

L-849 Voltage/Current, Style A and E LED Runway End Identifier Light (REIL)

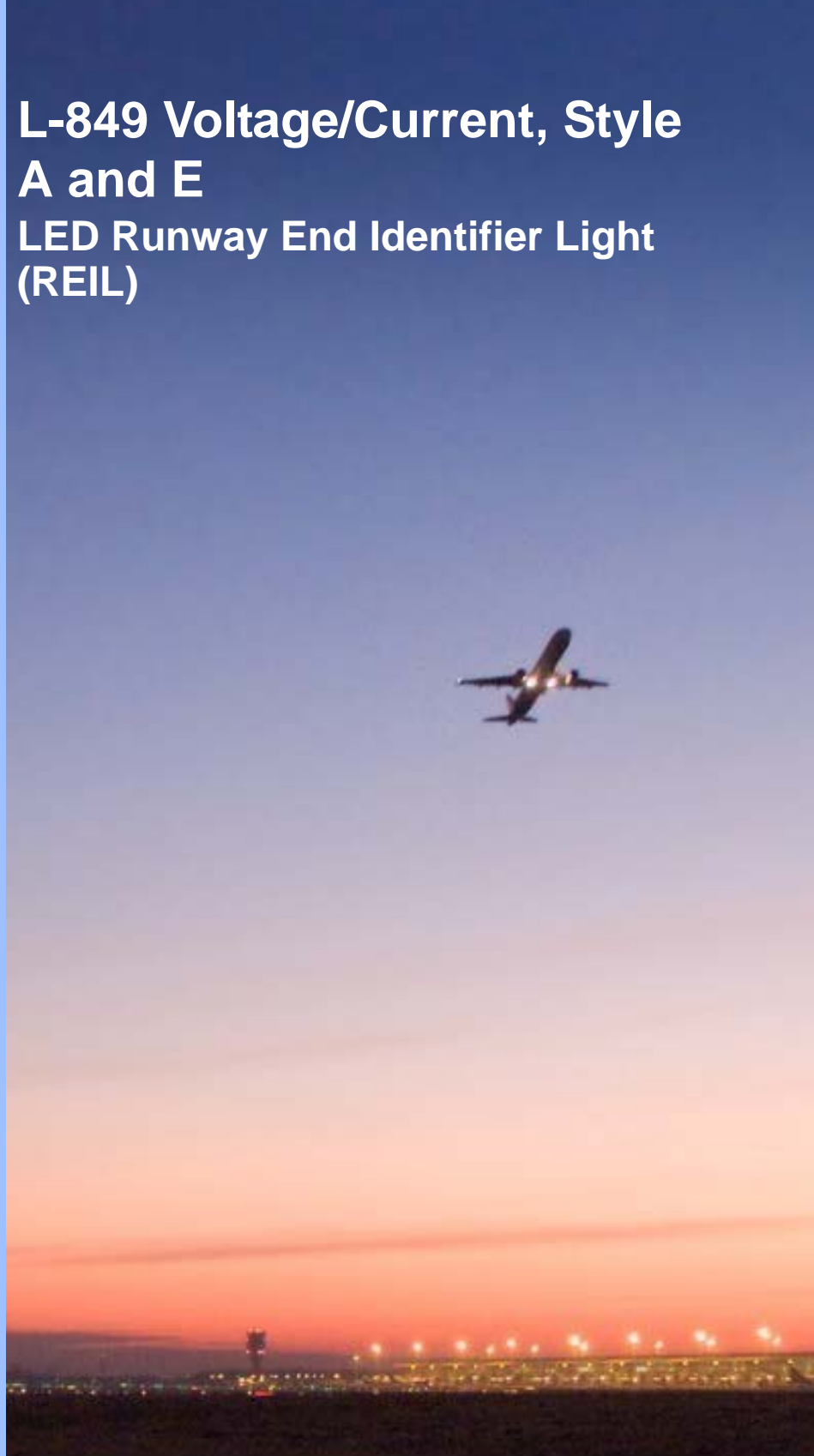
User Manual

96A0381

Retain for future use.

Rev. L, 11/26/12

ETL Certified to FAA Specification
AC 150/5345-51 latest version and
LED Performance Requirements per
FAA Engineering Brief 67



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a.1 Record of Change

Page	Rev	Description	EC No.	Checked	Approved	Date
All	A	Released manual for certification	N/A	WT	WT	9/18/07
All	B	Released manual for production	1858	WT/JR	WT	12/13/07
"Schematics" on page 31	C	Corrected external wiring diagram descriptions	1900	JC	JC	2/29/08
"Parts" on page 25	D	Added description to PC Assembly 44A6724	1903	JC	JC	3/11/08
"Parts" on page 25	E	Added Stainless Steel enclosure (no paint) to ordering code	1987	JC	JC	6/20/08
All	F	General editorial updates	2061	ER	DR	9/17/08
Section 5, 6, and 7	G	Drawing updates - added 2 leg current to parts	2130	DR	RW	12/11/08
Install Diag 3-8	H	Update install diagram to match FAA	2355	ER	GM	09/09/09
4-1 > 4-2	I	Updated setting the operational modes	2881	JR	RS	10/18/10
7-1 > 7-5	J	Updated Drawings and start up procedures	2253	JC	JG	05/17/11
Parts	K	updated parts and 177A0044 drawings		JC	JG	
All	L	Update drawings / parts and schematics		JC	BE	12/06/12

Record of Change

Disclaimer

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1.0 Safety

This section contains general safety instructions for installing and using ADB Airfield Solutions equipment. Some safety instructions may not apply to the equipment in this manual. Task- and equipment-specific warnings are included in other sections of this manual where appropriate.

1.1 To use this equipment safely:



WARNING

Read installation instructions in their entirety before starting installation.

- Refer to the FAA Advisory Circular AC 150/5340-26, Maintenance of Airport Visual Aids Facilities, for instructions on safety precautions.
- Observe all safety regulations. To avoid injuries, always disconnect power before making any wiring connections or touching any parts. Refer to FAA Advisory Circular AC 150/5340-26.
- Become familiar with the general safety instructions in this section of the manual before installing, operating, maintaining or repairing this equipment.
- Read and carefully follow the instructions throughout this manual for performing specific tasks and working with specific equipment.
- Make this manual available to personnel installing, operating, maintaining or repairing this equipment.
- Follow all applicable safety procedures required by your company, industry standards and government or other regulatory agencies.
- Install all electrical connections to local code.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local codes.
- Route electrical wiring along a protected path. Make sure they will not be damaged by moving equipment.
- Protect components from damage, wear, and harsh environment conditions.
- Allow ample room for maintenance, panel accessibility, and cover removal.
- Protect components from damage, wear, and harsh environment conditions.
- Allow ample room for maintenance, panel accessibility, and cover removal.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning prior to returning power to the circuit.

1.1.1 Additional Reference Materials:

- NFPA 70B, Electrical Equipment Maintenance.
- NFPA 70E, Electrical Safety Requirements for Employee Workplaces.
- ANSI/NFPA 79, Electrical Standards for Metalworking Machine Tools.
- OSHA 29 CFR, Part 1910, Occupational Health and Safety Standards.
- National and local electrical codes and standards.

1.1.2 Qualified Personnel

The term **qualified personnel** is defined here as individuals who thoroughly understand the equipment and its safe operation, maintenance and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations and have been trained to safely install, operate, maintain and repair the equipment. It is the responsibility of the company operating this equipment to ensure that its personnel meet these requirements.

Always use required personal protective equipment (PPE) and follow safe electrical work practices.

1.1.3 Intended Use



WARNING

Using this equipment in ways other than described in this manual may result in personal injury, death or property and equipment damage. Use this equipment only as described in this manual.

ADB Airfield Solutions cannot be responsible for injuries or damages resulting from nonstandard, unintended applications of its equipment. This equipment is designed and intended only for the purpose described in this manual. Uses not described in this manual are considered unintended uses and may result in serious personal injury, death or property and equipment damage. Unintended uses may result from taking the following actions:

- Making changes to equipment that are not recommended or described in this manual or using parts that are not genuine ADB Airfield Solutions replacement parts.
- Failing to make sure that auxiliary equipment complies with approval-agency requirements, local codes and all applicable safety standards.
- Using materials or auxiliary equipment that are inappropriate or incompatible with ADB Airfield Solutions equipment.
- Allowing unqualified personnel to perform any task.

1.1.4 Storage



CAUTION

If equipment is to be stored prior to installation, it must be protected from the weather and kept free of condensation and dust.

Failure to follow this instruction can result in injury or equipment damage.

1.1.4.1 Operation



WARNING

- Only qualified personnel, physically capable of operating the equipment and with no impairments in their judgment or reaction times, should operate this equipment.
- Read all system component manuals before operating this equipment. A thorough understanding of system components and their operation will help you operate the system safely and efficiently.
- Before starting this equipment, check all safety interlocks, fire-detection systems, and protective devices such as panels and covers. Make sure all devices are fully functional. Do not operate the system if these devices are not working properly. Do not deactivate or bypass automatic safety interlocks or locked-out electrical disconnects or pneumatic valves.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning.
- Route electrical wiring along a protected path. Make sure they will not be damaged by moving equipment.
- Never operate equipment with a known malfunction.
- Do not attempt to operate or service electrical equipment if standing water is present.
- Use this equipment only in the environments for which it is rated. Do not operate this equipment in humid, flammable, or explosive environments unless it has been rated for safe operation in these environments.
- Never touch exposed electrical connections on equipment while the power is ON.

1.1.4.2 Material Handling Precautions



CAUTION

This equipment may contain electrostatic sensitive devices.

- Protect from electrostatic discharge.
- Electronic modules and components should be touched only when this is unavoidable e.g. soldering, replacement.
- Before touching any component of the cabinet you should bring your body to the same potential as the cabinet by touching a conductive earthed part of the cabinet.
- Electronic modules or components must not be brought in contact with highly insulating materials such as plastic sheets, synthetic fiber clothing. They must be laid down on conductive surfaces.
- The tip of the soldering iron must be grounded.
- Electronic modules and components must be stored and transported in conductive packing.

1.1.4.3 Action in the Event of a System or Component Malfunction



WARNING

- Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.
- Disconnect and lock out electrical power.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component according to instructions provided in its manual.

1.1.4.4 Maintenance and Repair



WARNING

Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks.

- Only persons who are properly trained and familiar with ADB Airfield Solutions equipment are permitted to service this equipment.
- Disconnect and lock out electrical power.
- Always use safety devices when working on this equipment.
- Follow the recommended maintenance procedures in the product manuals.
- Do not service or adjust any equipment unless another person trained in first aid and CPR is present.
- Connect all disconnected equipment ground cables and wires after servicing equipment. Ground all conductive equipment.
- Use only approved ADB Airfield Solutions replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals and create safety hazards.
- Check interlock systems periodically to ensure their effectiveness.
- Do not attempt to service electrical equipment if standing water is present. Use caution when servicing electrical equipment in a high-humidity environment.
- Use tools with insulated handles when working with electrical equipment.

1.1.4.5 Operation of Overloaded Regulators



WARNING

- Operation of a Regulator while overloaded at any step may result in equipment failure or equipment damage.

2.0 Introduction



WARNING

Read the instructions in their entirety before starting installation.

This section provides an introduction to the ADB FAA Type L-849V (voltage) and I (current), Style A and E, REIL with LED optical flash heads. See Figure 1. The ADB FAA Type L-849V (voltage) and I (current), Style A and E, REIL with LED optical flash heads consists of two unidirectional light units, one located on each side of the runway. Each REIL assembly utilizes an integrated head and power supply. The Primary REIL assembly controls operation of the Secondary REIL assembly. Remote control signals are connected only to the Primary assembly. These light units flash twice a second to provide a visual indication to pilots of the runway threshold during an approach for landing.

Figure 1: REIL ASSEMBLY



NOTE: The L-867 baseplate that the assembly is mounted on is not a part of the REIL assembly.

Refer to Table 1 for the L-849 optical assembly type and style.

