ITX-A Series Circuit Isolation Transformers

User Manual

DM00021-000-01, Rev. 1.1, 2023/08/09

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 below, 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 manufactured by ADB SAFEGATE 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 applicable sales agreement for a complete warranty description.

Replaced or repaired equipment under warranty falls into the warranty of the original delivery. No new warranty period is started for these replaced or repaired products.

FAA Certified products manufactured by ADB SAFEGATE

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 LED products (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). These FAA certified constant current (series) powered LED products must be installed, interfaced and powered with and through products certified under the FAA Airfield Lighting Equipment Program (ALECP) to be included in this 4 (four) year warranty. This includes, but is not limited to, interface with products such as Base Cans, Isolation Transformers, Connectors, Wiring, and Constant Current Regulators.

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Note

See your sales order contract for a complete warranty description.

Replaced or repaired equipment under warranty falls into the warranty of the original delivery. No new warranty period is started for these replaced or repaired products.

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
Failure to observe a warning may result in personal injury, death or equipment damage.

DANGER - Risk of electrical shock or ARC FLASH
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
Failure to observe may result in serious injury.

WARNING - Do not touch
Failure to observe this warning may result in personal injury, death, or equipment damage.

CAUTION
Failure to observe a caution may result in equipment damage.

ELECTROSTATIC SENSITIVE DEVICES
This equipment may contain electrostatic devices.

Qualified Personnel

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

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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

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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 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.

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1.1.5 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

1.1.6 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

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1.1.7 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

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2.0 Isolation Transformers for Airfield Lighting Systems

This manual covers all information pertaining to the ADB Safegate ITX-A Series Circuit Isolation Transformers.

2.1 About this manual

The manual shows the information necessary to:

- Install and maintain ADB Safegate ITX-A Series Circuit Isolation Transformers in an airfield application.

2.1.1 How to work with the manual

1. Become familiar with the structure and content.
2. Carry out the actions completely and in the given sequence.

2.2 Introduction

2.2.1 Series Circuit Isolation Transformer

Compliance with Standards

FAA	AC 150/5345-47 (Current Edition) ETL Certified

Uses

Designed for use in airfield lighting systems to isolate low voltage light fixtures from the high voltages in airfield series lighting circuits. The primary winding of the transformer is connected to a 6.6 A high voltage series circuit supplied by a constant current regulator. The secondary winding of the transformer delivers an isolated 6.6 A low voltage to the light. Operates on series circuits rated up to 5,000 Vac.

The isolation transformer electrically isolates the high voltage primary and low voltage secondary winding to ensure continuity of the series circuit even if a light has been disconnected or has failed (commonly due to lamp failure).

Series circuit components and connectors must be installed as per the recommendations shown in FAA AC 150/5340-30 (latest revision) or local regualtory requirements. There are many installation variables outside the control of ADB Safegate that may affect the overall circuit insulation resistance.

Features

- High voltage isolation between the primary/secondary windings
- Insulation voltage rating 5000 Vac
- Waterproof encapsulated body with molded on cable leads
- Factory-molded L-823 plugs and receptacles provide quick and easy connections
- Molded on secondary FAA L823 style 8, two-socket contact receptacle lead for frangible mounting, 12 AWG 600 Vac
- Molded primary FAA L823 style 2 plug and style 9 receptacle leads, 8 AWG 5,000 Vac
- Reinforced construction to withstand the rugged airfield conditions
- Fully encapsulated design can be safely immersed in water and suitable for direct bury use
- Chemical resistance: Acid, alkali, and oil-resistant design is safe for deicing fluids and other common fluids found on an airfield
- UV-resistant design is safe for exposure to sunlight
- Temperature-resistant design is safe for use at –67 to +149 °F (–55 to +65 °C)
- Made in Columbus Ohio, USA and meets the requirements for Buy American Preference

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General Notes

ADB Safegate is not responsible for series circuit insulation resistance requirements above the limits defined in FAA AC 150/5340-30 or AC 150/5340-26 (latest revisions).

