8-inch Taxiway LED Inset Light Type LTS / LTC

User Manual

AM.03.450e, Rev. 6.5, 2023/01/24

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 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.

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.

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 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.

1.1.5 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

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

2.0 Information about this Manual

2.1 Parts Identification

Parts identification symbols (e.g. A1, E4...) appearing in the text, refer to the Exploded Views section.

3.0 Product Information

3.1 Overview

3.1.1 Introduction

In this chapter you will find all the general information and the identification of the ADB SAFEGATE taxiway inset lights types LTS/LTC.

3.2 General Information

3.2.1 LTS/ LTC

The ADB SAFEGATE taxiway inset lights types LTS/LTC are light fixtures which provide optimum visual guidance along the taxiway centerline with minimal maintenance, extremely low life-cycle costs and maximum reliability. They are designed to withstand the high impact and roll-over loads imposed by today's wide body aircraft during taxiing operations while remaining waterproof and serviceable.

The LTS/LTC taxiway centerline fixtures are usually shipped ready for installation on an ADB 8" Eurobase or HPI Shallow base. For installation on a 12" ADB or FAA shallow base or FAA deep bases (L-868 size B) an adapter ring is required.

The ADB taxiway inset lights types LTS/LTC are intended for the following uses:

Centerline lights, in straight and curved sections and on rapid exit taxiways, Intermediate holding position lights, De-/anti-icing facility exit lights, Apron lead-in lights, Runway guard lights where applicable and Stop bar lights.

- LTS: straight section.
- LTC: curved section.

3.2.2 Monitoring Option

A version with monitoring capability is available, for use with either the Lamp Fault Detection option of Constant Current Regulators or with Individual Light Control and Monitoring Systems (ILCMS) that check the status of the light by performing a continuity test on the secondary of the ILCMS remote module.

In case of failure of any of the LEDs, the failure is detected by the electronics embarked in the light. The electronics opens the input circuit of the light, so that the faulty light can then be detected as an open circuit, identical to a failed filament lamp.

Many ILCMS systems exist, with no standardization of the operational conditions. Incompatibility between the ILCMS system and the light might result in faulty information given to the tower with respect to the ICAO requirements for serviceability of the airfield lighting system.

WARNING

It is therefore strongly advised to ask your ADB representative a confirmation of the compatibility of the ILCMS system and the light.

3.2.3 Purpose of this Manual

This manual describes procedures for the installation, maintenance and troubleshooting of the inset light type LTS/ LTC.

3.2.4 Scope of this Manual

This manual covers the LTS/LTC taxiway centerline light fixtures manufactured in accordance with FAA specification AC 150/5345-46 (except for photometry when it differs from ICAO Annex 14) and compliant to ICAO annex 14.

3.3 Equipment Data

3.3.1 Equipment supplied

Each unit is supplied completely assembled, tested and sealed, ready for installation. The electrical connection is made via one cable assembly with either FAA L-823 style 6 2-pole plug, 3-pole plug derived from FAA L-823 style 6 or flat 3- pole plug. A labyrinth gasket is included.

Each unit is individually packed in a durable, cushioned and corrugated cardboard box, labeled with ADB ordering number.

Upon customer request, the lights can also be palletized in a cardboard box in a number of layers, each fitting separated by cardboard.

At least one instruction manual is delivered per order.

3.3.2 References

Note

Ordering codes and reference data pertinent to the light fixture and its components are listed in the tables in the Ordering Codes and Exploded Views section.

3.3.3 Differences between Versions

All the inset lights used for a particular function look externally identical.

The differences between versions depend on the LED type used.

Make sure to use a fixture with the correct color coding when installing it onto its base.

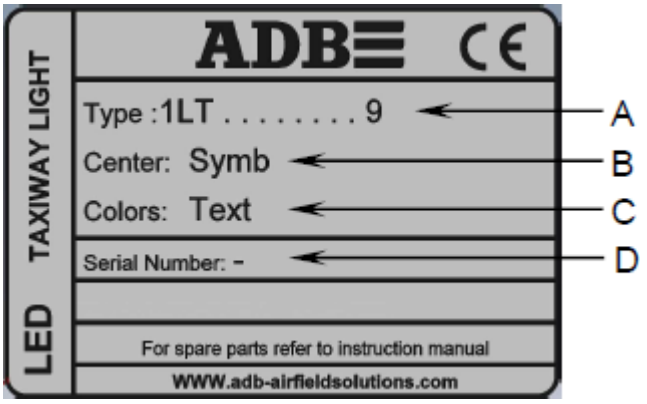
3.3.4 Name Plate

A name plate is attached to the bottom of the light, where:

- A: the fixture code.
- B: the toe-in:
  - ↑: points in the direction of the centreline or the centre of the curve.
  - •: no toe-in.
- C: the colour of the light at side 1 and 2.

  E.g. G/Y means green at side 1, Yellow at side 2.
- D: Serial number.

Refer to to the ordering code in the Ordering Codes and Exploded Views section.

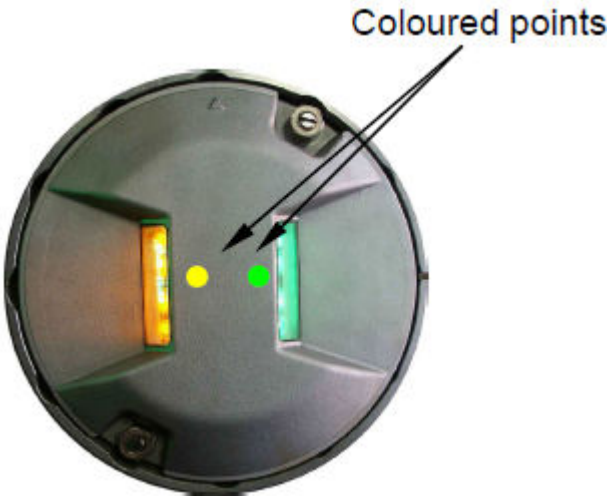


3.3.5 Beam Color

The colors of the beams are identified by colored points atop the window. A green point, for example, refers to a corresponding green LED source.

Note

Refer to the ordering code in the Ordering Codes and Exploded Views section.



3.3.6 Equipment required for Installation and Maintenance

Beyond the light itself, some equipment is required for installation and maintenance. This equipment is not supplied with the light but can be obtained through ADB SAFEGATE.

Note

It is listed in the Use the correct Fixing Hardware section.

4.0 Mounting and Connection

4.1 Overview

4.1.1 Introduction

This chapter instructs you how to connect and mount the LTS/LTC inset light on its base or adapter ring.

It includes important safety notifications regarding the choice and use of fixing hardware.

Note

It is supposed that the base supporting the LTS/LTC inset light, the adapter ring (if needed) and the secondary connector are already installed. All information pertinent to the installation of bases is available in the instruction manual Am.05.120, Edition 2.2 or subsequent.

4.2 Important Safety Notifications

4.2.1 Fixing Hardware

Various types of fixing hardware can be used for the fixation of the light on its base or adapter ring (e.g. screws or studs and nuts). Moreover, bases and adapter rings may be supplied with threaded holes according either to ISO metric or UNC standards.

WARNING

Only use fixing hardware of the same type as the one originally supplied with the base or adapter ring!

Always tighten the fixing hardware to the recommended torque, using a calibrated torque wrench and applying the recommended type of sealant!

Refer to the How to mount the Light Assembly? section for the tool to use, the requirement for use of Loctite and the torque to apply.

It is possible to insert a 3/8"-16 UNC screw in a M10 threaded hole. However, such a combination damages the female thread and does not ensure a correct fastening so that the screw could become loose under repeated operation of rolling aircrafts. Using screws of incorrect standard might lead to either damage to the thread in the base or to an incorrect fixation of the lights.

Generally, using fixing hardware of a different type of the one originally supplied with the bases or adapter rings, or tightening it at an incorrect torque, may lead to a loosening of the fixing hardware, damage to the light and base, and potentially to the separation of the light fitting or parts thereof from its base. This can lead to a highly dangerous situation of Foreign Object Debris (FOD), with potential lethal consequences.

4.3 General Recommendations

4.3.1 Receiving, Storage and Unpacking

1. Upon receipt of goods at the site store, check all packing for visible damage.
   Every damaged box should be opened and its contents inspected for damage.

