



High Intensity Unidirectional Elevated Light for Approach,
Threshold and Runway End and for Sequenced Flashing Lights
(SFLS)

Runway Threshold Identification (RTILS) Systems

User Manual

UM-4020 / AM02-630e, Rev. 2.1, 2022/05/10


**ADB
SAFEGATE**

A.0 Disclaimer / Standard Warranty

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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.

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Note

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Note

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- 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.

	<p>WARNING Failure to observe a warning may result in personal injury, death or equipment damage.</p>
	<p>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.</p>
	<p>WARNING - Wear personal protective equipment Failure to observe may result in serious injury.</p>
	<p>WARNING - Do not touch Failure to observe this warning may result in personal injury, death, or equipment damage.</p>
	<p>CAUTION Failure to observe a caution may result in equipment damage.</p>

Qualified Personnel

	<p>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.</p>
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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

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 Operation Safety



CAUTION

Improper Operation

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

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

Failure to follow these instructions can result in equipment damage

1.1.5 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 About this Manual

This manual describes the procedures for installation, maintenance and troubleshooting of the ADB SAFEGATE type UEL lights.

This manual covers the light fixtures suitable for use in systems described in ICAO Annex 14, Attachment A, Section 11 .

The light construction is in compliance with FAA E 982 specification for the general functional constructional requirements, and with AC150/5345-46B for mechanical & environmental properties.

This light also complies with NATO STANAG 3316.

Operation beyond the limitations mentioned in those specifications may result in degradation of performance, damage or failure of components or hazardous conditions.

For more information, see www.adbsafegate.com.

3.0 Introduction

3.1 General information

3.1.1 UEL

The UEL-1-150 steady burning lights are used for:

- Precision Approach lighting in Cat. I, II and III in white and red light,
- Threshold and Threshold wingbar lighting in Cat. I, II and III in green light,
- Runway end lighting in Cat. I, II and III in red light,
- Supplementary elevated stopbar lights.

The UEL-1-120 flashing lights are used for:

- Sequence Flashing Lights (SFLS) or Runway Threshold Identification Lights (RTILS), using a low voltage (400V) Xenon flash lamp.

3.1.2 Model definition

- The **UEL-1-150** is a steady burning unidirectional elevated light.
- The **UEL-1-120** is a flashing unidirectional elevated light used in a flashing system in combination with the control cabinets FCU.



Note

Refer to the exploded views, see § [Exploded views](#).

3.1.3 Installation

They are shipped ready for installation and can be mounted in three different ways, on any support with a 60 mm outer diameter mounting interface:

- At ground level
- On a 60 mm O.D. conduit
- On a safety approach mast

3.2 Product data

3.2.1 Equipment supplied

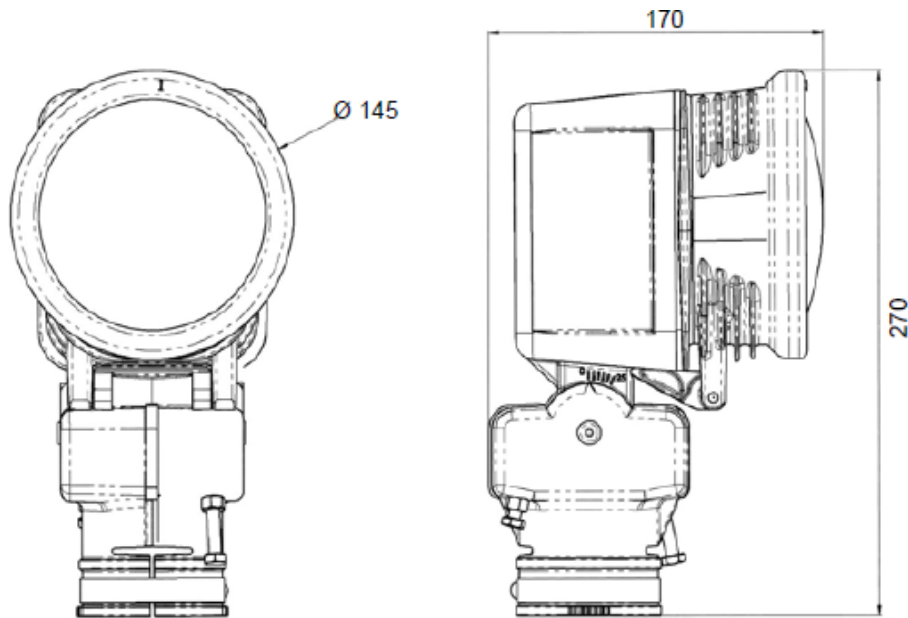
UEL units are either packed individually in a durable, cushioned and corrugated cardboard box, labeled with ADB SAFEGATE and ordering numbers, or on pallet boxes in larger quantities.

Depending on the ordered code number, the fittings are supplied:

- With lamp (packed separately)
- With or without power supply cable cable (packed separately)
- With or without top light, see § [Exploded views](#)

Unless contractually specified differently, one instruction manual is delivered per order.

