LED REIL, Style A/E
LED Runway End Identification Light

# User Manual

96A0461, Rev. i, 2020/09/03

ADB SAFEGATE

# A.0 Disclaimer / Standard Warranty

## CE certification

The equipment listed as CE certified means that the product complies with the essential requirements concerning safety and hygiene. The European directives that have been taken into consideration in the design are available on written request to ADB SAFEGATE.

## ETL certification

The equipment listed as ETL certified means that the product complies with the essential requirements concerning safety and FAA Airfield regulations. The FAA directives that have been taken into consideration in the design are available on written request to ADB SAFEGATE.

## All Products Guarantee

ADB SAFEGATE will correct by repair or replacement per the applicable guarantee above, at its option, equipment or parts which fail because of mechanical, electrical or physical defects, provided that the goods have been properly handled and stored prior to installation, properly installed and properly operated after installation, and provided further that Buyer gives ADB SAFEGATE written notice of such defects after delivery of the goods to Buyer. Refer to the Safety section for more information on Material Handling Precautions and Storage precautions that must be followed.

ADB SAFEGATE reserves the right to examine goods upon which a claim is made. Said goods must be presented in the same condition as when the defect therein was discovered. ADB SAFEGATE furthers reserves the right to require the return of such goods to establish any claim.

ADB SAFEGATE's obligation under this guarantee is limited to making repair or replacement within a reasonable time after receipt of such written notice and does not include any other costs such as the cost of removal of defective part, installation of repaired product, labor or consequential damages of any kind, the exclusive remedy being to require such new parts to be furnished.

ADB SAFEGATE's liability under no circumstances will exceed the contract price of goods claimed to be defective. Any returns under this guarantee are to be on a transportation charges prepaid basis. For products not manufactured by, but sold by ADB SAFEGATE, warranty is limited to that extended by the original manufacturer. This is ADB SAFEGATE's sole guarantee and warranty with respect to the goods; there are no express warranties or warranties of fitness for any particular purpose or any implied warranties of fitness for any particular purpose or any implied warranties other than those made expressly herein. All such warranties being expressly disclaimed.

## Standard Products Guarantee

Products of ADB SAFEGATE manufacture are guaranteed against mechanical, electrical, and physical defects (excluding lamps) which may occur during proper and normal use for a period of two years from the date of ex-works delivery, and are guaranteed to be merchantable and fit for the ordinary purposes for which such products are made.

**Note**
See your sales order contract for a complete warranty description.

## FAA Certified product installed in the United States and purchased or funded with monies through the Airport Improvement Program (AIP) installations guarantee

ADB SAFEGATE L858 Airfield Guidance Signs are warranted against mechanical and physical defects in design or manufacture for a period of 2 years from date of installation, per FAA AC 150/5345-44 (applicable edition).

ADB SAFEGATE L858(L) Airfield Guidance Signs are warranted against electrical defects in design or manufacture of the LED or LED specific circuitry for a period of 4 years from date of installation, per FAA EB67 (applicable edition).

ADB SAFEGATE LED light fixtures (with the exception of obstruction lighting) are warranted against electrical defects in design or manufacture of the LED or LED specific circuitry for a period of 4 years from date of installation, per FAA EB67 (applicable edition). .

**Note**

See your sales order contract for a complete warranty description.

## Liability

WARNING

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

ADB SAFEGATE cannot be held responsible for injuries or damages resulting from non-standard, unintended uses of its equipment. The equipment is designed and intended only for the purpose described in the manual. Uses not described in the manual are considered unintended uses and may result in serious personal injury, death or property damage.

Unintended uses, includes the following actions:

- Making changes to equipment that have not been recommended or described in this manual or using parts that are not genuine ADB SAFEGATE replacement parts or accessories.
- Failing to make sure that auxiliary equipment complies with approval agency requirements, local codes, and all applicable safety standards if not in contradiction with the general rules.
- Using materials or auxiliary equipment that are inappropriate or incompatible with your ADB SAFEGATE equipment.
- Allowing unskilled personnel to perform any task on or with the equipment.

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# 1.0 Safety

### Introduction to Safety

This section contains general safety instructions for installing and using ADB SAFEGATE 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 Safety Messages

### HAZARD Icons used in the manual

For all HAZARD symbols in use, see the Safety section. All symbols must comply with ISO and ANSI standards.

Carefully read and observe all safety instructions in this manual, which alert you to safety hazards and conditions that may result in personal injury, death or property and equipment damage and are accompanied by the symbol shown below.

| | |
|---|---|
|  | WARNING<br>Failure to observe a warning may result in personal injury, death or equipment damage. |
|  | DANGER - Risk of electrical shock or ARC FLASH<br>Disconnect equipment from line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage. ARC Flash may cause blindness, severe burns or death. |
|  | WARNING - Wear personal protective equipment<br>Failure to observe may result in serious injury. |
|  | WARNING - Do not touch<br>Failure to observe this warning may result in personal injury, death, or equipment damage. |
|  | CAUTION<br>Failure to observe a caution may result in equipment damage. |

### Qualified Personnel

| | |
|---|---|
|  | Important Information<br>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.<br>Always use required personal protective equipment (PPE) and follow safe electrical work practice. |

### 1.1.1 Introduction to Safety

## CAUTION

**Unsafe Equipment Use**
This equipment may contain electrostatic devices, hazardous voltages and sharp edges on components

- Read installation instructions in their entirety before starting installation.
- 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 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.

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

## Additional Reference Materials

Important Information

- IEC - International Standards and Conformity Assessment for all electrical, electronic and related technologies.
- IEC 60364 - Electrical Installations in Buildings.
- FAA Advisory: AC 150/5340-26 (current edition), Maintenance of Airport Visual Aid Facilities.
- Maintenance personnel must refer to the maintenance procedure described in the ICAO Airport Services Manual, Part 9.
- ANSI/NFPA 79, Electrical Standards for Metalworking Machine Tools.
- National and local electrical codes and standards.

### 1.1.2 Intended Use

## CAUTION

**Use this equipment as intended by the manufacturer**
This equipment is designed to perform a specific function, do not use this equipment for other purposes

- 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.

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

### 1.1.3 Material Handling Precautions: Storage

## CAUTION

**Improper Storage**
Store this equipment properly

- 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 equipment damage**

### 1.1.4 Material Handling: Heavy Equipment

## DANGER

**Unstable load**
Use caution when moving heavy equipment

- Use extreme care when moving heavy equipment.
- Verify that the moving equipment is rated to handle the weight.
- When removing equipment from a shipping pallet, carefully balance and secure it using a safety strap.

**Failure to follow this instruction can result in death, serious injury, or equipment damage**

### 1.1.5 Material Handling Precautions: Fasteners

## DANGER

**Foreign Object Damage - FOD**
This equipment may contain fasteners that may come loose - torque properly.

- Only use fasteners of the same type as the one originally supplied with the equipment.
- Use of incorrect combination of gaskets, bolts and nuts can create severe damages to the product installation and create safety risk .
- You need to know what base the light fixture will be installed in, in order to chose the correct gasket, bolts and nuts.
- Bolt type, length, and torque value are determined by type of base, height of spacers used, and clamp force required in FAA Engineering Brief No 83 (latest revision).
- Due to the risk of bolts vibrating loose, do not use any type of washer with the fixing bolts (such as split lock washers) other than an anti-vibration washer. Anti-vibration washers as defined in FAA EB 83 (latest edition) must be used. For installations other than FAA, use the base can manufacturer's recommendations.
- Always tighten the fasteners to the recommended torque. Use a calibrated torque wrench and apply the recommended adhesive type.
- Obey the instructions of the adhesives necessary for the fasteners.

**Failure to follow these warnings may cause the fasteners to loosen, damage the equipment, potentially to loosen the equipment. This can lead to a highly dangerous situation of FOD, with potential lethal consequences.**

## Note

To minimize the risk of errors, the ADB SAFEGATE Sales Representative will have information on which gasket goes with which base. This information is also provided in the product Data sheets, the User Manuals and the Spare Part Lists.

**CAUTION**

Use of incorrect combination of gaskets, bolts and nuts can create severe damages to the product installation and create multiple safety risks.

To obtain a safe and watertight installation the O-ring and retaining bolt stated in the document must be used.

You need to know what base the light fixture will be installed in, in order to choose the correct gasket, bolts and nuts.

**Failure to follow these cautions can result in equipment damage or aircraft FOD.**

### 1.1.6 Operation Safety

**CAUTION**

**Improper Operation**

Do Not Operate this equipment other than as specified by the manufacturer

- 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.

**Failure to follow these instructions can result in equipment damage**

### 1.1.7 Laser Safety Information

Safedock system is an Advanced Visual Docking Guidance System, an aircraft parking aid for airport and aircraft safety and efficiency. The design is according to strict airport industry standards for the safety of, and use by authorised airport personnel.

**CAUTION**

The chapter Operating Procedures must be distributed to all airlines using the system.

- Airport Operations, Maintenance and other Authorised Personnel
- This information is a summary of the safety requirements on operation and maintenance personnel based on general electrical and laser safety precautions.

## CAUTION

It is very important for authorised personnel to study this section before any operation or maintenance work on the system is commenced.

- Safedock system should only be used by airport operations and maintenance personnel who have been properly trained in the use of the system. ADB SAFEGATE takes no responsibility for incorrect use of the system. All warnings contained in the text of this manual must be strictly observed.
- Airport operations and maintenance personnel are strongly advised to observe the following symbols and safety advisories.


## CAUTION

**Laser Safety**

Store this equipment properly

- Safedock system is a Class 1 laser product, which means that it is safe under foreseeable conditions of operation, including the use of optical instruments for intra beam viewing.
- The Laser Scanning Unit compartment of the Pilot Display unit contains a Laser Range Finder, which is a Class 1M laser product. A Class 1M laser product is safe under foreseeable conditions of operation, but may be hazardous, if the user employs optical instruments within the beam, e.g. binoculars or telescope.

**Failure to follow this instruction can result in permanenet eye injury.**


## CAUTION

**Invisible Laser Radiation**

Store this equipment properly

- The laser output from this system is within Class 1 limits (USA FDA 21 CFR 1040.10 – 11 and IEC 60825-1:2014 (Third Edition) as long as the range finder is installed and operated as specified by ADB SAFEGATE.
- If operated in any other fashion than described, the range finder is capable of emitting radiation up to Class 1M limits.

**Failure to follow this instruction can result in permanenet eye injury.**


## CAUTION

**Eye Safety**
Store this equipment properly

- ADB SAFEGATE accepts no liability for the misuse of its equipment or for the consequences of this misuse.
- ADB SAFEGATE recommends that eye safety procedures be followed in accordance with ANSI Z136.1 – 1993 or IEC 60825-1 during maintenance.
- The laser beam exiting the window of the Safedock enclosure is within Class 1 limit for eye safety, when the product is operated as specified by ADB SAFEGATE.
- To provide eye safety the user is advised to treat this laser unit as a Class 1 M laser product. Class 1 M denotes lasers or laser systems that can produce a hazard if viewed through light collecting optics such as binoculars.