Characteristics

Wattage	FAA Type	Primary current (A)	Secondary current (A)	Minimum Efficiency (%) [1]	Secondary Maximum Open-Circuit Voltage - VRMS	Weight - (lb (kg))
10/15	L-830-16	6.6	6.6	70	8.0	2.6 (1.2)
20/25	L-830-17	6.6	6.6	70	8.0	2.8 (1.3)
30/45	L-830-1	6.6	6.6	80	25	3.0 (1.4)
65	L-830-3	6.6	6.6	80	30	4.8 (2.2)
100	L-830-4	6.6	6.6	85	70	5.9 (2.7)
150	L-830-18	6.6	6.6	85	70	6.7 (3.0)
200	L-830-6	6.6	6.6	90	100	10.6 (4.8)

Notes
1 Minimum power factor is 0.95 and minimum efficiency is as stated at 6.6 A input, at rated resistive load.

2.3 Installation

ADB Safegate Series Circuit Isolation Transformers installation procedures are covered in this section.

The isolation transformers are shipped ready to install in the airfield series circuit.

WARNING
Refer to the FAA Advisory Circular AC 150/5340-30 (current edition), Design and Installation Details for Airport Visual Aids, for details on installation requirements.

2.3.1 Unpacking

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

2.3.2 Installation Procedure Options

The following diagrams show the two main option for isolation transformer installation.

WARNING
Refer to the FAA Advisory Circular AC 150/5340-30 (current edition), Design and Installation Details for Airport Visual Aids, for details on installation requirements.

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WARNING

Read installation instructions in their entirety before starting installation.

- Do not install a damaged isolation transformer in any circuit.
- Do not disconnect an isolation transformer from an operating series circuit. Extreme voltages will result, along with the possibility of an arc flash explosion. Failure to follow this instruction can result in injury, death, and equipment damage.

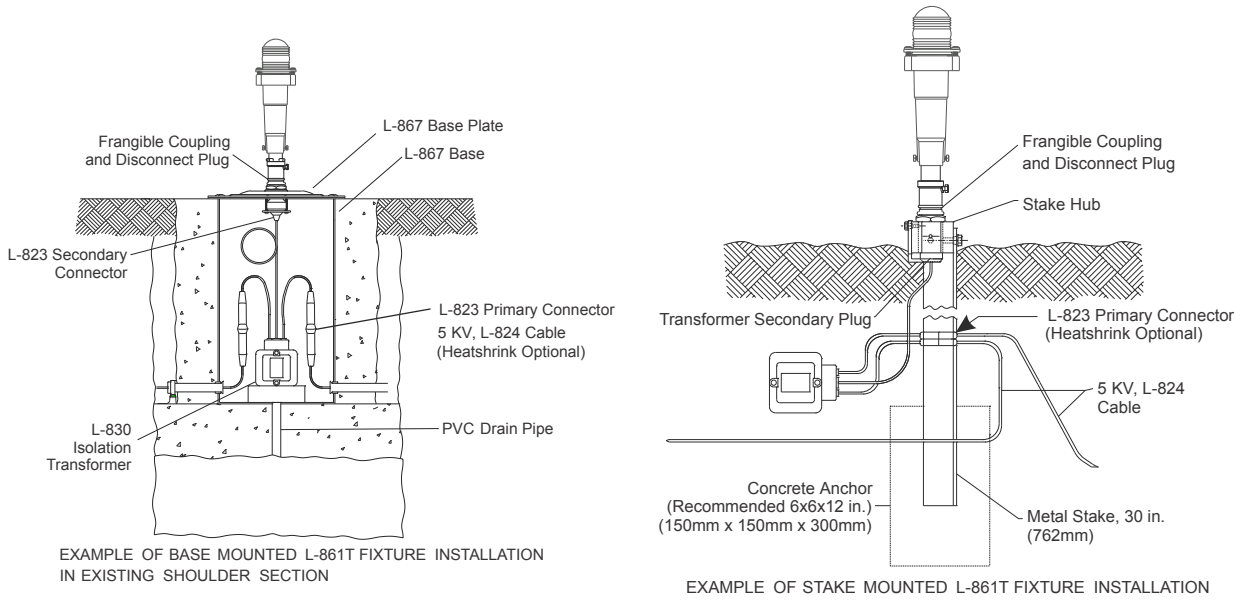
To protect and help insulate the primary circuit from earth, wrap connections with at least one layer of rubber or synthetic rubber tape, and one layer of plastic tape, one-half lapped, extending at least 1 1/2 in (3.8 cm) on each side of joint.