Table 1: Optical Assembly

FAA Type/Style	Power	Optical Assembly
L849I/A	2.8A-6.6A	Unidirectional, 1 Brightness Step (high intensity)
L849I/E	2.8A-6.6A	Unidirectional, 3 Brightness Steps (low, medium, high intensity)
L-849V/A	240 Vac (2 wire) or 120/240Vac (3 wire) $\pm 10\%$ 50/60Hz	Unidirectional, 1 Brightness Step (high intensity)
L-849V/ E	240 Vac (2 wire) or 120/240Vac (3 wire) $\pm 10\%$ 50/60Hz	Unidirectional, 3 Brightness Steps (low, medium, high intensity)

Introduction

2.1 Specifications

Table 2: L-849 V/I, Style A/E Assembly

Power Rating	L-849V	120/240Vac, ±10%, 60Hz, 3-wire	
	L-849V	240Vac, ±10%, 50/60Hz, 2-wire	
	L-849I	2.8 - 6.6 A from a Constant Current Regulator	
LED	LED Clusters		
	Average Life	50,000 hours	
Photometric Output¹	L-849V/I, A	Intensity	15,000 cd
	L-849V/I, E	High Intensity Candelas	15,000 cd
		Medium Intensity Candelas	1,500 cd
		Low Intensity Candelas	300 cd
Flash Rate	120 flashes per minute with less than 1% misfiring (no consecutive skips) over average life.		
Operating Temperature Range	-40 to +55 °C (-40 to +131 °F)		
Wind	Velocities up to 150 knots (173 mph) (278 km/h)		
Relative Humidity	0 to 100%		
Altitude	Sea level to 10,000 ft (3000 m)		
Dimensions	20 x 16 x 8 inches (508 x 406 x 203.2 mm) (enclosure L x H x D)		
Weight	46 lbs (each unit)		

¹ Photometric output is within a beam pattern of 10 degrees vertical by 30 degrees horizontal for each flasher (tolerance of 50% in effective intensity). The effective intensities are maintained when operated within the operating temperature range listed.

2.2 Theory of Operation

2.2.1 General

The L-849 REIL with LED cluster flashing light system provides a visual indication of the runway threshold to pilots during an approach for landing. The system is composed of two flashers that operate simultaneously to produce short-duration flashes twice a second.

The REIL system may be operated either by local or remote control. The L-849A operates at high intensity and the L849E operates at low, medium, or high intensity.

2.2.1.1 Theory of Operation: Overview

The L-849 LED systems consist of an individual control cabinet with an integrated flash head. The electronic package housed in the control cabinet is the same for both flash heads.

3.0 Installation

This section provides instructions for installing the L-849 Runway End Identifier Lights (REIL). Refer to the airport project plans and specifications for the specific installation instructions. Also see FAA AC 150/5340-30.



WARNING

Read the instructions in their entirety before starting installation.

- Refer to the FAA Advisory Circular AC 150/5340-26, Maintenance of Airport Visual Aids Facilities, for instructions on safety precautions.
- Observe all safety regulations. To avoid injuries, always disconnect power before making any wiring connections or touching any parts. Refer to FAA Advisory Circular AC 150/5340-26.
- Become familiar with the general safety instructions in this section of the manual before installing, operating, maintaining or repairing this equipment.
- Read and carefully follow the instructions throughout this manual for performing specific tasks and working with specific equipment.
- Make this manual available to personnel installing, operating, maintaining or repairing this equipment.
- Follow all applicable safety procedures required by your company, industry standards and government or other regulatory agencies.
- Route electrical wiring along a protected path. Make sure they will not be damaged by moving equipment.
- Protect components from damage, wear, and harsh environment conditions.
- Allow ample room for maintenance, panel accessibility, and cover removal.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning prior to returning power to the circuit.

3.1 L-849A/E REIL: Required Equipment

Refer to Table 3 for required equipment that is supplied. Refer to Table 4 for required equipment that is not supplied. Refer to the *Parts* section for ordering information.

Table 3: Required Equipment Supplied

Description	Quantity
REIL system	1
Instruction manual	1 per order

Table 4: Required Equipment Not Supplied

Description	Quantity
Wire, input power. (AWG 16, 600V min. assuming distance is 600 feet or less). See Table 5 if distance >600 feet.	As required
Wire, remote control (AWG 16, minimum, 600 V)	As required
Wire, interconnection individual control cabinets (AWG 16, minimum, 600 V)	As required
Remote control device	As required
Ground rods and AWG 6 solid copper ground wire	As required
External circuit breaker for voltage powered REIL	1
Base pads, cement for mounting cabinets	As required
Silicone grease for pipe thread installation	As required
Conduit elbow, 2-in. (50.8 mm-) diameter	2
Conduit elbow coupling to attach frangible coupling to elbow	2
Base flange, 6 ¼-in. (158.75-mm-) diameter. Not required if conduit elbow coupling is used. 62B0107	2
L-867 base, 16-in. (406.4-mm-) diameter.	1

Installation

Description	Quantity
L-823 connector, male and female, kit	1
L-823 male secondary splice kit	As required
Level	1
Padlock for control cabinets (if required)	2

Table 5: External Power AWG Wire Size

Distance between Individual Control Cabinet		AWG Wire Size
L-849V/I, A/E Feet	L-849V/I, A/E Meters	Minimum
1400	427	12
900	275	14
600	183	16

3.1.1 Unpacking

The equipment is shipped ready for installation. Handle equipment very carefully to prevent component damage. Unpack the carton upon receipt and check the contents and their condition. Note any exterior damage to the carton that might lead to detection of equipment damage.

If you note any damage to any equipment, file a claim with the carrier immediately. The carrier may need to inspect the equipment.

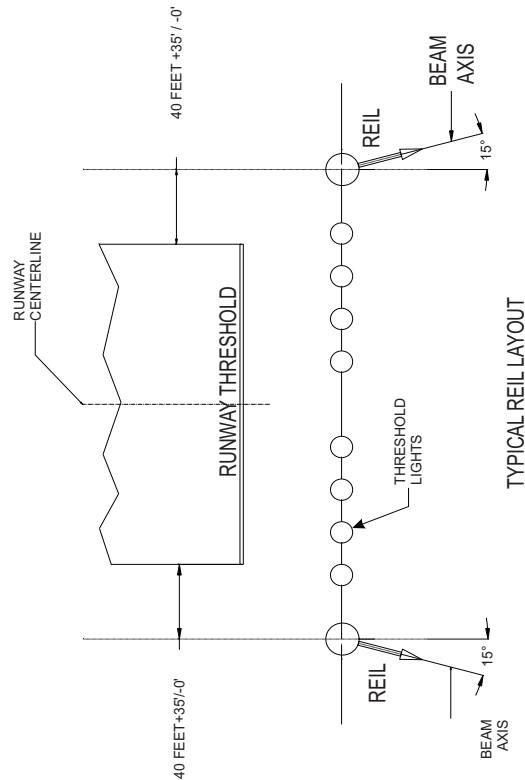
3.1.2 Specific Site Information

Site information is provided in the airport project plans and specifications. The installation must conform to the applicable sections of the National Electric Code and local codes.

Refer to the guidelines below when preparing the site.

- See Figure 2. Each L-849 REIL light unit should be placed in a line with the runway threshold at 40 feet (12.2 m) from the runway edge. A tolerance of 100 feet (30.4 m) upwind and 30 Feet (9.1 m) downwind with respect to being in line with the threshold is permitted.
- The light units shall be equally spaced with respect to each other from the runway threshold. See FAA Advisory Circular AC 150/5340-30 for additional installation requirements.
- The beam centerline of each light unit is aimed 15 degrees outward from a line parallel to the runway centerline and inclined at an angle of 10 degrees above the horizontal.
- If REILs are used with VASI-2, install REILs 75 feet from the runway edge.

Figure 2: Typical Layout for REIL



3.1.3 Tools and Test Equipment

Conventional tools and test equipment used by general and electrical contractors should suffice for installation. However, a true RMS multi-meter such as a Fluke 87V (or equivalent) and a clamp-on amp probe should be available. A waterproof shroud is needed if a cabinet door has to be opened in extremely inclement weather.

3.1.4 Installation of the Control Cabinets

Unpack the individual cabinets, and open the cabinet doors by depressing the "red" button at the bottom of the door lever and then insert a medium width bladed screw driver in the slot and rotate the screwdriver counter clockwise and turn the handle, approximately ¼ turn clockwise to unlock and open the door.

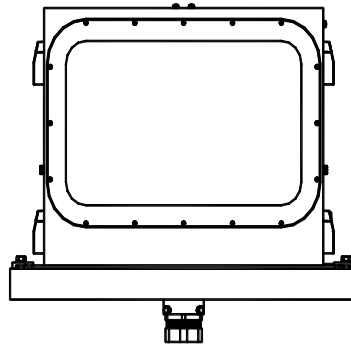
NOTE: The ADB LED L-849V/I, A and E REIL uses the same enclosure for both the Primary and Secondary Units.

Make sure all components in the enclosures are in place and fastened to the panel assembly. The ON/OFF service switch in the cabinets should be in the OFF position. If all components are in place, close the door and tighten the bolts.

3.1.5 Mounting Options

The standard mounting method is with a single leg. See Figure 3 and Figure 4 for mounting instructions. An optional two leg mounting system is available- see Figure 23.

Figure 3: L-849V/I REIL Standard Single Leg Mounting Configuration

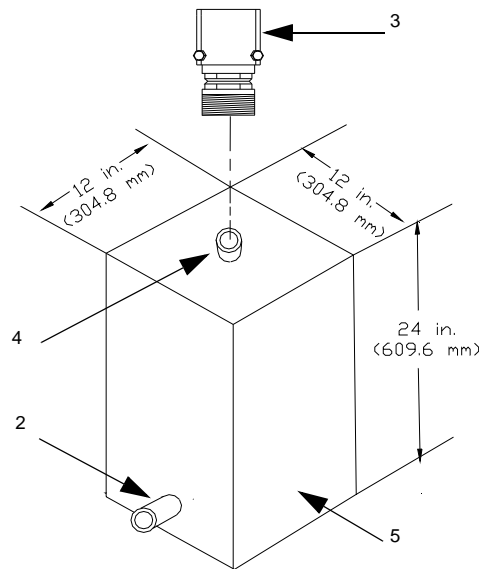


3.1.6 Mounting Cabinets

NOTE: Mount the LED L-849 REIL cabinet directly onto the existing frangible coupling supplied with the assembly.

Figure 4 is given only as guide. Check local codes and the airport project plans and specifications for installation requirements. See FAA AC 150/5345-30 for additional mounting instructions. Not shown is the L-867 base can to house the L-830 or L-831 isolation transformer for current driven applications.

Figure 4: Single-Leg Control Cabinet



1. L-849 Assembly (not shown)	4. Use Two-Inch Threaded Coupling if Flange Not Used.
2. Two-Inch Elbow for External Wires	5. Concrete Foundation
3. Frangible Coupling (supplied)	6.

3.1.6.1 Mounting the Cabinets

To install the L-849 REIL control cabinets, perform the following procedure:

NOTE: A customer-supplied external circuit breaker should be separately mounted to the input power supply lines.

1. Install a customer-supplied 2-inch (50.8 mm) conduit elbow in the concrete pad for external wiring routing into the bottom mounting hub of the cabinet.

NOTE: Depth of the concrete foundation should be a minimum of 6 in. (152.4 mm) below frost line.

2. Install a customer-supplied 2-inch (50.8 mm) threaded coupling on the threaded end of the conduit elbow.

NOTE: Make sure the coupling is installed level and square with the concrete pad. Level by adjusting slip-fitters on pipe extending downward from cabinet. An alternate method is to use a 6 1/4-inch (158.75 mm) base flange, and bolt the flange to the concrete pad over the conduit elbow flush with top of pad.

When the base flange is used, make sure the flange can be installed level with the concrete pad. Use shims on the flange if further leveling of unit is required. Make sure the conduit is flush with the top of the concrete pad.

3. Coat the threaded end of frangible coupling with silicone grease and thread onto base flange or conduit elbow coupling.
4. Loosen the hex head screws in the mounting hub and mount cabinet on frangible coupling.
5. Place a level on top of the cabinet. Level by adjusting slip-fitters on the pipe extending downward from the cabinet.
6. Tighten the hex head screws in the mounting hub against the frangible coupling when the cabinet is level.

NOTE: To properly aim the light unit, each cabinet must be level and parallel to the runway centerline when the cabinets are installed.

7. Tighten the hex head screws against the hub.

3.1.6.2 Series Circuit Connection Installation

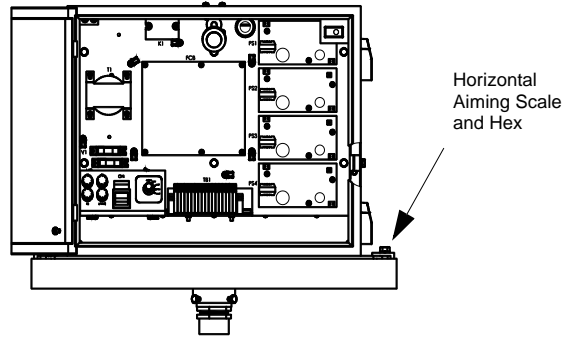
- For L-849I series circuit powered REILS, install a L-867 base can to house the L-830 or L-831 isolation transformer. See Figure 23 for details.
- For L-849V voltage powered REILS that use current sensing for remote control, install a L-867 base can next to the Primary enclosure. See Figure 23 for details.