**Failure to follow this instruction can result in permanenet eye injury.**

**Table 1: Laser Information**

For the laser the following values apply:

- Pulse width ~ 10 ns
- Wavelength 905 nm

## CAUTION

If the laser by any reason should be switched on and used outside the docking system, safety procedures may include, but are not necessarily limited to the following:

- Do not stare into the laser beam.
- Do not view the beam with binoculars or other devices that collect light.
- Do not point the laser at people.

## CAUTION

Do not point the laser range finder at the sun.

### 1.1.8 Maintenance Safety

## DANGER

**Electric Shock Hazard**
This equipment may contain electrostatic devices

- 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.

**Failure to follow these instructions can result in death or equipment damage**

### 1.1.9 Material Handling Precautions, ESD

## CAUTION

**Electrostatic Sensitive Devices**
This equipment may contain electrostatic 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 shall 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.

**Failure to follow this instruction can result in equipment damage**

### 1.1.10 Arc Flash and Electric Shock Hazard

## DANGER

**Series Circuits have Hazardous Voltages**
This equipment produces high voltages to maintain the specified current - Do NOT Disconnect while energized.

- Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks.
- Only persons who are properly trained and familiar with ADB SAFEGATE equipment are permitted to service this equipment.
- An open airfield current circuit is capable of generating >5000 Vac and may appear OFF to a meter.
- Never unplug a device from a constant current circuit while it is operating; Arc flash may result.
- 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 SAFEGATE replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals and create safety hazards.
- Check the 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 airfield electrical equipment.

**Failure to follow these instructions can result in death or equipment damage**

# 2.0 Introduction

**WARNING**

Read the instructions in their entirety before starting installation.

The LED REIL is a Runway End Identifier Light with LED array flashing light system that provides a visual indication of the runway threshold to pilots during an approach for landing. The system is composed of two sequenced flashers that operate simultaneously to produce short duration flashes twice a second. Each REIL assembly is composed of a single enclosure LED optical flash assembly integrated with a control cabinet.

The LED REIL system may be operated either by local or remote control. The REIL flash system (style A) operates at high intensity and (style E) operates at low/medium/high intensity. The system can be powered by a 120/240 Vac power supply or by a 6.6 A or 20 A series circuit.

The LED REIL systems electronic package housed in the control cabinet is the same for both REIL units with some minor variations due to style A/E and primary/secondary unit design.

**Figure 1: REIL ASSEMBLY**

**Note**

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

## 2.1 Runway End Identification Light

### Compliance with Standards

| | |
|---|---|
| FAA: | L-849(L) Style A, C or E AC 150/5345-51 (Current Edition) and the FAA Engineering Brief No. 67. ETL Certified. |
| ICAO: | Annex 14, Vol. 1, para. 5.3.8 |

### Uses

LED REIL provides a visual indication to pilots of the runway threshold during an approach.

**L-849(L) Style A**
- Unidirectional, high intensity / one brightness step

**L-849(L) Style C**
- Unidirectional, low intensity, one brightness step

**L-849(L) Style E**
- Unidirectional, three brightness steps

## Operating Conditions

| | |
|---|---|
| Temperature: | -40 °F to +131 °F (-40 °C to +55 °C) |
| Humidity: | 0 to 100% (including conditions where condensation takes place in the form of water or frost) |
| Altitude: | 0 to 10,000 ft (3,000 m) |
| Wind: | Velocities up to 150 knots |
| Exposure: | Withstands windblown rain, sand, dust particles,and a salt-laden atmosphere |

## Power Supply

The LED REIL system operates from a 240 VAC (2-wire) or 120/240 VAC (3-wire), ±10%, 50/60 Hz power supply. The system can also operate from a series lighting circuit using a 6.6 A/6.6 A or 20 A/ 6.6 A L-830/L-831 isolation transformer at each unit.

**Maximum Power Requirements**

| **Style** | **Each Unit** | **Total** |
|---|---|---|
| Voltage-driven | | |
| A/E | 171 VA | 342 VA |
| C | 45 VA | 90 VA |
| Current-driven | | |
| A/E | 108 VA [1] | 216 VA [2] |
| C [3] | 53 VA [4] | 106 VA [2] |
| C [5] | 86 VA [6] | 172 VA [2] |

**Notes**

1 Use 200 W isolation transformer each unit
2 This is total CCR load and includes isolation transformer losses.
3 Without current sensing
4 Use 30/45 W isolation transformer each unit
5 With current sensing
6 Use 100 W isolation transformer each unit

# 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.
- 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 Required Equipment

Refer to Table 2 for required equipment that is supplied. Refer to Table 3 for required equipment that is not supplied. Refer to the *Parts* section for ordering information.

**Table 2: Required Equipment Supplied**

| Description | Quantity |
|---|---|
| REIL system | 1 |
| Instruction manual | 1 per order |

**Table 3: Required Equipment Not Supplied**

| Description | Quantity |
|---|---|
| Wire, input power. (AWG 16, 600V min. assuming distance is 600 feet or less). See Table 4 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 |

**Table 3: Required Equipment Not Supplied (continued)**

| Description | Quantity |
|---|---|
| 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. | 2 |
| L-867 base, 12-in. (304 mm) diameter. | 1 |
| L-823 connector, male and female, kit | 1 |
| L-823 male secondary splice kit | As required |
| Level | 1 |

**Table 4: External Power AWG Wire Size**

| Maximum distance between Individual Control Cabinet | | Minimum Wire Size |
|---|---|---|
| **Feet** | **Meters** | **Wire Gauge AWG** |
| 1400 | 427 | 12 |
| 900 | 275 | 14 |
| 600 | 183 | 16 |

## 3.2 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.

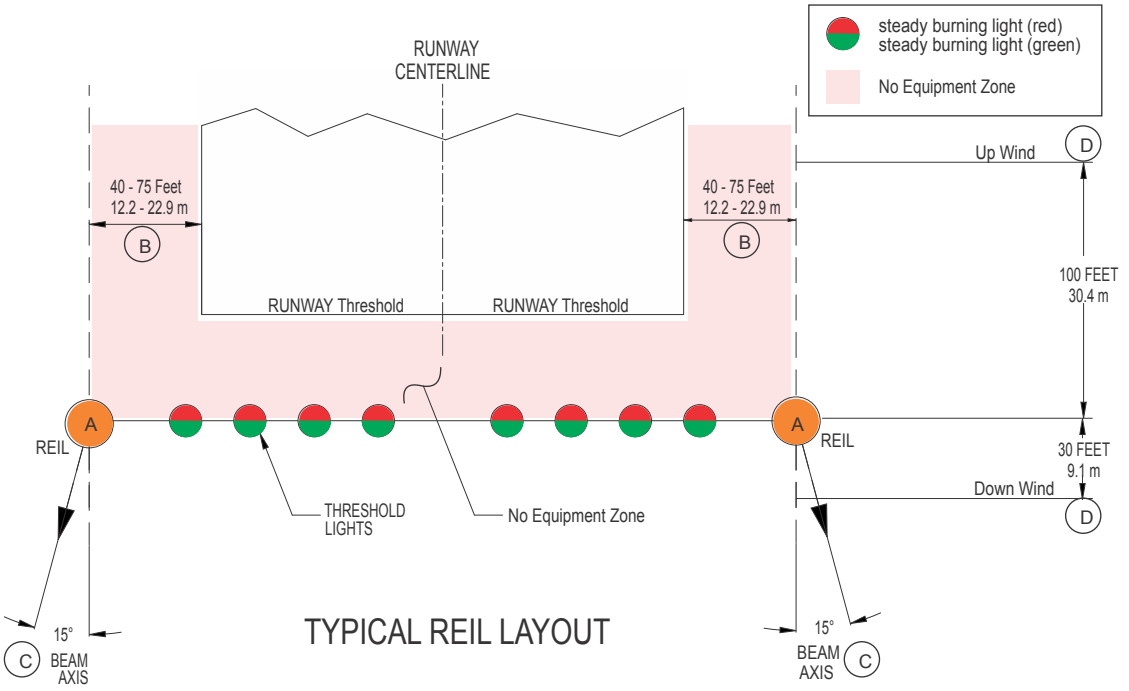
The carrier may need to inspect the equipment.

## 3.3 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 FAA Advisory Circular AC 150/5340-30, ICAO Annex 14, Vol. 1, paragraph 5.3.8, Transport Canada TP 312, 5th Edition, Sec. 5.3.10, or applicable standards for additional installation requirements.

**Figure 2: Typical Layout for REIL**




A. The optimum location for each light unit is in line with the runway threshold lights 40 ft [12.1 m] laterally from the runway edge. Space the light units equally from the runway centerline. When adjustments are necessary the difference in the distance of the units from the runway centerline must not exceed 10 ft [3 m]. Locate the REIL equipment a minimum distance of 40ft [12.1 m] from other runways and taxiways. Both REIL units must be at the same elevation and within 3 ft [0.9 m] of the horizontal plane through the runway centerline.

B. If REILs are used with VASI, install REILs 75 ft [22.8 m] from the runway edge. When installed with other glideslope indicators, install REILs 40 ft [12.1 m] from the runway edge if there are concerns with jet blast and wing vortices. See FAA order jo 6850.2 for additional information.

C.The beam centerline (aiming angle) of each light unit is aimed 15 degrees outward from a line parallel to the runway centerline and inclined at an angle 10 degrees above the horizontal. If angle adjustments are necessary, provide an optical baffle and change the angles to 10 degrees horizontal and 20 degrees vertical.

D. A 100 ft [30.4 m] upwind and a 30 ft [9.1 m] downwind longitudinal tolerance is permitted from the runway threshold lights in locating the light units.

**Note**

For REIL sitting, refer to: FAA AC 150/5340-30 or ICAO Annex 14, Vol. 1, paragraph 5.3.8 as applicable.

## 3.4 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.

## 3.5 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.

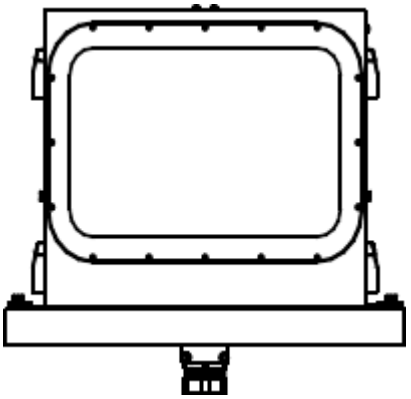
**Note**
The ADB Safegate LED REIL uses the same enclosure for both the Primary and Secondary Units.

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.

