Airfield Lighting Field Lightning Arrestor

# User Manual

96A0489, Rev. E, 2020/09/02

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.

## © ADB SAFEGATE BV

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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 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 Airfield Lighting Field Lightning Arrestor

Airfield Lighting Field Lightning Arrestor (FLA) is designed to help reduce the susceptibility of airfield series circuits to lightning strikes or surges. The FLA is designed to be installed at 600m (2000 ft) intervals in the 5KV airfield primary series circuit but can be installed at closer intervals as desired. Each FLA adds additional local protection against damage from lightning strikes reducing the risk of widespread damage in the field and to equipment in the electrical vault.

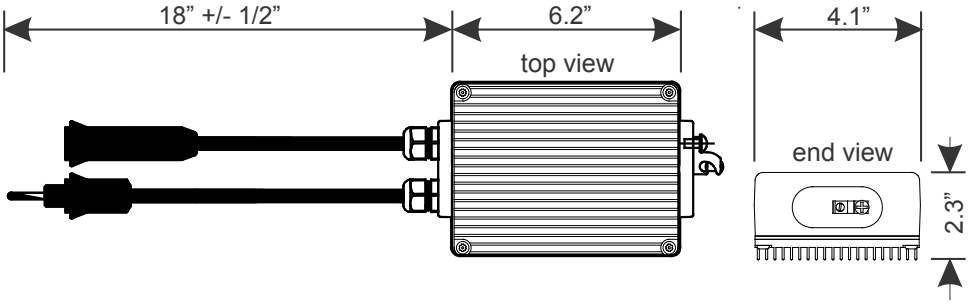
## 2.1 Introduction

The Field Lightning Arrestor incorporates distribution class Metal Oxide Varistors (MOVs). When a voltage transient occurs, the impedance of the MOVs changes from a near open circuit to a highly conductive path to ground, clamping the voltage to a safe level to protect the equipment. After passage of the surge, the MOVs return to their initial state, conducting minimal leakage current.

The manual shows the information necessary to:

- Install and maintain the Field Lightning Arrestor.

### Dimensions




### 2.1.1 Field Lightning Arrestor

### Compliance with Standards

| | |
|---|---|
| FAA: | Complies with AC 150/5345-10, Section 3.4.12 (Lightning/Surge Arrestors) |

Airfield Lighting Field Lightning Arrestor

## Overview

- For use on airfield series circuits to further reduce the risk of lightning damage on the series circuit
- Can be inserted at various points in the 5 kV airfield primary series circuit to provide additional lightning protection.
- Can be used on any airfield circuit (6.6 A from 4 kW to 30 kW and 20 A from 15 kW to 70 kW)
- Rated for 25,000 A peak (8/20 microsecond discharge)
- Assembly rated NEMA 6P
- Insulation resistance is 10 GΩ (minimum)
- Includes a UL 467 rated ground lug, which accepts an AWG 4 to AWG 14 earth ground wire
- Operating temperature: -55 °C to +55 °C (-67 °F to +131 °F)

## Installation

It is recommended that the field lighting arrestor be installed a maximum of about every 2,000 feet around the series circuit, starting at the first base can closest to the vault on each leg of the series circuit. Simply disconnect (unplug) the L-823 connectors at the designated point and plug in the field lighting arrestor. Connect a known good earth ground (25 Ω or less) to the earth ground lug of the field lighting arrestor using at least an AWG 6 wire.

The field lightning arrestor can be installed in a base can (preferred) or direct earth buried. Heat shrink each L-823 connector interface using an airport approved method. The field lighting arrestor body is waterproof (rated NEMA 6P) and is fully resistant to deicing fluids.

| Ordering Code | 44A6102 |
|---|---|

## Maintenance Notes

The number of Field Lightning Arrestors included in a series circuit may effect the MEG readings. Please keep this in mind if your results differ from the expected values.

# 3.0 Installation

This manual provides the detailed procedures required to safely and correctly install the Field Lightning Arrestor.

## 3.1 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.

## 3.2 Inspection on Arrival

Please inspect the Field Lightning Arrestor upon arrival. Note any issues and contact the shipper.

## 3.3 Storage

### CAUTION

**IMPROPER STORAGE**
If equipment is to be stored prior to installation, it must be protected from direct sunlight.
**Failure to follow this instruction can result in equipment damage**

For proper storage, place the box of the product on a shelf or in a warehouse.

