY#	PART NUMBER	DESCRIPTION
2	KTK1	1 amp FUSE
2	FNQ10	10 amp FUSE
2	KTK5	5 amp FUSE
2	FUSE.5	1/2 amp FUSE
2	FLQ18	1/8 amp FUSE
1	STH01329	E-1DB2 PCB #1
1	6390 – FAA2	120V AC PHOTOCELL
1	STJ10006	HV RELAY
1	STJ02003	BEACON SAFETY SWITCH
1	STJ02001	CABINET SAFETY SWITCH
1	STFLSHTB6	DAYMODE FLASH TUBE
1	STFLSHTB7	NIGHTMODE FLASH TUBE
1	KRPA11AG120V	DPDT OCTAL RELAY
1	RM35JA32MRSP01	CURRENT SENSOR
1	KRPA5AG120V	SPDT OCTAL RELAY
1	STB99006	40 uf1.1KV CAP

TWR Lighting® Inc. HARK

Enlightened Technology®

E-1DB2 CONTROLLER

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:

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

TWR Lighting® Inc. HARK

Enlightened Technology®

E-1DB2 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:

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

TWR Lighting® Inc. HARK

Enlightened Technology®

E-1DB2 CONTROLLER

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**.**

- Product(s) that is deemed defective and/or unrepairable and covered under warranty - a credit will be issued to the customer's account.
- 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.
- 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.

TWR Lighting® Inc. HARK

Enlightened Technology®

E-1DB2 CONTROLLER

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.

TWR Lighting® Inc. HARK

Enlightened Technology®

E-1DB2 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

TWR Lighting® Inc. HARK

Enlightened Technology®

E-1DB2 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:_____

_____

_____

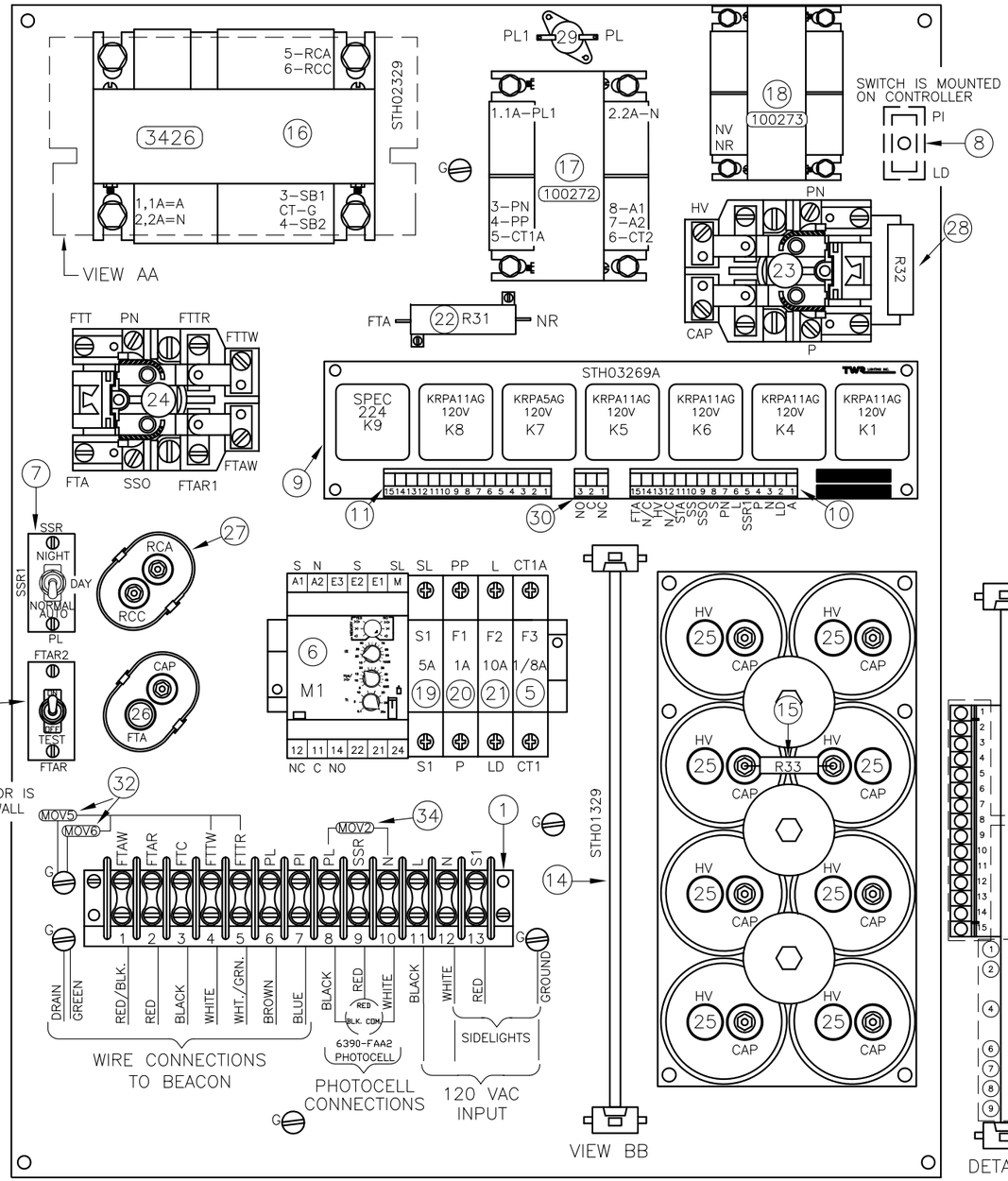
_____

SIGNED_____ **DATE NEEDED**_____

RETURN ADDRESS:_____

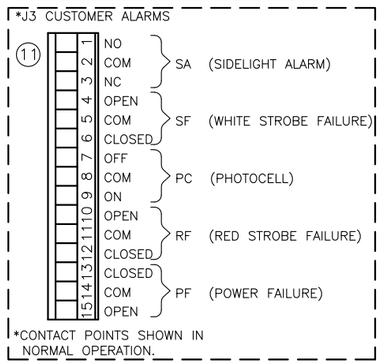
_____

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

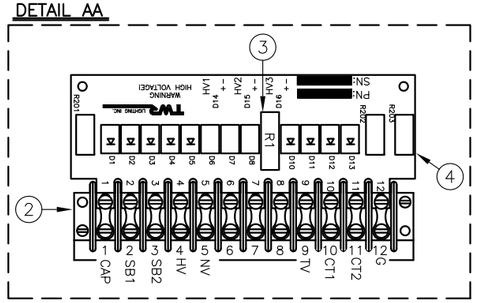


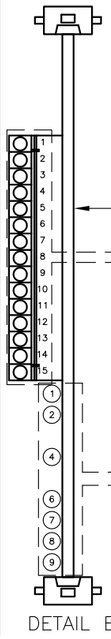
J2 ALARM INTERCONNECT

CUSTOMER STROBE ALARM POINTS



DETAIL AA





P1 CONNECTIONS

12

1 = FTT	6 = CAP	11 = TV
2 = FTAR2	7 = FTC	12 = G
3 = FTAR1	8 = SSO	13 = A1
4 = STA	9 = SS	14 = A2
5 = P	10 = PN	15 = TS

LED DIAGNOSTICS

13

LED1: FLASH VERIFY
LED2: RED FLASH FAIL
LED4: CONTROL POWER ON
LED6: TRIGGER VOLTAGE
LED7: NIGHT MODE
LED8: OPERATION SIGNAL
LED9: TIMING SIGNAL VERIFY

ITEM NO.	SCH. TAG NO.	DESCRIPTION
1	TB1	13–POSITION TERMINAL BLOCK, TERMBLK–13
2	TB2	12–POSITION TERMINAL BLOCK, TERMBLK141–12
3	R1	TRIGGER RESISTOR 10K 11W STA08001
4	PCB2	E1DB2 RECTIFIER PCB STH02329
5	F3	1/8A TRIGGER FUSE. FLQ18
6	M1	CURRENT SENSOR RM35JA32MRSP01
7	SW1	PHOTOCELL BYPASS SWITCH (SWITCH IN OFF POSITION FOR NORMAL OPERATION) STJ01004
8	CSS	ENCLOSURE SAFETY SWITCH STJ02001
9	PCB3	RELAY PCB STH03269A
	K1	POWER/POWER FAIL RELAY
	K4	PHOTOCELL RELAY
	K5	DAY/NIGHT INTENSITY RELAY
	K6	SIDE LIGHT RELAY
	K7	STROBE FAIL RELAY
	K8	RED STROBE FAIL ALARM RELAY
	K9	RED STROBE FAIL TRANSFER RELAY SPEC224
10	J1	RELAY PCB CONNECTION STT60021
11	J3	CUSTOMER ALARM POINTS STT60021
12	P1	CONTROL PCB CONNECTION STT60021
13	LED	DIAGNOSTIC LEDS
14	PCB1	TIMING & CONTROL PCB STH01329
	f1	.5 AMP FUSE FUSE.5
15	R33	AUXILIARY BLEEDER RESISTOR STA08010 2.4MΩ
16	T1	FERRORESONANT TRANSFORMER STC30018
17	T2	ISOLATION TRANSFORMER 100272
18	T3	BURSTING CHOKE 100273
19	S1	SIDELIGHT FUSE KTK5
20	F1	CONTROL FUSE 1 AMP, KTK1
21	F2	10 AMP POWER FUSE FNQ10
22	R31	RESISTOR 50 OHM 50W STA22012
23	K2	BLEEDER RELAY STJ10006
24	K3	WHITE/RED BEACON RELAY STJ10006
25	C103–C110	DAY CAPACITOR 40uf STB99006
26	C102	NIGHT CAPACITOR 3uf STB99008CSI
27	C101	RESONANT CAPACITOR 3uf , STB99008CSI
28	R32	BLEEDER RESISTOR 25K 20W STA08020
29	TLS	THERMAL LIMITING SWITCH 0A210 QCV STJ10008
30	J2	SIDELIGHT ALARM INTERCONNECT
31	SW2	RED STROBE FAIL TEST SWITCH (SWITCH IN ON POSITION FOR NORMAL OPERATION) STJ01002
32	MOV5,6	TRIGER MOV V275LA20A
33	MOVMOD1	SURGE ARRESTOR SPM–120
34	MOV2	PHOTOCELL MOV MOV524V15

NOTES:

1. WIRES ARE CONNECTED LETTER TO LETTER. (EXAMPLE: N TO N TO N)
2. THIS DRAWING IS PROVIDED AS A GENERAL REFERENCE. TWR LIGHTING, INC. DOCUMENTATION SUPERCEEDES THIS DRAWING AND SHOULD BE REVIEWED PRIOR TO INSTALLATION OF THIS SYSTEM.

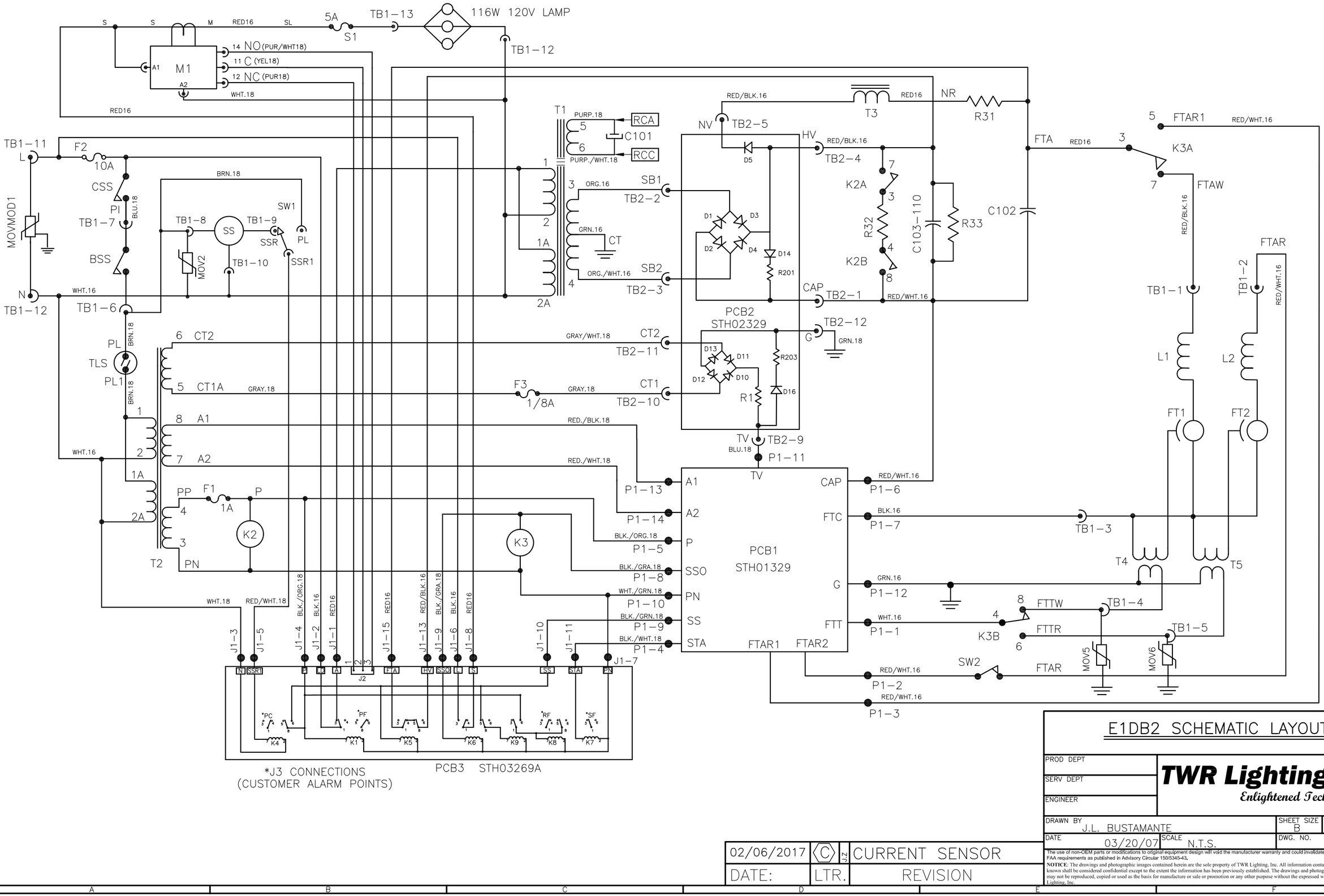
E–1DB2 CHASSIS LAYOUT

L–864/L–865 DUAL CONTROLLER 120VAC

PROD DEPT			
SERV DEPT			
ENGINEER			
DRAWN BY	J.L.BUSTAMANTE	SHEET SIZE	B
DATE	03/19/07	SCALE	N.T.S.
SHEET QTY.	1 OF 1	DWG. NO.	H40–329