## 3.6 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 17.

**Figure 3: LED REIL Standard Single Leg Mounting Configuration**

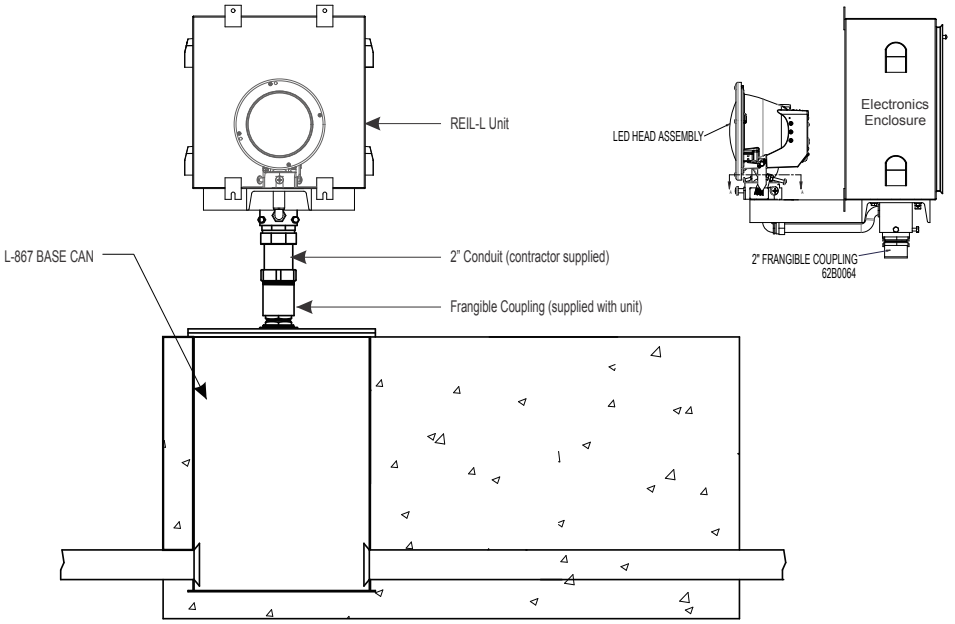


## 3.7 Mounting Cabinets

**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 150/5345-51 (Current Edition) 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**




### Mounting the Cabinets

To install the LED 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.

**Current Powered Installation**

- For current powered powered LED REILs, install a L-867 base can to house the L-830 or L-831 isolation transformer.

  See Figure 17 for details.

**Voltage Powered with Current Sensing Installation**

- For voltage powered LED REILS that use current sensing for remote control, install a L-867 base can next to the Primary enclosure.

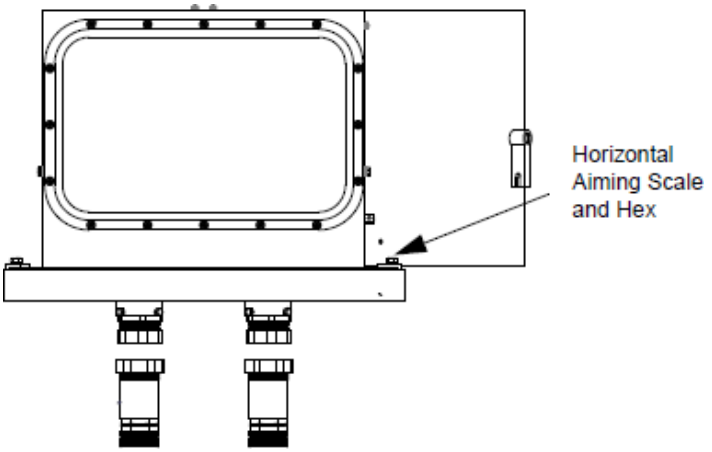
  See Figure 17 for details.

## 3.8 Aiming the Flash Heads

**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**

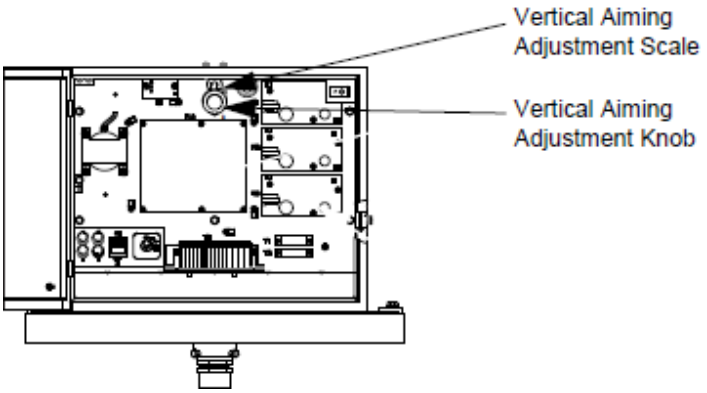



1. See Figure 5. Locate and loosen the hex head cap screws on horizontal aiming bracket found on both outside ends of the enclosure. Manually rotate the head assembly and orientate the beam axis of the flash head to the desired angle to a maximum of 15 degrees outward from a line parallel to the runway 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.

## 3.9 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.

## 3.10 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 13 thru Figure 16 in the Schematics 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 13 thru Figure 16.

**Note**

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

## 3.11 Grounding the Units

**WARNING**

Read the 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.

## 3.12 Cabinet and Remote Control Wiring

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

For LED REILs, install interconnecting power and control wiring (AWG 16 minimum, 600 V) between terminal block TB1 in each cabinet. See Figure 13 and Figure 15.

- Make remote control circuitry connections (AWG 16 minimum, 600 V) to Primary terminal block TB1 in both cabinets. See Figure 13 for L-849I series circuit powered applications. See Figure 15 for L-849V voltage powered applications.

  **Note**

  When the current sensing option is used on LED REILs, remote control is not possible with discrete wiring therefore TB1 terminals 4 through 8 are not used.

- Check for proper installation and firm connections.

- For current powered LED REILs, connect a 200W isolation transformer as shown in Figure 15.
- For voltage powered LED REILs, connect 120/240Vac (3 wire) or 240Vac (2 wire) to TB1 as shown in Figure 13. Connect an isolation transformer to the Primary unit if optional current sensing is used.

**Table 5: 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: Style E Only
NOTE B: Used if optional current sensing is present

## 3.13 Voltage Powered LED 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.

## 3.14 Installation Checkout

This subsection describes procedures for installation checkout. See the “Schematics” on page 27.

**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.

**Connector, Plug, and Jack Checkout**

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

## 3.15 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.

## 3.16 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 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:

- Current Powered: 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.
- Voltage Powered: Verify the following voltages are present in each cabinet:
  - TB1-14 to TB1-16: 120Vac
  - TB1-15 to TB1-16: 120Vac
  - TB1-14 to TB1-15: 240Vac
  - For 240VAC powered REILs, verify the following voltage is present in each cabinet:
    TB1-14 to TB1-15: 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.

## 3.17 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:

  **Note that the following procedures program the control board for one-step or three-step current sensing only. Other changes are required to modify the REIL into single step or three-step operation.**

- Style A (One-Step) (see Figure 10 )
- Changing from a 3-step setting to a 1-step setting:
  - Press the CURRENT ADJUST buttons: SET HIGH and SET LOW simultaneously and hold for 4 seconds. The HIGH LED will blink for 2 seconds and turn off.
  - Set the constant current regulator (CCR) to the lowest step setting where LED REIL operation is desired.
  - On the LED REIL control board 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.

- Style E (Three-Step) (see Figure 10 )
- Changing from a 1-step setting to a 3-step setting:
  - Press the CURRENT ADJUST buttons: SET LOW, SET MED and SET HIGH simultaneously and hold 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, 44A7338, 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.

# 4.0 Operation

This section provides instructions for operating the voltage and current powered, style A/E, LED Runway End Identification 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 LED REIL system.

The LED 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 LED REIL system may be operated either by local or remote control. The Style A operates at high intensity and the Style E operates at low, medium, or high intensity. The LED REIL 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.

## 4.1 Operational Modes

Refer to Table 6 and Table 7. A rotary selector switch is in the control cabinet.

Style A has 3 settings (REMOTE, OFF and, ON) and the 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.

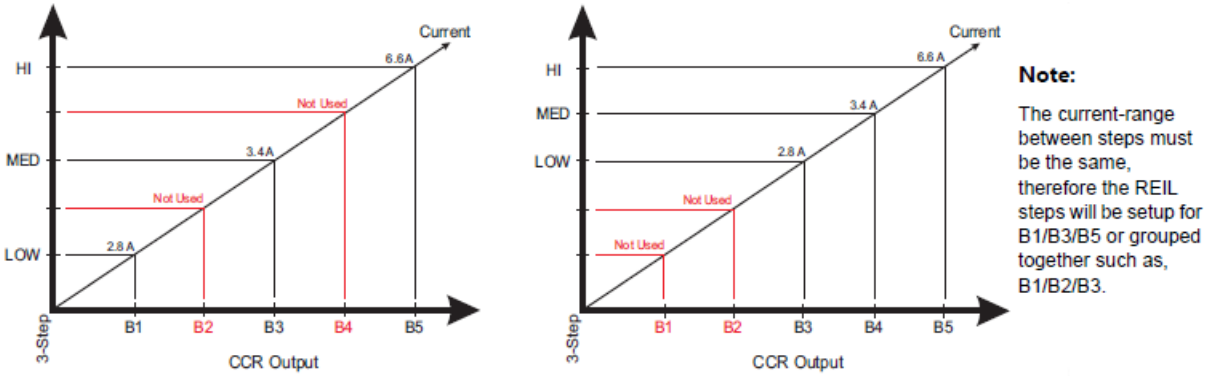
**Table 6: Voltage Powered and Current Powered, Style A Modes of Operation**

| 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 7: Voltage Powered and Current Powered, Style E 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, med, high) | Flashers operate |

**Figure 7: Example allowed current settings for 3-step REIL, Style E**




## 4.2 Operating Procedures

### 4.2.1 REIL Startup Procedure

See Figure 8 and the guidelines below:

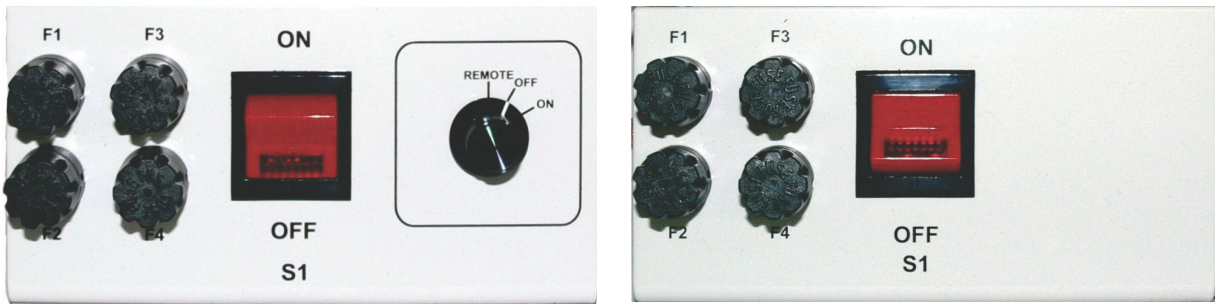
1. Set the ON/OFF switch S1 on the input module in both the Primary and Secondary control cabinet to the ON position.
2. Set the rotary control switch in the primary control cabinet to either:
   - REMOTE position for remote operation (voltage powered only) or current sensing operation. (voltage powered or current powered). This is typical 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 LED REILs: 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 LED REILs: 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 17.