   Note

   If equipment is damaged, a claim form shall be filed with the carrier immediately. It may then be necessary for the carrier to inspect the equipment.

2. Store the light assembly preferably in its original packing in a protected area.

When stored unpacked (not recommended), please take care not to damage the cable insulation.

3. Unpack the light assembly at the installation site to avoid damage during transportation and handling.

4.3.2 Electrical Connection

The light assemblies covered by this manual are designed for connection to 6.6 or 20 A series circuits via one (or more) L-830 or L-831 series transformer. (In case of use on a 20 A series circuit, we consider that the series transformer is a 20 A / 6.6 A transformer). The current to the light should not exceed 6.6 A + 3%.

For the version of the LTS/LTC with monitoring option, the power of the series transformer is limited to max. 200W.

Refer to ADB cat. leaflet A.06.112 or Instruction manual AM.06.112 for more information on series transformers.

The series transformer and associated connectors have to be ordered separately.

4.3.3 Base Earthing

Whatever the chosen installation method, it is strongly recommended to earth the base, especially in locations presenting a risk of lightning strikes.

WARNING

This recommendation is extremely important in case of LED lights: this is the only way to guarantee a complete effectiveness of the protection system against voltage surges included in the light fitting.

Failure to earth correctly the base will void the warranty for all damages occurring as a result of voltage surges.

Note

Guidelines on how to realize the earthing of the base are given in instruction manual Am05.120.

4.3.4 Location and Tolerances

The applicable documents for location details and tolerances are the following:

Table 1: Compliance

Organization	Applicable documents
ICAO	Annex 14
	Aerodrome Design Manual Part 4
FAA	Advisory Circular AC no. 150/5340-30

4.4 How to mount the Light Assembly?

4.4.1 Before you start

Make sure that the contact surfaces of the light assembly with base or adapter ring and the gaskets are absolutely clean and smooth.

4.4.2 Use the correct Fixing Hardware

Please refer to the Important Safety Notifications section: **only use fixing hardware of the same type as the one originally supplied with the base or adapter ring!**

In ADB shallow bases delivered since mid-2006, the type of thread is indicated on the bottom or the flange of the base: **METRIC M10** or **3/8"-16UNC**.

How to be sure of the type of fixing hardware you are using?

- M10 screws require the use of a 17mm socket.
- 3/8"-16UNC screws require a 9/16" socket, this is approximately 14.3mm.

WARNING

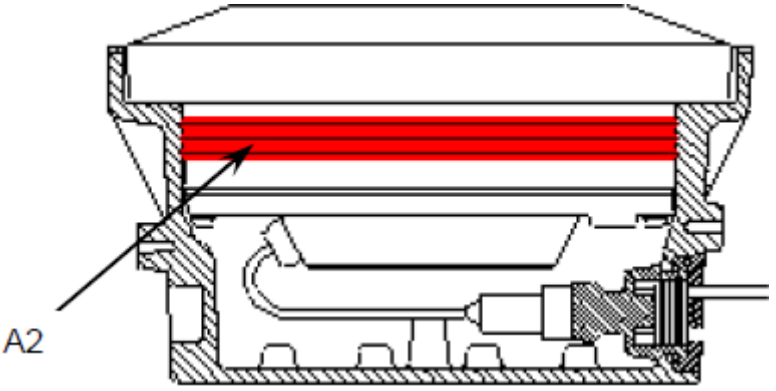
On a base or adapter ring with metric M10 female thread, never use a screw that can be fastened with a socket smaller than 17mm: it would indicate that you are inserting a 3/8"-16UNC screw in a M10 female thread.

The opposite -inserting a M10 screw in a 3/8"-16UNC female thread- is impossible.

4.4.3 How to mount the Light Assembly?

To mount and connect the light assembly, proceed as follows:

1. In case a light has already been mounted on the base, remnants of Loctite are present in the fixation holes. Clean them using a cleaning tap for blind holes (preferably use a tap with a right spiral groove) and blow with dry, oil-free compressed air.
2. If the labyrinth gasket (A2) is not installed, put a new, clean one in the dedicated groove at the cover periphery.



CAUTION

Never re-use an already used gasket.

3. Slightly moisten the gasket with soapy water, to lubricate.

CAUTION

Never lubricate the gasket with silicone or any other kind of grease. Avoid the use of soap containing silicone or glycerine.

4. Apply Loctite on the three first threads of the threaded holes in the base.

CAUTION

Always use Loctite 2701 to fasten the light fixture on its support.

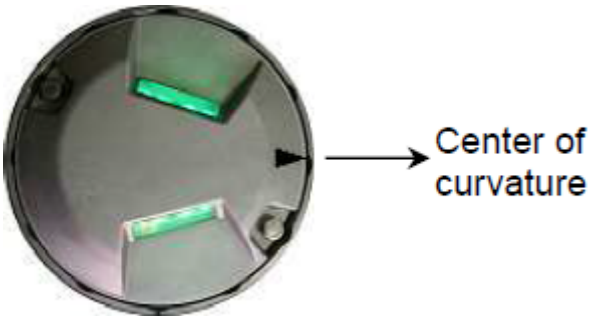
5. Connect the light by inserting its plug into the receptacle of either the shallow base, the secondary cable or the transformer.
6. Gently install the light fixture; press it home in the adapter ring or base. Make sure not to drop the light assembly or to pinch the wires.

CAUTION

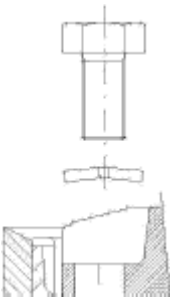
Verify the light fixture is seating correctly onto the base or adapter ring

CAUTION

In case of curved sections of taxiway, make sure that the arrow on the Center of top of the light is pointed curvature toward the center of curvature of the taxiway.



7. Make sure that the lock washers are mounted correctly-dents facing upwards - to avoid denting the cover.



8. Torque down gradually the 2 screws (or self-locking nuts in case of a stud-equipped base).

CAUTION

Make sure the screws are tightened with a torque of 21 Nm/190 Lb.in .

4.5 Installation of Adapter Ring

4.5.1 Adapter Ring Installation

To install the adapter ring, proceed as follow:

1. Clean the contact surfaces of the deep base and adapter ring.

   In case an adapter ring has already been mounted on the base, remnants of Loctite are present in the fixation holes. Clean them using a cleaning tap for blind holes (preferably use a tap with a right spiral groove) and blow with dry, oil-free compressed air.

2. Put onto the contact layer of the base a layer of RTV106 (ADB NC 7835.55.151 or equivalent).
3. Apply Loctite on the three first threads of the threaded holes in the base.

CAUTION

Always use Loctite 2701 to fasten the adapter ring on its support.

4. Mount the adapter ring onto the base and torque down the fixation screws.

CAUTION

Make sure the screws are tightened with a torque of 21 Nm/190 Lb.in .

5. Install the light as described above.

5.0 Maintenance

5.1 Overview

5.1.1 Introduction

This chapter describes the general ideas on workshop maintenance and preventive maintenance and you will learn how to lift the unit out of the base or adapter ring. The servicing of the light assembly in the maintenance workshop will be described in detail in the Servicing in the Maintenance Base chapter .

5.1.2 Warranty Limitation

The lights are delivered fully tested and sealed. In case of malfunctioning during the warranty period, the defective light shall be shipped back to ADB SAFEGATE without opening it. Any attempt to open the light during the warranty period will void the warranty.

5.2 Workshop Maintenance and preventive Maintenance

5.2.1 Workshop Maintenance

The light assemblies can be serviced in the field, but it is recommended to limit field maintenance to cleaning the prisms. It is recommended to replace the inset lights at regular intervals and to have them overhauled in the maintenance shop. The same applies to lights found unserviceable in the field.

No specific tools are required to remove or re-install the fittings, except for the lifting tool. Refer to the Lifting Tool section.

5.2.2 Preventive Maintenance

The assembly's service life depends to a large extent on its waterproofness. All metal mating surfaces and seals must be clean, smooth, dry and free of all foreign particles if the light fixture is to operate for extended periods without requiring maintenance.

Greasing of O-ring seals may be required as indicated in this manual.

Preventive maintenance of the light fixtures should be performed as listed in the table on the next page.