TWR Lighting, Inc. Enlightened Technology® HARK®

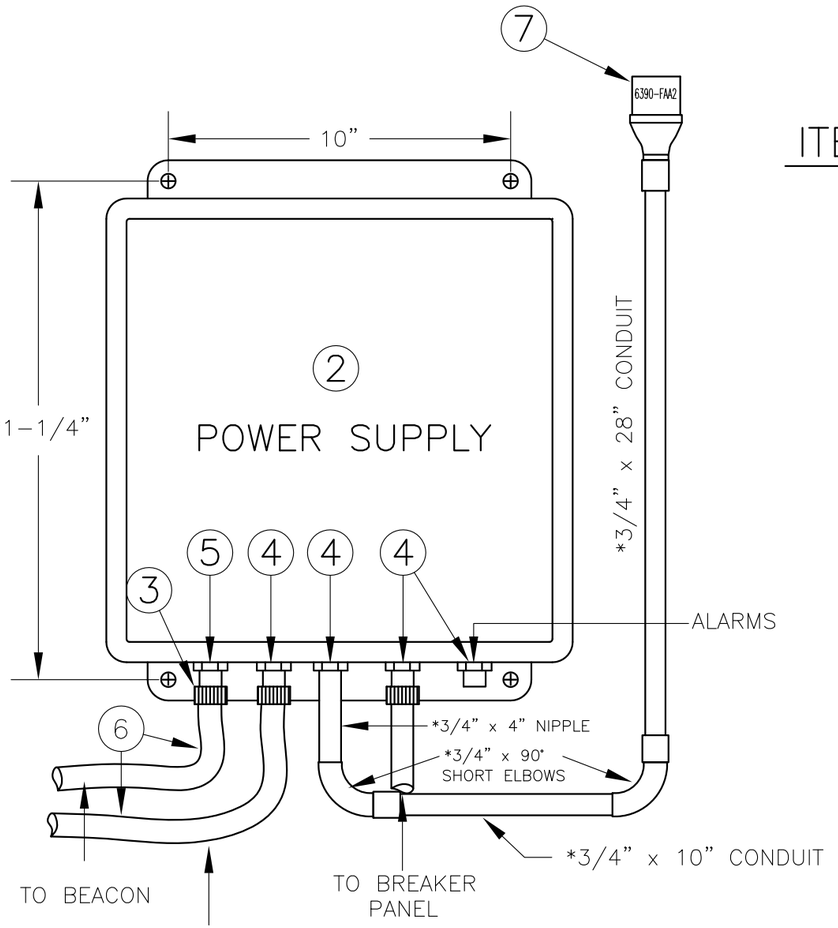
DATE:	LTR.	REVISION
08/01/2018	E	J.Z M1, S TO E2 INPUT



E1DB2 SCHEMATIC LAYOUT

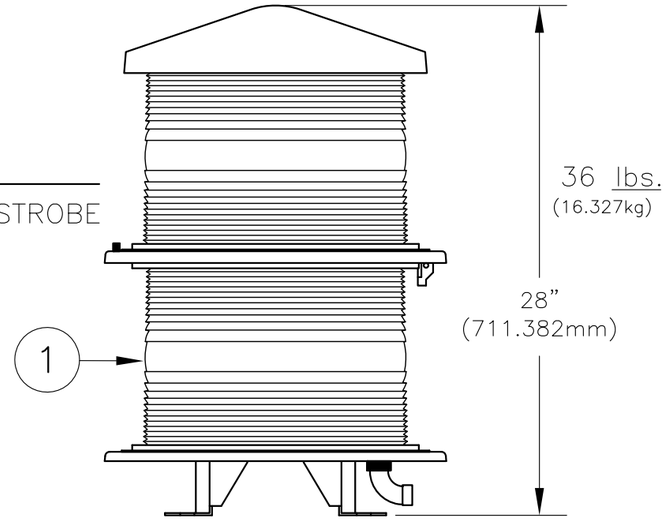
PROD DEPT	**TWR Lighting, Inc.** *Enlightened Technology®*
SERV DEPT	
ENGINEER	
DRAWN BY: J.L. BUSTAMANTE	SHEET SIZE: B — SHEET QTY.: 1 OF 1
DATE: 03/20/07	SCALE: N.T.S. — DWG. NO.: M01-329

DATE:	LTR.	REVISION
02/06/2017	C	JZ — CURRENT SENSOR

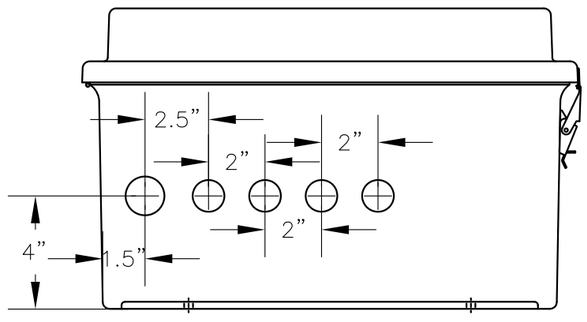


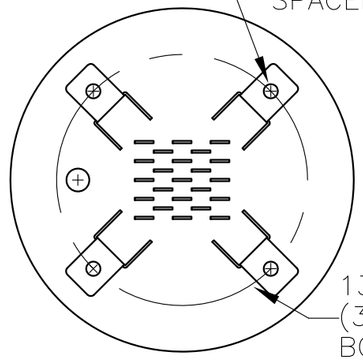
* = ITEMS NOT INCLUDED BUT ARE AVAILABLE UPON REQUEST.

ITEM #	DESCRIPTION
1	BEACON L-864/L-865 DUAL RED/WHITE STROBE
2	POWER SUPPLY E-1DB2
3	WATER TIGHT CABLE CONNECTOR WITH SEALING GLAND.
4	ENTRANCE HUB 3/4" (19.055mm)
5	ENTRANCE HUB 1-1/4" (31.75mm)
6	RIGID GALVANIZED CONDUIT OR STROBE CABLE.
7	6390 FAA-2 PHOTOCELL



SIDE VIEW





BASE

NOTES:

A. POWER SUPPLY IS NORMALLY MOUNTED AT GROUND LEVEL ON TOWER. IT CAN ALSO BE MOUNTED INDOORS. RECOMMENDED MOUNTING HEIGHT IS 48" (1219.512mm) TO BOTTOM OF THE ENCLOSURE FOR EASE OF MAINTENANCE.

B. MOUNT BEACON HINGES SO LENS WILL OPEN UNOBSTRUCTED BY STRUCTURE.

C. POWER SUPPLY DETAIL FOR L864/L865 MODEL NO. E1DB2 LIGHTING CONTROLLER.

DATE:	LTR.	REVISION
3/31/2009	A R.N.M	UPDATED DWG.

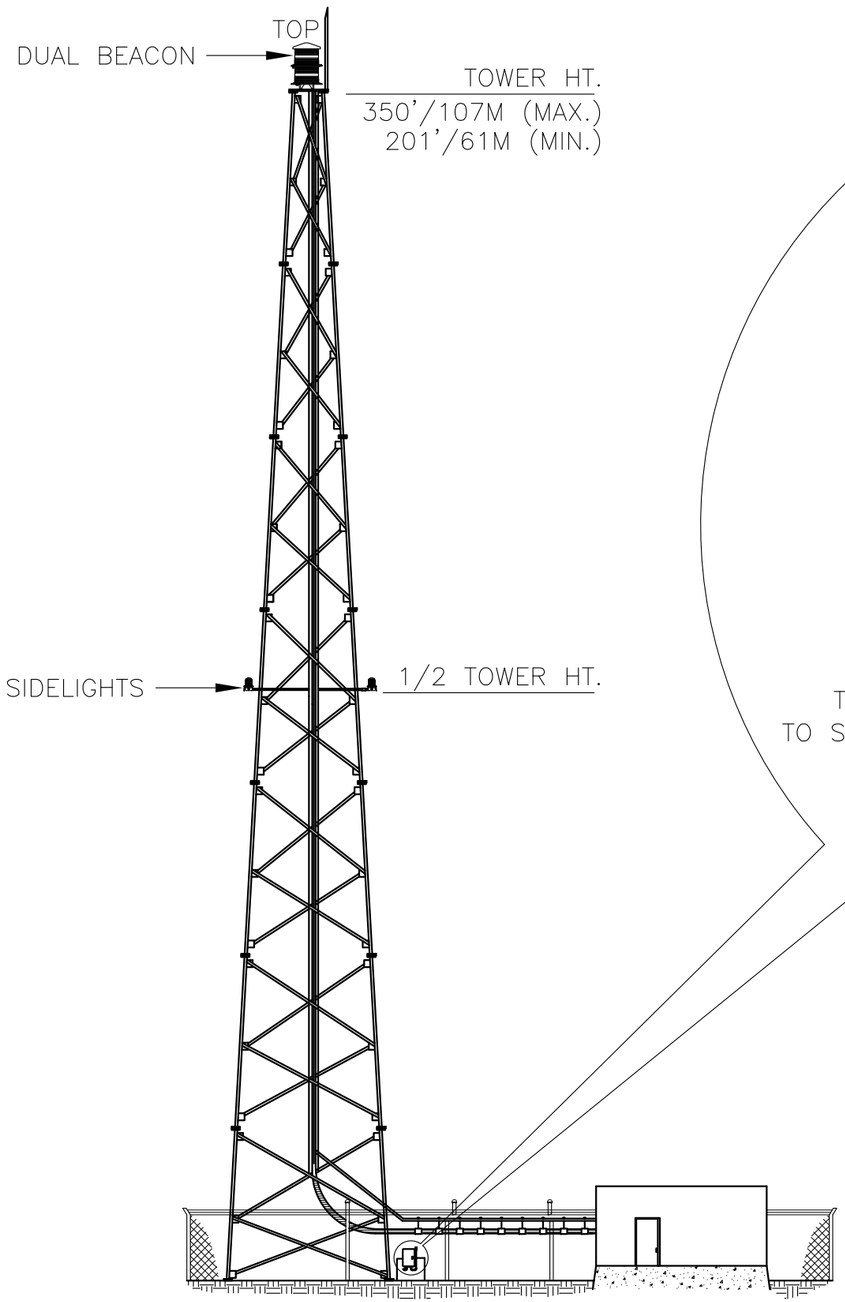
HOUSING DETAILS E-1DB2
L-864/L-865 RED/WHITE STROBE