**Figure 8: Switch and Fuse Panel (Voltage Powered, Style A shown)**




Primary unit

Secondary unit

### 4.2.2 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:

- Current Driven LED REILs: Put the ON/OFF switch in both control cabinets in the OFF position.
- Voltage Driven LED REILs: Turn the power off in the control cabinet of both LED REILs by placing the On/Off service switch in the OFF positions, then de-energize and lockout incoming power.

# 5.0 Maintenance and Repair

This section provides preventive maintenance for the LED REIL, Runway End Identification Lights 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 LED REIL system operating efficiently, follow a preventive maintenance schedule. Refer to Table 8.

**Table 8: LED REIL Maintenance**

| Interval | Maintenance Task | Action |
|---|---|---|
| Daily | Check LED operation and flashing sequence. | If flashing malfunctions, follow Troubleshooting procedures. |
| Weekly | 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 Panel Assembly

To remove and replace the LED Panel Assembly see Figure 9 and then proceed as follows:

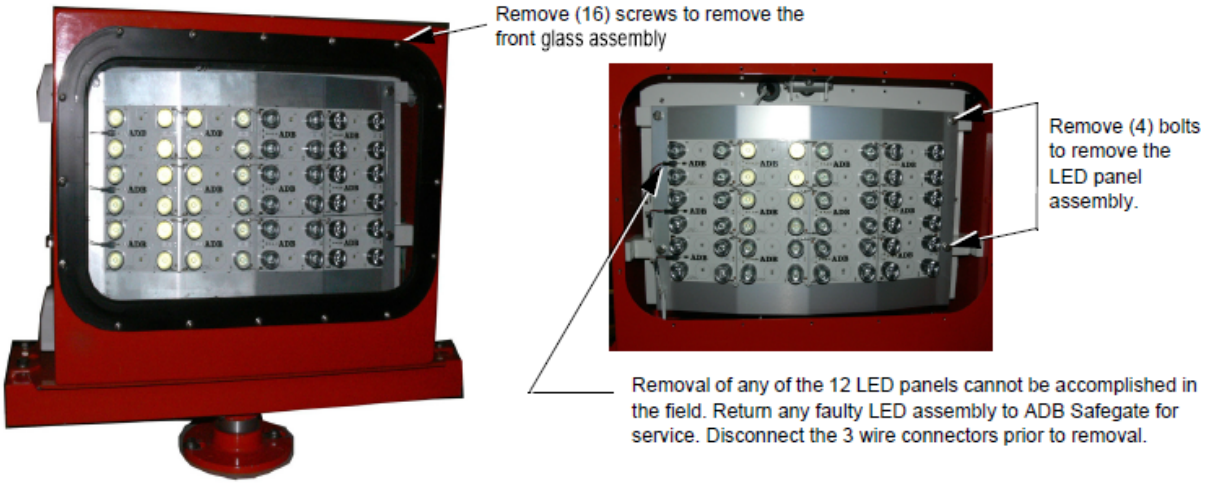
**Note**
Individual LED's and Individual LED panels cannot be replaced.

1. Turn the power off in the control cabinet by placing the On/Off service switch in the OFF position, then 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.

**WARNING**
Note the polarity of each individual LED connection before removing the panel Assembly. Polarity is marked on the face of the LED Panel assembly.

4. Disconnect the 3 wire-connectors to the LED Panel Assembly.
5. Remove the LED Panel Assembly.
6. Install the new LED Panel Assembly ensuring that the polarity is the same as the removed panel. Reconnect the 3 wire-connectors to the LED Panel Assembly.
7. Apply Thermal-joint Compound between the LED Panel 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 by placing the On/Off service switch in the ON position or by re-engaging the external circuit breaker.
11. Close panel and lock access door.

**Figure 9: LED Panel Assembly Replacement**




## 5.2 Troubleshooting

This section provides troubleshooting information for the L-849V/I, Style A/E LED Runway End Identification Light (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 Safegate 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 9: LED REIL Troubleshooting Procedures

| Problem | Possible Cause | Solution |
|---|---|---|
| 1. No flashing in either individual control cabinets | No input power | Voltage Powered: Check voltage at terminal block TB1 terminals 14 and 15.<br>Current Powered: 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. |
| | Voltage Powered: External circuit breaker trips each time it is turned on | Lightning arrestor V1 or V2 is shorted. Replace lightning arrestor. |
| | 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.<br>Blown F1, F2 or F3 fuse in non-flashing unit. | Turn Secondary unit ON<br>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. |
| | Loose external wire connection. | With the power off and using an ohmmeter, check continuity of each wire. |
| 3. Light flashes intermittently | Flasher Control PCB failing. | Replace Flasher Control PCB. |
| | LED Optical Assembly failing | Replace the assembly. |
| 4. Operates in Local control but not In Remote | 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 or PS3 has failed. | On the suspected failing board, verify presence of 55VDC ± 5VDC at J2 + to -.<br>Replace board if voltage is incorrect. |

### Table 10: 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<br>P/N 47A0026 | Incoming power protection. |
| | S1 Panel Fuse | F3 | 2A, 250V,Slow Blow<br>P/N 47A0049 | Protection on the 240VDC output of Power Supply PS5. |
| | S1 Panel Fuse | F4 | 1A, Slow Blow<br>P/N 47A0017 | 120VDC remote control source protection. |

**Table 10: Protection Devices (continued)**

| | Device | Designation | Value | Function |
|---|---|---|---|---|
| voltage | S1 Panel Fuse | F1, F2 | 2A, 250V,Slow Blow<br>P/N 47A0049 | Incoming power protection. |
| | S1 Panel Fuse | F3 | 2A, 250V,Slow Blow<br>P/N 47A0004 | Protection on the 120Vac secondary of T1, terminals 6-7. |
| | S1 Panel Fuse | F4 | 1A, Slow Blow<br>P/N 47A0017 | 120VDC remote control source protection. |
| | Control Board Fuse | F1 | 1A, 250V, Slow Blow, 3AG, P/N 47A0017 | Incoming power protection on the Control Board, 44A7338/CD or 44A7338/VD. |
| | Flasher Power Supply Board Fuse | F1 | 2A, 250V, Slow Blow, 5x20mm, 47A0215 | Incoming power protection on the Flasher Power Supply Board, 44A6545/55. |

**Figure 10: Flasher Control PCB 44A7338 Operation**

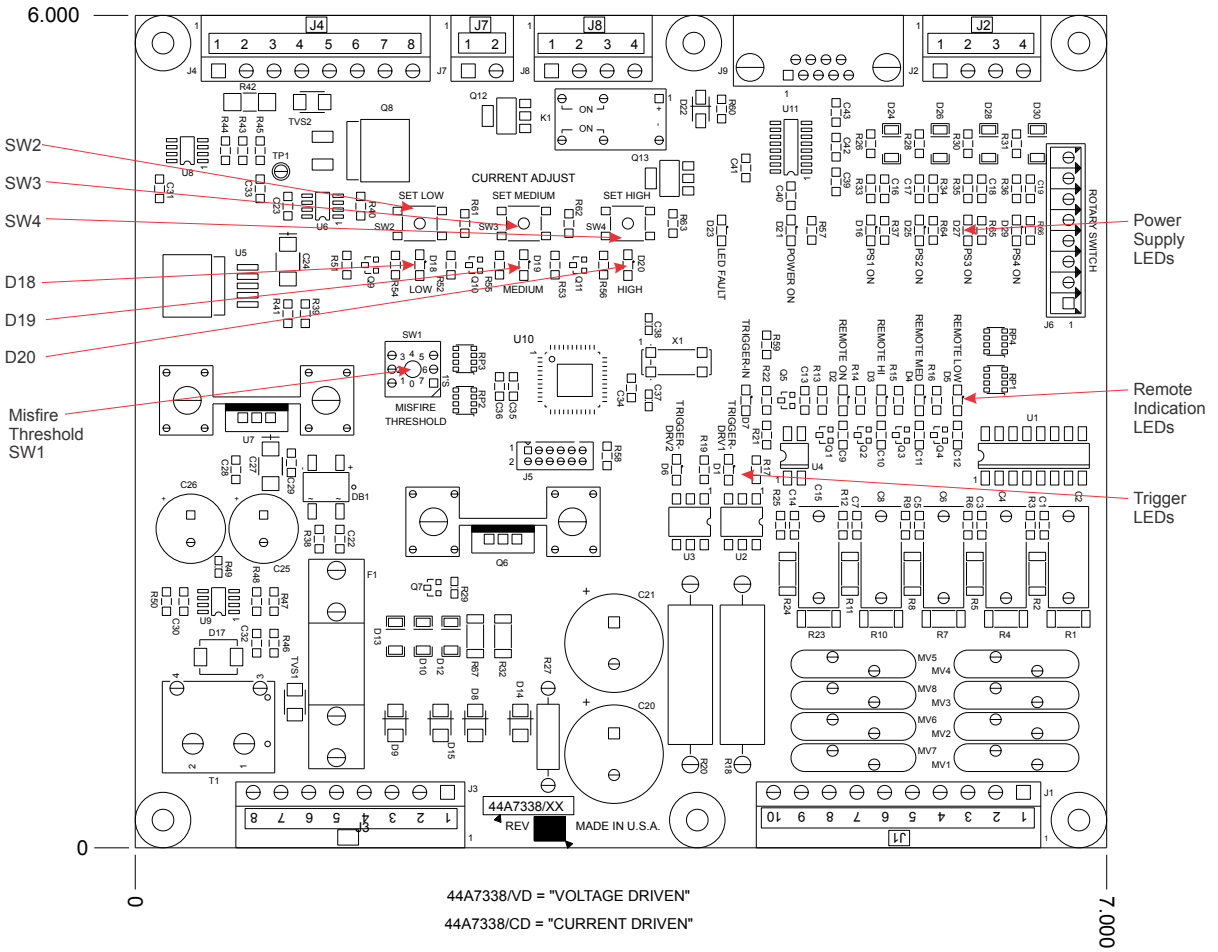


**Table 11: Control Board Controls and Indicators**

| 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.<br>Not used in a Style A REIL. |
| D5 | Remote Low | Green | Illuminates when a Remote-Low intensity command has been input into the unit.<br>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. |
| D27 | PS3 On | Green | Illuminates when power is being output to LED Power Supply PS3. |
| SW1 | Misfire Threshold | -- | Position 0 - Turns off fault tracking / produces no fault indication.<br>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.<br>Not used in a Style A REIL. |
| SW3 | Med | -- | Medium intensity Current Sensing adjustment control.<br>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 11: Current Powered LED REIL, Style A/E Interior Assembly**