## 3.4 Installation Procedures

### WARNING

- Protect from electrostatic discharge.
- The Field Lightning Arrestor assembly must be grounded to a low resistance earth ground.
- Failure to ground the FLA assembly will result in no added protection to the circuit.

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

To install the Field Lightning Arrestor (FLA) into the series circuit, perform the following procedure:

1. Determine the specific location for the FLA to be installed in the circuit.

**Note**
It is recommended that the Field Lightning Arrestor assembly be installed approximately every 2000 feet around the series circuit starting at the first useable L867/L868 light base can outside the vault on each side of the series circuit. At the airport's option, Field Lightning Arrestors may be installed more frequently if it is desired to further reduce lightning risk.

2. Remove the light fixture from the L867/L868 light base can and disconnect one L-823 connection from the airfield series circuit. This could be from the L-830 isolation transformer or a splice found in the light base.
3. Plug in the lightning arrestor as shown in the wiring diagram. See Figure 1 and hook-up label on enclosure.
4. After the connection has been made, reinstall heat shrink (in accordance with local heat shrinking practice).
5. Check site plan drawings and specifications to verify the presence and location of the counterpoise lightning wire. Wiring intended to be connected to a safety ground should not normally be attached to the FLA. See FAA AC 150/5340-30 (current edition) for further discussion about lightning and safety grounds on series circuits.

**Note**
IF COUNTERPOISE LIGHTNING WIRE IS PRESENT, connect a 4 AWG (minimum) copper grounding wire, to the ground screw on end of the FLA enclosure and attach the other end of the ground wire to the counterpoise wire using an appropriate attachment method.

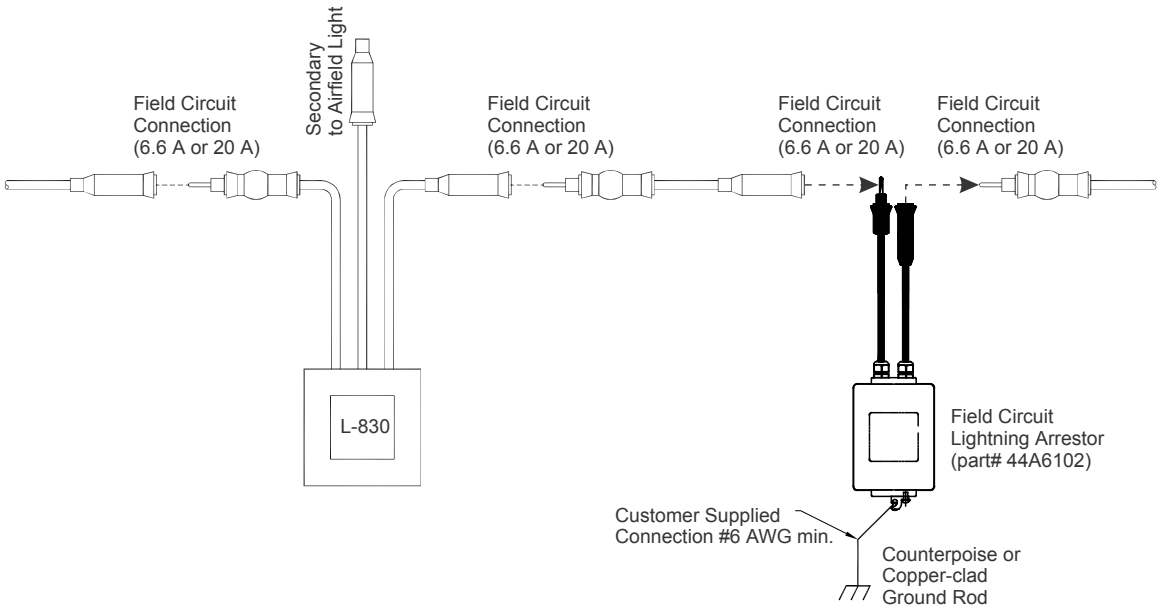
**Note**
IF COUNTERPOISE LIGHTNING WIRE IS NOT PRESENT, an 8 ft. (min) long copper clad steel grounding rod may have to be added in the vicinity of the FLA. It may be possible in some locations to add the ground rod through a pre-existing hole in the bottom of the light base can. Connect ground wire between the grounding screw on the enclosure using a UL 467 ground lug, or equivalent, and the grounding rod.

**Note**

Depending on the design of the counterpoise lightning system, connecting the FLA directly to a dedicated ground rod may provide more effective protection of the circuit.

6. After the FLA has been installed, reinstall the light fixture back onto the light base and torque the mounting bolts to the required torque specifications found in the equipment product manual.