PROD DEPT
SERV DEPT
ENGINEER

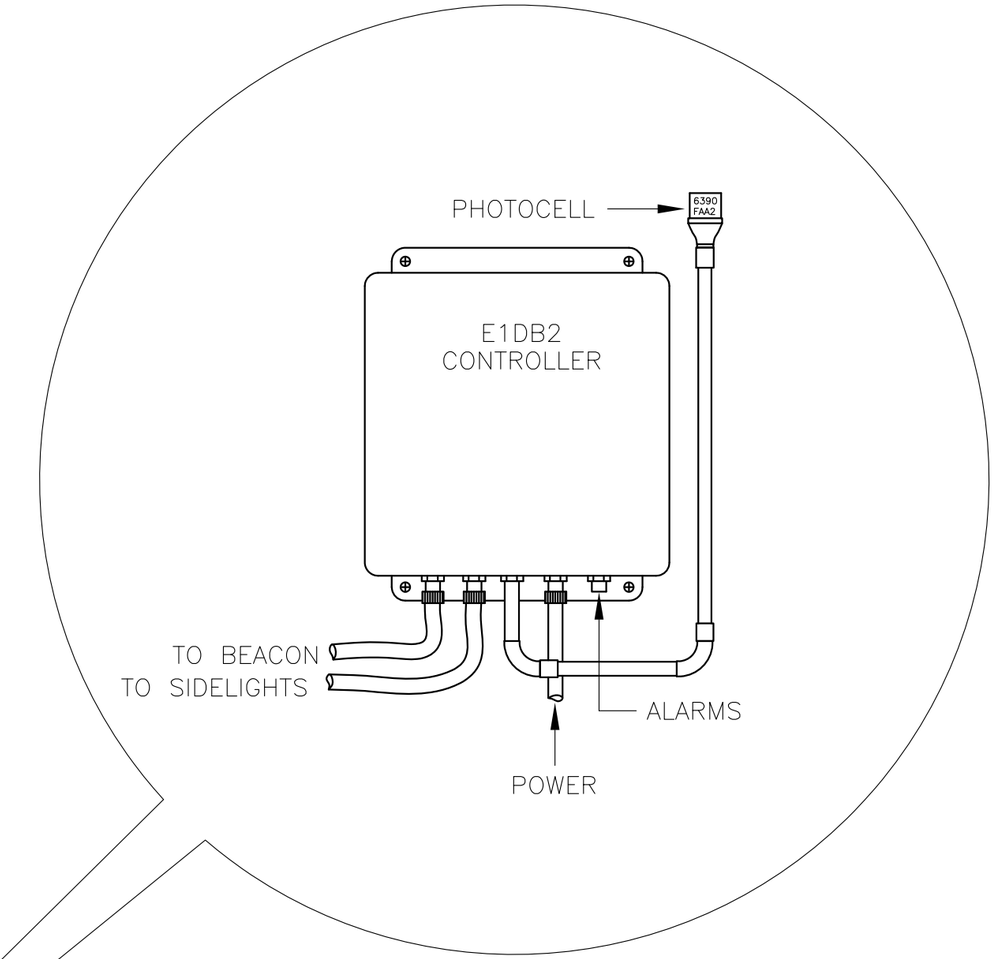
TWR Lighting,® Inc.
Enlightened Technology®

DRAWN BY R.MORENO | SHEET SIZE B | SHEET QTY. 1 OF 1
DATE 11/17/08 | SCALE N.T.S. | DWG. NO. HD0-329

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.



TYPICAL SITE LAYOUT



NOTES:

1. THIS CONTROLLER CAN BE MOUNTED INDOOR OR OUTDOOR.
2. IT IS HIGHLY RECOMMENDED TO MOUNT A LIGHTING ROD AT THE TOP LEVEL.
3. FOR MORE DETAILS REFER TO DRAWINGS HD0-329 (HOUSING DETAILS), 600-04 (LIGHT KIT CABLE RUN), AND T1369 (LIGHT KIT ONLY CONDUIT RUN).

DATE:	LTR.	REVISION
3/31/2009	A R.N.M	UPDATED DWG.

E-1DB2 INSTALLATION GUIDELINE

PROD DEPT

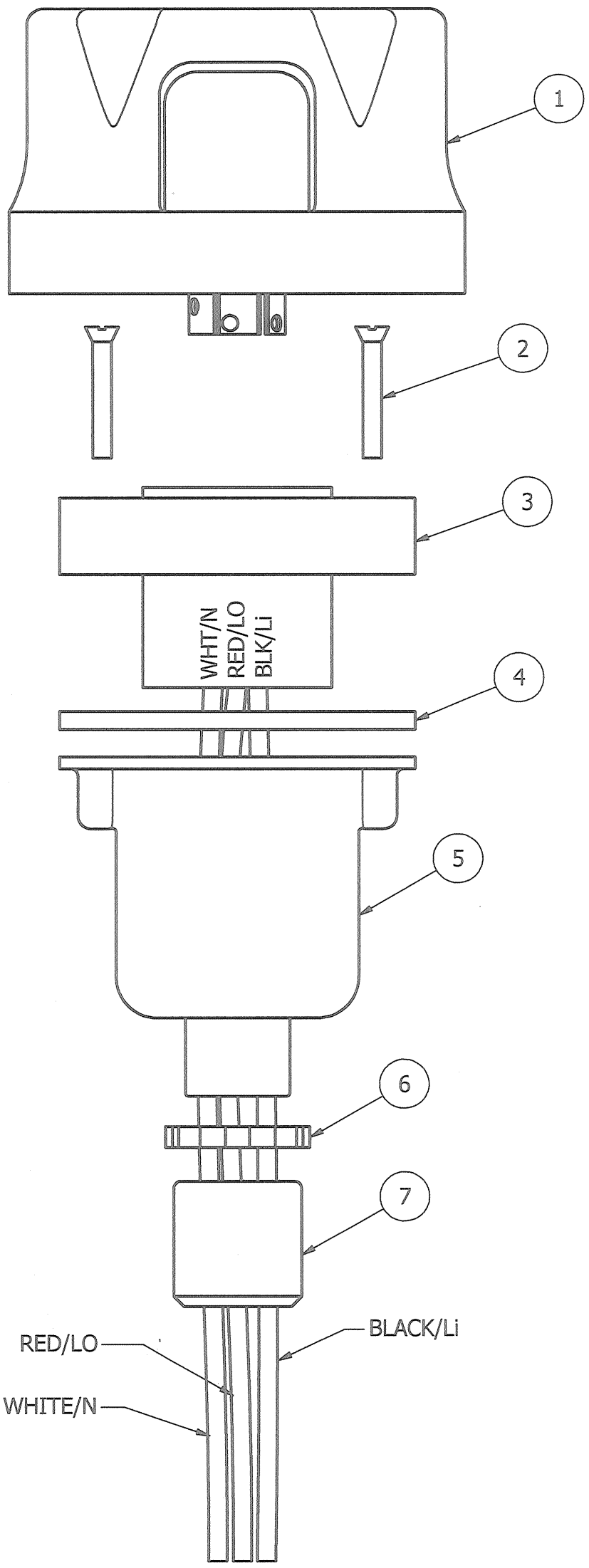
SERV DEPT

ENGINEER

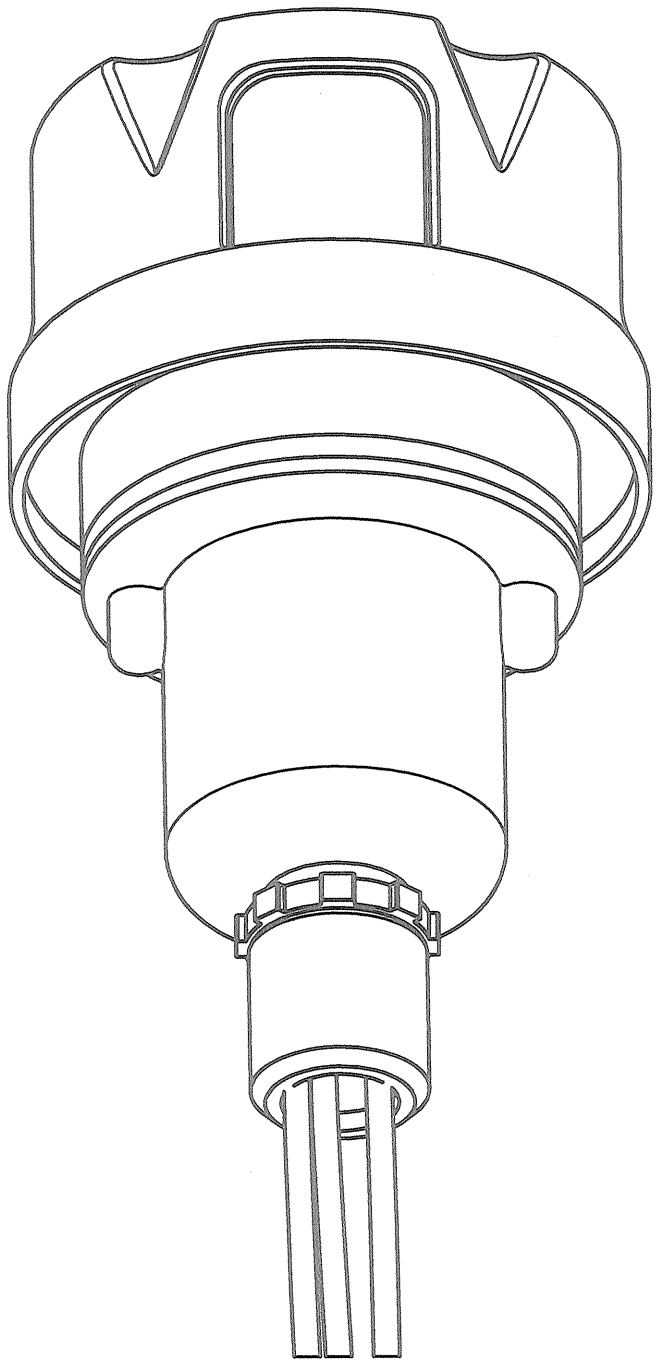
TWR Lighting, Inc.
Enlightened Technology®

DRAWN BY	SHEET SIZE	SHEET QTY.
R.MORENO	B	1 OF 1
DATE 11/17/08	SCALE N.T.S.	DWG. NO. INS-329

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



EXPLODED VIEW



ASSEMBLY

NOTES:
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

DATE	REV	AUTHOR	DESCRIPTION
02/03/2015	H	JZAMORANO	UPDATED NOTES

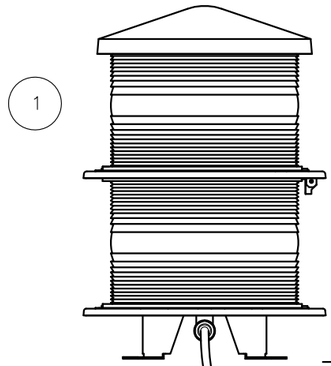
PHOTOCELL HOUSING DETAIL

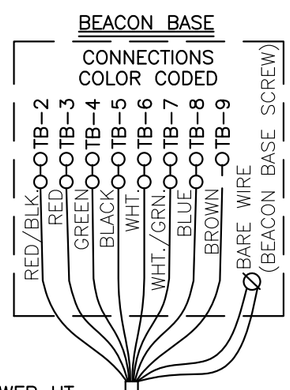
PROD DEPT
SERV DEPT
ENGINEER

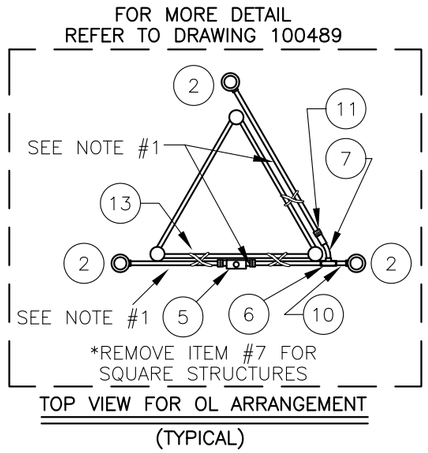
TWR Lighting, Inc. HARK
Enlightened Technology®

DRAWN BY: vhernandez		SHEET SIZE: B	SHEET QTY.: 1 OF 1
DATE: 10/18/1995	SCALE: 1/1	DWG. NO.: 100239i	

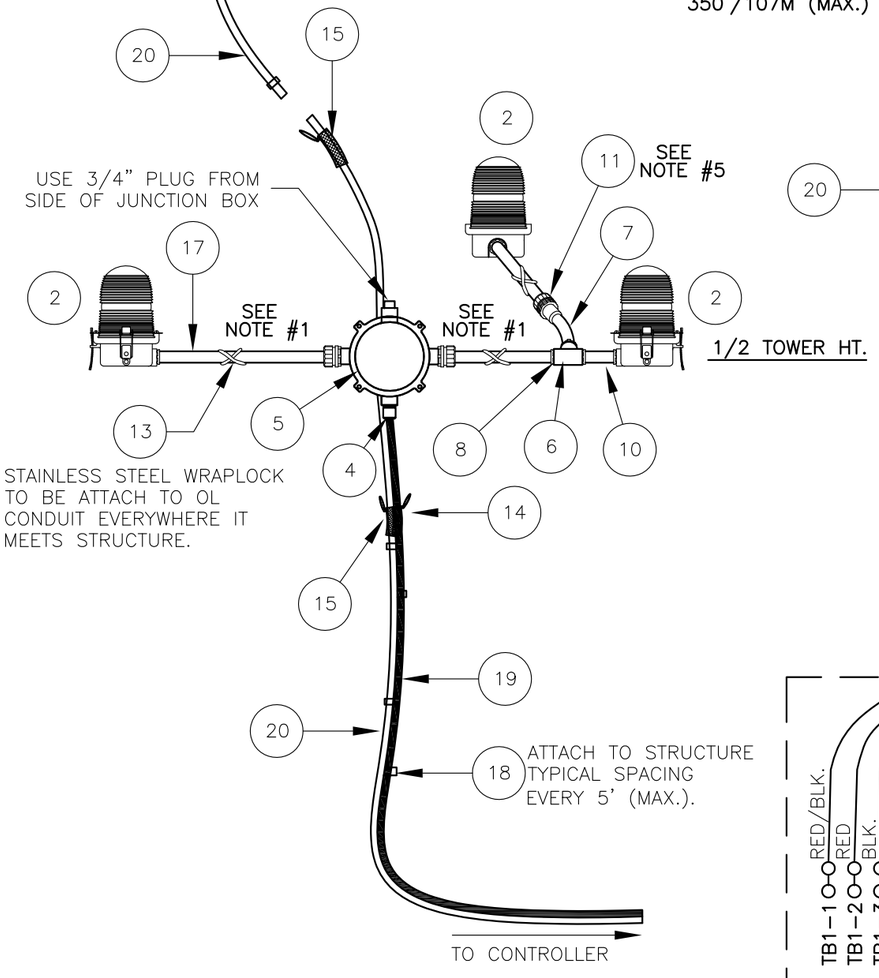
The use of non-OEM parts or modifications to original equipment design will void the manufacturer warranty and could invalidate the assurance of complying with FAA requirements as published in Advisory Circular 150/5345-43.