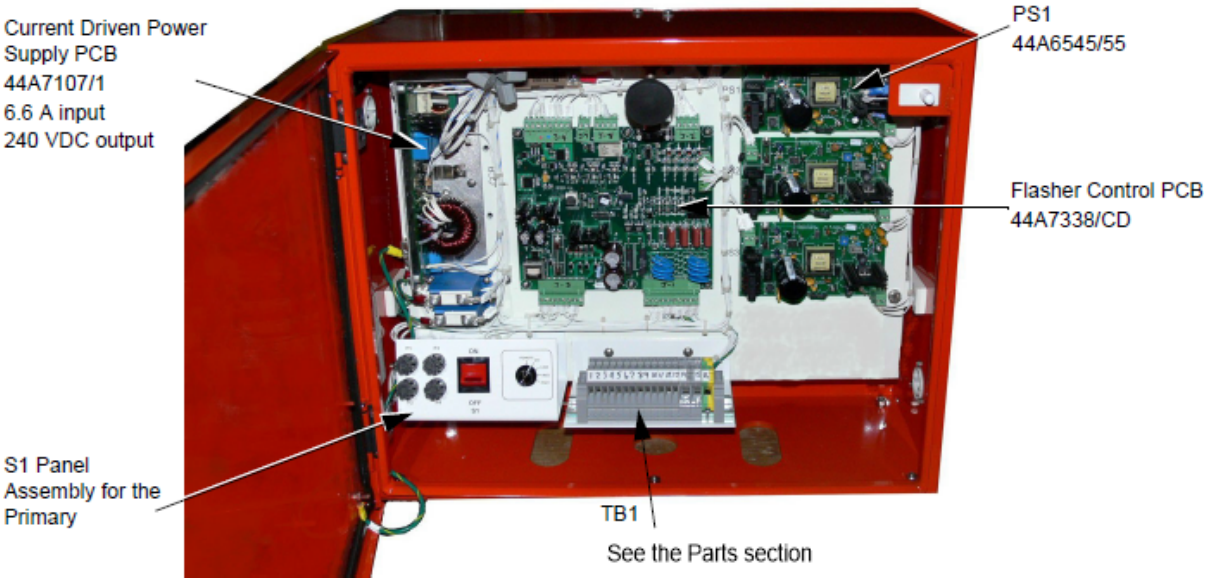
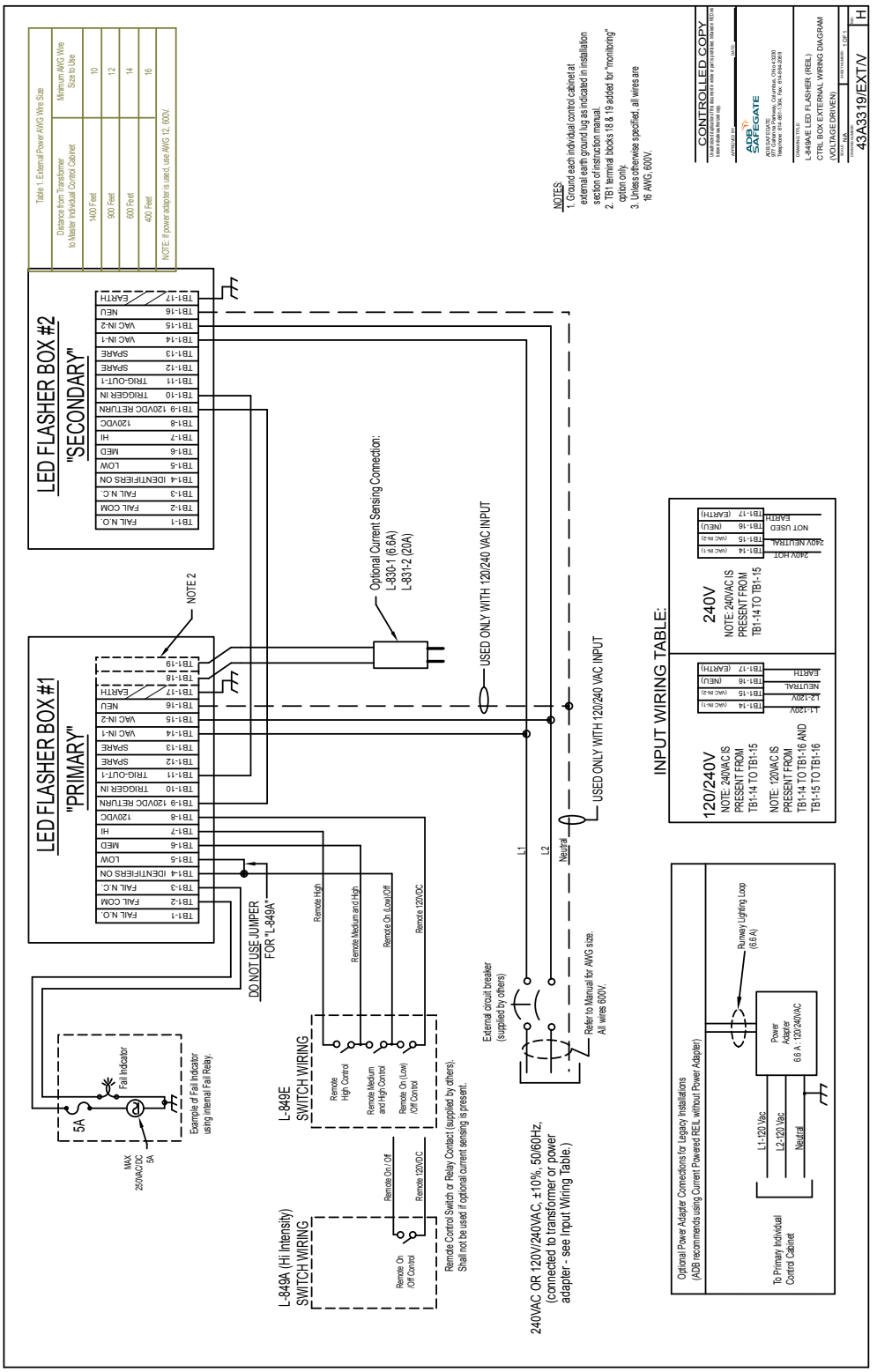