Maintenance frequency depends on the conditions under which the taxiway is used (i.e. climate, traffic, etc.). The recommended practices for maintenance are described in the FAA advisory circular no. AC 150/5340-26 and in the ICAO Airport Services Manual, Part 9 Airport Maintenance Practices.

Reference

For components mentioned in this chapter, refer to the Exploded Views section.

5.2.3 Preventive Maintenance Tasks

In the table below you will find a checklist of preventive maintenance tasks. In case lights are found to be defective during the warranty period, do not open them as explained below, but replace them by new units, and send the defective ones, unopened , to ADB SAFEGATE.

Interval	Check	Action
Daily	For low light output	1. Clean outer surface of prism if dirty. 2. Check for misalignment or presence of moisture in fixture.
Weekly	For obstruction in light output channel	Clean channel and prism surface.
Monthly [1]	For presence of moisture or water (visual inspection for condensation on inner side of prisms) For LED failure	1. Open up light assembly. 2. Clean, dry and inspect. 3. Replace cover/inner cover gasket and other parts found defective.Replace cover assembly.
Bimonthly	Torque on hold-down bolts	Refer to the paragraph "How to mount the light assembly?", page 19, for the tool to use, the requirement for use of Loctite and the torque to apply.
Semi-annually [1]	For presence of water in base	1. Pump water from the base. 2. Remove, dismantle and inspect light for water damage. 3. Cure the cause of water ingress.
After snow removal	For damaged light fixtures	1. Replace badly damaged fixtures. 2. Use a power broom for snow removal in the vicinity of the light fixture, if practical. 3. Follow recommended snow removal techniques described in FAA AC 150/5200-30 to avoid or at least to reduce damage to light fixtures.

Notes
[1] * More frequently during rainy seasons.

5.3 How to lift the Light Assembly out of the Base or Adapter Ring

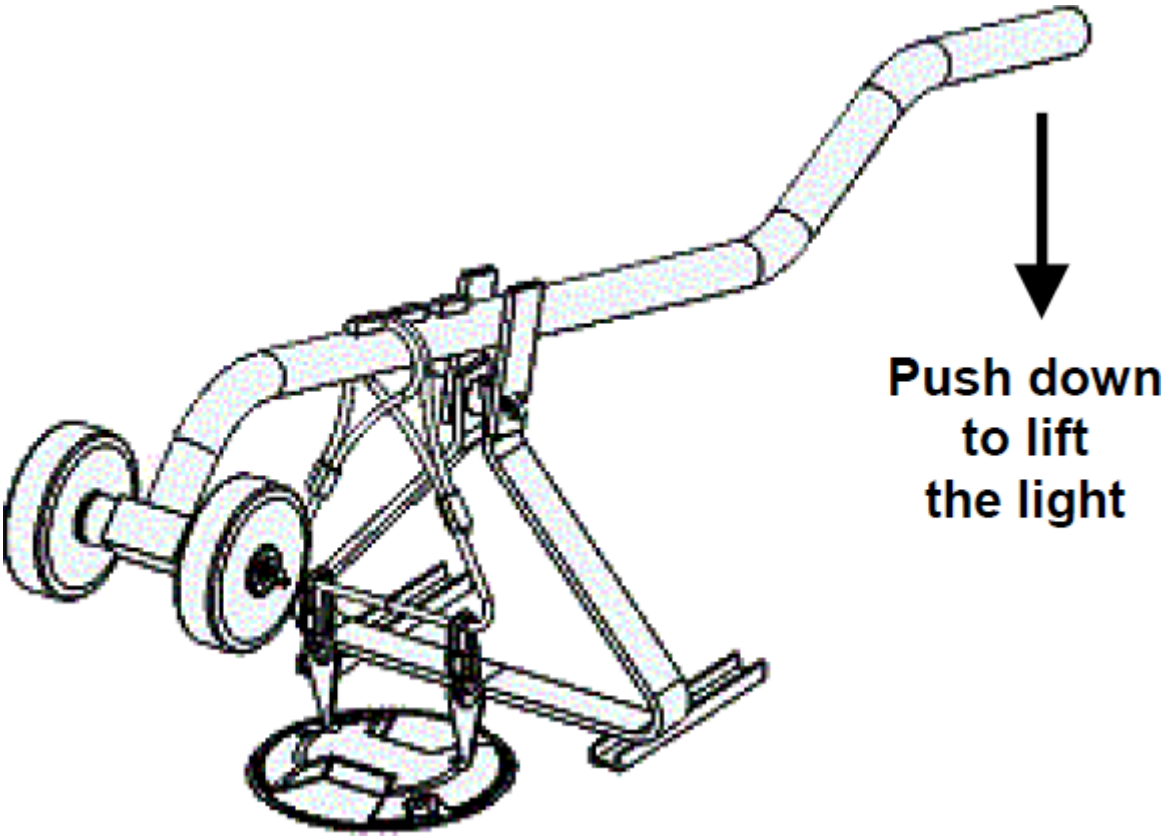
5.3.1 Lifting Tool

Beside the simple jig delivered with the standard tool case, ADB SAFEGATE has developed a more sturdy and efficient lifting tool (see illustration below). Refer to the Accessories section.

5.3.2 Procedure

To lift the optical unit out of the base receptacle or adapter ring, proceed as follows:

1. Remove the fixing screws and washers (A1) or self locking nuts and discard them.
2. Fit the appropriate lifting tool into both holes located (180° apart) in the cover (B1), lift the optical unit out of the base or adapter ring and place it next to it.



3. Disconnect the light fixture wires from the power wires coming from the transformer(s).
4. Remove the labyrinth gasket (A2) and discard it.
5. Mount a serviced or new fitting as described in the How to mount the Light Assembly? section.
6. Take the optical unit back to the maintenance base where it can be serviced.

CAUTION

Never hold the light fixture by the wires as this may damage the insulation, break the waterproof seal and cause insulation faults and water leakage.

6.0 Servicing in the Maintenance Base

6.1 Overview

6.1.1 Introduction

This chapter describes how to perform the various servicing tasks in the maintenance base.

6.1.2 Preliminary

All the screws used in this product are listed at the end of this manual.

Note

Refer to the Screws Overview section for the tool to use and the torque to apply.

6.2 How to open the Light Assembly?

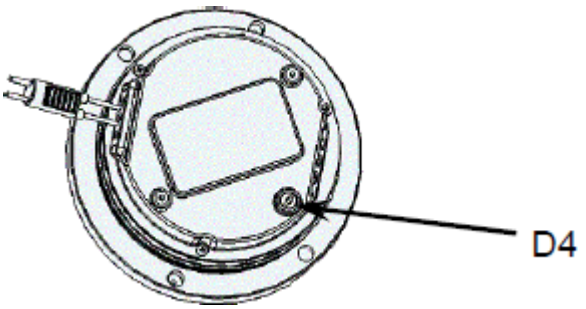
6.2.1 Procedure

To open the light assembly, proceed as follows (for the tools to use, refer to the Screws Overview) section:

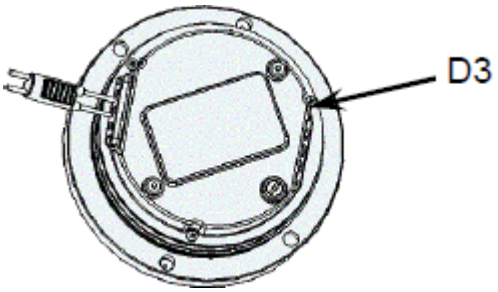
1. Turn the light unit upside-down.

   In order for the light to rest on a stable surface it is advised to lay it upside down on the top of a shallow base.