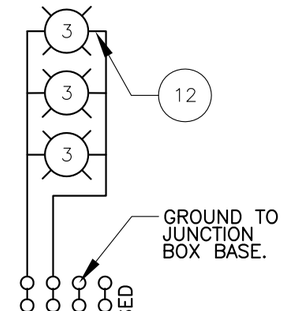


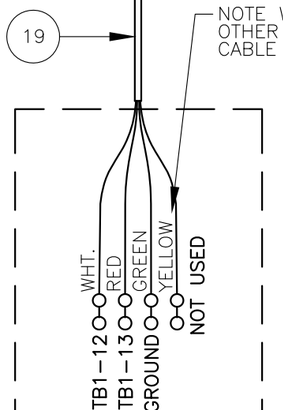


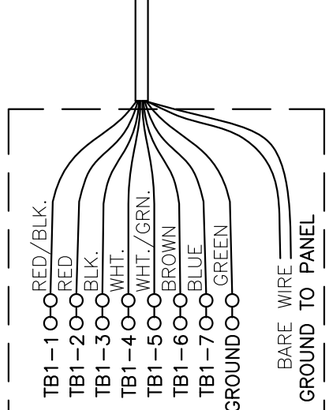


TOWER HT.
201'/61M (MIN.)
350'/107M (MAX.)









= TERMINAL

BILL OF MATERIALS

	ITEM NO.	QTY.	TWR PART NO.	DESCRIPTION
	1	1	STDBEACON	DUAL BEACON
	2	3	OL1	3/4" OBSTRUCTION LIGHT
*	3	3	116A21TS	116 WATT 120 VOLT LAMP
	4	1	CGB295SA	3/4" CORD CONNECTOR 0.50 – 0.625
	5	1	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	HC-402	3/4" NO THREAD CONNECTOR
	12	3	SLPIGTAIL25	25' SIDELIGHT PIGTAIL
	13	1	SS5012	STAINLESS STEEL WRAPLOCK 50'
	14	1	CABLEGRIP1	SINGLE EYE LACE MESH 0.5 – 0.62
	15	2	CABLEGRIP3	SINGLE EYE LACE MESH 0.63 – 0.74
*	16	1	STH40329	SINGLE DUAL BEACON CONTROLLER
	17	30'	CONDUIT34	3/4" CONDUIT

ITEM NUMBERS #18–#20 ARE NOT INCLUDED IN THE KIT BUT ARE AVAILABLE UPON REQUEST, AND REQUIRED FOR INSTALLATION.

~	18	–	STCABLTIE	STROBE CABLE TIES (TWR. HEIGHT ÷ 5 x 1.5)
~	19	–	STCABLEOB	OBSTRUCTION LIGHT CABLE(1/2 TWR. HT.+30')
~	20	–	STROBCABLE-3	STROBE CABLE (TWR. HT. + 30')

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

NOTES:

1) ITEM CONDUIT34 CUT TO LENGTH FOR PROPER EXTENTION OF OL1 (6"–12") FROM STRUCTURE. ATTACH ITEM HC402 TO UNTHREADED CONDUIT TO COMPLETE ASSEMBLY.
2) MOUNT BEACON HINGE SO LENS WILL OPEN UNOBSTRUCTED BY STRUCTURE.
3) ON AM TOWER APPLICATIONS, KEEP GROUND LUG FROM BEING CONNECTED TO EARTH GROUND. GROUND TO THE TOWER ONLY.
4) THIS DRAWING IS PROVIDED AS A GENERAL REFERENCE. TWR LIGHTING, INC. DOCUMENTATION SUPERSEDES THIS DRAWING & SHOULD BE REVIEWED PRIOR TO INSTALLATION OF THIS SYSTEM.
5) USE COUPLING THAT IS PROVIDED WITH ITEM CONDUIT34.

DATE:	LTR.	REVISION
3/31/2009	A RAM	UPDATED ITEM#16

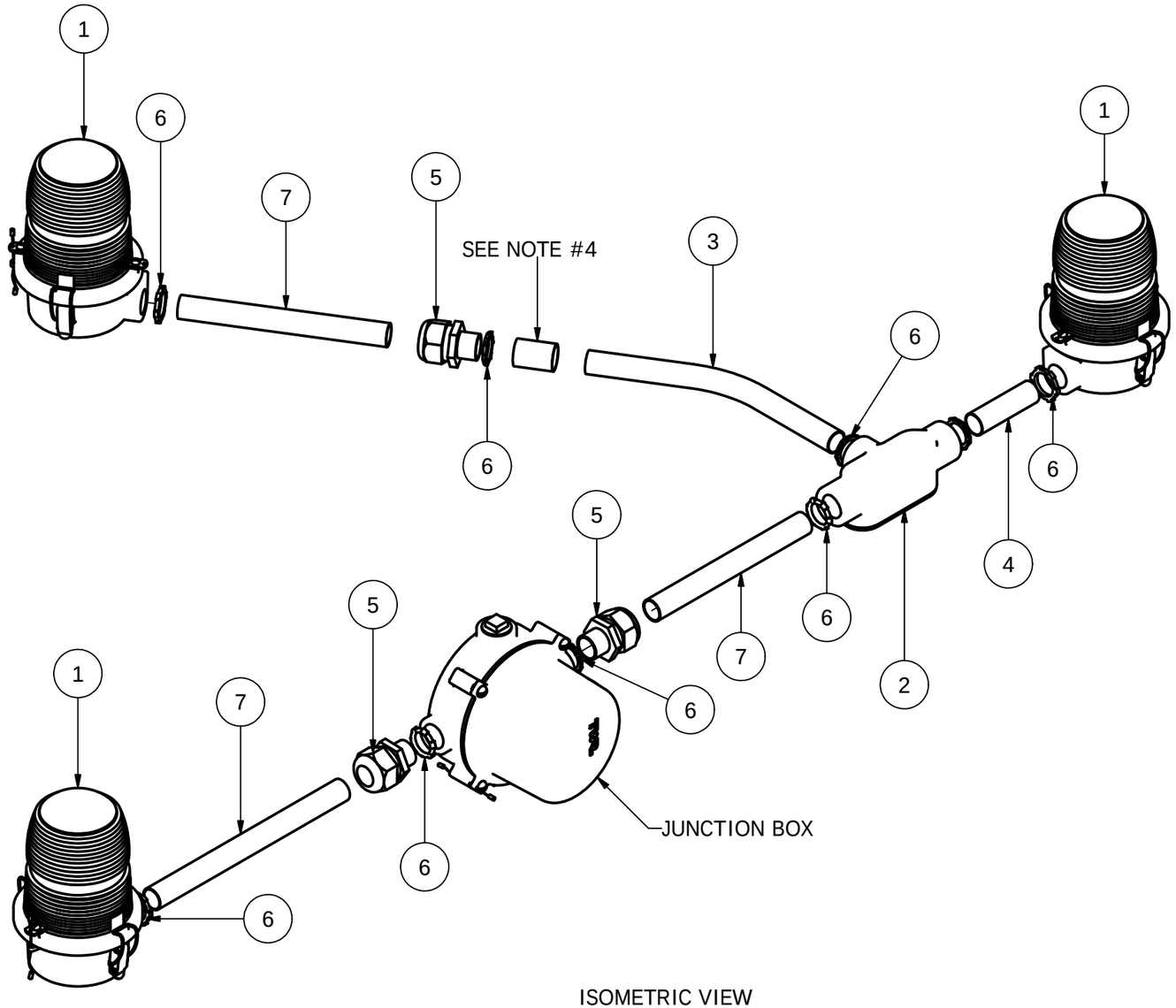
LK1E1DB2 TOWER LIGHTING KIT CABLE RUN

(TOWERS 201'/61M TO 350'/107M/10' FACE WIDTH MAX)

PROD DEPT
SERV DEPT
ENGINEER

TWR Lighting,® Inc.
Enlightened Technology®

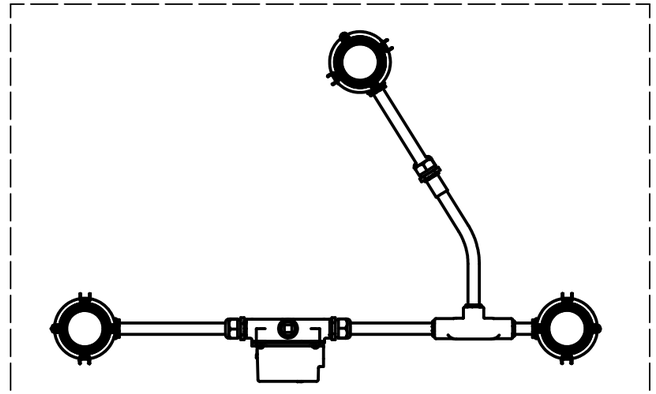
DRAWN BY RMORENO | SHEET SIZE B | SHEET QTY. 1 OF 1
DATE 11/17/08 | SCALE N.T.S. | DWG. NO. 600-04



ISOMETRIC VIEW

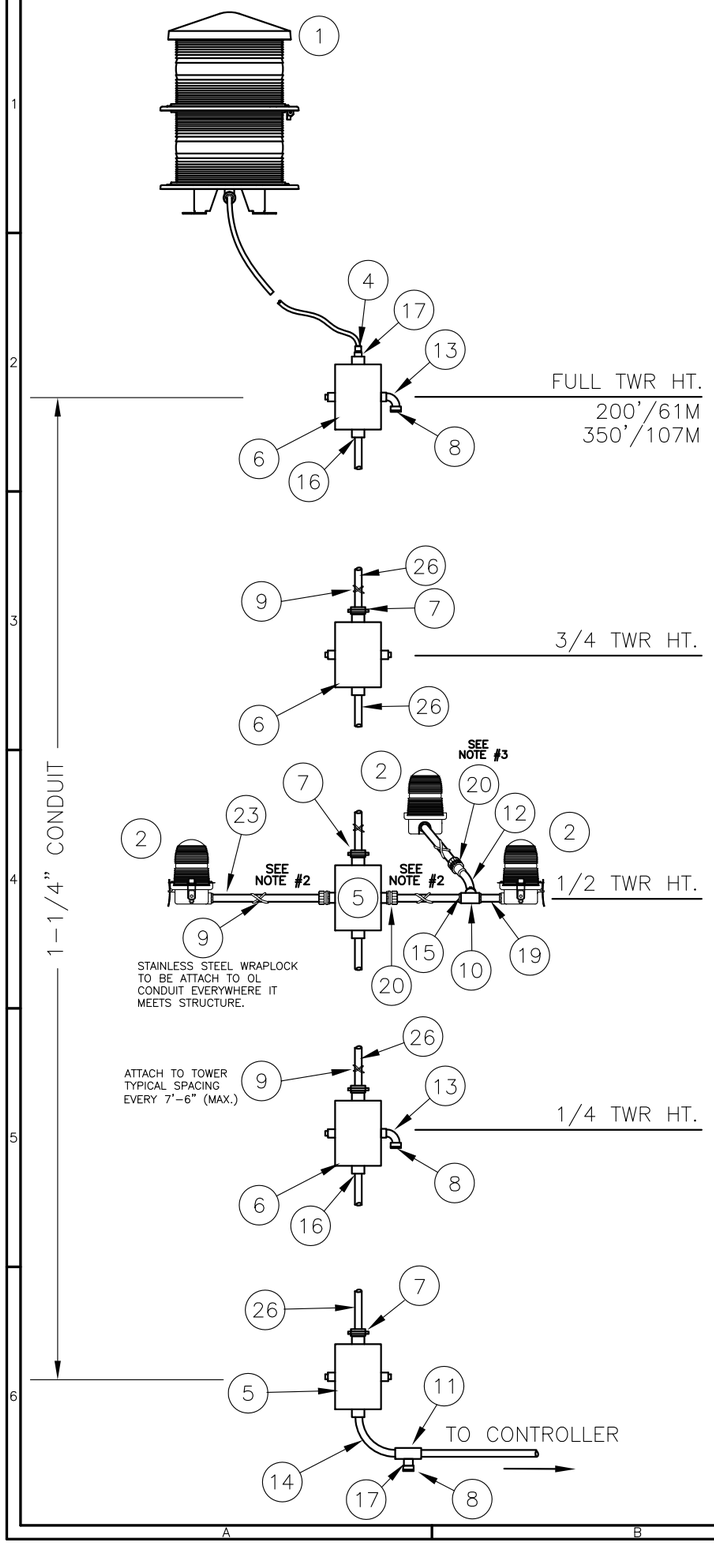
Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	3	OL1/LED	3/4" OBSTRUCTION LIGHT
2	1	T27CG	3/4" CONDULET W/COVER AND GASKET
3	1	EL3430	3/4" 30° ELBOW
4	1	N34T3	3/4" X 3" NIPPLE
5	3	HC402	3/4" NO THREAD CONNECTOR
6	5	A314	3/4" CONDUIT LOCKNUTS
7	1	CONDUIT34	3/4" CONDUIT