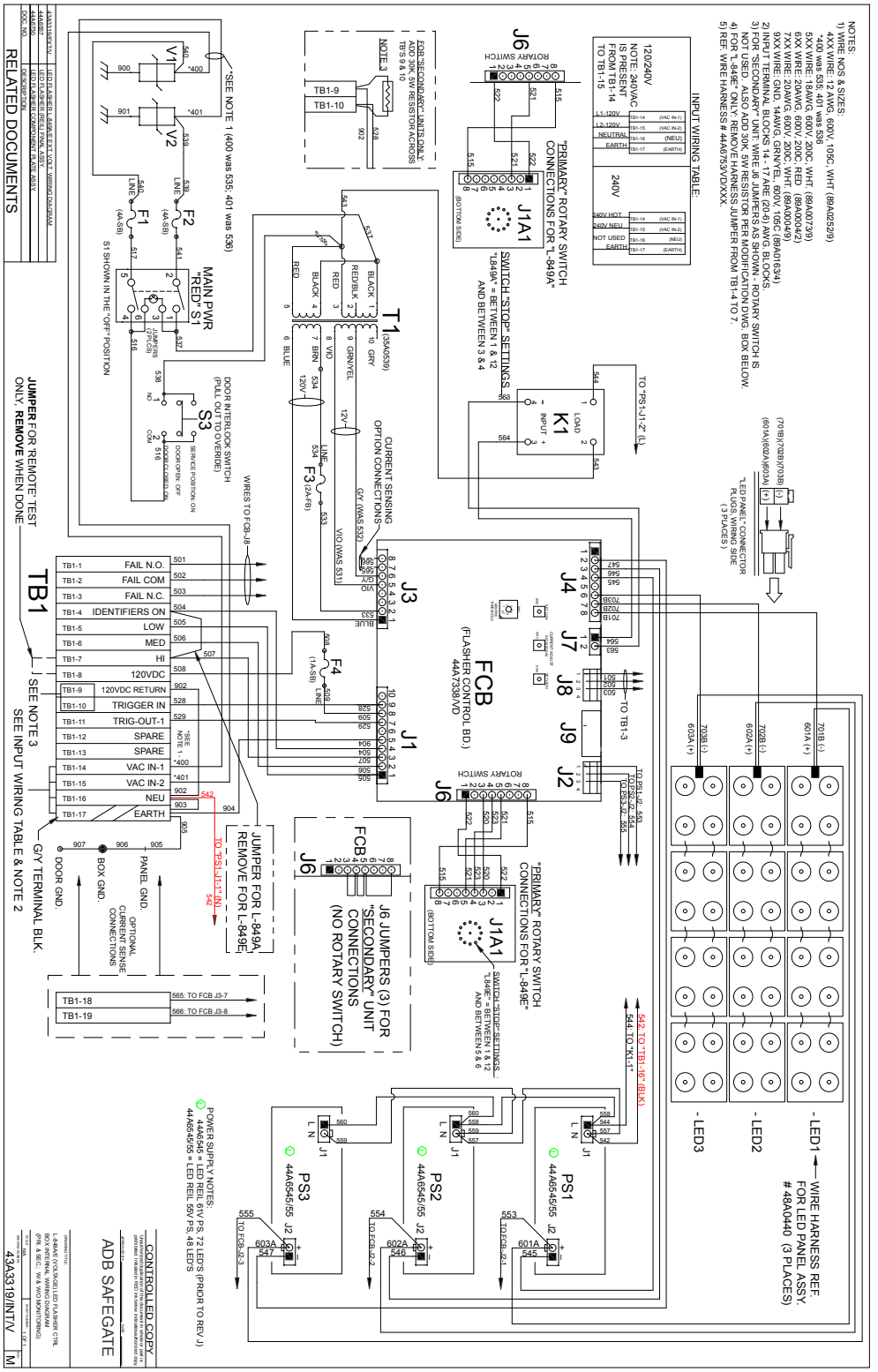

**Figure 12: Voltage Powered LED REIL, Style A/E Interior Assembly**

## 5.3 Schematics

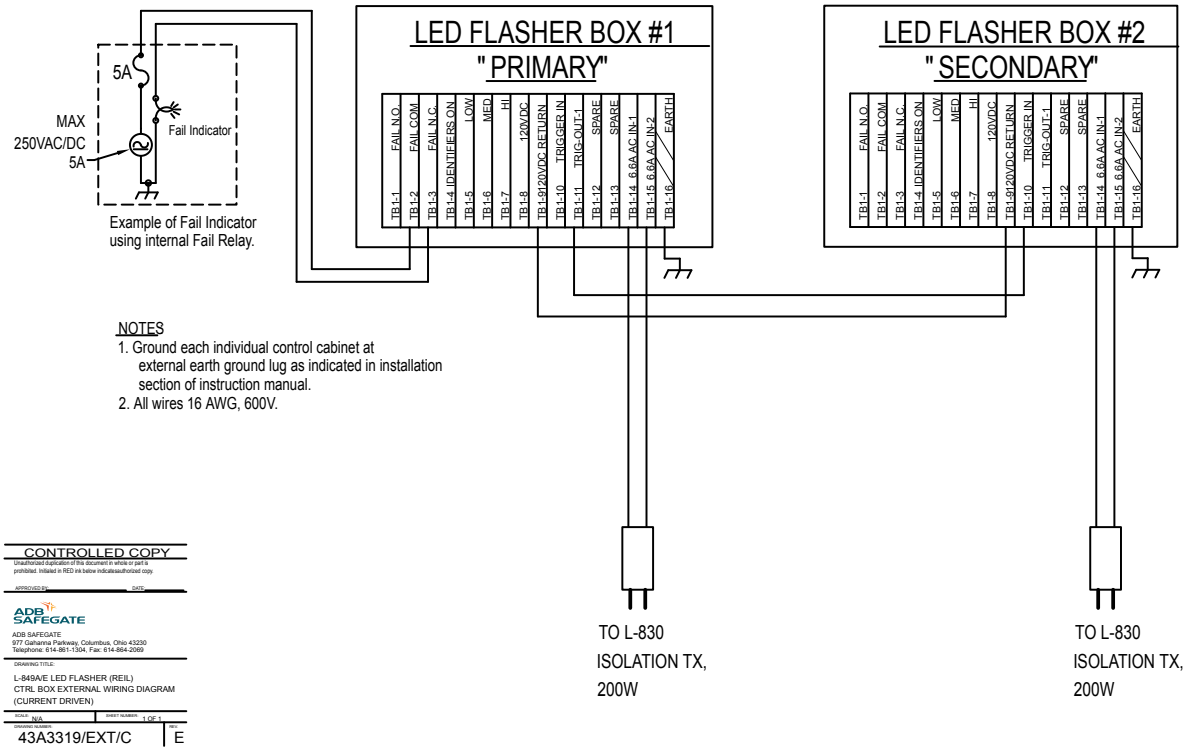
**Figure 13: Voltage Powered LED REIL, Style A/E, CTRL Box External Wiring Diagram**



## Figure 14: Voltage Powered LED REIL, Style A/E, LED Flasher CTRL Box Internal Wiring Diagram



## Figure 15: Current Powered LED REIL, Style A/E, CTRL Box External Wiring Diagram (Current Driven)

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APPROVED BY: _____ DATE: _____

ADB SAFEGATE

ADB SAFEGATE
977 Gahanna Parkway, Columbus, Ohio 43230
Telephone: 614-861-1304, Fax: 614-864-2069

DRAWING TITLE:
L-849A/E LED FLASHER (REIL)
CTRL BOX EXTERNAL WIRING DIAGRAM
(CURRENT DRIVEN)

| SCALE | SHEET NUMBER | REV |
|---|---|---|
| N/A | 1 OF 1 | |
| DRAWING NUMBER | | |
| 43A3319/EXT/C | | E |

**Figure 16: Current Powered LED REIL, Style A/E, CTRL Box Internal Wiring Diagram (Primary and Secondary w/ Monitoring)**

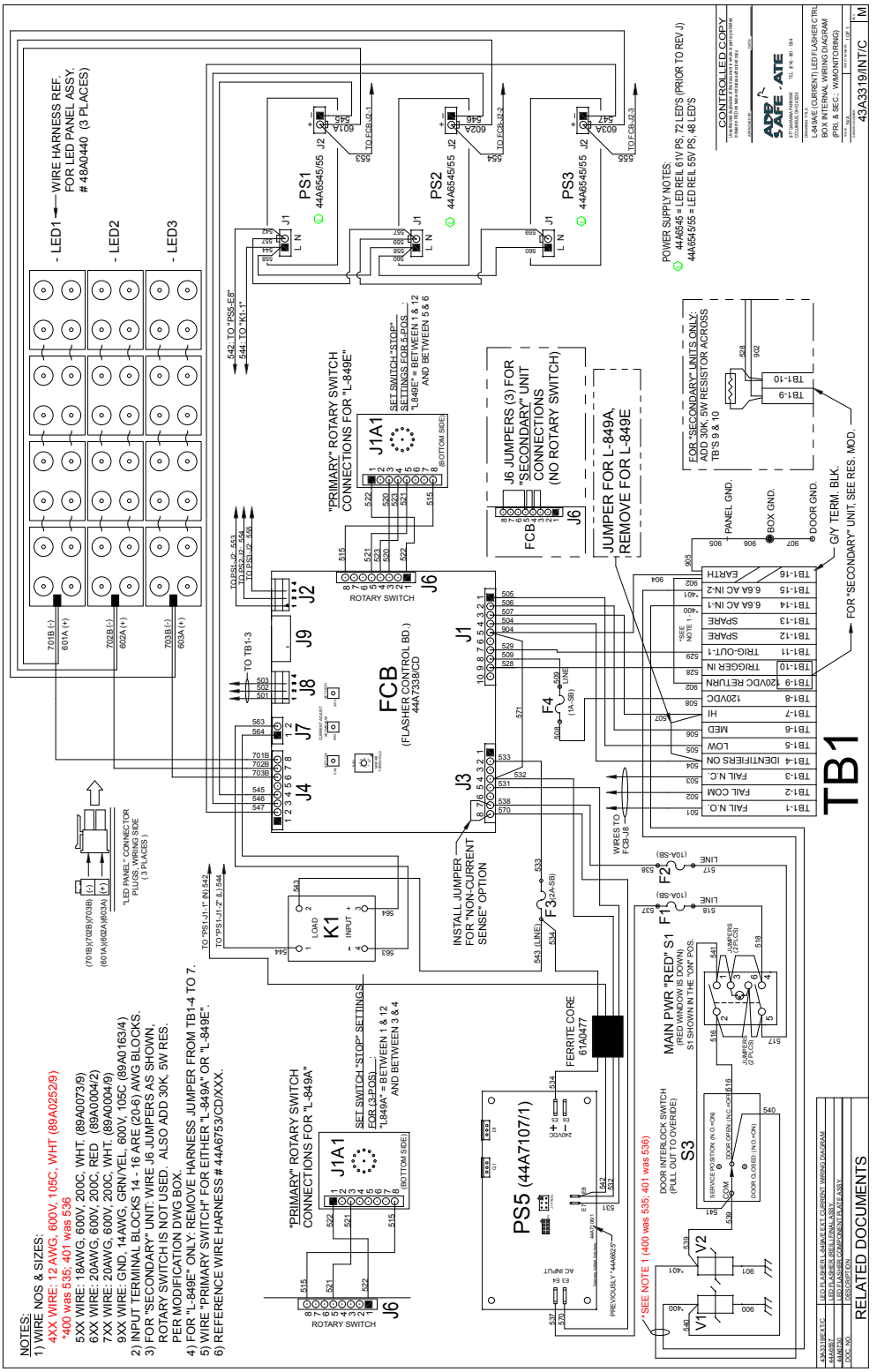
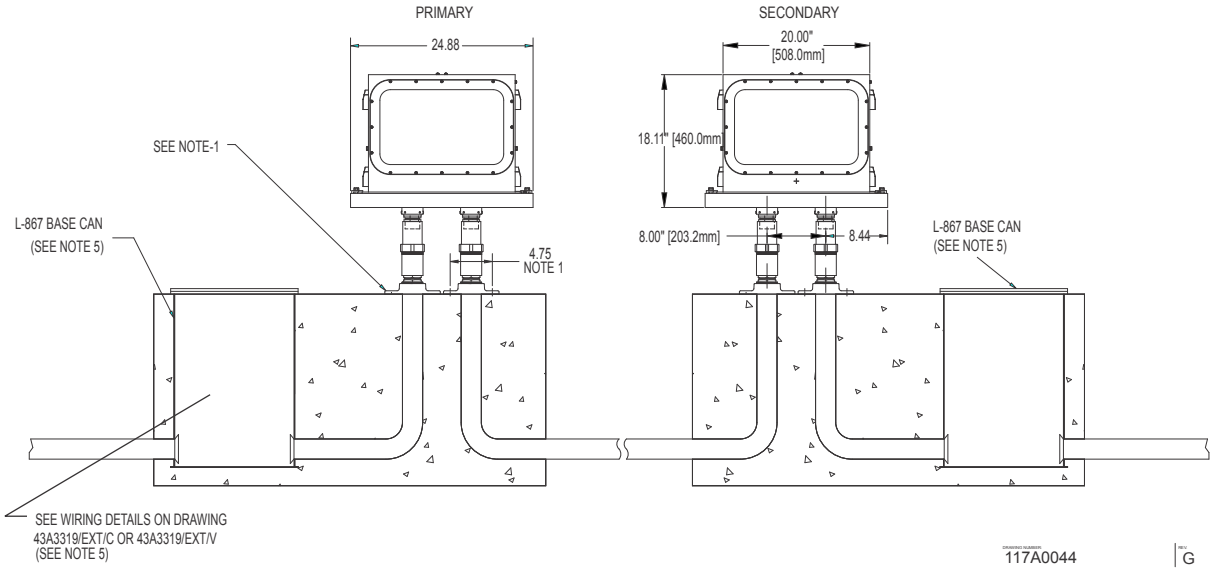


**Figure 17: LED REIL, Style A/E Typical Installation Details 117A0044**




## Note

1. OPTIONAL BASE FLANGE 62B0064 SHOWN FOR REFERENCE ONLY. USE HILTI BOLTS OR EQUIVALENT FOR MOUNTING FLANGES.
2. USE 2 INCH RGS FEMALE COUPLING IF THE BASE FLANGE NOT USED.
3. 2 INCH ELBOW FOR EXTERNAL WIRES.
4. THE OVERALL HEIGHT OF THE OPTICAL ASSEMBLY SHALL NOT EXCEED 34-inches
5. BASE CANS ARE ONLY NEEDED ON CURRENT POWERED REIL TO HOUSE ISOLATION TRANSFORMER. SEE WIRING DIAGRAM 43A3319 fig 13.