3.1.7 Aiming the Flash Heads

3.1.7.1 Horizontal Aiming Adjustments

The horizontal axis of the light beam can be adjusted at a maximum angle of 15 degrees from runway center line. To adjust the horizontal setting, perform the following procedure:

Figure 5: Horizontal Aiming

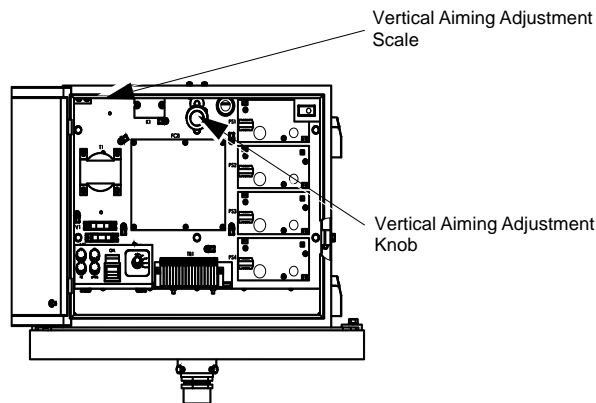


1. See Figure 5. Locate and loosen the hex head cap screws on horizontal aiming bracket found on both outside ends of the enclosure. Manually rotate the head assembly and orientate the beam axis of the flash head to the desired angle to a maximum of 15 degrees outward from a line parallel to the runway centerline. Ref. Figure 2.
2. Hand-tighten the hex screws and then check the new setting by verifying that the alignment pointer is set at the required horizontal angle. Loosen the hex head screw and repeat the adjustment procedure if the angle is not correct.
3. If horizontal setting is correct, ensure that the screws are tight to lock the head at the desired angle.

3.1.7.2 Vertical Aiming Adjustment

The vertical axis of the light beam can be adjusted upward at a maximum angle of 15 degrees above the horizontal. To adjust the vertical setting, perform the following procedure:

Figure 6: Vertical Aiming



1. See Figure 6. Open the enclosure door and find the vertical aiming scale located in the upper left - hand corner inside the enclosure. Next locate the adjustment screw knob

located inside in the upper center of the enclosure. Loosen the jam nut located behind the knob.

2. Rotate the vertical adjustment screw knob CW to increase the angle and turn CCW to decrease the angle. Verify the angle by viewing the vertical adjustment scale.
3. When desired vertical angle is obtained, tighten the jam nut. Once the jam nut is tight, verify angle by checking the scale. Check the alignment pointer on the scale to verify that the required vertical angle is correct. Repeat the adjustment procedure if the angle is not correct.

3.1.8 Electrical Connections



WARNING

Read the instructions in their entirety before starting installation. Disconnect power to the lighting circuit before attempting to make any electrical connections. Coordinate a power outage with air traffic personnel before turning power to the airport lighting system off.

See Figure 19 thru Figure 22 in the "Schematics" on page 31 for external wire connections to the flash units.

NOTE: All electrical wiring shall be made in accordance with the National Electrical Code and the local regulator authority.

Wiring between the flash head and the individual control cabinet is connected and supplied with unit. Proper wire size information for the external connections is given in Figure 19 thru Figure 22.

NOTE: It is recommended that external lightning arrestors be added to incoming power lines as local conditions require.

3.1.8.1 Grounding the Units



WARNING

Read installation instructions in their entirety before starting installation. Pipe straps shall not be used for grounding purposes. Ground connections and lugs shall be the best commercial type.

Ground the Primary and Secondary units by connecting a No. 6 bare solid copper wire at the earth ground lug provided inside the cabinets and route the wire through the conduit to the grounding rod. The ground resistance shall not exceed 25 ohms with the power feeder neutral disconnected. If necessary, additional ground rods shall be installed and interconnected to obtain the required resistance. The ground wires shall be connected to the ground rods by either an exothermic process (Erico Products Corporation, Cadweld, Burndy Corporation, Thermoweld or equivalent) or by brazing.

3.1.8.2 Cabinet and Remote Control Wiring

Refer to the guidelines below when wiring the cabinet and the remote control.

For L-849 REILs, install interconnecting power and control wiring (AWG 16 minimum, 600 V) between terminal block TB1 in each cabinet. See Figure 19 and Figure 22.

- Make remote control circuitry connections (AWG 16 minimum, 600 V) to Primary terminal block TB1 in both cabinets. See Figure 19 for L-849I series circuit powered applications. See Figure Figure 22 for L-849V voltage powered applications.

NOTE: When the current sensing option is used on L-849V REILS, remote control is not possible and TB1 terminals 4 through 8 are not used.

- Check for proper installation and firm connections.
- For L-849I series circuit powered REILS, connect a 200W isolation transformer as shown in Figure 22.
- For L-849V voltage powered REILS, connect 120/240Vac (3 wire) or 240Vac (2 wire) to TB1 as shown in Figure 19. Connect an isolation transformer to the Primary unit if optional current sensing is used.

Table 6: L-849A/E, V/I, TB1 Terminal Functions - Control Cabinet 1 & 2

Terminal	Function	Note
TB1-1	Failure Indication Relay N.O. Contact	
TB1-2	Failure Indication Relay Common Contact	
TB1-3	Failure Indication Relay N.C. Contact	
TB1-4	Remote Control – Identification ON	
TB1-5	Remote Control – Low	A
TB1-6	Remote Control – Medium	A
TB1-7	Remote Control – High	A
TB1-8	Remote Control – 120Vdc Source	
TB1-9	Remote control – 120Vdc Return	
TB1-10	Trigger Input	
TB1-11	Trigger Output	
TB1-12	Spare	
TB1-13	Spare	
TB1-14	VAC Input	
TB1-15	VAC Input	
TB1-16	Neutral	
TB1-17	Earth	
TB1-18	Current Monitoring Option	B
TB1-19	Current Monitoring Option	B

NOTE A: L-849V/I, E Only

NOTE B: Used if optional current sensing is present

3.1.9 240Vac Powered REIL

Perform the procedure below if power for the REIL system is provided from a 120/240Vac split or 240Vac single phase power supply.

To install 120/240Vac or 240Vac powered REIL, perform the following procedure:

1. Install interconnecting and control wiring as specified in *Control Cabinet and Remote Control Wiring* in this section.
2. Connect the 120/240Vac or 240Vac power supply lines to a customer-supplied external circuit breaker, if required.
3. Disengage the circuit breaker and connect power supply lines from the circuit breaker to terminal block TB1 terminals labeled VAC IN-1 and VAC IN-2 in the cabinet.
4. Tighten all connections.

3.1.10 Installation Checkout

This subsection describes procedures for installation checkout. See Figures in the *Wiring Schematics* section.

3.1.10.1 Wiring Checkout

Refer to the guidelines below when checking out wiring.

- All grounding connections to equipment, housing, structures, and ground rods shall be thoroughly checked. The ground resistance of all ground rods shall be within the limits specified in project plans and specifications.



WARNING

All power should be off while resistance checks are being made. A potential of 240 Vac may be present, which can be lethal.

- All power and control wiring shall be carefully and thoroughly verified. Using an ohmmeter, check all wires to make sure that proper connections are made.



CAUTION

If the system is turned on and wiring is connected improperly, all or part of the system can be damaged and void the warranty.

3.1.10.2 Connector, Plug, and Jack Checkout

Carefully check all connections plug and jack connections, and other wiring disconnects for proper mating. Check all terminal board connections for tightness.

3.1.11 Safety Switch Checkout

Check the Primary and Secondary cabinets and flash heads for complete closure and latching, making sure that the interlock safety switches are depressed.

3.1.12 Initial Startup and Preliminary Test



WARNING

Before applying power to any part of the system, carefully read and observe at all times the safety instructions in the *Safety* section in this manual.

Refer to the guidelines below upon initial startup and preliminary testing.

In each LED L-849 REIL control cabinet insure that the control switches are set to OFF. Turn on power to the REIL (engage external circuit breaker for voltage powered applications or turn on CCR for series circuit powered applications) and verify that the following is present on TB1 in the control cabinet:

- L-849I: Place a clamp-on ammeter probe around TB1-14. Insure 2.8 to 6.6A (for 5-step CCRs) or 4.8A-6.6A (for 3-step CCRs) is present and matches the CCR step setting.
- L-849V: For 120/240Vac powered REILS, verify the following voltages are present in each cabinet:
 - TBI-14 to TBI-16: 120Vac
 - TBI-15 to TBI-16: 120Vac
 - TBI-14 to TBI-15: 240Vac
 - For 240VAC powered REILS, verify the following voltage is present in each cabinet:
TBI-14 to TBI-15: 240Vac
- If the optional external failure indicator is used, set the Misfire Threshold switch SW1 on the Flasher Control Board to the desired consecutive misfire alarm level. SW1 may be set from 1 to 7. Set SW1 to zero if the external failure indicator is not used.

NOTE: Changing Step Modes (Primary only)

Only the Primary Unit requires programming.

Changing from a 3-step setting to a single-step setting:

- Press the CURRENT ADJUST button SET HIGH for 4 seconds. The HIGH LED will blink for 2 seconds and turn off.

Changing from a 1-step setting to a 3-step setting:

- Press the CURRENT ADJUST button SET LOW, SET MED and SET HIGH buttons simultaneously for 4 seconds. The LOW, MED, and HIGH LEDs will blink for 2 seconds and then turn off.

3.1.12.1 Startup Procedures

- Turn the Primary unit ON, followed by the Secondary unit. Check the L-849 REIL system in all modes of operation. Refer to REIL Startup Procedure in the Operation section.

Check the remote control operations, if used. For current sensing, set the activation levels as follows:

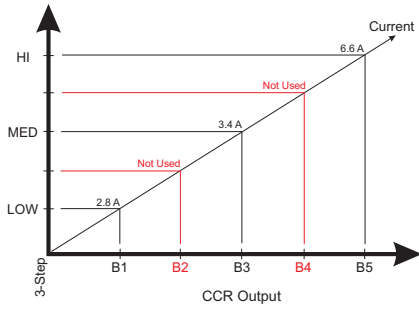
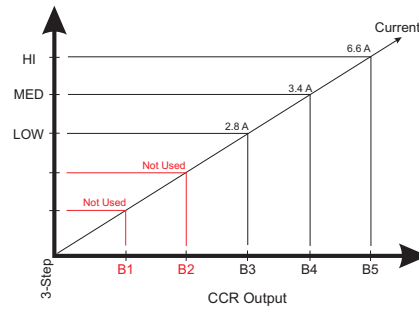
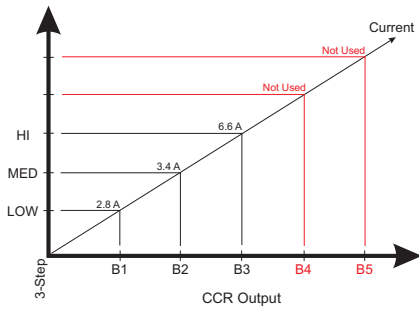
- **L-849 A (One-Step)** (see Figure 11)
- Changing from a 3-step setting to a single-step setting:
 - Press the CURRENT ADJUST button SET HIGH for 4 seconds. The HIGH LED will blink for 2 seconds and turn off.
 - Set the constant current regulator (CCR) to the step setting where REIL operation is desired.
 - On the LED REIL control board, 44A6724, in the Primary Unit, turn the rotary switch to the 'Remote' position. Push the SET HIGH push button for 4 seconds. The LED D20 will light for 2 seconds and turn off. Release the button.
 - The board is now programmed for the desired current to activate the unit.
 - The REIL will shut off at lower current steps.

NOTE: Only the primary unit is programmed. The secondary unit must not be programmed.

- **L-849 E (Three-Step)** (see Figure 11)
- Changing from a 1-step setting to a 3-step setting:
 - Press the CURRENT ADJUST button SET LOW, SET MED and SET HIGH buttons simultaneously for 4 seconds. The LOW, MED, and HIGH LEDs will blink for 2 seconds and then turn off.
 - Set the constant current regulator (CCR) to the highest step setting where Low intensity REIL operation is desired.
 - On the LED REIL control board, 44A6724, in the Primary Unit, turn the rotary switch to the 'Remote' position. Press and hold the SET LOW Switch SW2 for 4 seconds. The 'Low' LED D18 will flash.
 - Set the CCR to the highest step setting where Medium intensity REIL operation is desired. Press and hold the SET MEDIUM Switch SW3 on the Flasher Control Board for 4 seconds. The 'Med' LED D19 will flash.
 - Set the CCR to the highest step setting where High intensity REIL operation is desired. Press and hold the SET HIGH Switch SW4 on the Flasher Control Board for 4 seconds. The 'High' LED D20 will flash.
 - Set the CCR to the LOW intensity setting, verify that the LOW LED D18 is lit.
 - Set the CCR to the MEDIUM intensity setting, verify that the MEDIUM LED D19 is lit.
 - Set the CCR to the HIGH intensity setting, verify that the HIGH LED D20 is lit.
 - Set the CCR to the desired intensity setting, verify that the desired intensity LED Dxx is lit.

NOTE: Only the primary unit is programmed. The secondary unit must not be programmed.


Figure 7: Examples of allowed current settings



NOTE: The current-range between steps must be the same, therefore the REIL steps will be setup for B1/B3/B5 or grouped together as shown in the top two graphs.

4.0 Operation

This section provides instructions for operating the L-849A/E, Voltage/Current (V/I) Runway End Identifier Lights (REIL).