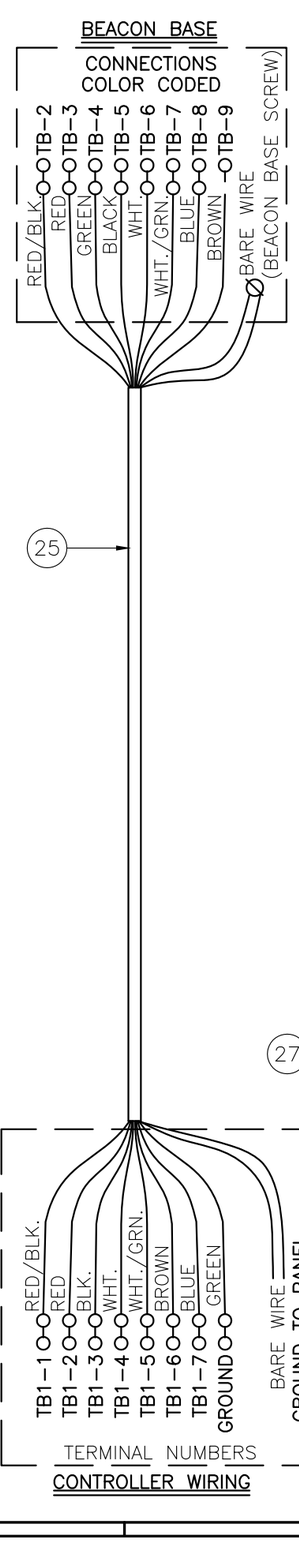
NOTES:
1. THIS DRAWING IS A TYPICAL INSTALLATION DETAIL FOR 3 OL-1 PER LEVEL SYSTEM.
2. PART # EL3430 MAY BE OMITTED WHEN ARRANGING FOUR LEG TOWERS.
3. PART # COUNDUIT34 CUT TO LENGTH FOR PROPER EXTENTION OF OL1 FROM STRUCTURE (6"-12"). ATTACH PART # HC402 TO UNTHREADED CONDUIT TO COMPLETE ASSEMBLY.
4. USE COUPLING THAT IS PROVIDED BY PART # CONDUIT34.
5. GREEN WIRE USED ONLY ON LED SIDELIGHTS

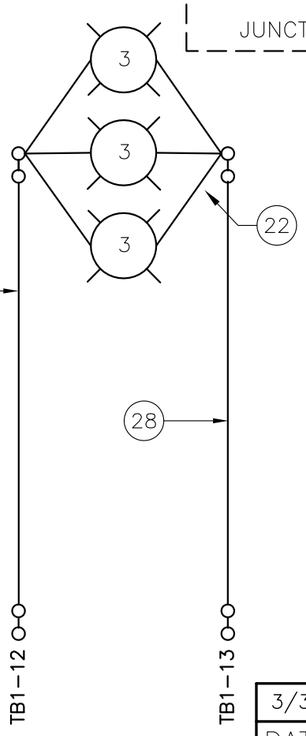


TOP VIEW

DRAWN jbustamante	1/4/2008	**TWR Lighting, Inc.** Enlightened Technology®
CHECKED		
QA		TITLE: SIDELIGHT MOUNT ASSEMBLY (10' FACE WIDTH MAX)
MFG		
APPROVED		
		SIZE B | DWG NO 100489 | REV A
		SCALE | SHEET 1 OF 1

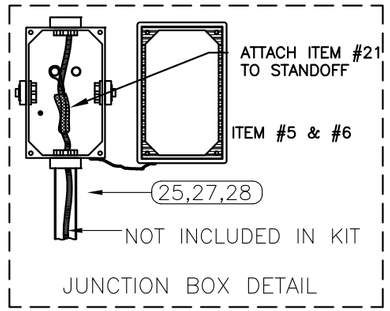


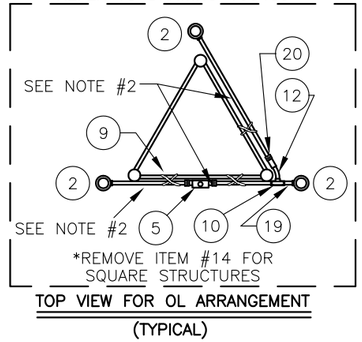




NOTES:

1) MOUNT BEACON HINGE SO LENS WILL OPEN UNOBSTRUCTED BY STRUCTURE.
2) ITEM #23 CUT TO LENGTH FOR PROPER EXTENTION OF OL1 (6"–12") FROM STRUCTURE. ATTACH ITEM #20 TO UNTHREADED CONDUIT TO COMPLETE ASSEMBLY.
3) USE COUPLING THAT IS PROVIDED WITH ITEM #23.
4) ON AM TOWER APPLICATIONS, KEEP GROUND LUG FROM BEING CONNECTED TO EARTH GROUND. GROUND TO THE TOWER ONLY.
5) USE RIGID GALVANIZED STEEL CONDUIT.
6) BREATHERS ALLOW FOR CIRCULATION OF AIR TO PREVENT CONDENSATION.
7) POWER SUPPLY IS NORMALLY MOUNTED AT EYE LEVEL ON TOWER. IT CAN ALSO BE MOUNTED INDOORS. RECOMMENDED MOUNTING HEIGHT IS 42" TO BOTTOM OF ENCLOSURE FOR EASE OF MAINTENANCE.
8) THIS DRAWING IS PROVIDED AS A GENERAL REFERENCE. TWR LIGHTING, INC. DOCUMENTATION SUPERCEEDS THIS DRAWING & SHOULD BE REVIEWED PRIOR TO INSTALLATION OF THIS SYSTEM.





BILL OF MATERIALS

	ITEM NO.	QTY.	TWR PART NO.	DESCRIPTION
	1	1	STDBEACON	DUAL STROBE BEACON
	2	3	OL1	3/4" OBSTRUCTION LIGHT
	3	3	116A21TS	116 WATT 120 VOLT LAMP
	4	1	CGB296SA	3/4" CORD CON. (KILLARK ZS210)
	5	2	JB8114C	1-1/4" JUNCTION BOX
	6	3	JB8SR114C	1-1/4" STRAIN RELIEF JUNCTION BOX
	7	4	UNY405	1-1/4" UNION
	8	3	5012902	3/4" BREATHER
	9	1	SS10012	WRAPLOCK
	10	1	T27CG	3/4" CONDULET W/COVER AND GASKET
	11	2	T47CG	1-1/4" CONDULET W/COVER AND GASKET
	12	1	EL3430	3/4" 30° ELBOW
	13	2	EL3490	3/4" 90° SHORT ELBOW
	14	2	EL11490	1-1/4" 90° SWEEP ELBOW
	15	3	A314	3/4" CONDUIT LOCKNUTS
	16	10	A316	1-1/4" CONDUIT LOCKNUTS
	17	3	RE42	1-1/4" TO 3/4" REDUCER
*	18	1	PIPDOP	4 oz. PIPE DOPE
	19	1	N34T3	3/4" x 3" NIPPLE
	20	3	HC402	3/4" NO THREAD CONNECTOR
*	21	4	CABLEGRIP3	SINGLE EYE LACE MESH 0.63-0.74
	22	3	SLPIGTAIL25	25' SIDELIGHT PIGTAIL
	23	30'	CONDUIT34	3/4" CONDUIT (FOR OLS)
*	24	1	STH40329	SINGLE DUAL BEACON CONTROLLER

ITEM NUMBERS #25–#28 ARE NOT INCLUDED IN THE KIT BUT ARE AVAILABLE REQUEST, AND REQUIRED FOR INSTALLATION.

~	25	–	STROBCABLE-3	STROBE CABLE (TWR. HT. + 30')
~	26	–	CONDUIT114	1-1/4" CONDUIT(TWR. HT. + 30'/9M)
~	27	–	12THHNWHT	#12 THHN WHT. WIRE(1/2 TWR HT+40'/12M)
~	28	–	12THHNRED	#12 THHN RED. WIRE(1/2 TWR HT+40'/12M)

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

DATE:	LTR.	REVISION
3/31/2009	A	UPDATE ITEM#24

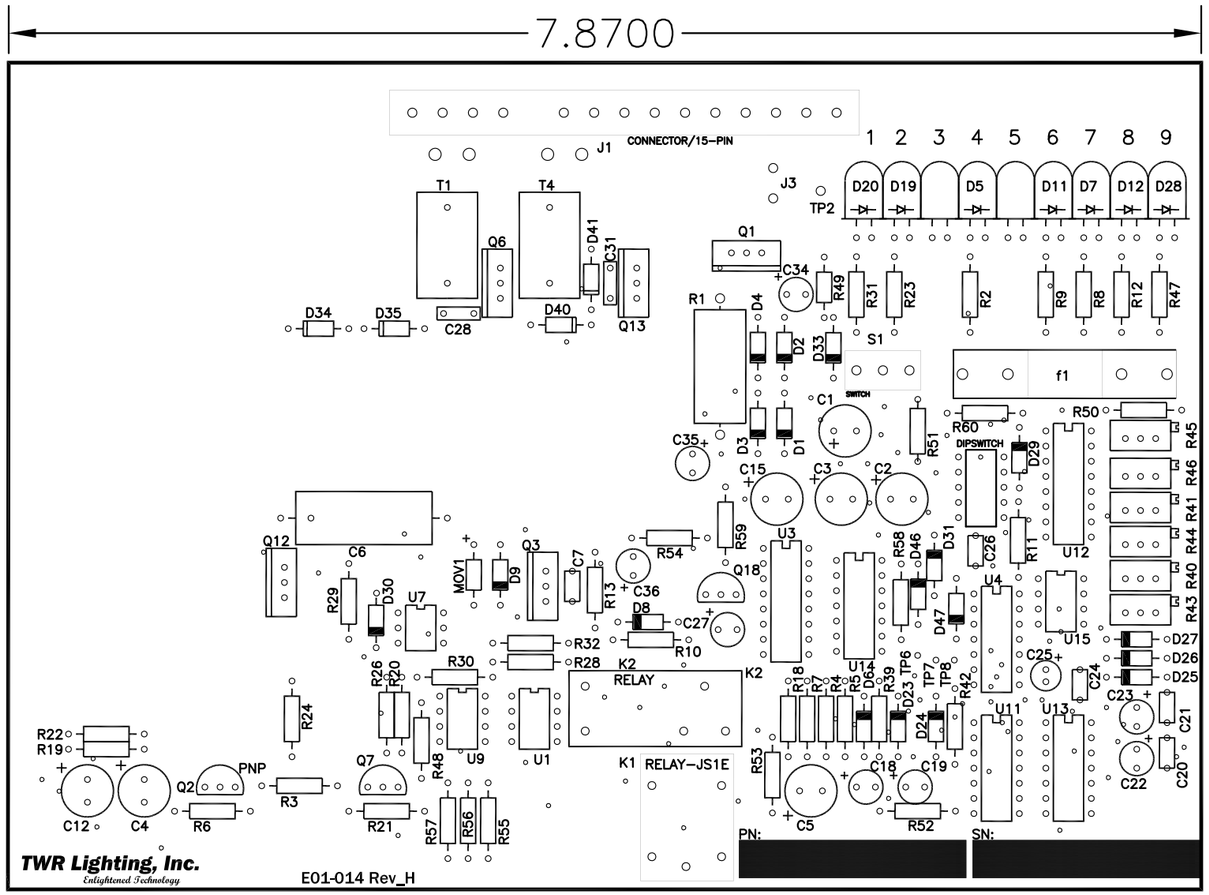
R.N.M

LKT1369 E1DB2 TOWER LIGHTING KIT
(CONDUIT RUN FOR 200'/61M TO 350'/107M TOWERS)

PROD DEPT
SERV DEPT
ENGINEER

TWR Lighting, Inc.
Enlightened Technology

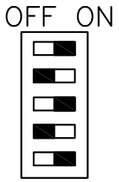
DRAWN BY: RMORENO
SHEET SIZE: B
SHEET QTY.: 1 OF 1
DATE: 11/17/08
SCALE: N.T.S.
DWG. NO.: T1369



FACTORY SETUP:

MASTER & STAND ALONE

1 ON
2 OFF
3 ON
4 OFF
5 ON

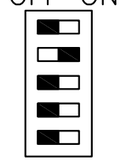


DIPSW

OPTIONAL SETUP:

SLAVE

1 OFF
2 ON
3 OFF
4 OFF
5 OFF



DIPSW

DATE:	LTR.	REVISION
3/31/2009	A R.N.M	UPDATED NOTES

E-1DB2 CONTROL PCB

PROD DEPT

SERV DEPT

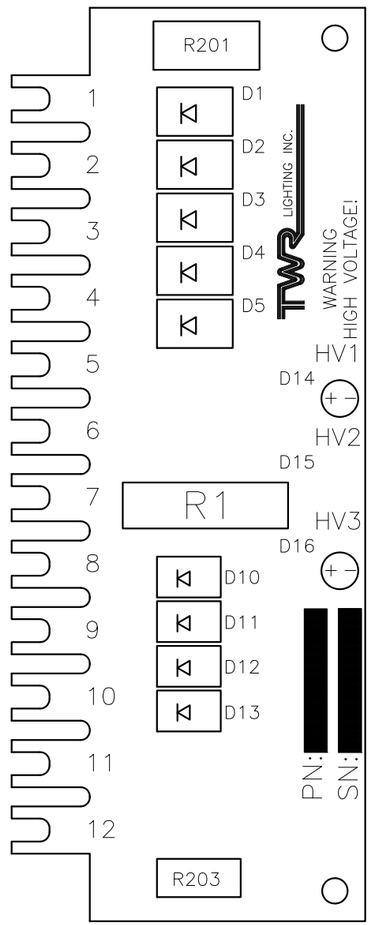
ENGINEER

TWR Lighting, Inc.
Enlightened Technology®

DRAWN BY J.L.BUSTAMANTE | SHEET SIZE B | SHEET QTY. 1 OF 1

DATE 04/03/07 | SCALE N.T.S. | DWG. NO. H01-329

TAG NO.	DESCRIPTION
D1...D5	3W 2.5 REETIFIER SCD2500V2A
R201	1.5 MΩ 2W RESISTOR STA08014
D14	HIGH VOLTAGE INDICATOR STD05001
D16	TRIGER VOLTAGE INDICATOR STD05002
R1	TRIGGER RESISTER 10KΩ 11W STA08001
D10...D13	D1ODE STD01006
R203	RESISTER 270KΩ 1/4W STA02014



DATE:	LTR.	REVISION
4/8/2009	A R.N.M.	REMOVED D6

E1DB2 RECTIFIER PCB

PROD DEPT

SERV DEPT

ENGINEER

TWR Lighting, Inc.
Enlightened Technology®

DRAWN BY R.MORENO

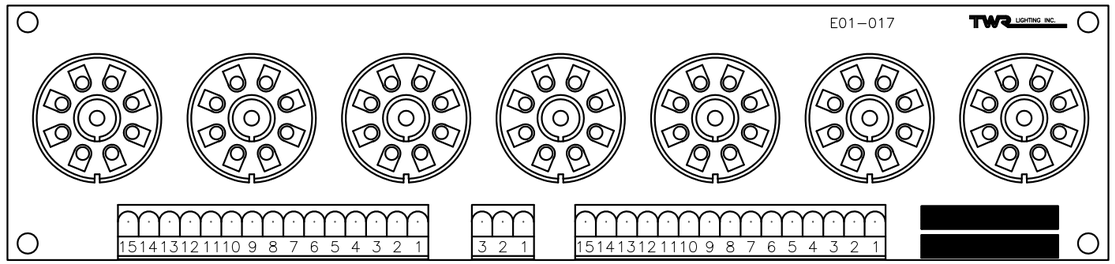
SHEET SIZE B

SHEET QTY. 1 OF 1

DATE 11/17/08

SCALE FULL

DWG. NO. H02-329



DATE:	LTR.	REVISION
3/31/2009	A R.N.M	UPDATE NAME

E1DB AND E1DB2 RELAY PCB3 PART #STH03269A

ALARM LOCKOUT ELIMINATION MODIFICATION

PROD DEPT

SERV DEPT

ENGINEER

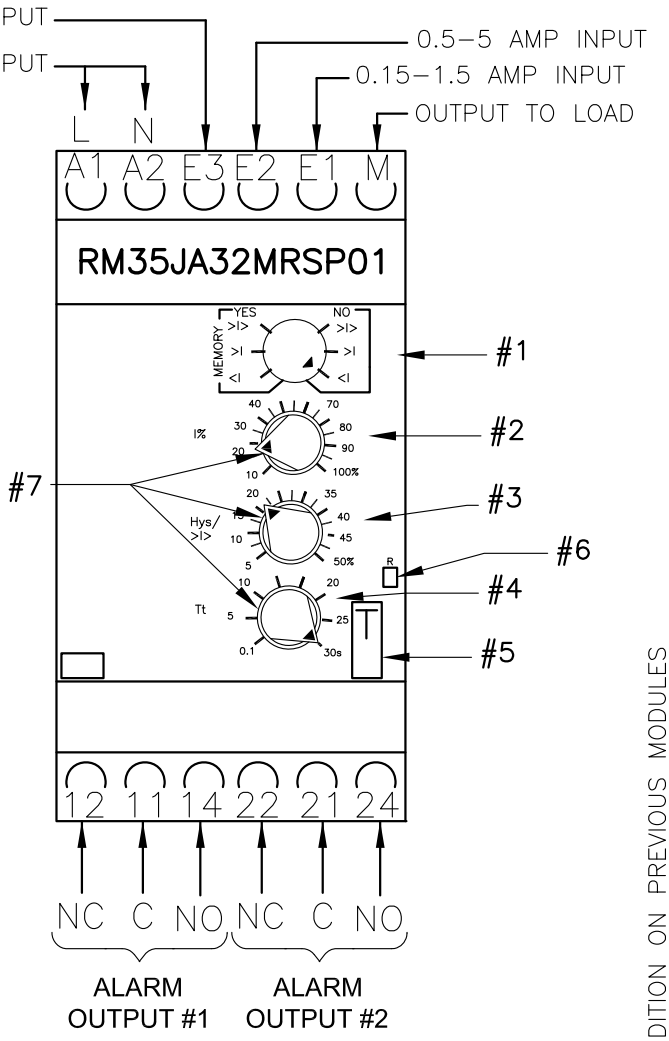
TWR Lighting,® Inc.

Enlightened Technology®

DRAWN BY	SHEET SIZE	SHEET QTY.
E.A.SALAZAR	B	1 OF 1
DATE 07/13/06 — SCALE N.T.S.	DWG. NO.	H03–269A

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.

CURRENT MEASUREMENT RELAY RM35JA32MRSP01



120VAC PRODUCT SPECIFIC SETTINGS

QTY.	PART NO.	INPUT	#1	#2	#3	#4	#5	PRD.
2	STLDBEACON2A	E1	*<1	20	20	30	OFF	ORGA
2	LEDBEACON2A	E1	*<1	20	20	30	OFF	ORGA
3	LEDBEACON2A	E1	*<1	30	20	30	OFF	ORGA
1	116A21TS	E1	*<1	30	20	30	OFF	TWR
2	116A21TS	E2	*<1	30	20	30	OFF	TWR
3	116A21TS	E2	*<1	45	20	30	OFF	TWR
4	116A21TS	E2	*<1	65	20	30	OFF	TWR
6	116A21TS	E2	*<1	35	20	30	OFF	TWR

24VDC PRODUCT SPECIFIC SETTINGS

QTY.	PART NO.	INPUT	#1	#2	#3	#4	#5	PRD.
1 2	LEDBEACON3SL OL1VLED3	E2	*<1	30	20	30	OFF	TWR

*NO MEMORY

FUNCTIONS

1) Configuration: Selection of operation mode (<1 / >1 / >1<) with or without memory.
2) Adjustment of current threshold as % of setting range.
3) Hysteresis adjustment from 5% to 50%.
4) Time Delay adjustment from 0.1 to 30sec.
5) Diagnostic button.
6) Yellow indicator light **(See conditions below)**
7) Dial Pointer (Green) LED
   - Steady green LED indicates that supply to the RM35 is present
   - Flashing green LED indicates a setting has been changed that requires a power cycle.

YELLOW LED CONDITIONS

NOTE: (*) ASTERISK INDICATES LED CONDITIONS OPERATE OPPOSITE FROM RM22JA31MR MODULE

Steady Burn Fixtures

- Yellow light *off : Normal condition (no alarm)
- Yellow light flashing : Undercurrent condition detected and time delay initiated
- Yellow light *on : Alarm condition

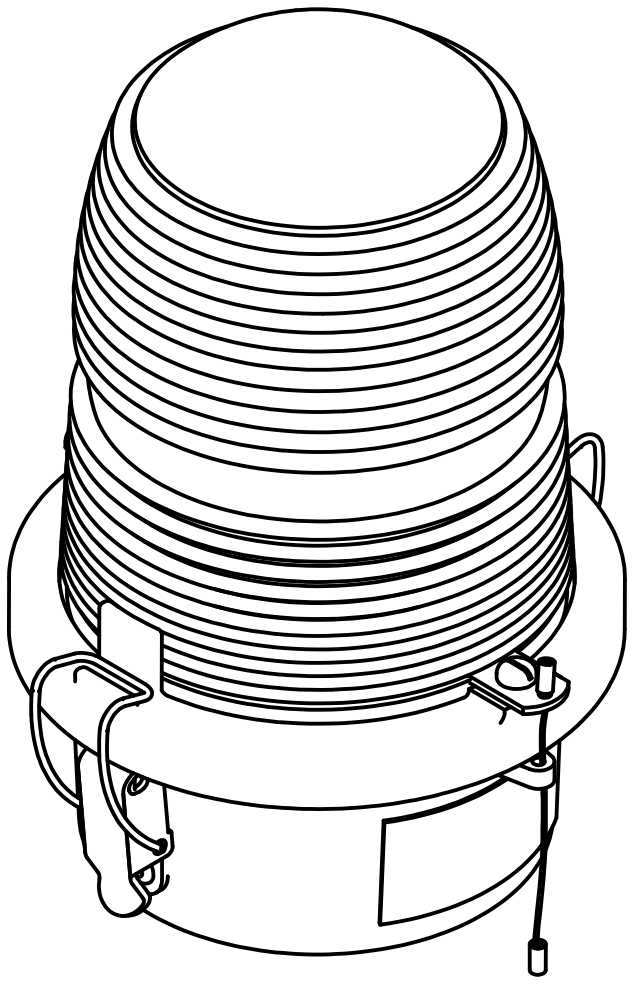
Flashing Fixtures

- Yellow light flashing inconsistent : Normal condition (no alarm)
- Yellow light flashing consistent : Under current condition detected and time delay initiated
- Yellow light *on : Alarm condition

NOTE : To help troubleshoot or to set the sense current, turn the time delay(#4) to 0sec. **Adjusting the current setting(#2) should only be done if it is known that all the lights are functioning.** For Steady Burn adjust the current until the yellow LED comes *off, and the relay is not dropping in and out. For Flashing Fixtures adjust the current setting(#2) until the yellow light starts to flash. This is the normal condition setting. Return the time delay(#4) back to 30sec.

*Due to current draw tolerances slight adjustments to setting #2 may be needed for proper alarming.