**Figure 18: LED REIL, Style A/E, Mounting Dimensions 117A0044**

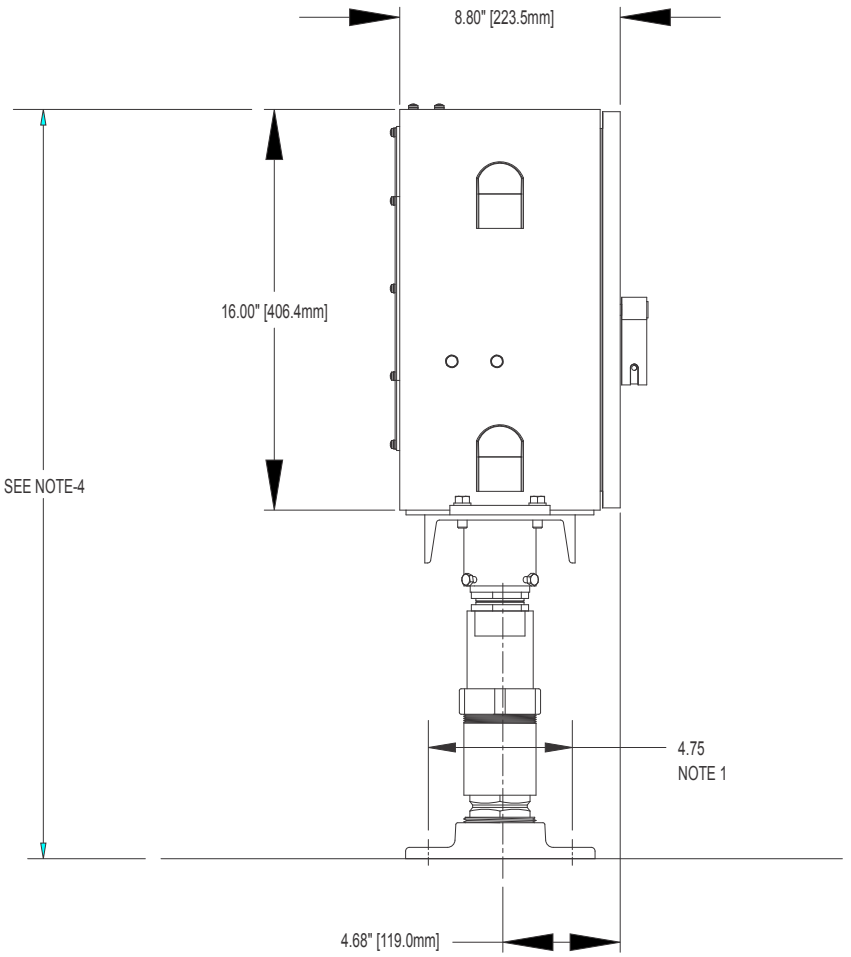
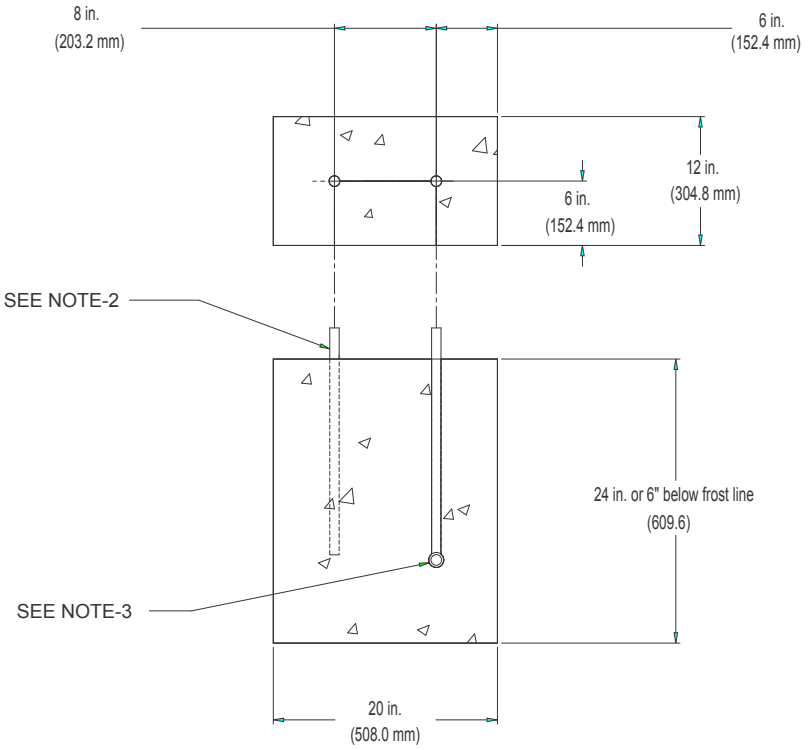


**Figure 19: LED REIL, Style A/E, Cabinet Mounting 117A0044**

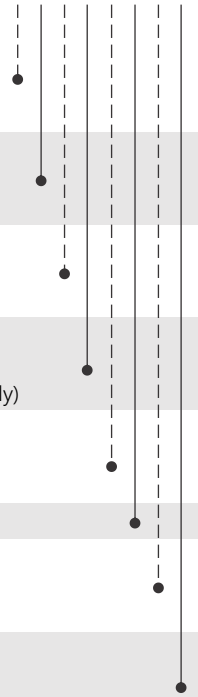


# 6.0 REIL A/E Parts

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

## Ordering Code

REIL / X X X X X 0 X X



**Style**
A = High-intensity, one brightness step
C = Low-intensity, one brightness step
E = Three brightness steps

**Input Power**
1 = Current-driven[1]
2 = Voltage-driven

**Current Sensing Option[2]**
0 = Without current sensing[3]
1 = With current sensing

**Flash Head Mounting**
0 = Integrated with enclosure (Style A, C, or E)
1 = Separate mounting on a 2" EMT (Style C only)

**Enclosure Mounting**
1 = Single leg
2 = Two legs

**0**

**Enclosure Type**
1 = Steel (Painted Aviation Orange)
2 = Stainless Steel (Not ETL Certified)

**LED Configuration**
0 = Style C
1 = Style A/E (48 LEDs)

**Note:**

1 The current-driven REIL is only available with the current-sensing option. A current-driven REIL cannot be ordered without current sensing.

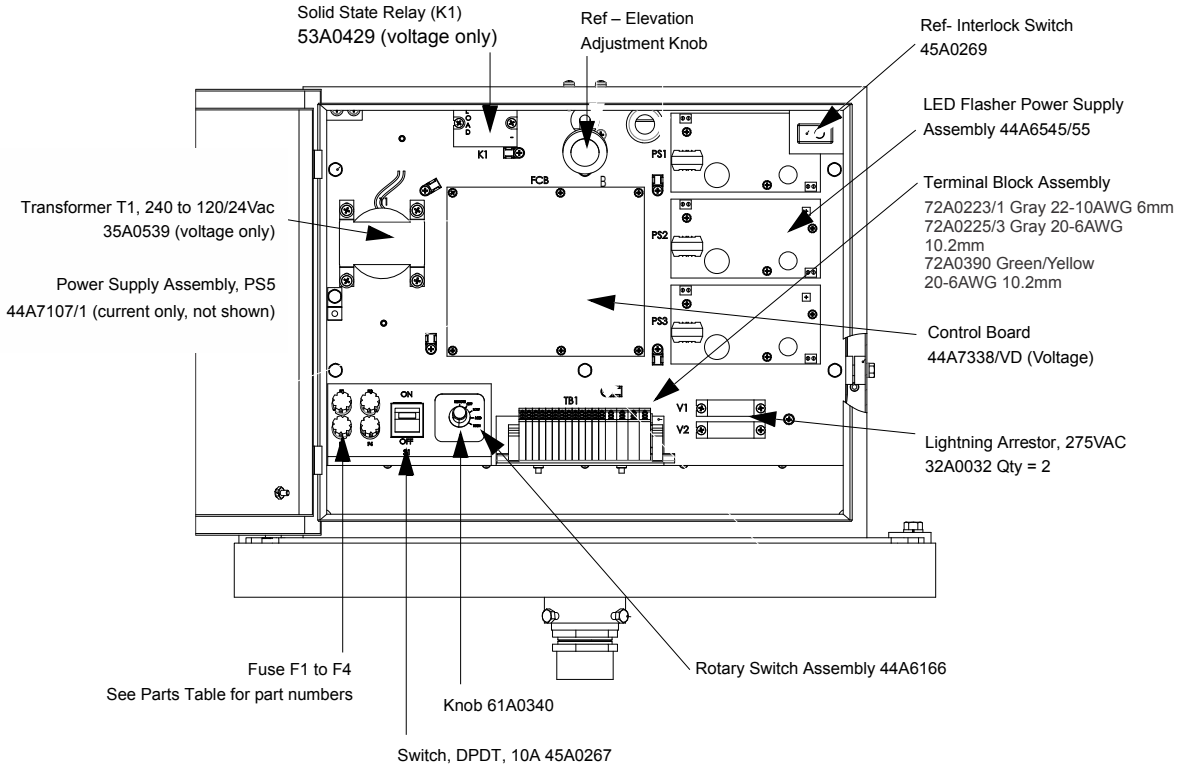
2 The current sensing option provides ON/OFF control for Style A, Style C or 3-step intensity control for Style E of the REIL system depending on the current level in the series lighting circuit. The current-driven (powered by a CCR) doesn't require a separate isolation transformer – The input current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

3 The without current sensing option is only available with the voltage driven REIL.

## 6.1 Control Panel Assembly Part Numbers

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

**Figure 20: Control Panel Assembly (single-leg, voltage shown)**

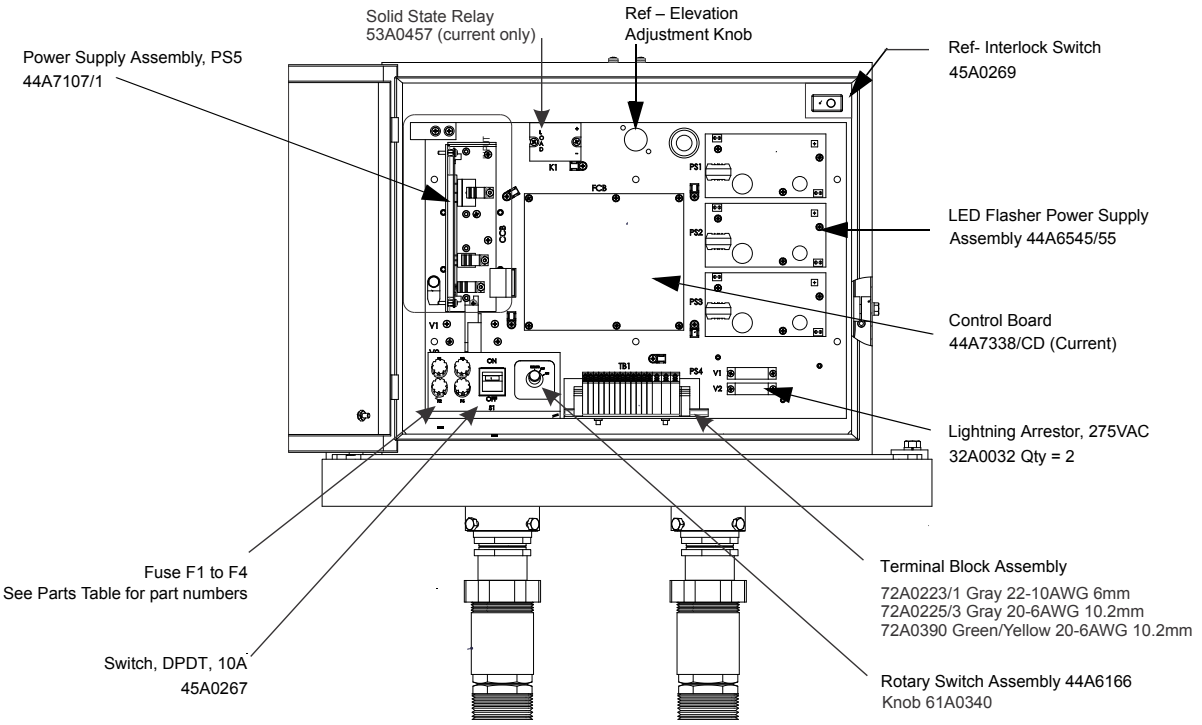



**Note**

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 21: Control Panel Assembly (duel-leg, current unit shown)**