WARNING
Read the instructions in their entirety before operating the REIL.
Allow only qualified personnel to perform the following tasks.
Observe and follow the safety instructions in this document and all other related documentation.

This section provides instructions for operating the L-849A/E, Voltage/Current (V/I), REIL.

The L-849 REIL system may be operated by local or remote control. Remote control is by switch or radio receiver/decoder unit. For maintenance purposes, a rotary selector switch is provided inside the Primary individual control cabinet for local control.

4.1 Operational Modes

Refer to Table 7 and Table 8. A rotary selector switch is in the L-849A/E, Voltage/Current (V/I) individual control cabinet. L-849 style A has 3 settings (REMOTE, OFF and, ON) and the L-849 style E has 5 settings (REMOTE, OFF, LOW, MEDIUM and, HIGH). These settings control the flashing lights locally or turn control of the lights over to a remote location. The REMOTE setting on the rotary selector switch turns control of the system over to a remote control system that can turn the flashing lights on or off.

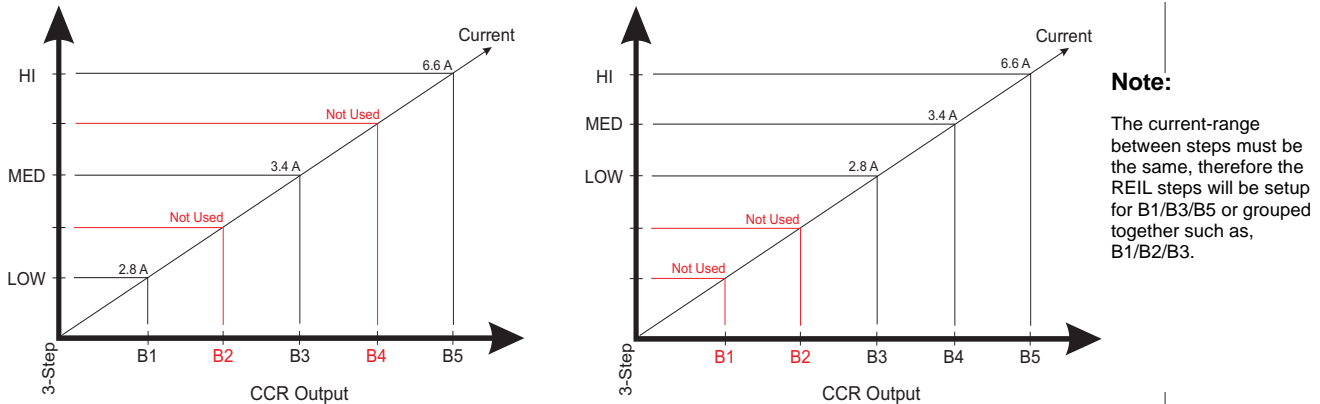
Table 7: L-849 Voltage and Current, Style A REIL Modes of Operation

Rotary Switch Position (Primary Cabinet)	Remote Control Panel Setting	Operational Results
OFF	All Settings	System off – no flashing
ON	All settings	Flashers operate
REMOTE	OFF	System off – (except when current sensing is present)
REMOTE	ON	Flashers operate

Table 8: L-849 Voltage and Current, Style E REIL Modes of Operation

Rotary Switch Position (Primary Cabinet)	Remote Control Panel Setting	Operational Results
OFF	All Settings	System off – no flashing
ON	Any	Flashers operate
REMOTE	OFF	System off – no flashing
REMOTE	ON (low, medium, high)	Flashers operate

Figure 8: Example allowed current settings for 3-step REIL, L-849 “E”



4.2 Operating Procedures

4.2.1 REIL Startup Procedure

This subsection provides information on the L-849A/E, V (voltage driven) procedure.

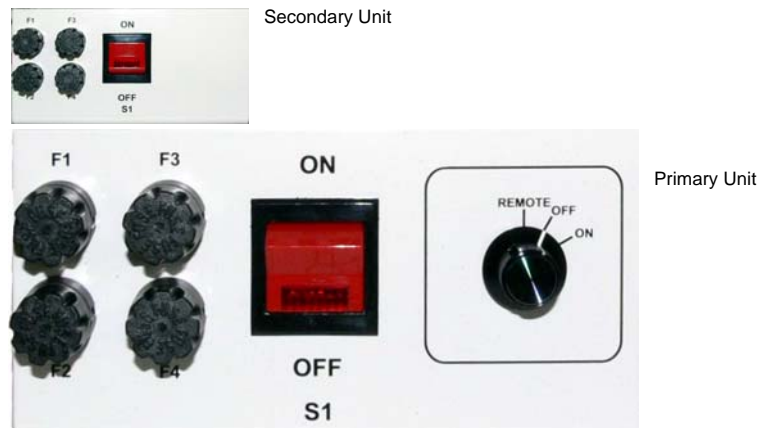
See Figure 9 and the guidelines below:

1. Set the ON/OFF switch S1 on the input module in both the Primary and Secondary control cabinet to the ON position.
2. Set the rotary control switch in both control cabinets to either:
 - REMOTE position for remote (voltage only) or current sensing operation
 - ON position for local operation
3. Make sure that both control cabinet doors are properly closed to activate interlock switch S3 on the door.
4. If remote operation, make sure that the remote control switch is set to the REMOTE position.

NOTE: For the voltage powered L849 REIL: The system should start flashing when the external circuit breaker is in the ON position supplying power to both control cabinets.

For the current powered L849 REIL: The system should start flashing when the series circuit is energized for both units at the desired current step set in the procedure in "Initial Startup and Preliminary Test" on page 13.

Figure 9: Switch and Fuse Panel (L-849V A shown)



4.2.2 Changing Step Modes (Primary only)

Changing from a 3-step setting to a single-step setting:

- Press the CURRENT ADJUST button SET HIGH for 4 seconds. The HIGH LED will blink for 2 seconds and turn off.

Changing from a 1-step setting to a 3-step setting:

- Press the CURRENT ADJUST button SET LOW, SET MED and SET HIGH buttons simultaneously for 4 seconds. The LOW, MED, and HIGH LEDs will blink for 2 seconds and then turn off.

NOTE: Only the Primary Unit requires programming.

4.2.3 Shutdown Procedure

When it is necessary to shut down the control cabinets, open the cabinet door and place the ON/OFF switch to the OFF position. The switch is located in the upper right hand corner of the cabinet enclosure behind the door. When the entire system is to be shut down:

- L-849I: Put the ON/OFF switch in both control cabinets in the OFF position.
- L-849V: Turn the CCR off. Put the ON/OFF switch in both control cabinets in the OFF position. Put the external circuit breaker in the OFF position.

5.0 Maintenance and Repair

This section provides preventive maintenance for L-849 Runway End Identifier Lights (REIL) system.



WARNING

Read the instructions in their entirety before starting any maintenance activities. Disconnect power to the lighting circuit before attempting to make any electrical repairs. Coordinate a power outage with air traffic personnel before turning off power to the airport lighting system. Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

5.1 Maintenance Schedule

To keep the L-849 REIL system operating efficiently, follow a preventive maintenance schedule. Refer to Table 9.

Table 9: L-849 REIL Maintenance

Interval	Maintenance Task	Action
Daily	Check LED operation and flashing sequence.	If flashing malfunctions, follow Trouble Shooting Procedures in Section 6.
Bimonthly	Check operation of controls.	If controls malfunction, replace controls.
	Check cleanliness of front glass.	If dirty, clean front glass as required.
Monthly	Check operation of interlocks.	If interlocks malfunction, replace interlocks.
	Check for vegetation or other obstruction near LED engine.	Use herbicide or manually to remove vegetation.
Semi-Annually	Check cabinets for cleanliness and moisture.	If cabinets are moist, wipe dry.
	Check seals on enclosures.	Replace worn or deteriorated seals.
	Check electrical connections and terminal block contacts for tightness.	If connections are loose, repair or replace.
	Check cabinet vertical and horizontal alignment.	Realign cabinet if needed.
	Check wires for cracks and deterioration.	If wires are cracked or deteriorated, replace wires.
	Check for rigidity of support structures.	Tighten all mounting hardware.
Annually	Verify incoming power is within tolerance.	Calibrate or repair power distribution equipment if needed.
	Check insulation resistance of external interconnection wiring.	If reading is less than 50M ohms at 1000VDC, replace wiring.
	Check resistance of grounding system.	If resistance is greater than 25 ohms to earth, take steps necessary to lower resistance.
	Check need for painting.	Touch up any painted surface.

5.1.1 Replacing LED PCB Assembly

To remove and replace the LED PCB Assembly see Figure 10 and then proceed as follows

NOTE: Individual LED's cannot be replaced.

1. Turn the power off in the control cabinet by placing the On/Off service switch in the OFF position or by disengaging the external circuit breaker. De-energize and lockout incoming power.
2. Remove the screws that secure the Optical Glass Assembly to the front of the enclosure.
3. Remove the Optical Glass Assembly and gasket from the enclosure. Disconnect the leads to the LED Panel Assembly.



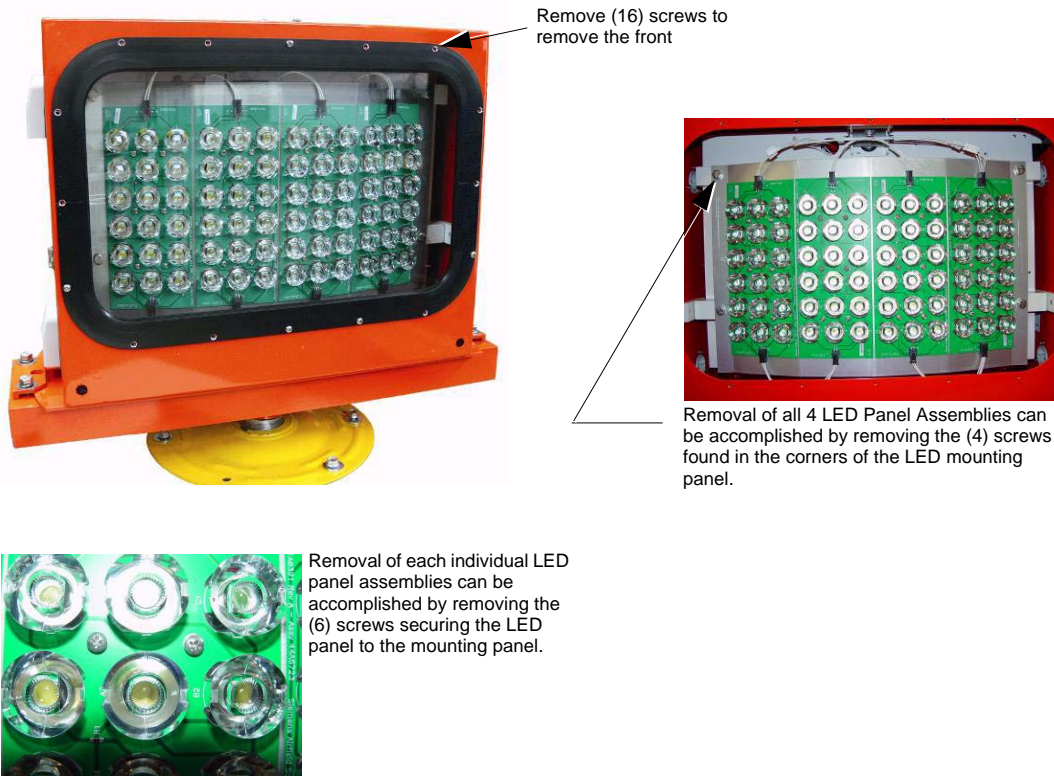
CAUTION

Note the polarity of each individual LED panel before removing any panel. Polarity is marked on the face of the LED PCB. If all four (4) individual LED Panel Assemblies are to be replaced, replace one panel assembly at a time.

4. Remove the LED Panel Assembly.

5. Remove the faulty individual LED panel, if more than one is faulty, remove one at a time. See Figure 10.
6. Install the new LED Panel Assembly insuring that the polarity is the same as the removed panel. Reconnect the power leads to the panel assembly.
7. Apply 67A0033 Thermal-joint Compound between the LED PCB and the mounting plate.
8. Before reinstalling the Optical Glass Assembly check the gasket for any signs of deterioration such as cracks or tears. If the gasket is damaged, replace with a new gasket.
9. Install all of the mounting screws used to fasten the Optical Glass Assembly to the enclosure face. Ensure that all screws are tight.
10. Restore power to return the unit to service.

Figure 10: LED Engine PCB Replacement



Maintenance

5.1.2 Troubleshooting

This section provides troubleshooting information for the L-849V/I, Style A/E LED Runway End Identifier Lights (REIL) system. This information covers only the most common problems that may be encountered. If the problem cannot be solved with the information given here, contact the ADB Airfield Solutions Service department for assistance.



WARNING

Read the instructions in their entirety before starting any repair activities.