2. Remove the pressure release screw (D4).



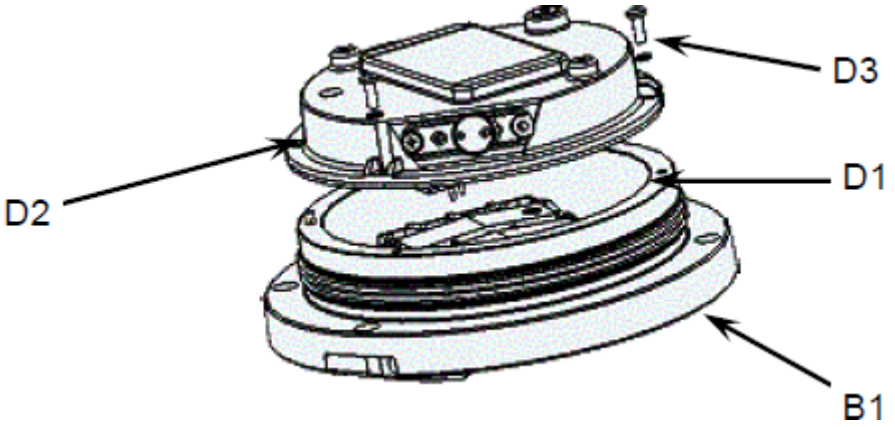
3. Remove the five screws (D3).



CAUTION
Do not apply a torque higher than 2.5 Nm and do not use an attack driver: in both cases the screw head could break. Make use of a torque wrench to avoid exceeding the maximum torque.

4. Carefully lift-off the inner cover (D2) from the top cover (B1), taking care not to damage the flat-wire connections between the main PCB and the LED assemblies.

   When the inner cover does not separate from the cover assembly, use the screwdriver flat blade to separate it.



CAUTION
Be careful, do not pull on the flat cable when you lift the inner cover, this might damage the connections! Disconnect the connectors before laying the inner cover on the table

Disconnect the LED assemblies from the main PCB by pulling out their connectors.

Use a small flat screwdriver to separate the connector from its base.

CAUTION
Do not pull on the flat cable to disconnect as the cable might be pulled out of the connector. Always use a small screwdriver.

5. Now you can take the inner cover away from the top cover.

CAUTION
Always replace the cover / inner cover gasket (D1) and the 5 screws with washers (D3) by new ones when a light is opened and closed again.

This to guarantee fixture water tightness.

6.3 How to replace a LED Kit?

6.3.1 Caution

Lights manufactured before 08/2013 (up to version "8" of the light) had a different optical system. The LED assemblies of the new version are not compatible with the old ones. To avoid any confusion, LED kit is available for the replacement of any LED components on all versions of the lights. It consists of:

- The LED assembly (C1)
- The collimator (B4)
- The flat seal (B3)
- The prism (B2)
- The prism gasket (B1)
- The screws (C1)
- An instruction notice

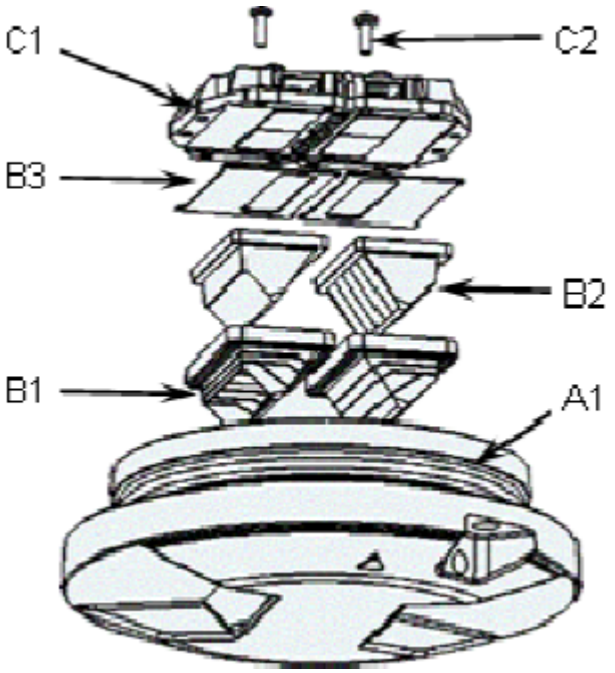
6.3.2 Procedure

To install a LED kit, proceed as follows:

Note

Refer to the Screws Overview Screws Overview section for the tool to use and the torque to apply.

1. Open the light assembly (see previous page).
2. Unscrew the eight screws (C2).Remove the Led assembly (C1), the collimator (B4), the flat seal (B3), the prism (B2) and the prism gasket (B2).



CAUTION

Do not apply a torque higher than 2.5 Nm and do not use an attack driver: in both cases the screw head could break. Make use of a torque wrench to avoid exceeding the maximum torque.

3. Remnants of Loctite are present in the fixation holes of the screws (C2).

Clean them using a cleaning tap for blind holes (preferably use a tap with a right spiral groove) and blow with dry, oil-free compressed air.

4. Replace the prism (B2), prism gasket (B1) and flat seal (B3) by the ones supplied in the kit.
   Refer to the How to replace a Prism and Prism Gasket? section, step 3 to 5.
5. Take the new LED assembly of the LED kit.

WARNING

Color is indicated by a coloured ring around the flat cable:

- Green ring: green LED assembly
- Yellow ring: yellow LED assembly
- Red ring: red LED assembly

Version is indicated by the number of rings:

- One ring: for a light without monitoring option
- Two rings: for a light with monitoring option

Put the new collimator and the new flat seal of the kit in the LED assembly (never re-use an already used flat seal).

CAUTION

Flat seal position is different between LTS and LTC. See below illustration for the correct positioning.

6. Install the new LED assembly with collimator, flat seal and screws over the prisms.

   Install new screws (C2) (do not forget the washers) and tighten them.

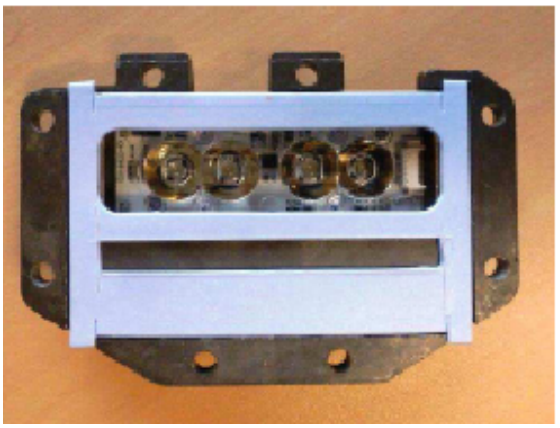
Note

If both LED assemblies of a straight bidirectional light must be replaced together, it is easier to install both assemblies in the cover before starting tightening the screws (C2).

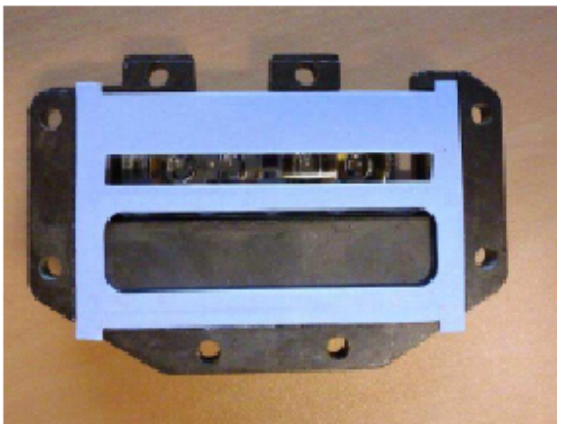
6.3.3 Illustration

Positioning of the flat seal:

LTS:



LTC



6.4 How to replace a Prism and Prism Gasket?

6.4.1 Procedure Prism and Prism Gasket

To replace the prism (B2) and the prism gasket (B1), proceed as follows:

1. First remove the LED assembly, collimator and flat seal (see previous page steps 1-2).
2. Push the prism (B2) with the prism gasket (B1) towards the inside of the cover (A1).
3. Clean the prism recess in the cover thoroughly with any effective solvent.Clean the collimator with alcohol or water and mild soap.

WARNING
Do not use solvents that might degrade the polycarbonate material.

4. Take a new prism

   Bring a new prism gasket (B1) over the prism (B2).