3.2.2 UEL dimensions



The illustration below gives you the outside dimensions of the UEL light, in mm.

3.2.3 Technical data

The table below lists technical data of the UEL.

Type	UEL-1-150	UEL-1-120
Input	6.6 A	400 V (through FCU cabinet)
Rated lamp life	1000 hours	3.600.000 flashes
Temperature range	- 55°C to + 55°C	- 55°C to + 55°C
Humidity	up to 100%	up to 100%
Protection class	IP 44	IP 44
Altitude	Sea level to 3000 m	Sea level to 3000 m
Wind	Velocities up to 560 km/hr	Velocities up to 560 km/hr
Weight	Approx. 1.7 kg	Approx. 2.0 kg

3.2.4 References



For ordering codes and reference data pertinent to the product, see § [Spare Parts](#) .

4.0 Installation

4.1 Overview

4.1.1 Introduction

This chapter instructs you on how to install the UEL lights.

Generally, the installation complies with the applicable sections in the ICAO Aerodrome Design Manual, part 4, FAA Advisory Circulars and, if applicable, other National Codes or local rules.

4.1.2 Mounting methods

The UEL can be mounted in three different ways, on any support with a 60 mm outer diameter mounting interface:

- At ground level
- On a 60 mm O.D. conduit
- On a safety approach mast

4.2 General recommendations

4.2.1 Receiving, storage and unpacking

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

4.2.2 Electrical connection

- The UEL-1-150 light assemblies are designed for connection to 6.6 or 20 Amps series circuits via one FAA L-830 or L-831 isolation transformer (type ADB : RST), with a nominal secondary current of 6,6A.

Refer to ADB cat. leaflet A.06.110 or Instruction manual AM.06.110 for more information on isolation transformers.

The isolation transformers are to be ordered separately.

- The UEL-1-120 light assemblies are designed for connection to a FCU control cabinet by means of a 5-core cable.

Refer to ADB Instruction Manual A.02.6200 for more information on the connection to the FCU control cabinet and the type of cable to use. The FCU control cabinets are to be ordered separately.

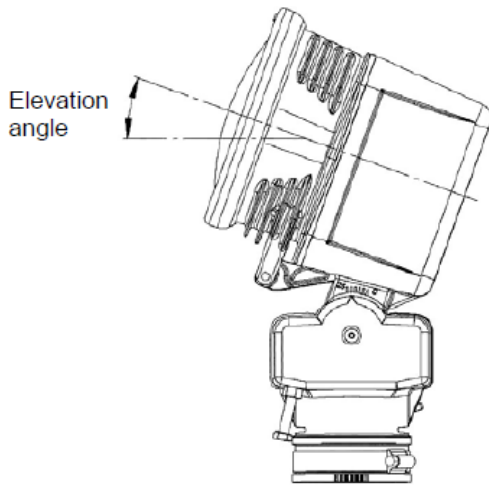
4.2.3 Elevation and azimuth setting angles

Elevation and azimuth setting angles according to the specific use and location of the light can be found in ICAO Annex 14, Appendix 2, Fig. 2.1 to 2.4 and 2.8.



Note

For instructions about how to set the elevation angle, see § [Orientation and elevation settings](#) .



4.3 Equipment required for installation

4.3.1 Equipment required, but not supplied

In the table below you will find a list of the equipment required for installation, but not supplied with the lights:

Description	CN	Quantity
L-867 base plate assembly and gasket (if base mounted)	see cat.leaf.	A/R
L-867 deep base (if base mounted)	see cat.leaf.	A/R
Conduit elbow (if mounted on conduit elbow)	1409.00.012	A/R
Breakable coupling MR/F2 for mounting on 60mm O.D. conduit	1409.05.027	A/R
Breakable coupling for ground mounting	1409.06.020	A/R
2-core cable with factory-moulded FAA L-823 plug	-	1/light
Primary connector kit, 1-pole	-	1/light
Secondary connector kit, 2-pole	-	1/light
Natural hydraulic vacuum silicone grease	7850.42.210	A/R
Scotch N° 33 electrical tape	7637.55.123	A/R
Standard leveling device	1570.05.410	A/R
Electronic leveling device	1570.05.400	A/R

CN = Order Number

A/R = As requested

Notes

* = supplied with some versions of the UEL

4.4 How to mount the UEL at ground level

4.4.1 Introduction

The UEL is mounted on a breakable coupling which is screwed into a mounting device such as a conduit elbow or a deep base with cover.

4.4.2 Procedure

1. UEL-1-150 steady burning light

The following table instructs you on how to install the UEL-1-150 at ground level:

- a) Before installing the light, connect the plug of the two-core cable to the receptacle of the cable coming from the transformer.



Note

The transformer receptacle rests in the upper part of the conduit elbow or the cover plate.



CAUTION

Do not tape the plug/receptacle assembly in order to allow for quick disconnection in case of impact.