If you are using heat-shrink on the connections, see the **Heat Shrinkable Airfield Lighting Kit** section of the ADB SAFEGATE website, www.adbsafegate.com.

Installation Examples

The following figure shows examples of two common types isolation transformer installation.

Figure 1: Installation Examples



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3.0 Maintenance

ADB Safegate Isolation Transformers require little maintenance.

- Keep primary and secondary connections clean and dry to help insulate the circuit from earth.
- When available, visually inspect the isolation transformer for swelling or bulging. This can be evidence that a surge event has occurred, such as a lightning strike, and the isolation transformer should be replaced.
- When available, visually inspect the isolation transformer and cable assemblies for cracks or signs of damage, or deterioration. Replace isolation transformer as needed.

WARNING

De-energize the circuit prior to cleaning the connectors or replacing an isolation transformer.

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4.0 Troubleshooting

To inspect an isolation transformer for possible damage, maintenance personnel must refer to the maintenance procedure described in the ICAO Airport Services Manual, Part 9, Airport maintenance practices, and in FAA Advisory Circular AC 150/5340-26.

DANGER

Electric Shock Hazard
Use proper electrical safety procedures

- Do not carry out any action on the fixture unless you have read and understood all the information in the Safety Section.
- 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.
- Make sure that the power to the series circuit is OFF when you carry out maintenance.

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

1. De-energize and Lockout/Tagout the circuit using local procedures.
2. Inspect the entire assembly if an isolation transformer fault is suspected.
   To test a secondary circuit on a live airfield, USE EXTREME CAUTION.
3. Place a current testing device around the secondary wire.
4. Energize the circuit and note the secondary current.
5. Tagout/Lockout the circuit using local procedures and remove current testing.
6. Correct any fault or replace any damaged part found.
7. After replacement, clear the circuit, close any hatches or covers and place the circuit back in service.

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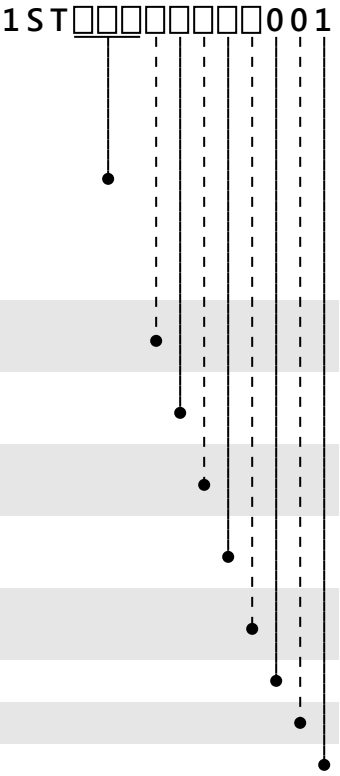
5.0 Parts

Ordering Code



Power Range
010 = 10/15 W
020 = 20/25 W
045 = 30/45 W
065 = 65 W
100 = 100 W
150 = 150 W
200 = 200 W

Primary Current
6 = 6.6 A

Secondary Current
6 = 6.6 A

Frequency
6 = 60 Hz

Earthing
0 = Without earthing connection

Secondary Lead
1 = 48 in (1219 mm) Style 8

0

0

1

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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
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Rest of Europe: +46 (0) 40 699 17 40
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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.

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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.

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