   Gently push the prism/gasket assembly in the prism recess from the inside

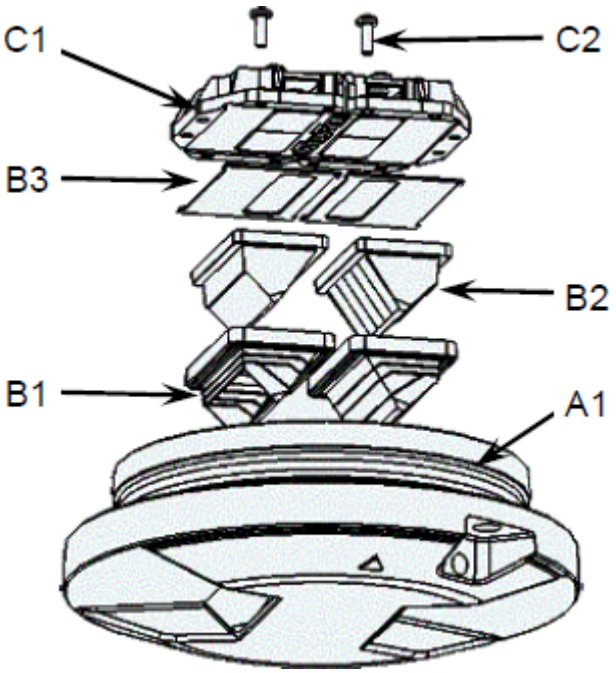
   Clean the inner surface of the prism.

5. Put the collimator and a new flat seal in the LED assembly (never re-use an already used flat seal), and take new screws (C2)

CAUTION
Flat seal position is different between LTS and LTC. See illustration on previous page for the correct positioning.

6. Re-install and fasten the LED assembly in the cover (see previous page).

6.4.2 Illustration



6.5 How to close and test the Light Assembly?

6.5.1 Cautions

1. ALWAYS REPLACE COVER/INNER COVER GASKET AND FIXING SCREWS BY NEW ONES!
2. Lights without monitoring option have been manufactured with only three - instead of five-fixation screws between the cover and inner cover. NEVER ATTEMPT TO MOUNT AN INNER COVER WITH MONITORING OPTION ON A COVER WITH ONLY THREE SCREWS! This might result in incorrect monitoring feedback.

6.5.2 Procedure

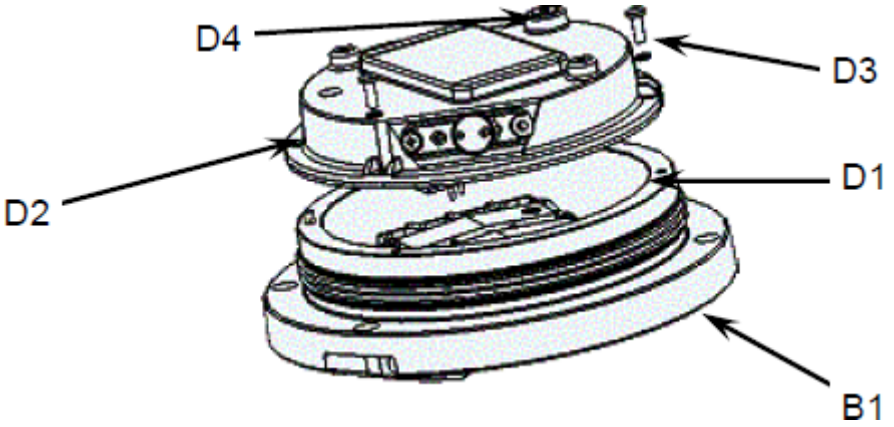
To close the light fixture, proceed as follows:

1. Turn the cover (B1) upside down. In order for the cover to rest on a stable surface it is advised to lay it upside down on the top of a shallow base.

2. Make sure the contact surfaces of the cover and of the inner cover to the gasket are clean.

   Remnants of Loctite may be present in the fixation holes of the screws D4. Clean them using a cleaning tap for blind holes (preferably use a tap with a right spiral groove) and blow with dry, oil-free compressed air.

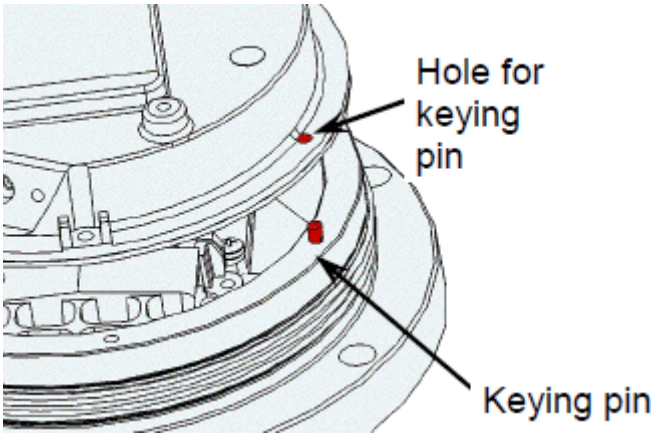
3. Put a new cover/inner cover gasket (D1) over the inner cover (D2



4. Check that the pressure release screw (D4) is loose or removed.
5. Connect the LED assemblies to the main PCB.

> **Note**
> Refer to the Correspondence Table page 36 to determine which LED assembly must be connected to which connector.

6. Gently put the inner cover (D2)on top of the cover (B1), taking into account the keying pin between both parts Make sure that all components in the cover and the inner cover such as the cover/inner cover gasket (D1) are correctly positioned and that the flat wires do not get damaged between cover (B1) and inner cover (D2).



7. Press the inner cover (D2) on the cover (B1) and secure with 5 new screws (D3) (do not forget the washers).

Note
Refer to the Screws Overview section for the tool to use and the torque to apply.

8. Check electrical insulation from two-pole plug to frame by means of a 500V insulation tester.

   Apply an AC current not exceeding 6.6 A on the two-pole plug and observe normal operation of the LEDs.

CAUTION
The electronic circuit is designed to be fed from a regulated AC current generator only (e.g. constant current regulator). Do not use a voltage generator as this might damage the electronic components or fail to energize the light.

9. Check waterproofness of the fitting by applying with dry air a pressure of 0.7 bar (70 kPA) above the atmospheric pressure via the pressure release hole. Whilst pressure is applied, immerse the light fixture for three minute in water and look carefully for any stream of air bubbles emanating from the light fixture.

   Dry the fixture and remove the air hose.

   Else, locate the leak source. Dry the fixture, remove the air hose. Replace the leaking gasket or part (check the contact surfaces for any scratches, corrosion or other damage) and repeat the test.For this purpose a water-tightness test adapter can be ordered from ADB (see ordering code in the Ordering Codes and Exploded Views section).

10. Replace the O-ring seal of the pressure release screw (D4) and secure the pressure release screw.

Note
Refer to the table Screws Overview section for the tool to use and the torque to apply.

6.6 Monitoring Option: How to repair a faulty Light?

6.6.1 Procedure

1. Open the light fitting as described in the How to open the Light Assembly? section.
2. Replace the fuse resistors as described in the Monitoring option: How to replace the Fuse Resistors? section.
3. Take a new top cover assembly (B1).

   Connect the LED assemblies to the main PCB of the inner cover (D2).

Note

Refer to the Correspondence Table in the Correspondence Table between Side of the Light, Input Cable and Connector on the main PCB section to determine which LED assembly must be connected to which connector.

Do not firmly fasten the top cover to the inner cover yet.

4. Connect the light fitting to a Constant Current Regulator through an isolation transformer of max. 200 W.

   Power the light with a current between 2.8 and 6.6 A. After approx. 1 second the light should turn on. In this case discard the used top cover assembly and proceed to step 8 of the procedure.

   In case the light does not turn on, then proceed further from step 5 of the procedure.

5. Disconnect the top cover from the inner cover.

6. Take a new inner cover assembly (D2), including new fuse resistors.

   Connect the LED assemblies to the main PCB of the inner cover (D2).

Note

Refer to the Correspondence Table in the Correspondence Table between Side of the Light, Input Cable and Connector on the main PCB section to determine which LED assembly must be connected to which connector.

Do not firmly fasten the top cover to the inner cover yet.

7. Connect the light fitting to a Constant Current Regulator through an isolation transformer of max. 200W.

   Power the light with a current between 2.8 and 6.6 A. After approx. 1 second the light should turn on. In this case discard the used inner cover assembly and proceed to step 8 of the procedure.

   In case the light does not turn on, please contact your ADB SAFEGATE representative for further examination of the faulty light.

8. Close and test the light fitting for watertightness as described in the How to close and test the Light Assembly?section.