When it is absolutely mandatory that the door interlock be bypassed to trace a fault or correct a malfunction, authorized maintenance personnel may perform the bypass by pulling the interlock out toward you for the specific test to be made. Immediately after completing the test, the interlock shall be restored to working condition.

When the current sensing option is present, turning the rotary switch S2 to OFF does not remove power to the flashers unless both the ON/OFF switch S1 is turned to OFF and the CCR connected to the isolation transformer is also turned off.

Table 10: REIL Troubleshooting Procedures

Problem	Possible Cause	Solution
1. No flashing in either individual control cabinets	No input power	L-849V: Check voltage at terminal block TB1 terminals 14 and 15. L-849I: Verify input current is present at TB1 terminals 14 and 15.
	Blown fuse F1 or F2 in Primary Cabinet	Replace fuse. Determine why fuse has blown and repair.
	L-849V: External circuit breaker trips each time it is turned on	Lightning arrester V1 or V2 is shorted. Replace lightning arrester.
	No power to Flasher Control Board.	Fuse F3 blown. Replace F3.
2. One individual control cabinet flashes, but the other one does not	Secondary unit is turned off.	Turn Secondary unit ON
	Blown F1, F2 or F3 fuse in non-flashing unit.	Replace fuse. Determine why fuse has blown and repair.
	LED Optical Assembly defective.	Replace Optical Assembly.
	Current driven REIL- Failed Power Supply PS5.	Verify that 240VDC is present at PS5 terminals E5 (+) to E6 (-). Replace power supply if correct voltage is not present.
	Flasher Control PCB failed.	Replace PCB.
3. Light flashes intermittently	Loose external wire connection.	With the power off and using an ohmmeter, check continuity of each wire.
	Flasher Control PCB failing.	Replace Flasher Control PCB.
4. Operates in Local control but not In Remote	LED Optical Assembly failing	Replace the assembly.
	Fuse F4 blown. No 120VDC is present for remote control signals.	Replace F4. Determine reason for short in external remote control circuitry.
5. Light output is dimmer in one of the Flashers.	One of the LED Power Supply PCBs, PS1, PS2, PS3 or PS4 has failed.	On the suspected failing board, verify presence of 70VDC ± 5VDC at J2 + to -. Replace board if voltage is incorrect.

Table 11: Protection Devices

	Device	Designation	Value	Function
	On/Off Switch	S1	--	Incoming power switch. Illuminates red if input power is present.
Current	S1 Panel Fuse	F1, F2	10A, Slow Blow P/N 47A0026	Incoming power protection.
	S1 Panel Fuse	F3	2A, 250V, Slow Blow P/N 47A0049	Protection on the 240VDC output of Power Supply PS5.
	S1 Panel Fuse	F4	1A, Slow Blow P/N 47A0017	120VDC remote control source protection.
voltage	S1 Panel Fuse	F1, F2	2A, 250V, Slow Blow P/N 47A0049	Incoming power protection.
	S1 Panel Fuse	F3	2A, 250V, Slow Blow P/N 47A0004	Protection on the 120Vac secondary of T1, terminals 6-7.
	S1 Panel Fuse	F4	1A, Slow Blow P/N 47A0017	120VDC remote control source protection.

Device	Designation	Value	Function
Control Board Fuse	F1	1A, 250V, Slow Blow, 3AG, P/N 47A0017	Incoming power protection on the Control Board, 47A6724 or 47A6724-C.
Flasher Power Supply Board Fuse	F1	2A, 250V, Slow Blow, 5x20mm, 47A0215	Incoming power protection on the Flasher Power Supply Board, 47A6545.

Figure 11: Flasher Control PCB 44A6724 Operation

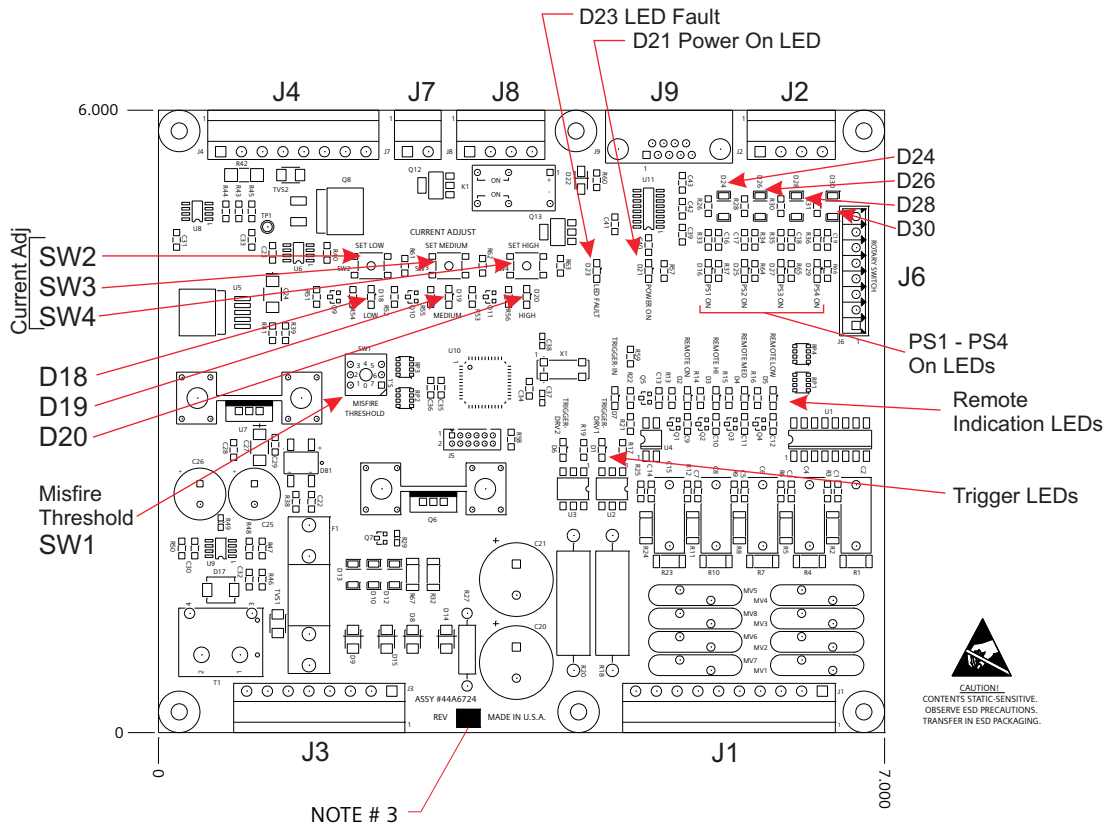
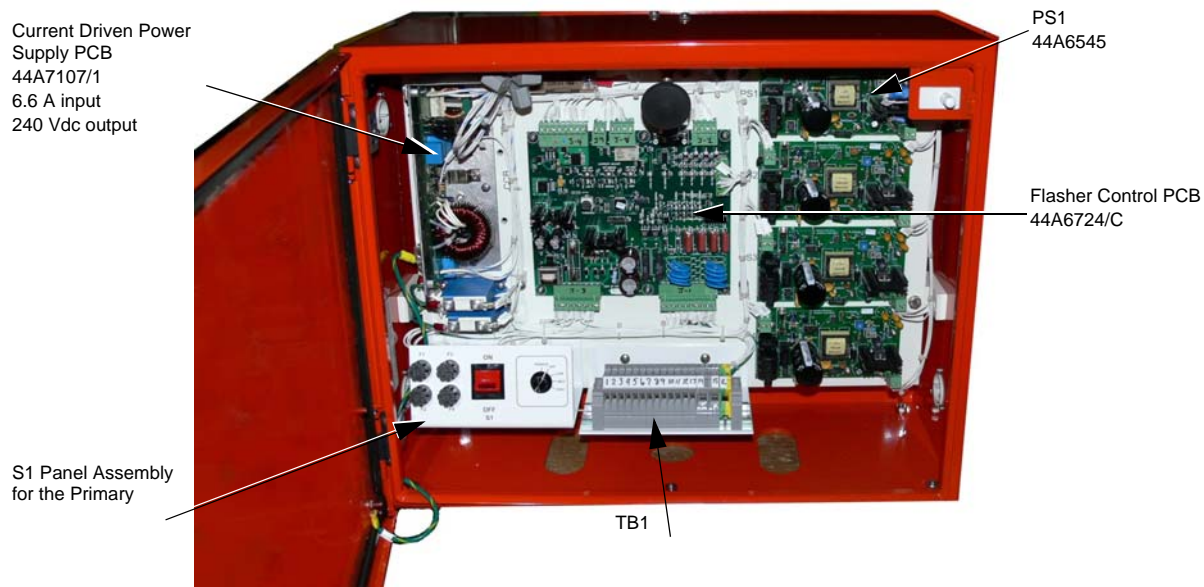


Table 12: Control Board Controls and Indicators

ID	Name	Indication	Description
D1	Trigger Driver 1	Green	Activated on the Primary Unit only. Flashes when a trigger pulse is output from the Primary Unit.
D6	Trigger Driver 2	OFF	Not used for REIL applications.
D7	Trigger In	Green	Activated on the Secondary Unit only. Flashes when a trigger pulse is received from the Primary Unit.
D2	Remote On	Green	Illuminates when a Remote-On command has been input into the unit.
D3	Remote Hi	Green	Illuminates when a Remote-High intensity command has been input into the unit.
D4	Remote Med	Green	Illuminates when a Remote-Medium intensity command has been input into the unit. Not used in a Style A REIL.
D5	Remote Low	Green	Illuminates when a Remote-Low intensity command has been input into the unit. Not used in a Style A REIL.
D16	PS1 On	Green	Illuminates when power is being output to LED Power Supply PS1.
D25	PS2 On	Green	Illuminates when power is being output to LED Power Supply PS2. Not used in a Style A REIL

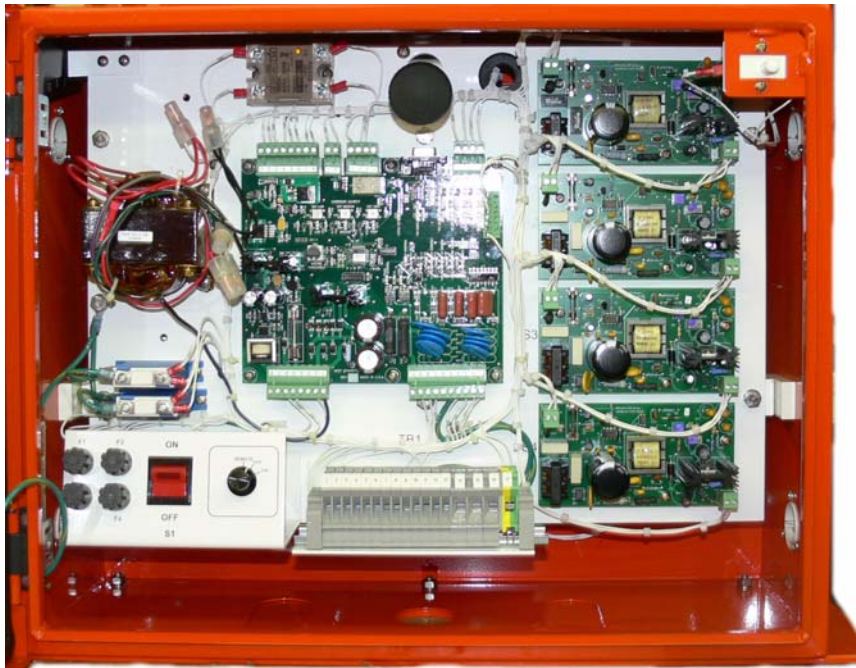
ID	Name	Indication	Description
D27	PS3 On	Green	Illuminates when power is being output to LED Power Supply PS3. Not used in a Style A REIL.
D29	PS4 On	Green	Illuminates when power is being output to LED Power Supply PS4. Not used in a Style A REIL.
SW1	Misfire Threshold	--	Position 0 - Turns off fault tracking / produces no fault indication. Position 1 - 7 sets the fault count, which is the number of misfires per 100 consecutive flashes. Misfires beyond the switch setting will activate the output fault contact closure and will illuminate LED D23.
D23	LED Fault	Green	Dependant on the position of SW1 - illuminates on the fault count selected.
SW2	Low	--	Low intensity Current Sensing adjustment control. Not used in a Style A REIL.
SW3	Med	--	Medium intensity Current Sensing adjustment control. Not used in a Style A REIL.
SW4	High	--	High intensity Current Sensing adjustment control.
D18	Low	Green	Illuminates when the circuit is operating in the Low current setting and operating within the proper current range. Not used in a Style A REIL.
D19	Medium	Green	Illuminates when the circuit is operating in the Medium current setting and operating within the proper current range. Not used in a Style A REIL.
D20	High	Green	Illuminates when the circuit is operating in the High current setting and operating within the proper current range.
D21	Power On	Green	Illuminates when the +5VDC power supply is operating properly on the Control board.