TWR Lighting, Inc. DWG#101104_RA *= OPPOSITE CONDITION ON PREVIOUS MODULES



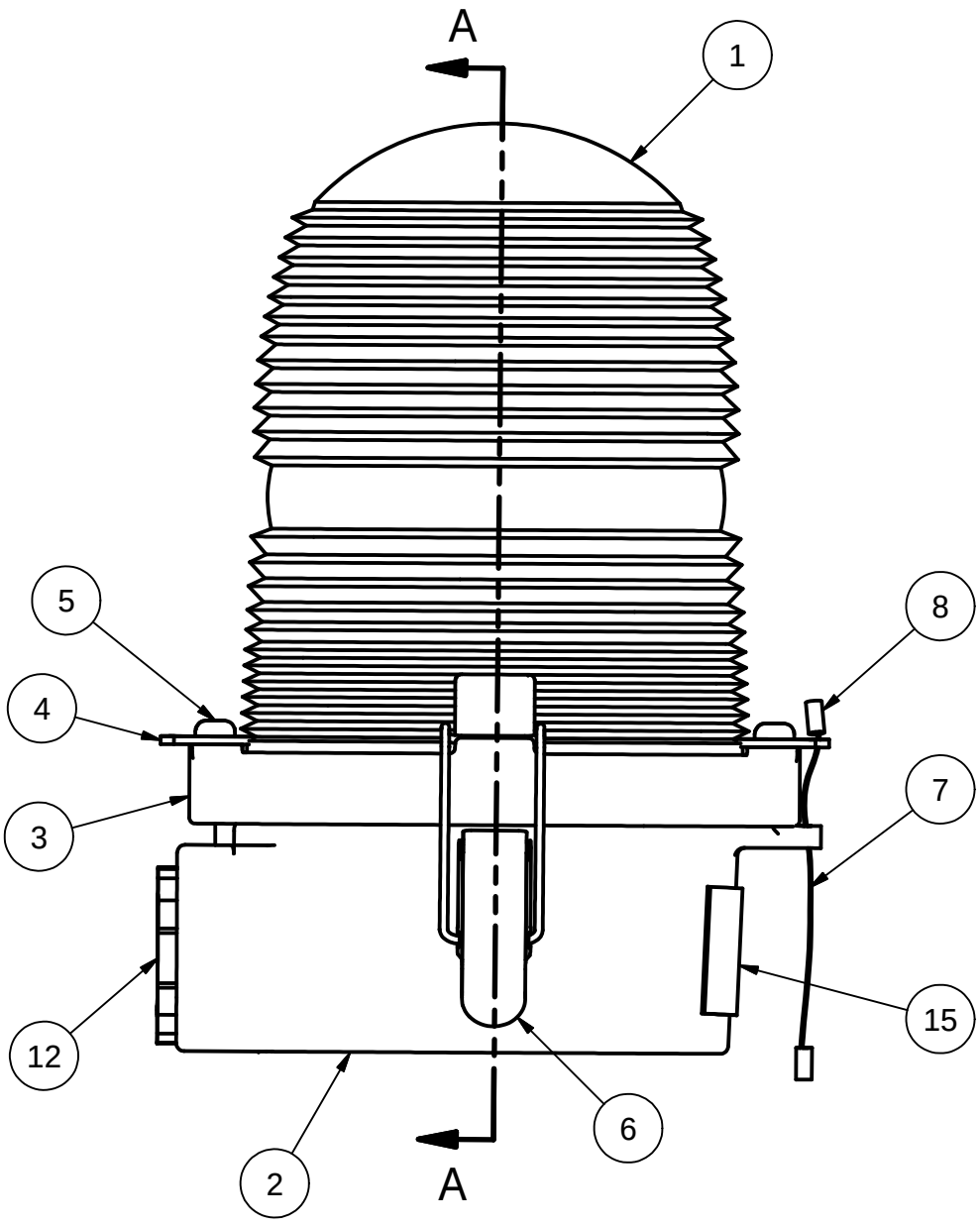
PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	AP35222	RED SIDELIGHT GLASS
2	1	105C	SINGLE SIDELIGHT BODY
3	1	106C	LENS HOLDER RING
4	2	12V245	OL LENS CLIP
5	2	832X14PH	8-32 X 1/4" PH SS SLOT SCREW
6	2	HC255SS	SIDELIGHT LATCH
7	1	7X7SS	1/16 HOL 7X7 S.S. WIRE
8	2	A1A	STAKON CRIMP
9	1	OLG	OL GASKET
10	1	TWR19062	SIDELIGHT RECEPTACLE
11	4	18PRSS	1/8 X .40 SS POP RIVET
12	1	A314	3/4" CONDUIT LOCKNUT GALV.
* 13	2	104G	WHITE TEFLON WASHER
14	2	832X34PH	8-32 X 3/4" S.S. RH SLOT
15	1	100327	OL1 SERIAL NUMBER LABEL
~ 16	1	116A21TS	116W-120V LAMP (TYP.)

* = PART NOT SHOWN

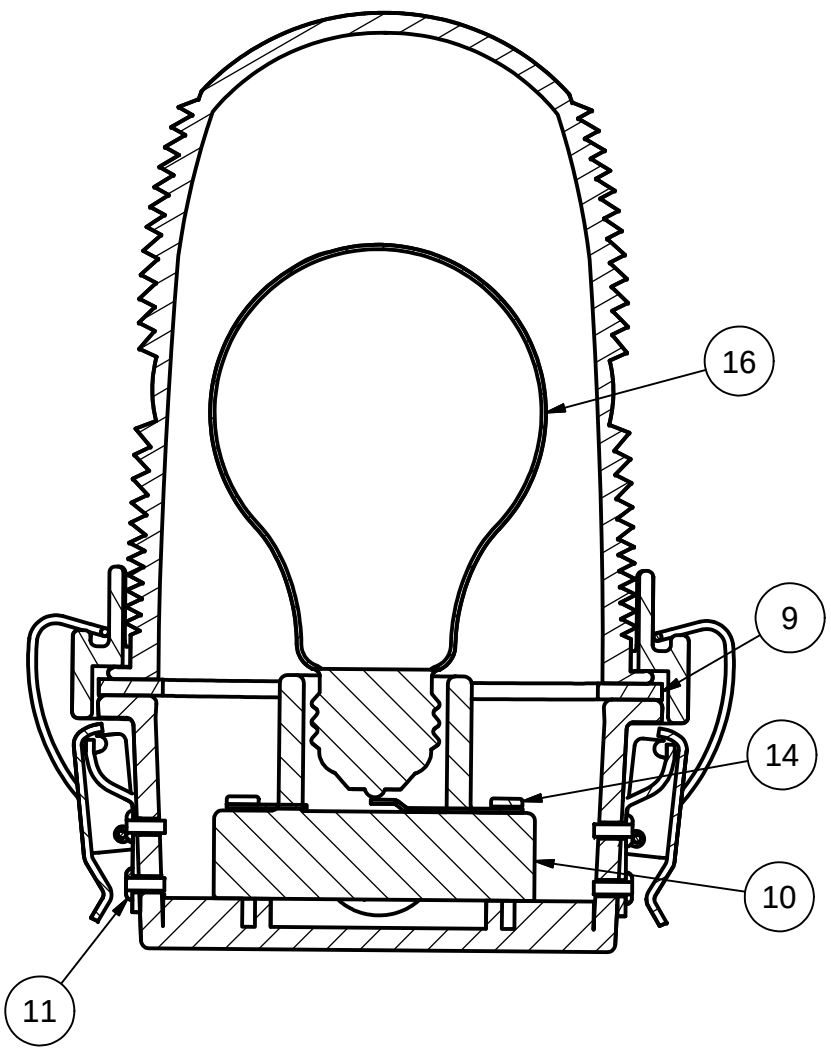
~ = PART SOLD SEPARATELY

NOTE:

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

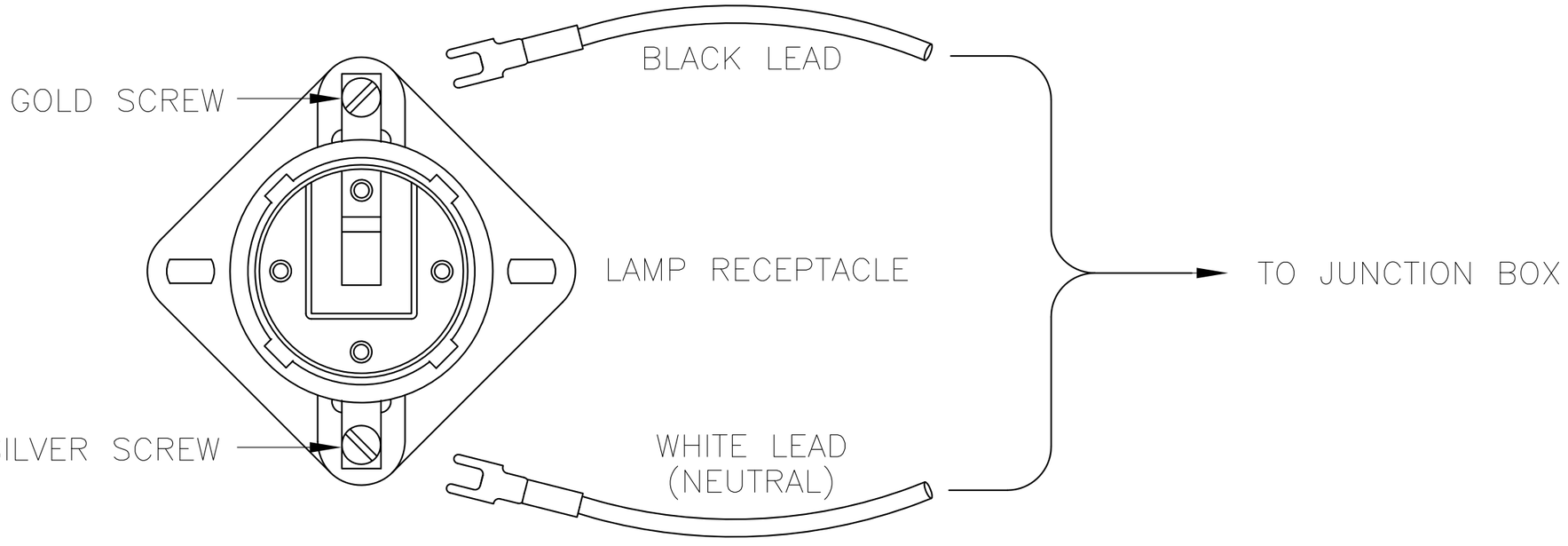


SECTION A-A



DRAWN vhernandez	2/13/2012	TWR Lighting,® Inc. *Enlightened Technology®*	
CHECKED		TITLE: 3/4" OL1 SIDE HUB ASSEMBLY DETAIL (PART#OL1)	
QA			
MFG			
APPROVED			
		SIZE B	DWG NO 279-OL
		SCALE 2/3	SHEET 1 OF 1

REV C

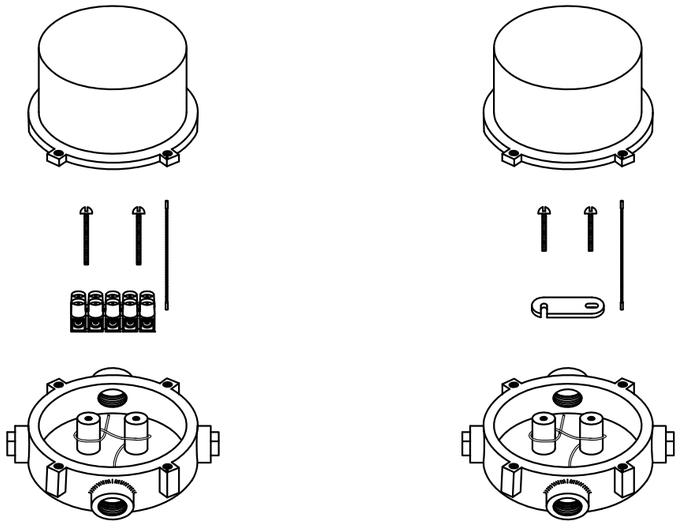


SIDELIGHT RECEPTACLE WIRING

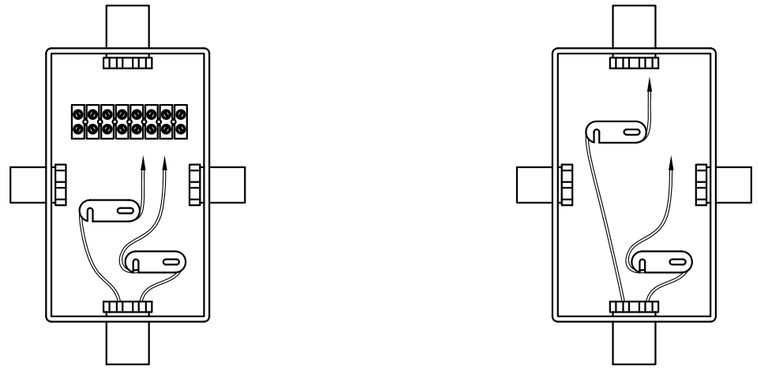
PROD DEPT	TWR Lighting, Inc. Enlightened Technology® HARK®
SERV DEPT	
ENGINEER	
DRAWN BY: G.D. SEBEK	SHEET SIZE: B — SHEET QTY.: 1 OF 1
DATE: 06/08/91 — SCALE: N.T.S.	DWG. NO.: 274–S

DATE:	LTR.	REVISION
7/2/98	A G.D.S.	CHANGED LABEL

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.



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.