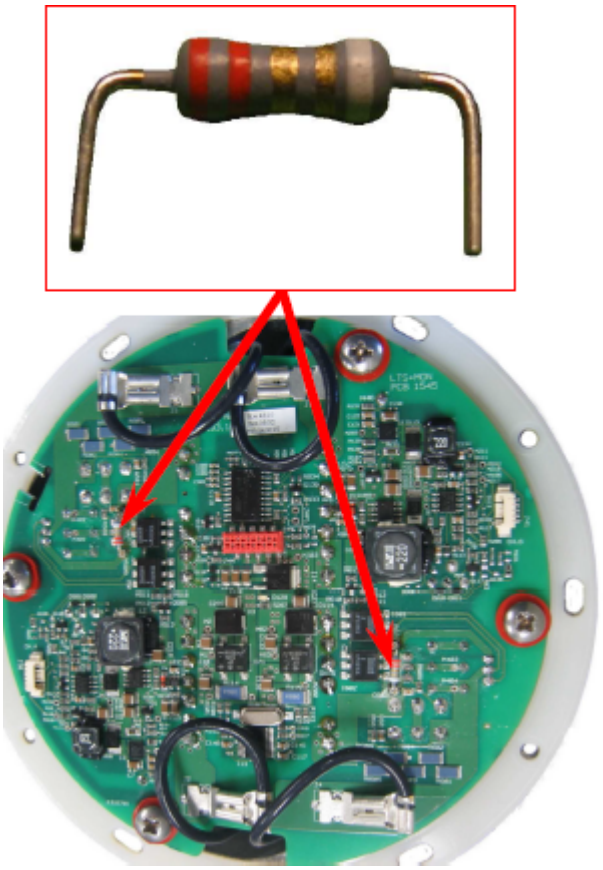
6.7 Monitoring option: How to replace the Fuse Resistors?

6.7.1 Procedure

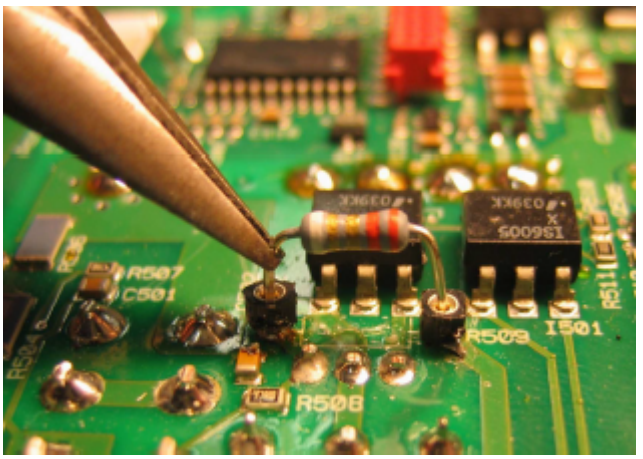
1. Open the light fitting as described in the How to open the Light Assembly? section.
2. On bidirectional lights, two fuse resistors (E1) are located on the PCB of the inner cover (D2).

   Always replace both fuse resistors. On unidirectional lights, there is only one fuse resistor.

   Remove the fuse resistor(s) by simply pulling the legs out of the socket.

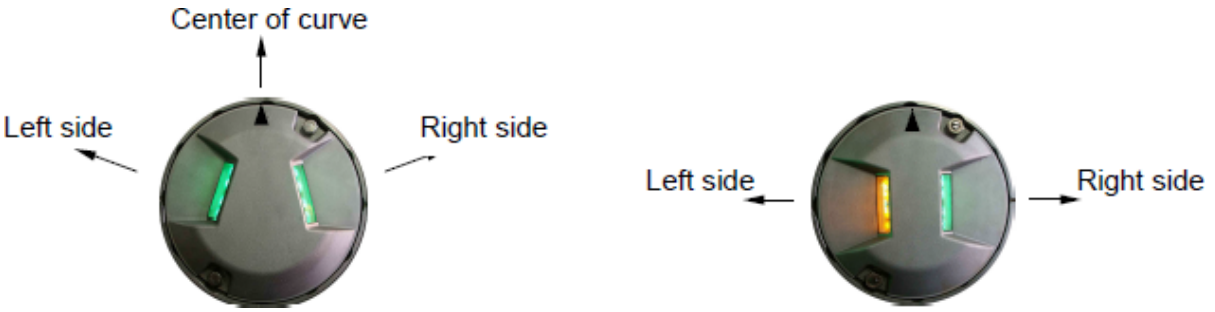


3. Bend the legs of the fuse resistor(s) and cut them to a length of approximately 10 mm, as shown on the picture above.
4. Using pliers, insert the legs of the new fuse resistor(s) in the socket.



6.8 Correspondence Table between Side of the Light, Input Cable and Connector on the main PCB

When the light is seen from above, the following convention applies to determine the left and the right side (the arrow on the cover pointing upwards:



The left side is powered from the cable entry marked "INPUT 1" on the inner cover; the right side from the cable entry marked "INPUT 2".

In the following table you can find the detailed correspondence between the side, the input cable and the connector on the main PCB.

Table 2: Correspondence table

Side of the light		**Left side**	**Right side**
Power input		INPUT 1	INPUT 2
Connector on the main PCB (Lights without monitoring option)	Unidirectional light & bidirectional light with two plugs	J1	J6
	Bidirectional light with one plug	J6	J1
Connector on the main PCB (Lights with monitoring option)		J41	J38

7.0 Troubleshooting

7.1 Troubleshooting Table

In the table below a number of problems are listed in the first column. In the second column, you will find the possible causes of the problem and in the third column the solution.

Problem	Possible cause	Solution
LEDs do not energize.	LEDs defective	Replace top cover assembly
	PCB defective	Replace the inner cover assembly
	Moisture inside assembly causing current leakage	1. Open light assembly. 2. Clean, dry, inspect or replace damaged components.
	No connection of primary loop. Defective isolation transformer or secondary wiring	Check transformer output current with A-meter.Check power line between the light fixture and the transformer, including connectors.
Weak light output	Partial short circuit in primary loop. Defective isolation transformer. Dirty prism.	1. Check cable assembly. 2. Replace transformer. 3. Clean prism.
Light beam distorted	Broken or damaged prism/cover	Replace top cover assembly or entire fixture.
Short LED life	Too high current	Check output current of isolating transformer at full brightness. Current should not exceed 6.7 A. Replace transformer if defective; if not, adjust CCR output current.
	Moisture in lighting fixture	1. Open light assembly. 2. Check for cause of leakage (Dirty or damaged seal mating surfaces, defective seals, cracked or broken prism, loose screws or damaged wire insulation). 3. Clean, dry, inspect or replace damaged components.

8.0 Ordering Codes and Exploded Views

8.1 Overview

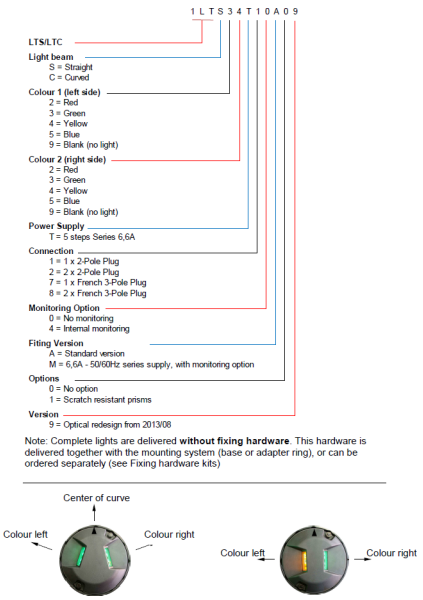
8.1.1 Introduction

References of the types of products described in this manual, of their spare parts and accessories are listed in this chapter, together with exploded views.

8.2 Complete Products

8.2.1 Ordering Code LTS/LTC

The table below clarifies the structure of the ordering code for the LTS/LTC lights.