Figure 12: Current Driven Type A/E, LED REIL Interior Assembly



Maintenance

Figure 13: Voltage Driven Type A/E, LED REIL Interior Assembly



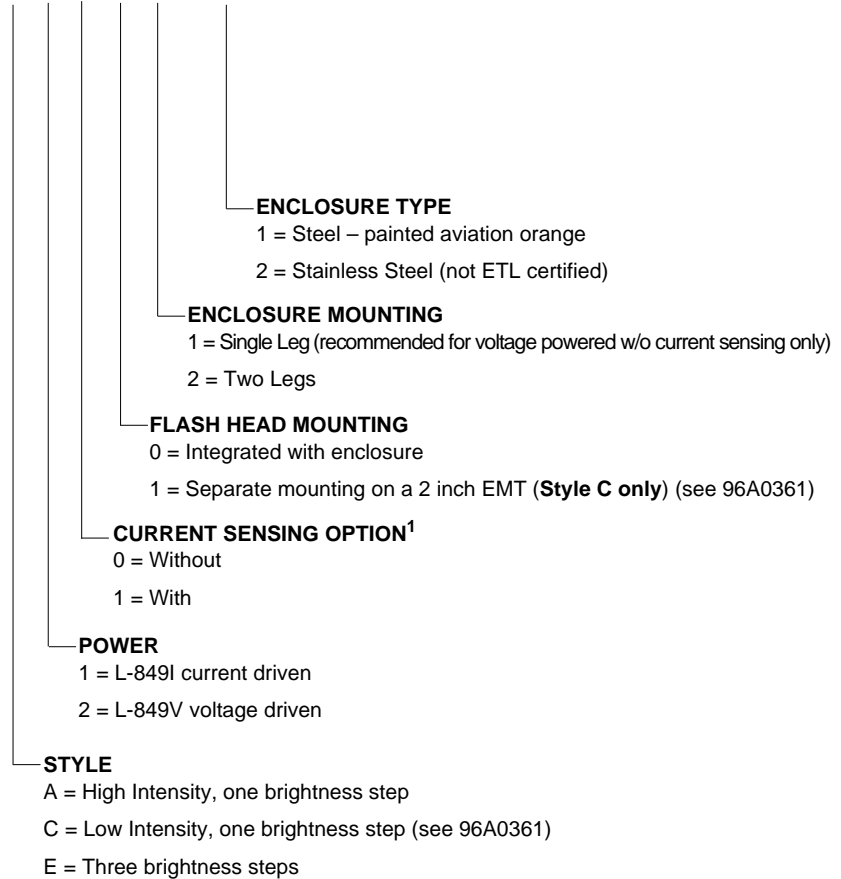
6.0 Parts

To order parts, call ADB Airfield Solutions Customer Service or your local representative. Use the parts lists, and the accompanying illustration, to describe and locate parts correctly.

6.1 849A/E REIL Ordering Code Numbering System

Figure 14: Ordering Code Number Chart

REIL - X X X X X 0 X 0



1. The current sensing option provides ON/OFF control (L-849 Style A/Style C) or 3-step intensity control (L-849 Style E) of the REIL system depending on the current level in the series lighting circuit. The L-849I (powered by a CCR) doesn't require a separate isolation transformer. (The input current from the isolation transformer that powers the Primary cabinet is also used for current sensing control.) The current sensing input of a L-849V (voltage powered) can be connected to 6.6A or 20A series circuits with an appropriate 6.6/6.6A or 20/6.6A isolation transformer.

Parts

**6.1.1 Control Panel
 Assembly Part Numbers**

The following main control panel components are identified below. See numerical parts list for detailed description of parts.

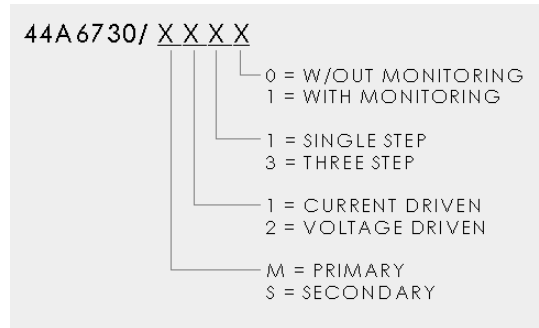
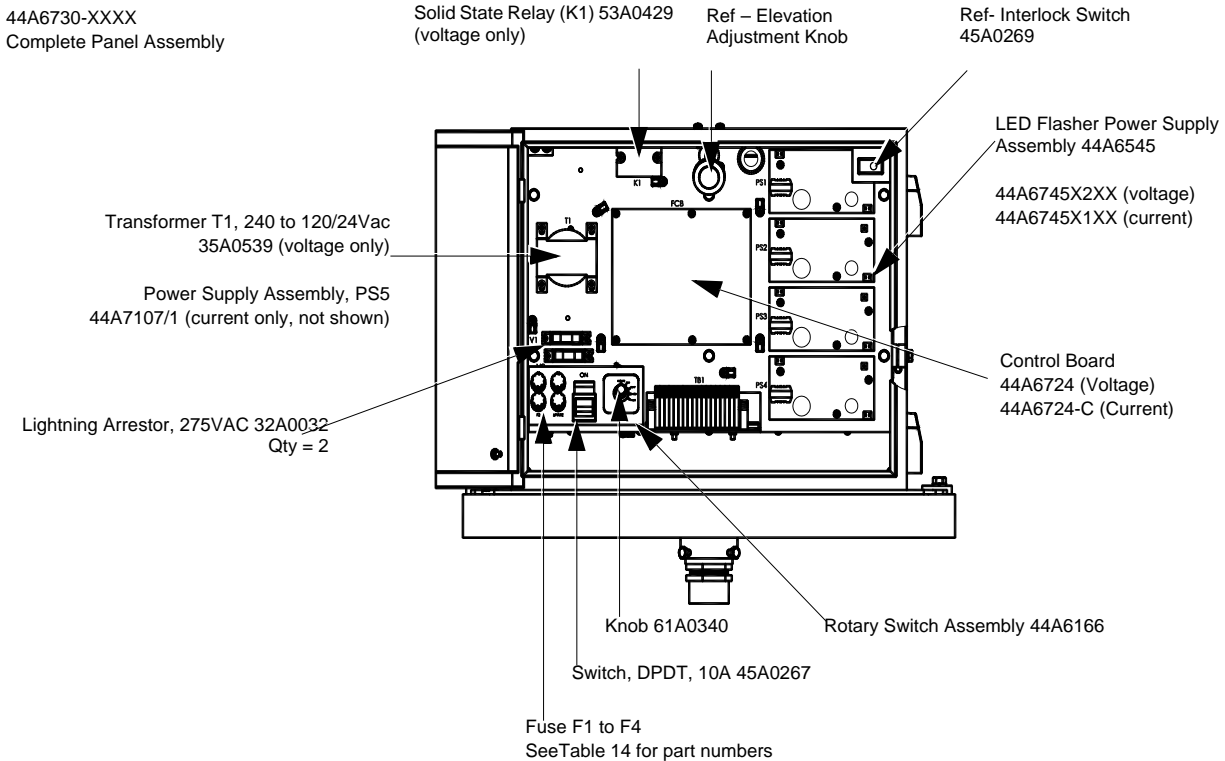


Figure 15: Control Panel Assembly (single-leg, voltage shown)

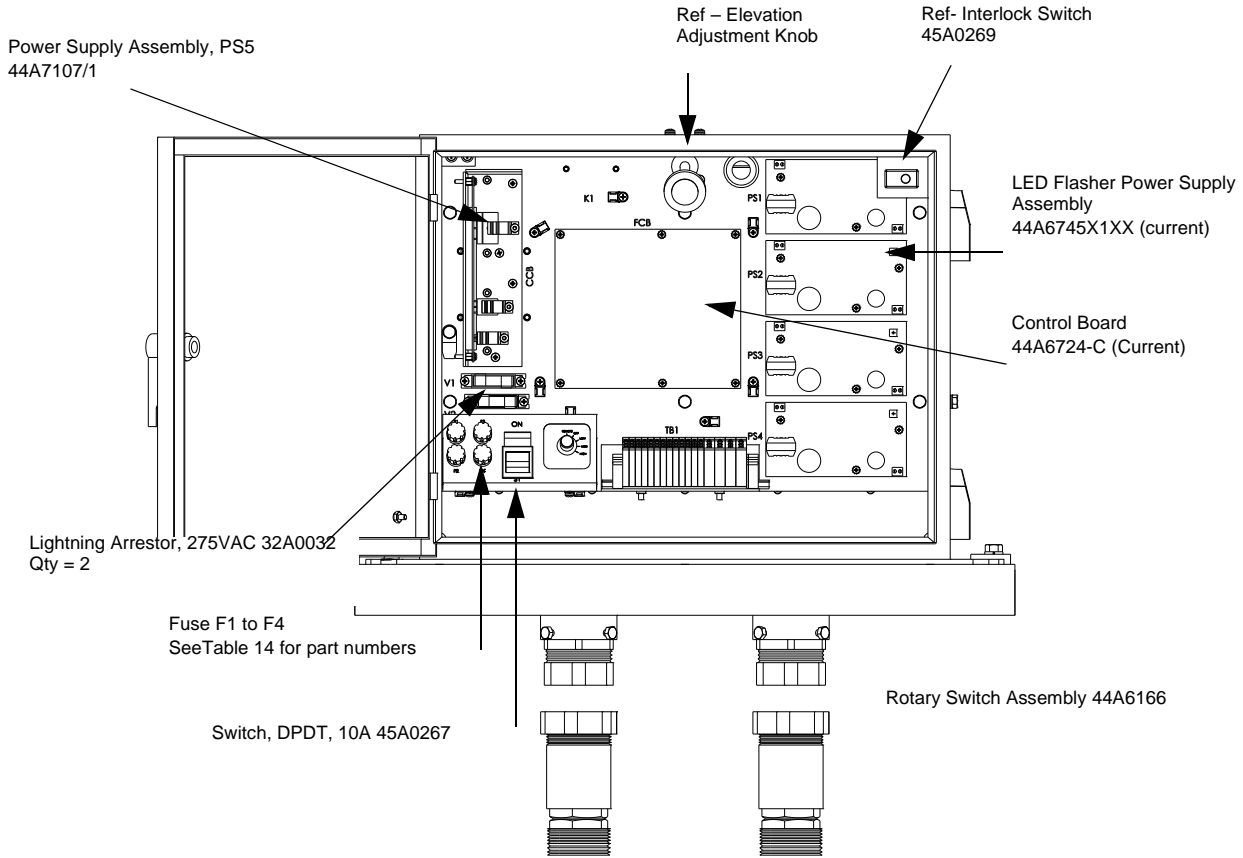


NOTE: See the Numerical and Spare Parts List for part numbers for full description on each of the labeled parts

The same control panel is used in each individual control cabinet.

Figure 16: Control Panel Assembly (dual-leg, current unit shown)

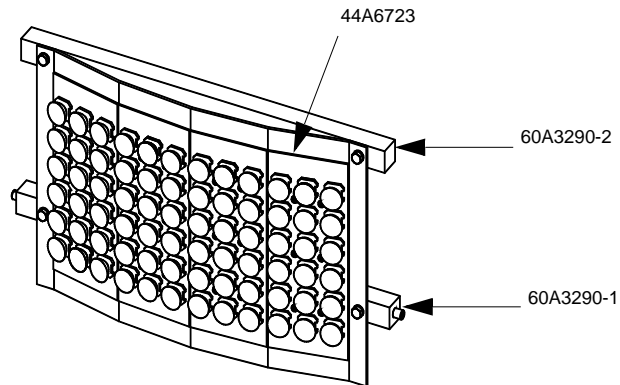
44A6730-XXXX
Complete Panel Assembly



6.1.2 Optical Assembly Part Numbers

The main components of the optical assembly are identified below. See the numerical parts list for detailed description of parts.

Figure 17: Optical Assembly Components



**6.1.3 L-849V/I, Style A/E
 Assembly Part Number**

The main assembly, 44A6726-XXXX, is composed of an integrated head and power supply enclosure, a single or dual leg assembly, and a frangible coupling for each leg as identified below.