**Figure 1: Connection Diagram**




## 3.5 Equipment Specification Data

**Table 1: Operating Specification**

| Model | FLA |
|---|---|
| Nominal Voltage | 6 KV |
| Continuous Operation Voltage | 5.1 KV |
| Duty Cycle | 10 kA crest (20 current surges)<br>40 kA crest (2 current surges)<br>8 / 20 µs waveshape |
| High Current Discharge (Short Duration) | 100 kA crest (2 current surges)<br>4 / 10 µs waveshape |
| Low Current Discharge (Long Duration) | 250A crest (20 current surges) 2000 µs duration |
| Maximum Discharge Voltage | 19.8kV Crest @ 10kA, 24.7KV Crest @ 40kA 8 / 20 µs waveshape |
| Protection Index | IP68 (NEMA 6P) |
| Operating Temperature | -40°F to +140°F (-40°C to +60°C) |
| Weight | 2 kg (4.4 lb) |

# 4.0 Troubleshooting

## WARNING

**ELECTRIC SHOCK HAZARD**

- 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.
- High voltage is present in an airfield series circuit which may result in personal injury, death, or damage to the equipment.
- A failed Field Lightning Arrestor case may be live. DO NOT troubleshoot the Field Lightning Arrestor on a live field circuit. Failure to disconnect the power supply may result in personal injury, death, or damage to the equipment.

**Failure to follow these warnings will result in death or equipment damage.**

The Field Lightning Arrestor (FLA) is connected between the series circuit and earth ground. If damage to any FLA is suspected, remove the series circuit wires from the output of the CCR and meg the entire series circuit. Compare this meg-ohm reading with previously recorded readings. If there has been a sudden, significant drop in the meg-ohm reading, a damaged FLA may be present. See FAA AC 150/5340-26, Chapter 5 for guidance on expected meg readings on new circuits and normal degradation of existing circuits. Isolate the suspected failed FLA using normal series circuit troubleshooting techniques. Note that the source of lowered insulation resistance may be due to existing series circuit wiring or isolation transformers. See FAA Advisory Circular 150/5340-26 (current edition) for series circuit troubleshooting guidance.

## Note

Series circuit insulation resistance is normally tested using either 500Vdc or 1000Vdc. The insulation resistance of series circuits with Field Lightning Arrestors can be tested with voltages up to 5000Vac or 7070Vdc.

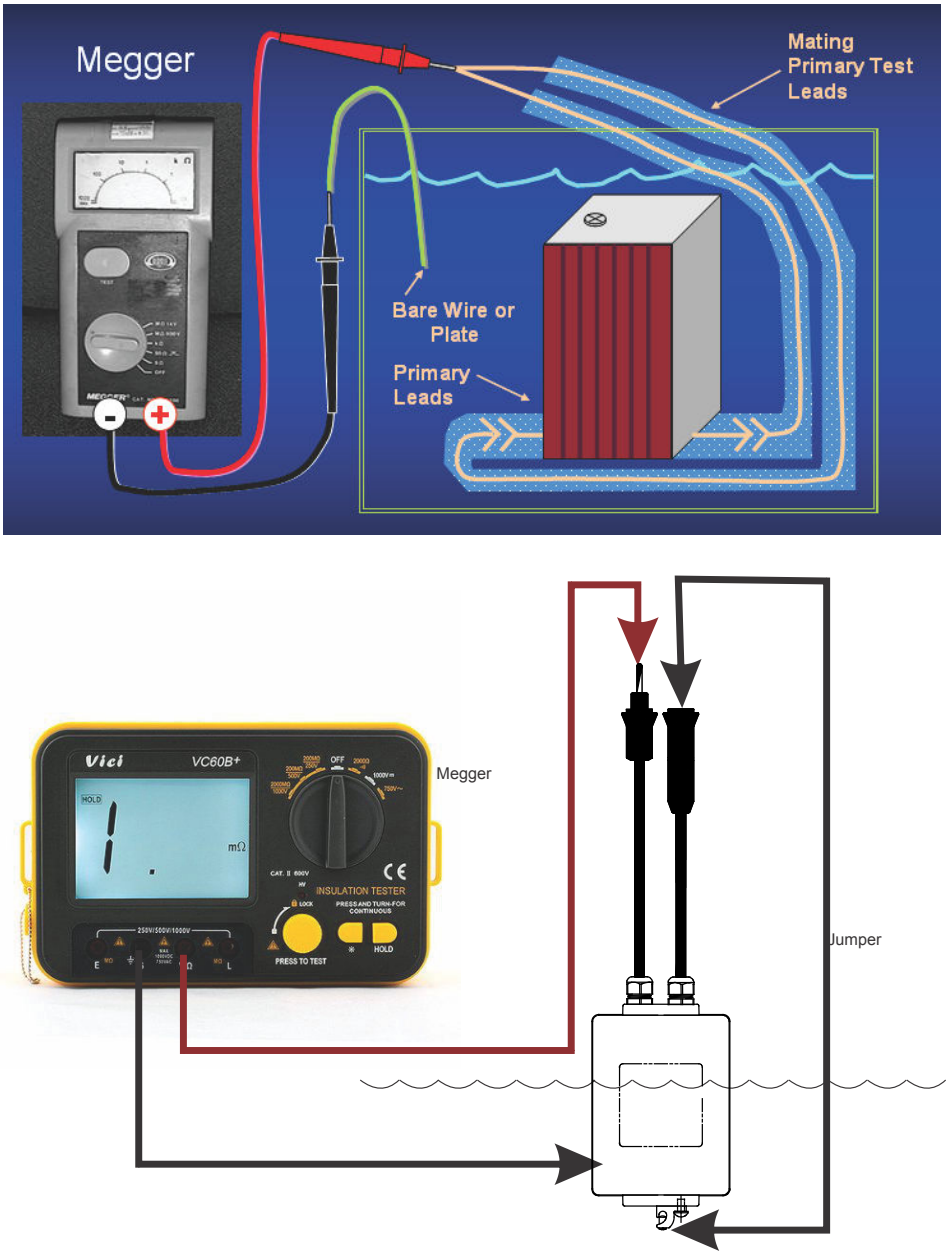
The following physical evidence may be present as a result of lightning strike(s):