8.3 Spare Parts

8.3.1 List of Tables

Below you will find a list of all tables in this chapter:

8.3.2 Table 1

In the tables below you will find all main assemblies of the LTS/LTC inset lights:

Table 3: Main assemblies

Fixture description			Cover assemblies *(A1, B1, B2, B3, B4, C1, C2)*	
Use	**Number of beams**	**Colors**	**Without monitoring**	**With monitoring**
LTS straight Centerline	Bidirectional	Green/Green	1413.10.000	1413.10.005
		Green/Yellow	1413.10.010	1413.10.015
		Yellow/Green	1413.10.020	1413.10.025
		Yellow/Yellow	1413.10.040	1413.10.045
		Green/Red	1413.10.050	1413.10.055
	Unidirectional	Green/Blank	1413.10.110	1413.10.115
		Yellow/Blank	1413.10.120	1413.10.125
LTC curved Centerline	Bidirectional	Green/Green	1413.10.500	1413.10.505
		Green/Yellow	1413.10.520	1413.10.525
		Yellow/Green	1413.10.510	1413.10.515
		Yellow/Yellow	1413.10.530	1413.10.535
	Unidirectional	Green/Blank	1413.10.560	1413.10.565
		Blank/Green	1413.10.570	1413.10.575
		Yellow/Blank	1413.10.580	1413.10.585
		Blank/Yellow	1413.10.590	1413.10.595
LTS Stop bar	Bidirectional	Red/Red	1413.10.030	1413.10.035
	Unidirectional	Red/Blank	1413.10.100	1413.10.105
		Inner cover assembly (D2, D3, D4, , E1)		

Table 4: Lights with/ monitoring option

Type of light	Standard version	Version with flat (French) plug	German version
Bidirectional, 1 plug	1413.07.018	1413.07.168	1413.07.198
Bidirectional, 2 plugs	1413.07.108	1413.07.078	1413.07.208
Unidirectional	1413.07.008	1413.07.068	1413.07.188

8.3.3 Table 2

In the table below you will find the LTS/LTC spare parts. Components of the cover assembly and of the inner cover assembly not listed are not available as spares. Please order the complete assembly (see Table 3).

Table 5: Spare parts

LTS/LTC components		
No.	**ADB part number**	**Description**
A2	4072.76.560	Labyrinth gasket between the light and the shallow base (10 pcs)
A2	4072.76.570	Labyrinth gasket between the light and the shallow base (100 pcs)
B1	SP.4071.94.250	Prism gasket (10 pcs)
B2	SP.1428.00.610	Prism (10 pcs) [1]
B3	SP.4072.46.490	Flat seal (10 pcs)
B4	SP.4071.95.760	Collimator (10 pcs)
C1+B1+B2+B3+B4+C2	4072.44.850	LED kit, green (no monitoring) [2]

Table 5: Spare parts (Continued)

LTS/LTC components		
No.	**ADB part number**	**Description**
C1+B1+B2+B3+B4+C2	4072.44.870	LED kit, yellow (no monitoring) [2]
C1+B1+B2+B3+B4+C2	4072.44.890	LED kit, red (no monitoring) [2]
C1+B1+B2+B3+B4+C2	4072.46.070	LED kit, green (for monitoring option) [2]
C1+B1+B2+B3+B4+C2	4072.46.060	LED kit, yellow (for monitoring option) [2]
C1+B1+B2+B3+B4+C2	4072.44.900	LED kit, red (for monitoring option) [2]
C2 = D4	SP.710010.125 + SP.7284.10.416	SCREW M4x14 DIN 7985-T-A2 (100 pcs) + lock washer M4 DIN 127B – A2 (100 pcs)
D1	SP.010812	Gasket between top cover and inner cover (10 pcs)
D3	SP.010869	Pressure release plug assembly including O-ring (10 pcs)
E1	6132.00.250	Fuse resistors (box of 20 items) (Only for version with monitoring option)

CAUTION

From 08/2013 onwards, a new optical system has been introduced (lights with code numbers finishing by "9"). To avoid compatibility issues between old and new components, "LED kits" have been introduced, with all components necessary to refurbish the optical system: LED strip in its support (C1), collimator (B4), flat seal (B3), prism (B2), prism gasket (B1) and fixation screws (C2).

On lights produced before 08/2013 (code numbers finishing by "8" or less), it is mandatory to install all the components of the LED kits in replacement of the old components. Failure to do so would result in a degradation of the photometric performances.

Note

For LTS light up to version "8", on which LED Kits have not been installed, please use former LTS prism 1428.00.600

[1] (1): Use this prism for all LTC lights and for the LTS lights produced after July 2013 (from version "9"), as well as for all lights on which LED Kits have been installed.

[2] (2): "Optical kits" are usable for all versions of LTS and of LTC.

8.3.4 Table 3

In the table below you will find the fixing hardware kits:

Table 6: Metric hardware kits

	METRIC FIXING HARDWARE KITS							
	Fixing hardware kit		Components					
	Description	ADB Part Number	7100.08.759 St. Steel Screw M10 X25	7150.53.320 St. Steel nut M10	7150.53.330 St. St. self-locking nut M10	7284.10.470 St. Steel lock washer M10	7284.70.345 Nylon encap. washer M10	4071.50.240 Metric anti-rotation pin
For mounting 8" inset lights on to ADB SAFEGATE 8" shallow bases or adapter rings	Metric screw kit 8" (with anti-rotation pins)	1411.20.400	2			2		2
	Metric nut kit 8"	1411.20.420		2		2		
	Self-locking metric nut kit 8"	1411.20.430			2			
	Metric screw kit 8" (Germany)	1411.20.441	2				2	
	Metric screw kit 8" (w/o anti-rotation pins)	1411.20.522	2			2		

Table 7: UNC hardware kits

	UNC FIXING HARDWARE KITS				
	Fixing hardware kit		Components		
	Description	ADB Part Number	71200.13.806 St. St. Screw 3/8"-16 UNC	7284.10.470 St. Steel lock washer M10	4071.50.120 UNC anti-rotation pin
For mounting 8" inset lights on to ADB 8" shallow bases or adapter rings	UNC screw kit 8"	1411.20.411	2	2	2

8.4 Screws Overview

8.4.1 Important Information

The table below gives for each screw used in this product, the reference on the exploded view, the type of screw, the tool to use and the torque.

Table 8: Screws, tools and torque

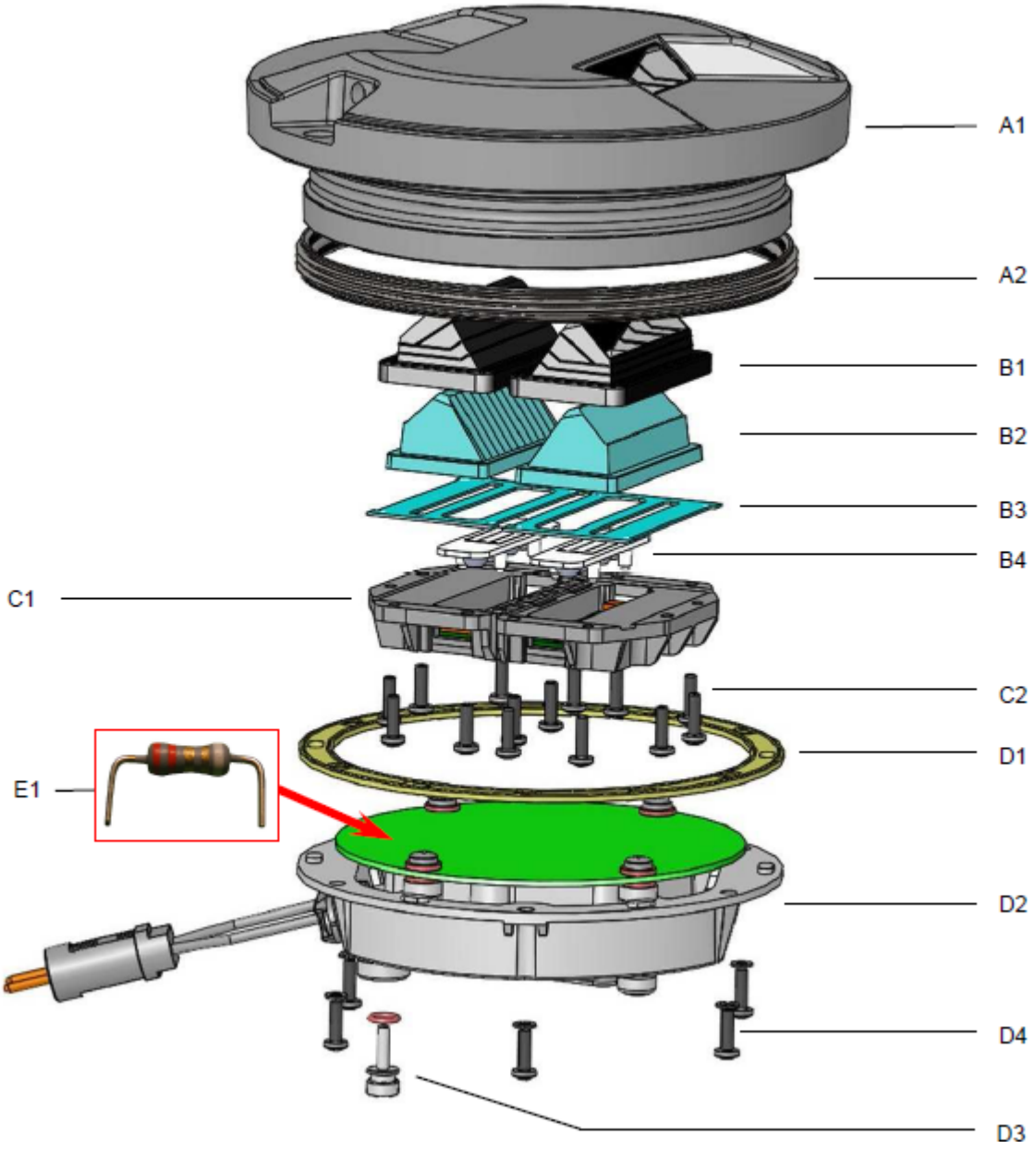
Screw	Tool	Torque
C2, D4 - 7100.10.125 SCREW M4x14 DIN 7985-T-A2	Torx20	2.5 Nm / 23 Lb.in
D3- 4070.77.150 - Pressure release screw	1.6 x 8 Flat	2.5 Nm/ 23 Lb.in
A1 - Fixation screws of the light fitting on the shallow base or adapter ring (not supplied with the light) Refer to the INTEROPERABILITY appendix.	Refer to the INTEROPERABILITY appendix.	Refer to the INTEROPERABILITY appendix.
Self-locking nut Refer to the INTEROPERABILITY appendix.	Refer to the INTEROPERABILITY appendix.	Refer to the INTEROPERABILITY appendix.