## 6.2 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 22: Optical Assembly Components**

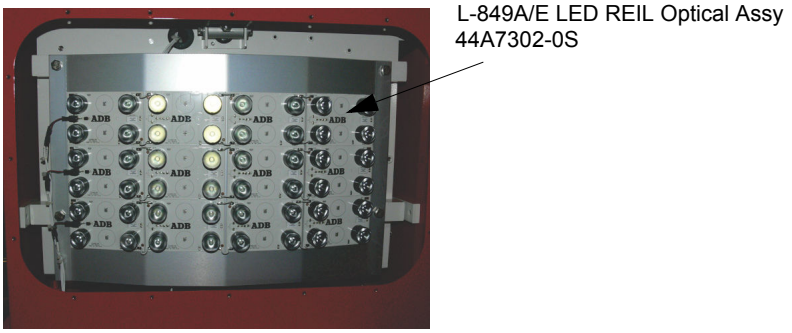
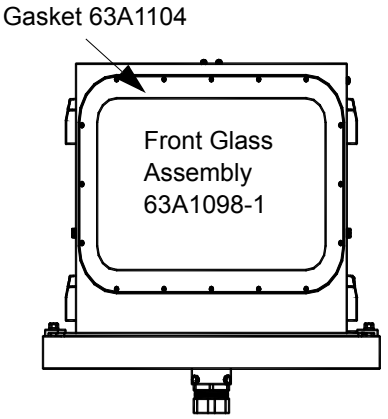


**Figure 23: Front Glass Assembly Components**




## 6.3 Spare Parts Lists

**Table 12: Current Powered LED REIL, Style A/E Spare Parts**

| Part Number | Description | Quantity | Notes |
|---|---|---|---|
| 32A0032 | Lightning Arrestor 275Vac | 4 | |
| 44A7338/CD | Control Board Assembly | 2 | Current Powered Only |
| 44A6545/55 | LED Flasher Power Supply Assembly | 6 | |
| 44A7107/1 | Power Supply Assembly, PS5 | 2 | Current Powered Only |
| 53A0457 | Solid State Relay, 50-400Vac, 5-24Vdc | 2 | Current Powered Only |
| 45A0269 | Interlock Switch, Door, SPST, 10A | 2 | |
| 62B0064 | 2-inch frangible coupling | 2 | Single Leg Only |
| 77A0009 | Compression Coupling, 2" EMT | 4 | Dual Leg Only |
| 44B0180 | Frangible Coupling, 2" EMT | 4 | Dual Leg Only |
| 47A0026 | Fuse, S1 Panel, F1 and F2, 10A, SB | 4 | Current Powered Only |
| 47A0049 | Fuse, S1 Panel, F3, 2A, SB | 2 | Current Powered Only |
| 47A0017 | Fuse, S1 Panel, F4, 1A, SB | 2 | Current Powered Only |
| 47A0017 | Fuse, Control Board, F1, 1A, SB | 2 | |
| 47A0215 | Fuse, Flasher Power Supply Board, F1, 1A, SB | 4 | |
| 44A7302/0S | Optical Assembly (includes gasket and mounting hardware) | 1 | |
| 63A1098/1 | Front Glass | 1 | |
| 63A1104 | Front Glass Gasket | 1 | |

**Table 13: Voltage Powered LED REIL, Style A/E Spare Parts**

| Part Number | Description | Quantity | Notes |
|---|---|---|---|
| 32A0032 | Lightning Arrestor 275Vac | 4 | |
| 44A7338/VD | Control Board Assembly | 2 | Voltage Powered Only |
| 44A6545/55 | LED Flasher Power Supply Assembly | 6 | |

**Table 13: Voltage Powered LED REIL, Style A/E Spare Parts (continued)**

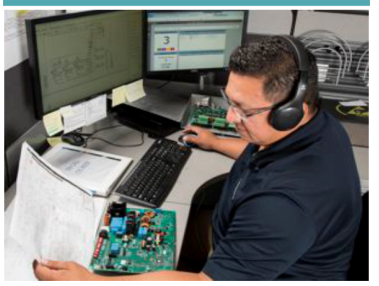
| Part Number | Description | Quantity | Notes |
|---|---|---|---|
| 62B0064 | 2-inch frangible coupling | 2 | Single Leg Only |
| 77A0009 | Compression Coupling, 2" EMT | 4 | Dual Leg Only |
| 44B0180 | Frangible Coupling, 2" EMT | 4 | Dual Leg Only |
| 45A0269 | Interlock Switch, Door, SPST, 10A | 2 | |
| 47A0017 | Fuse, S1 Panel, F4, 1A, SB | 2 | Voltage Powered Only |
| 47A0078 | Fuse, S1 Panel, F1 and F2, 4A, SB | 4 | Voltage Powered Only |
| 47A0004 | Fuse, S1 Panel, F3, 2A, SB | 2 | Voltage Powered Only |
| 47A0017 | Fuse, Control Board, F1, 1A, SB | 2 | |
| 47A0215 | Fuse, Flasher Power Supply Board, F1, 1A, SB | 4 | |
| 53A0429 | Solid State Relay 24-250Vac, 5-24Vdc | 1 | Voltage Powered Only |
| 35A0539 | Transformer 240/347/480-120/24CT 0.5 A | 1 | Voltage Powered Only |
| 44A7302/0S | Optical Assembly (includes gasket and mounting hardware) | 1 | |
| 63A1098/1 | Front Glass | 1 | |
| 63A1104 | Front Glass Gasket | 1 | |

# Appendix A: SUPPORT

Our experienced engineers are available for support and service at all times, 24 hour/7 days a week. They are part of a dynamic organization making sure the entire ADB SAFEGATE is committed to minimal disturbance for airport operations.

## ADB SAFEGATE Support

**Live Technical Support - Americas**
If at any time you have a question or concern about your product, just contact ADB SAFEGATE's technical service department. Trained in all areas of system issues, troubleshooting, quality control and technical assistance, our highly experienced Technical support specialists are available 24 hours a day, seven days a week to provide assistance over the phone.
ADB SAFEGATE **Americas Technical Service & Support (US & Canada): +1-800-545-4157**
**ADB SAFEGATE Americas Technical Service & Support (International): +1-614-861-1304**
During regular business hours, you can also Chat with a Service Technician. We look forward to working with you!
**Before You Call**
When you have an airfield lighting or system control system problem it is our goal to support airfield maintenance staff as quickly as possible. To support this effort we ask that you have the following information ready before calling.

- The *airport code*
- If not with an airport, then company name (prefer customer id number)
- Contact phone number and email address
- Product with part number preferable or product number
- Have you reviewed the product's manual and troubleshooting guide
- Do you have a *True RMS* meter available (and any other necessary tools)
- Be located with the product ready to troubleshoot

**Note**
For more information, see www.adbsafegate.com, or contact ADB SAFEGATE Support via email at support@adbsafegate.com or
Brussels: +32 2 722 17 11
Rest of Europe: +46 (0) 40 699 17 40
Americas: +1 614 861 1304. Press 3 for technical service or press 4 for sales support.
China: +86 (10) 8476 0106

## A.1 ADB SAFEGATE Website

The ADB SAFEGATE website, www.adbsafegate.com, offers information regarding our airport solutions, products, company, news, links, downloads, references, contacts and more.

## A.2 Recycling

### A.2.1 Local Authority Recycling

The disposal of ADB SAFEGATE products is to be made at an applicable collection point for the recycling of electrical and electronic equipment. The correct disposal of equipment prevents any potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling. The recycling of materials helps to conserve natural resources. For more detailed information about recycling of products, contact your local authority city office.

### A.2.2 ADB SAFEGATE Recycling

ADB SAFEGATE is fully committed to environmentally-conscious manufacturing with strict monitoring of our own processes as well as supplier components and sub-contractor operations. ADB SAFEGATE offers a recycling program for our products to all customers worldwide, whether or not the products were sold within the EU.

ADB SAFEGATE products and/or specific electrical and electronic component parts which are fully removed/separated from any customer equipment and returned will be accepted for our recycling program.

All items returned must be clearly labeled as follows:

- For *ROHS/WEEE* Recycling
- Sender contact information (Name, Business Address, Phone number).
- Main Unit Serial Number.

ADB SAFEGATE will continue to monitor and update according for any future requirements for *EU directives* as and when *EU member states* implement new *regulations* and or *amendments*. It is our aim to maintain our *compliance plan* and assist our customers.

## Company Addresses

| | |
|---|---|
| ADB SAFEGATE | ADB SAFEGATE, Belgium:<br>Leuvensesteenweg 585,<br>B-1930 Zaventem<br>Belgium |
| Contact:<br>Tel.: +32 2 722 17 11,<br>Fax: +32 2 722 17 64 | Email: marketing@adbsafegate.com<br>Internet: www.adbsafegate.com |

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| Americas LLC | ADB SAFEGATE, Americas:<br>977 Gahanna Parkway,<br>Columbus, OH 43230<br>USA |
| Contact:<br>Tel.: +1 (614) 861 1304,<br>Fax: +1 (614) 864 2069 | Email: sales.us@adbsafegate.com<br>Internet: www.adbsafegate.com |

| | |
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| ADB SAFEGATE Sweden AB | ADB SAFEGATE, Sweden:<br>Djurhagegatan 19<br>SE-213 76 Malmö<br>Sweden |
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| ADB SAFEGATE Airfield Technologies Ltd. China | ADB SAFEGATE, China:<br>Unit 603, D Block,<br>CAMIC International Convention Center,<br>No 3, Hua Jia Di East road, ChaoYang district,<br>Beijing 100102<br>P.R. China |
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| Contact:<br>Tel.: +49 (621) 87 55 76-0,<br>Fax: +49 (621) 87 55 76-55 | Email: marketing@adbsafegate.com<br>Internet: www.adbsafegate.com |

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