Figure 18: Complete Assembly – Single Leg Mounting Shown

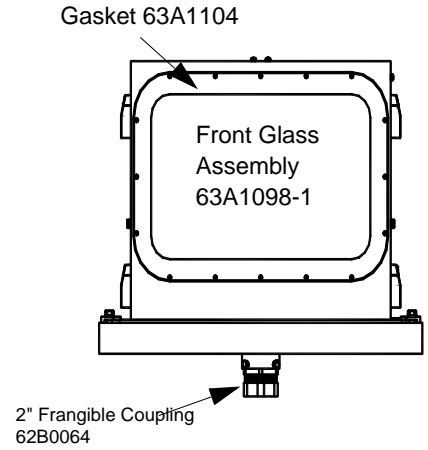
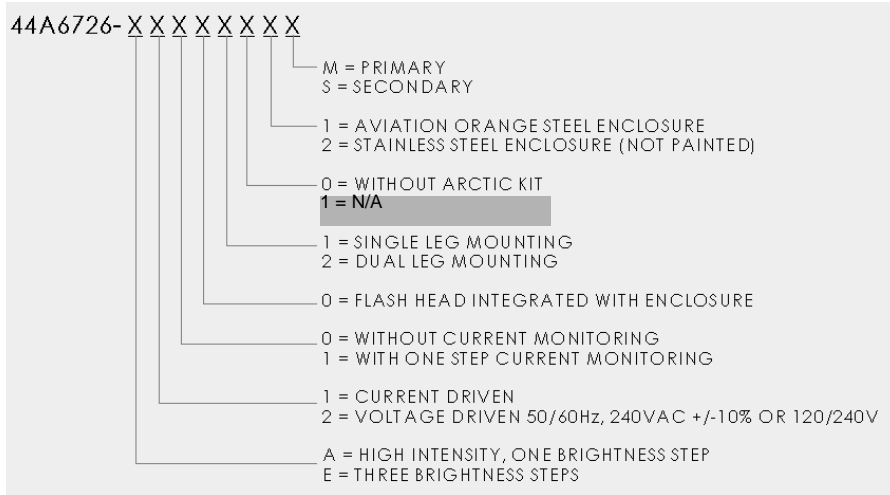


Table 13: Other Main Assembly Parts

Part Number	Description	Quantity	Notes
45A0269	Interlock Switch, SPST, 10A, ON-OFF-ON	1	Shown in Figure 15
77A0009	Compression Coupling, 2" EMT	2	For Dual Leg Mounting Option
44B0180	Frangible Coupling, 2" EMT	2	For Dual Leg Mounting Option

6.2 Numerical Parts Lists

Table 14: REIL A/E Parts, Current Powered

Part Number	Description	Quantity	Notes
32A0032	Lightning Arrestor 275Vac	4	
44A6724	Control Board Assembly	1	Used on voltage powered REIL only
44A6724-C	Control Board Assembly	1	Used on current powered REIL only
44A6545	LED Flasher Power Supply Assembly	2	
44A6631	Power Supply Assembly, PS5	1	Used on Current Powered REIL only
53A0429	Solid State Relay, 24-250Vac, 5-24Vdc	1	Used on voltage powered REIL only
45A0269	Interlock Switch, Door, SPST, 10A	1	
62B0064	2-inch frangible coupling	1	Used on single leg units only
77A0009	Compression Coupling, 2" EMT	2	Used on dual leg units only
44B0180	Frangible Coupling, 2" EMT	2	Used on dual leg units only
See table 6.3	Fuse, Panel, F1 and F2, 10A, SB	4	Used on current powered REIL only
	Fuse, Panel, F3, 2A, SB	2	Used on current powered REIL only
	Fuse, Panel, F4, 1A, SB	2	
	Fuse, Panel, F1 and F2, 4A, SB	4	Used on voltage powered REIL only
	Fuse, Panel, F3, 2A, SB	2	Used on voltage powered REIL only
47A0017	Fuse, Control Board, F1, 1A, SB	2	
47A0215	Fuse, Flasher Power Supply Board, F1, 1A, SB	4	

Table 15: REIL A/E Parts, Voltage Powered

Part Number	Description	Quantity	Notes
32A0032	Lightning Arrestor 275Vac	4	
44A6724	Control Board Assembly	1	Used on voltage powered REIL only
44A6545	LED Flasher Power Supply Assembly	1	
62B0064	2-inch frangible coupling	1	Used on single leg units only
77A0009	Compression Coupling, 2" EMT	2	Used on dual leg units only
44B0180	Frangible Coupling, 2" EMT	2	Used on dual leg units only
See table 6.3	Fuse, Panel, F4, 1A, SB	2	
	Fuse, Panel, F1 and F2, 4A, SB	4	Used on voltage powered REIL only
	Fuse, Panel, F3, 2A, SB	2	Used on voltage powered REIL only
47A0017	Fuse, Control Board, F1, 1A, SB	2	
47A0215	Fuse, Flasher Power Supply Board, F1, 1A, SB	4	

Parts

Table 16: REIL A/E Parts, Current Powered

Part Number	Description	Quantity	Notes
32A0032	Lightning Arrestor 275Vac	4	
44A6724-C	Control Board Assembly	1	Used on current powered REIL only
44A6545	LED Flasher Power Supply Assembly	1	
44A6631	Power Supply Assembly, PS5	1	Used on Current Powered REIL only
62B0064	2-inch frangible coupling	1	Used on single leg units only
77A0009	Compression Coupling, 2" EMT	2	Used on dual leg units only
44B0180	Frangible Coupling, 2" EMT	2	Used on dual leg units only
See table 6.3	Fuse, Panel, F1 and F2, 10A, SB	4	Used on current powered REIL only
	Fuse, Panel, F3, 2A, SB	2	Used on current powered REIL only
	Fuse, Panel, F4, 1A, SB	2	
47A0017	Fuse, Control Board, F1, 1A, SB	2	
47A0215	Fuse, Flasher Power Supply Board, F1, 1A, SB	4	

Table 17: S1 Panel Assembly Fuses

Fuse	Current Driven	Voltage Powered	Quantity
F1	47A0026	47A0078	4
F2	47A0026	47A0078	
F3	47A0049	47A0004	2
F4	47A0017	47A0017	2

7.0 Schematics

Figure 19: L-849A/E LED Flasher (REIL) CTRL Box External Wiring Diagram (Voltage Driven)

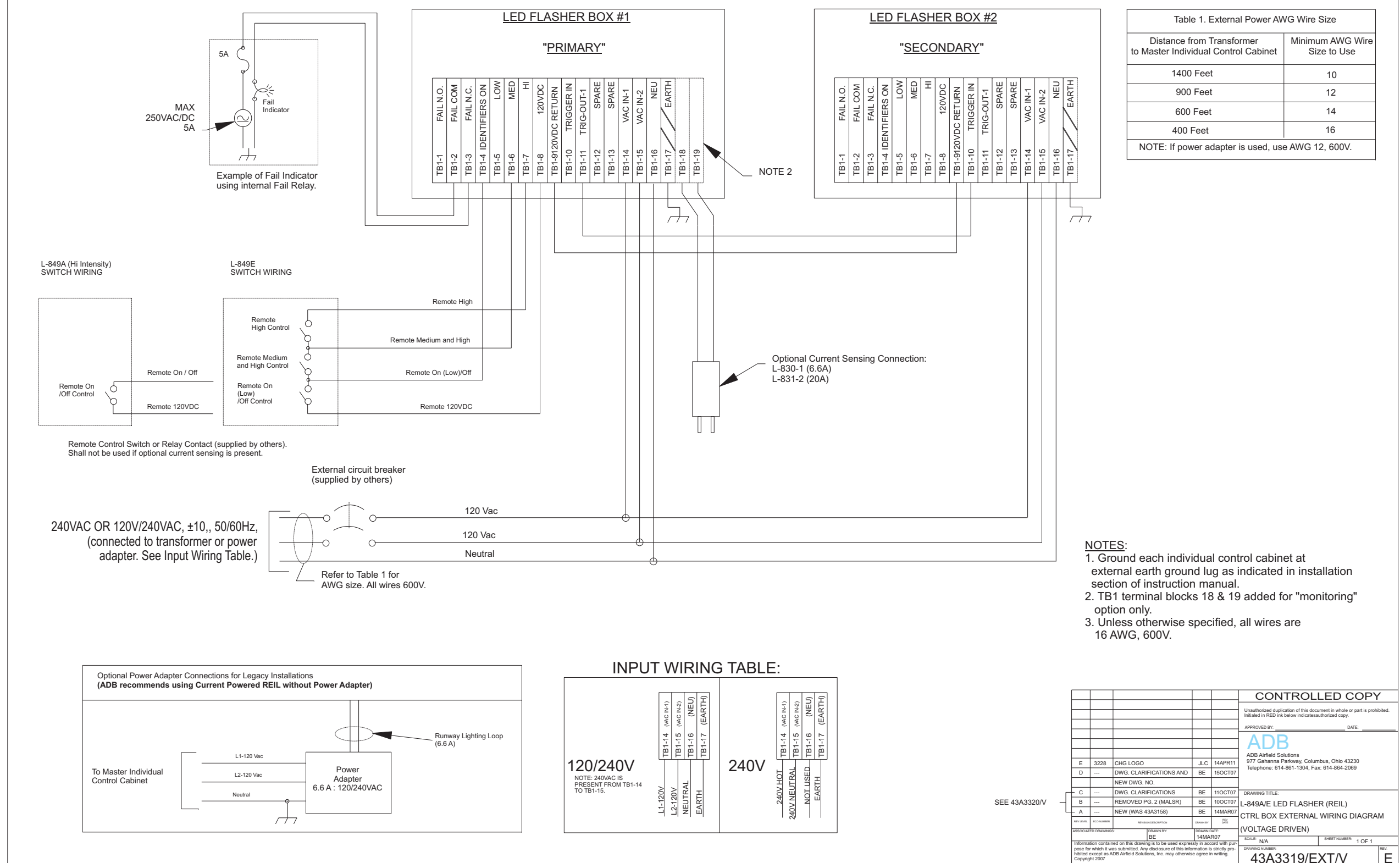
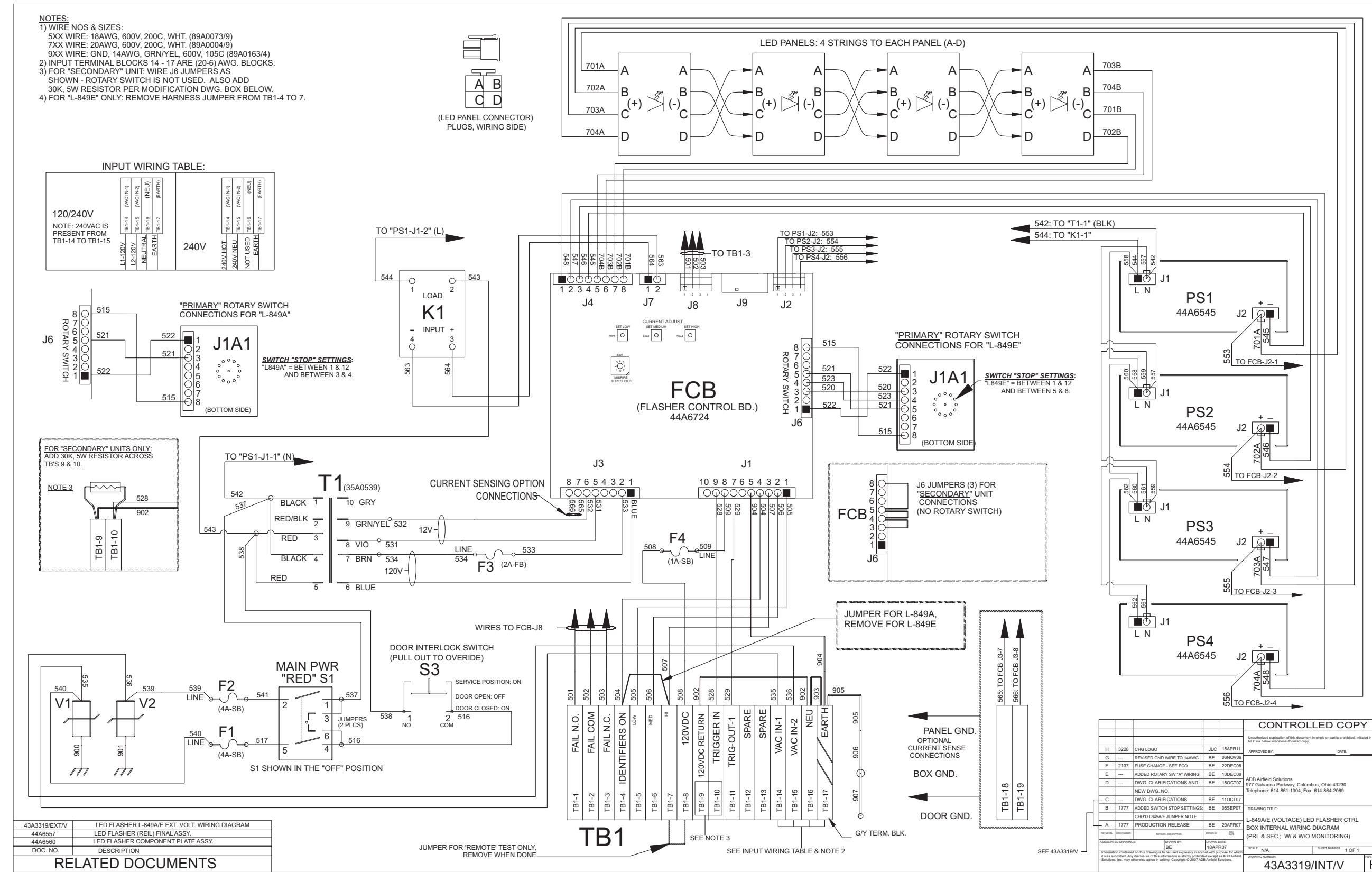