8.5 Exploded Views

8.5.1 LTS/LTC

The illustration below represents the exploded view of a Taxiway LED inset light LTS/LTC:

Figure 1: Exploded View



8.6 Accessories

8.6.1 Accessories

In the lists below you will find useful accessories for the installation, maintenance and repair of the LTS/LTC lights.

8.6.2 Tool Case

ADB SAFEGATE has designed a tool case (ADB part number **1411.19.421**) including the basic tools necessary for the maintenance of inset lights. It can also be used for the installation of the light fixture (please note this is a general tool case, some tools are of no use for LTS/LTC Lights). The table below lists the tools included in the case:

Table 9: Tool case part numbers

Description	ADB Part Number	Description	ADB Part Number
Tool case	6169.01.007	Screwdriver, flat blade AG. 8x150	8961.05.250
Torque wrench	8961.06.255	Screwdriver, pozidriv AD.2x125	8961.05.220
Socket hex 3/8", screw 3/8", J 9/16LA	8961.06.008	Loctite 2701	7870.05.130
Socket hex 3/8", screw M10, J 17LA	8961.06.000	Loctite 222	7870.05.140
Socket, 1/4", 1.6x8 Flat, RS.8E	8961.05.050	Lubricant Molykote HP870 Inerta (100 gr) (to replace prism)	7850.05.061
Socket, 1/4", Pozidriv2, RD.2	8961.05.060	Natural hydraulic vacuum silicone grease (50 gr)	7850.42.220
Extension, 1/4", R.210	8961.06.220	Attack driver	8961.04.100
Adaptation, 1/4"-3/8", R.232	8961.06.010	Hammer 212A50	8961.04.110
Hinged handle - short	8961.06.110	Bit holder	8961.04.120
Plier	8981.10.110	Bits END202, Pozidriv2	8961.04.130
Opening tool	4071.53.220	Lifting tool assembly for inset lights	1411.19.550
Screwdriver ANX25x100 TX20	8961.05.300	Bit Torx 1/4" - TX20 EX.620 L=70mm	8961.06.020
Screwdriver ANX25x100 TX25	8961.05.290	Bit Torx 1/4" - TX20 EX.625 L=70mm	8961.06.025

8.6.3 Additional Accessories

The following accessories can be purchased separately:

Table 10: Additional accessories - part numbers

Description	ADB Part Number
Watertightness test adapter for inset lights	4060.84.570
Set of spare anchor hooks for lifting tool 1411.19.550	1411.19.560
Lifting tool on wheels (see illustration in the Lifting Tool section)	1420.55.600

8.6.4 Fixing Hardware

The fixing hardware for securing the fitting on to the mounting interface is generally not supplied with the fitting as it depends on the exact type of mounting interface. It can be purchased as kits or loose components, as listed in the Ordering Codes and Exploded Views section.

Appendix A: INTEROPERABILITY

Base installation – O-ring selection and retaining bolts 8-inch

For 8-inch light fixtures the O-ring is required. Refer to data sheet for ordering code for corresponding 8-inch base.

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.

Table 11: Interoperability matrix

Base type	Required O-ring	Bolt installation		Stud installation	
		Required dimension	Recommended torque	Required nut	Recommended torque
ADB 8" Eurobase ADB 8" Eurobase CN 150 mm	White labyrinth gasket 4072.76.560/10 pcs 4072.76.570/100 pcs	1411.20.522 Metric screw kit 8'' M10x25mm	21 Nm + Loctite 2701 or 638	1411.20.430 Self-locking nut kit 8'' M10xH100	21 Nm Do not use Loctite or washer with self-locking nut
ADB 8" HPI Adapter ring ADB 8"-12"	White labyrinth gasket 4072.76.560/10 pcs 4072.76.570/100 pcs	1411.20.522 Metric screw kit 8'' M10x25 mm	21 Nm + Loctite 2701	1411.20.430 Self-locking nut kit 8'' M10xH100	21 Nm Do not use Loctite or washer with self-locking nut

Appendix B: CABLE LOSS

The cable resistance R (ohms) for 1 conductor is calculated with following formula:

- R (ohms) = resistivity of material (ohm m) × length (m)/cross sectional area (m^2)
- For copper conductors the resistivity is 1.72 10-8 (m^2)

Example; for 1 km 2.5 mm^2 copper conductor, the resistance R is calculated as follows:

1.72 10-8 × 1000 / 2.5 10-6 m^2= 6.88 ohms

The loss (Watt) is then R × I^2 or 6.88 ohms × 6.6^2 A^2= 299.69 W/km or 0.299 W/m.

The loss (Watt) for a secondary cable with 2 conductors is thus 2 × 0.299 = 0.599 or 0.6 W/m.

As such we can calculate:

- Secondary cable for a 2.5 mm^2 Cu-wire (2 conductors): 0.6 W/m
- Secondary cable for a 4 mm^2 Cu-wire (2 conductors): 0.4 W/m
- Primary cable for a 6 mm^2 Cu-wire (1 conductor): 0.12 W/m

The cable between the isolation transformer and the lamp adds losses that cannot be ignored when dimensioning the circuits and selecting rating for secondary transformers and regulators.

WARNING

Cable lengths should not exceed 100 meters.

For a secondary cable of e.g., 20 m of 2.5 mm^2 CU-wire, 20 m × 0.6 W/m = 12 W equals the additional loss to be taken into account.

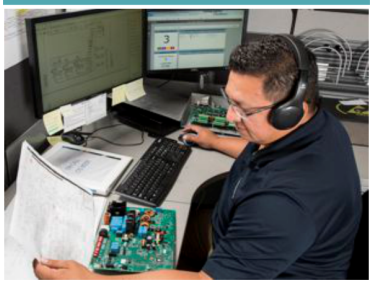
For a primary cable of e.g., 100 m of 6 mm^2 CU-wire, 100 m × 0.12 W/m = 12 W equals the additional loss to be taken into account.

Appendix C: 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

C.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.

C.2 Recycling

C.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.

C.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.

Powering Your Airport Performance from Approach to Departure

adbsafegate.com