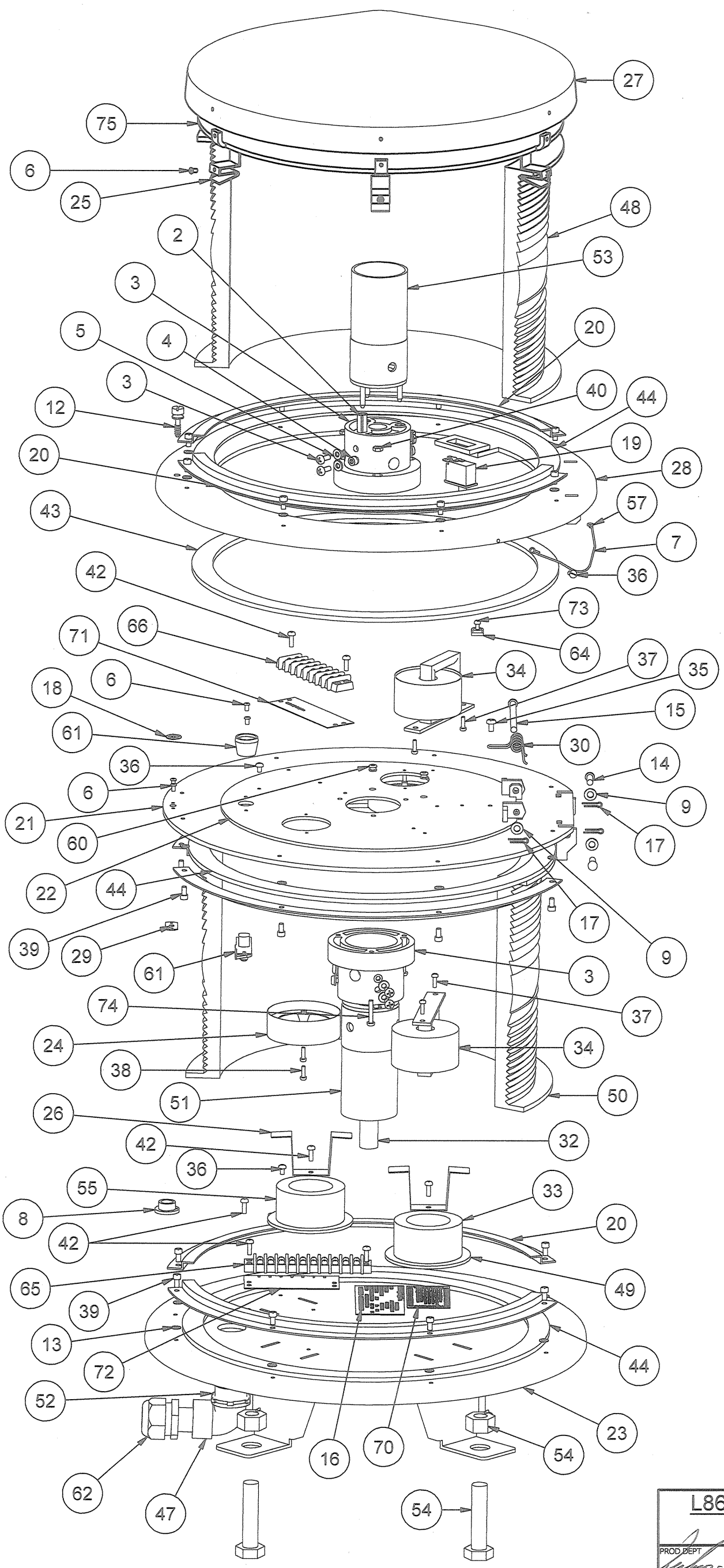
DATE:	LTR.	REVISION
9/29/00	A	UPDATED NOTES

JUNCTION AND STRAIN RELIEF BOXES

PROD DEPT
SERV DEPT
ENGINEER

TWR Lighting,® Inc.
Enlightened Technology®

DRAWN BY G.D. SEBEK | SHEET SIZE B | SHEET QTY. 1 OF 1
DATE 07/26/93 | SCALE N.T.S. | DWG. NO. 100089



Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	100319	DUAL BEACON FLASHTUBE SOCKET
2	6	BU27200	FLASHTUBE SOCKET INSERT
3	12	1032X12PHH	10-32 X 1/2 PHILLIPS BINDER SCREW
4	6	115510SS0	5/16 X 1/4 ROUND SS SPACER
5	6	1032FW	#10 SS FLAT WASHER
6	10	18PRSS-2	1/8 X .40 SS POP RIVET
7	2	7X7SS	1/16 HOL 7 X 7 SS WIRE
8	1	2-10000	CIRCULAR SPIRIT LEVEL
9	3	14FWDB	1/4 FLAT WASHER CH16L
10	2	* 18AWG BLU	#18AWG TEFLON BLUE WIRE
11	2	* 18AWG BRN	#18AWG TEFLON BROWN WIRE
12	1	121340712	DB QUICK OPEN CAPTIVE SCREW
13	24	8NFW	#8 NYLON FLAT WASHER
14	2	14X34CLVP	1/4 X 3/4 SHORT SS CLEVIS PIN
15	1	14X358CLVP	1/4 X 3-5/8 LONG SS CLEVIS PIN
16	1	STCONLAB2	Product Label
17	3	12SSCP	1/2" SS COTTER PIN
18	1	1261	SS RETAINER FOR QUICK OPEN
19	1	STJ02003	CHERRY SWITCH
20	6	100337	DUAL BEACON LENS RETAINER RING
21	1	100343	DUAL BEACON LOWER HINGE ASSEMBLY
22	1	100345	DUAL BEACON HATCH PLATE
23	1	100360	DUAL BEACON BASE ASSEMBLY
24	2	100367	DUAL BEACON VENT CAP
25	6	100368	DUAL BEACON CAP BRACKET
26	2	100396	INDUCTOR BRACKET
27	1	100344	CAP DUAL BEACON
28	1	100342	DUAL BEACON UPPER HINGE ASSEMBLY
29	1	121102013	DB QUICK OPEN SCREW FLAT RECEPTACLE
30	1	070-4500	DB HATCH SPRING SS DWG100558
31	1	* 16AWGBLK	#16AWG TEFLON BLACK WIRE
32	1	INSUTUBE	DUAL BEACON CERAMIC INSULATOR
33	1	INDCTRC3001	INDUCTOR .47MH TRANSFORMER
34	2	STC05005	TRIGGER TRANSFORMER
35	1	1032X38PHH	10-32 X 3/8 PILLIPS PAN HEAD SCREW
36	4	832X14PHH	8-32 X 1/4 PH SS SLOT SCREW
37	4	632X38PHH	6-32 X 3/8 PHILLIPS PAN HEAD SCREW
38	4	632X12PHH	6-32 X 1/2 PHILLIPS PAN HEAD SS SCREW
39	24	1032X38PHW	10-32 X 3/8 SS PHILIP HD CAPTIVE SCREW
40	3	832NUT	8-32 NUT
41	2	* 18RAD18277	T&B CONNECTOR
42	7	832X12PHH	8-32 X 1/2 PHILLIPS PAN HEAD
43	1	STBEAGSKT	GASKET NEOPRENE 13 1/4 X 15
44	3	STBEAGSK2	GASKET NEOPRENE 3/16 X 15 1/4
45	18	* TYZ23M	HI TEMP TY WRAPS
46	8	* 14RB10R	T&B CONNECTOR
47	1	EL190S	1" 90 DEGREE SHORT ELBOW GALV
48	1	STDBRLENS	RED DB LENS
49	2	100394-02	INDUCTOR BOTOM PAD GASKET
50	1	STDBCLENS	CLEAR DB LENS
51	1	STFLSHTB6	DAY MODE TUBE G01-109
52	1	A315	1" CONDUIT LOCKNUT GALVANIZED
53	1	STFLSHTB7	NIGHT MODE TUBE G01-112
54	4	58X112	A325 5/8 X 1-1/2 BOLT W/ANCO L/NUT
55	1	100453	INDUCTOR 135uh
56	2	* HEATSHRINK2	1/2" GLUE BASE HEAT SHRINK
57	4	CSL062X100	1/16 COPPER SLEEVE
58	2	* 14RB8FL	STAKON
59	.25	* HEATSHRINK	1/4" RED HEAT SHRINK
60	2	A10290	5/32" ID RUBBER GROMMET
61	1	57-10-401-10	SOUTHCO SPRING LATCH W/BLACK KNOB
62	1	CC-MPT-1-G	1' CORD CONNECTOR 0.700 TO .984
63	1	* STDBEAPIGTAIL2	DUAL BEACON PIGTAIL
64	1	TYANCHOR	TY WRAP ANCHOR 23N3669
65	1	621 RZ 10	10 PART TERMIBNAL BLOCK
66	1	621 RZ 07	7 PART TERMINAL BLOCK
67	24	* 18RA6FL	STAKON
68	13	* 14RB-6FL	14-16 AWG #6 LOCKING FORK
69	3	* KV10-8F-D	10-12 AWG #8 LOCKING FORK
70	1	NONOEMLBL	NON-OEM PARTS WARNING LABEL
71	1	MS621XP07	MS7-141 CINCH TERMINAL MARKER
72	1	MS621XP10	MS10-141 CINCH TERMINAL MARKER
73	1	632X14PHH	6-32 X 1/4 PHILLIPS PAN HEAD SCREW
74	3	832X1PHH	8-32 X 1 PHILLIPS PAN HEAD SS SCREW
75	1	100634	TOP SEAL PLATE

* = ITEMS NOT SHOWN

L865/864 DUAL BEACON ASSEMBLY (STDBEACON)

PROD DEPT

SERV DEPT

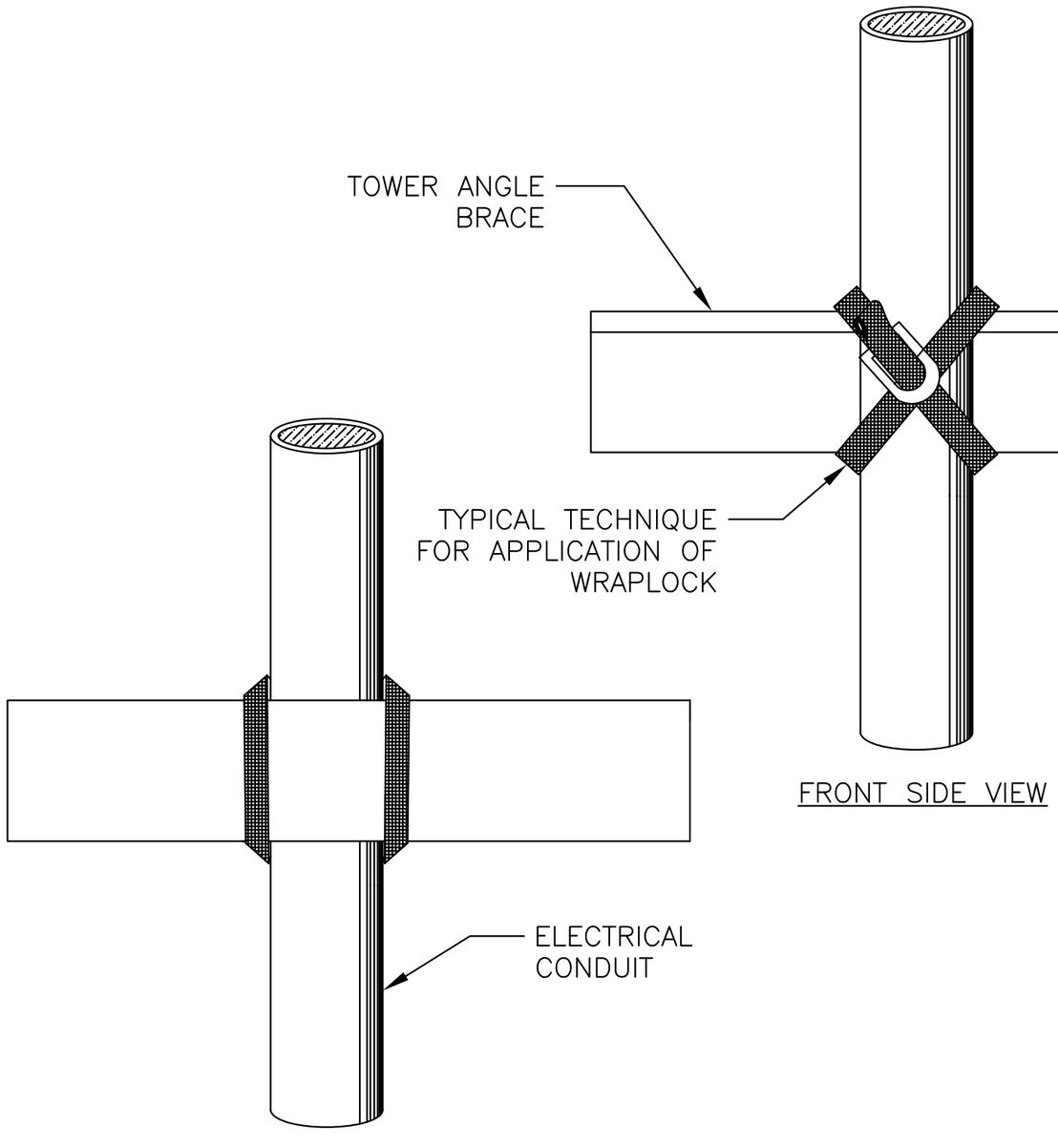
ENGINEER

TWR Lighting®, Inc. HARK
Enlightened Technology®

DRAWN BY		SHEET SIZE	SHEET QTY.
GAVIN SEBEK		B	1 OF 1
DATE 3/3/2004	SCALE N.T.S	DWG. NO. 100414	

AUTHOR	DATE	REV	DESCRIPTION
J.ZAMORANO	05/13/2015	D	UPDATED BOM

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.



FRONT SIDE VIEW

BACK SIDE VIEW

DIRECTIONS FOR USING WrapLock

CUT OFF BAND TO PROPER LENGTH.

(SEE TABLE ON COVER OF BOX)

1.— PASS ONE END THROUGH YOKE AND BEND BACK ABOUT 1 1/2" AND FLATTEN DOWN.

2.— PASS BAND AROUND WORK AND THROUGH YOKE.

3.— REPEAT AND PASS END THROUGH A SECOND TIME, DRAW UP FREE END SNUGLY WITH PLIERS.

4.—

INSERT FREE END IN SLOT OF RATCHET.

5.—

TURN DOWN UNTIL CLAMP IS TIGHT.

6.— BACK OFF SLIGHTLY TO REMOVE RATCHET. CLAMP IS NOW SECURELY LOCKED.

TO REMOVE WrapLock

UNCOIL END WITH RATCHET. PRESS DOWN AT POINT WHERE BAND METAL HAS BEEN FORCED THROUGH CURVED PART OF YOKE.

WRAPLOCK FASTENING DETAIL

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

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.