Figure 20: L-849A/E (Voltage) LED Flasher CTRL Box Internal Wiring Diagram



Schematics

Figure 21: L-849A/E LED Flasher (REIL) CTRL Box External Wiring Diagram (Current Driven)

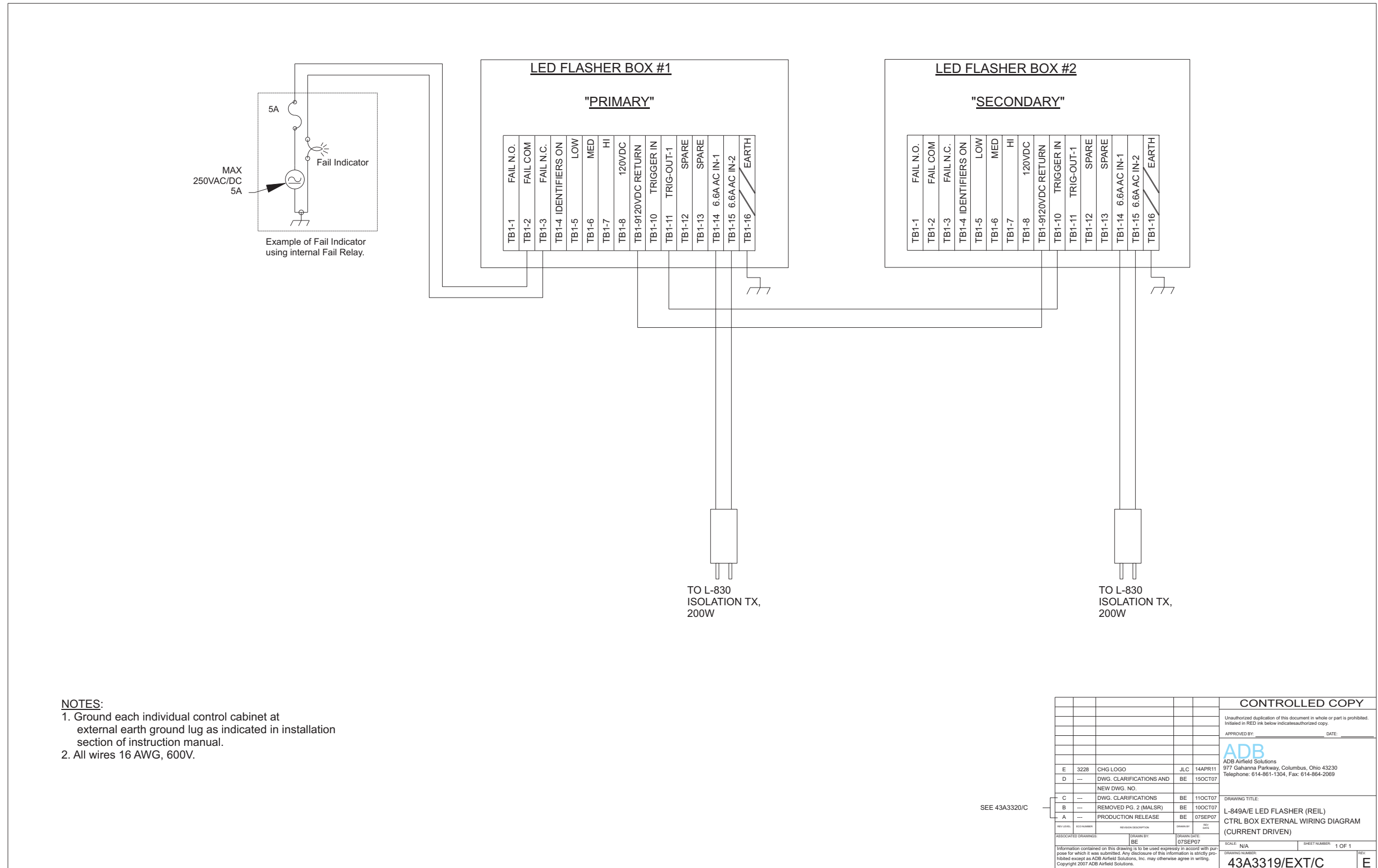
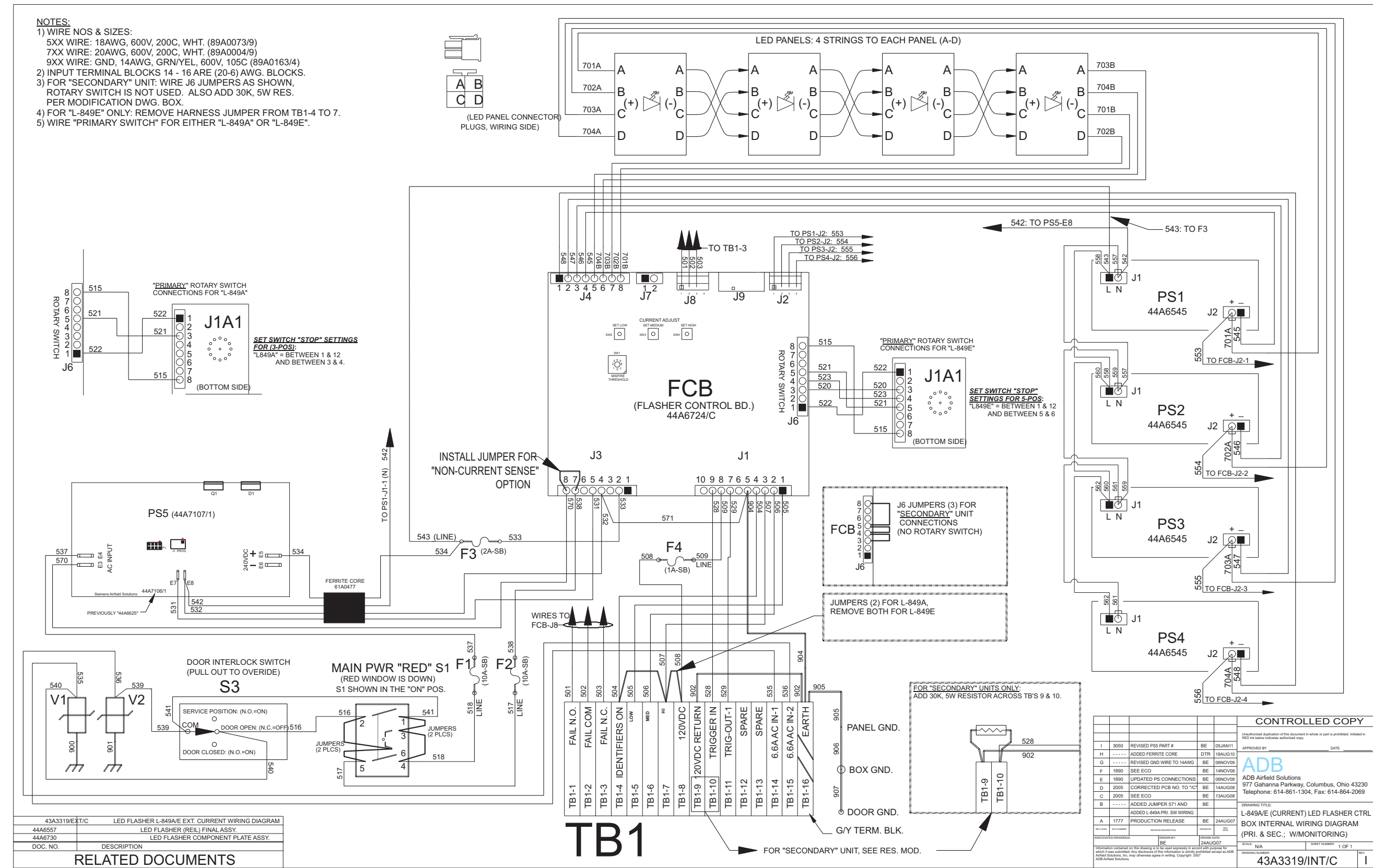


Figure 22: L-849A/E (Current) LED Flasher CTRL Box Internal Wiring Diagram (PRI. & SEC.; W/Monitoring)



Schematics

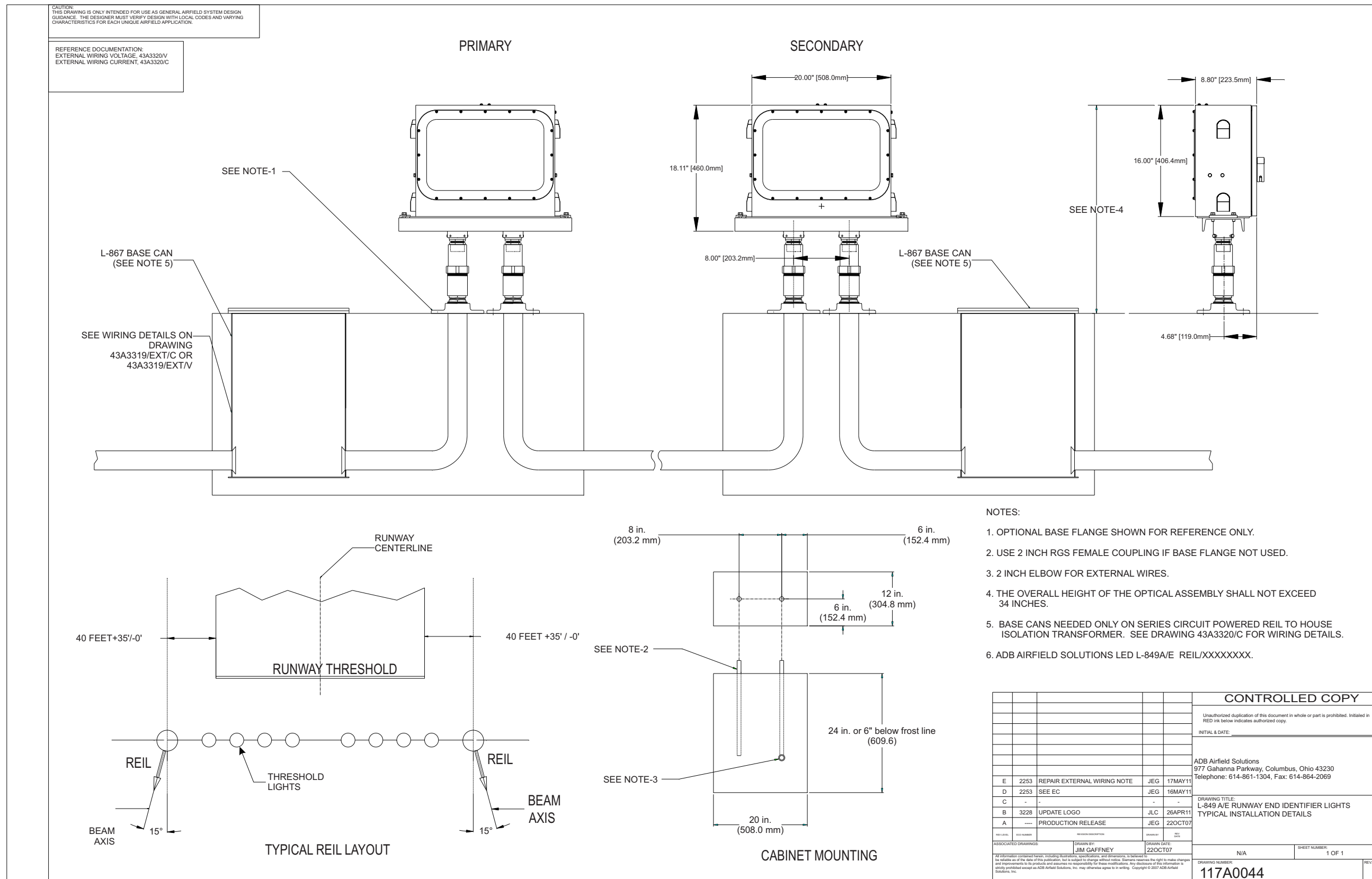
CONTROLLED COPY			
REV.	DESCRIPTION	DATE	APPROVED BY
I	3050 REVISED PSS PART #	05JAN11	BE
H	ADDED FERRITE CORE	18AUG10	DTR
G	REVISED GND WIRE TO 14AWG	08NOV09	BE
F	1890 SEE ECO	14NOV08	BE
E	1890 UPDATED PS CONNECTIONS	08NOV08	BE
D	2005 CORRECTED PCB NO. TO "C"	14AUG08	BE
C	2005 SEE ECO	13AUG08	BE
B	ADDED JUMPER S71 AND		
A	1777 PRODUCTION RELEASE	24AUG07	BE

ADDITIONAL INFORMATION: L-849A/E (CURRENT) LED FLASHER CTRL BOX INTERNAL WIRING DIAGRAM (PRI. & SEC.; W/MONITORING)

SCALE: N/A SHEET NUMBER: 1 OF 1

DRAWING NUMBER: 43A3319/INT/C

Figure 23: L-849 A/E Runway End Identifier Lights Typical Installation Details



**L-849 Voltage/Current, Style A and E
User Manual**

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