- A section of the airfield circuit may be dim or not lit.
- Visual evidence of physical damage to either cordset or the FLA enclosure.
- Ground wire is missing (vaporized).
- Burnt smell is present.

The following troubleshooting may be performed on the FLA to further determine if the device has failed:

- Remove the FLA from the series circuit.
- Connect an ohmmeter from the male connector pin to the female connector pin. The measured resistance should be less than 2 ohms. If the resistance is significantly higher, the lead connectors have been damaged. If the resistance is infinity, there is an open in the cordset wiring. In either case, the FLA must be replaced.
- See Figure 2. Connect the FLA to some mating cordsets and drop the FLA in a bucket of water. Connect the positive (red) terminal of a meg-ohm meter to the cordset leads. Put the negative (black) terminal of the meg-ohm meter in contact with the water or the ground wire. This is typically done by attaching a wire to a metal plate and dropping the metal plate in the water. Bring the attached wire out of the water and connect it to the negative terminal of the meg-ohm meter. Meg the FLA at 1000VDC for 1 minute. At the end of 1 minute, the insulation resistance should be greater than 2G ohms. If the resistance is less than 2G ohms, replace the FLA.

**Figure 2: FLA Field Insulation Resistance Check**

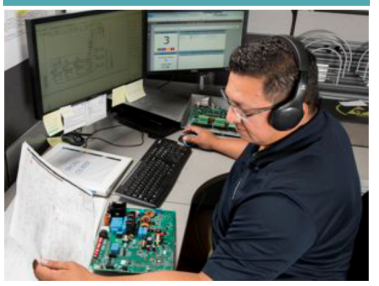


# Appendix A: SUPPORT

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 |

| | |
|---|---|
| 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 |

| | |
|---|---|
| ADB SAFEGATE Sweden AB | ADB SAFEGATE, Sweden:<br>Djurhagegatan 19<br>SE-213 76 Malmö<br>Sweden |
| Contact:<br>Tel.: +46 (0)40 699 17 00,<br>Fax: +46 (0)40 699 17 30 | Email: marketing@adbsafegate.com<br>Internet: www.adbsafegate.com |

| | |
|---|---|
| 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 |
| Contact:<br>Tel.: +86 (10) 8476 0106,<br>Fax: +86 (10) 8476 0090 | Email: china@safegate.com<br>Internet: www.adbsafegate.com |

| | |
|---|---|
| ADB SAFEGATE Germany GmbH | ADB SAFEGATE Germany GmbH, Mannheim:<br>Konrad-Zuse-Ring 6,<br>D-68163 Mannheim<br>Germany |
| 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 |

# Powering Your Airport Performance from Approach to Departure

adbsafegate.com