- b) Screw the breakable coupling in the conduit elbow or cover plate.
- c) Remove the optical cartridge (1) by hinging it down and lifting it out of the hinge.
Insert the two-core cable through the housing (3), and install the light without optical cartridge on the breakable coupling, without tightening the bracing clamp (5).
- d) Clamp the cable into the stress reliever (6).



Note

In case of a top light, the two cables should be clamped into the cable stress reliever.

- e) Cut the two-core cable in the light fitting to the right length, maintaining sufficient slack to easily connect it to the lamp with the cartridge hinged down.
Crimp the "fast-on" connectors on the cores of the cable.
Slip the insulation sleeves over the cores of the cable.
- f) Adjust the position of the light unit, see § [Orientation and elevation settings](#) .
- g) Once the position of the light is correct, put the optical cartridge back in place.
- h) Connect the lamp to the fast-on connectors.



CAUTION

To avoid short-circuits, make sure to slip the insulation sleeves over the fast-on connectors.

- i) Close the light fitting.

2. UEL-1-120 flashing light

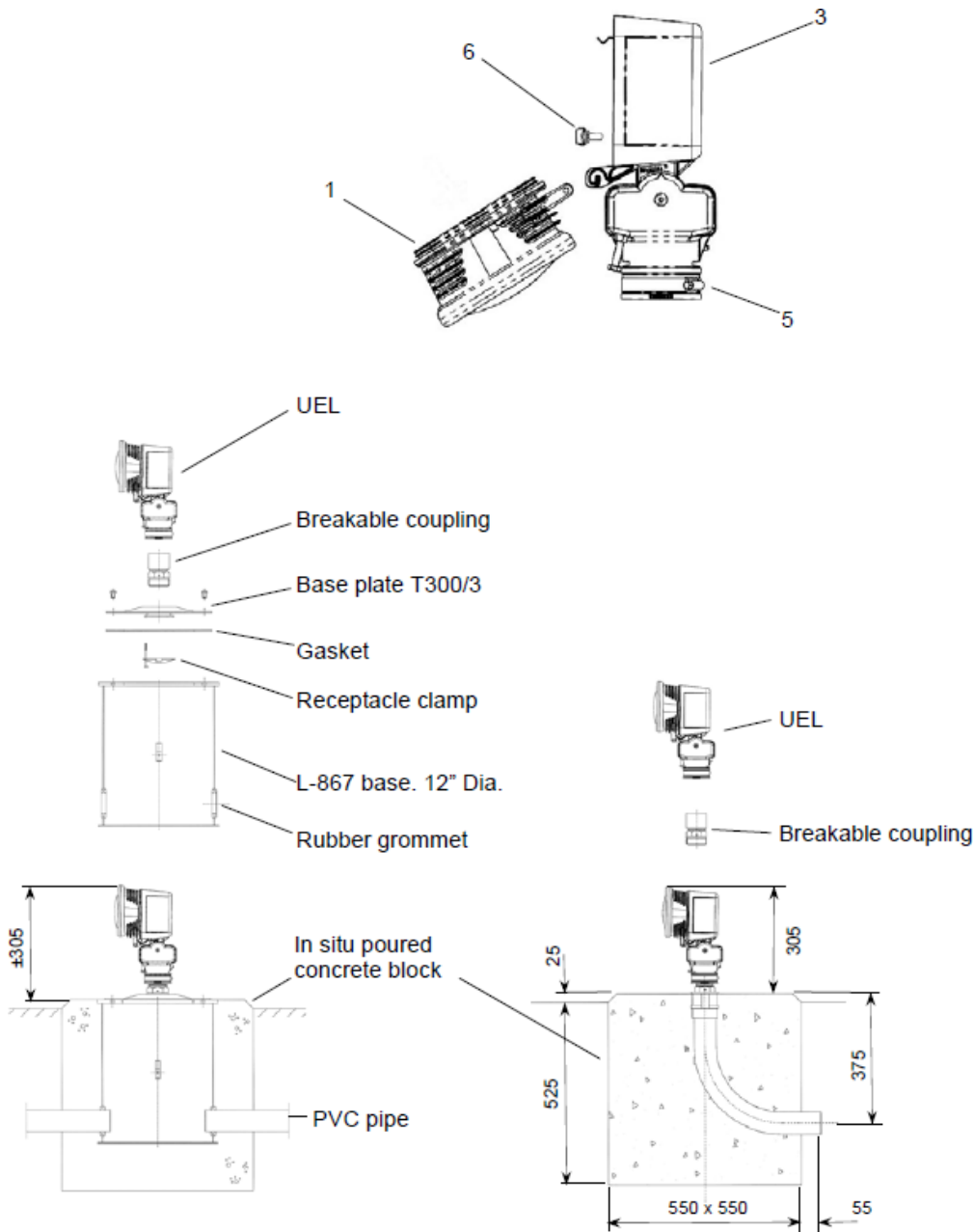
The following table instructs you on how to install the UEL-1-120 at ground level:

- a) Before installing the light, make sure that a sufficient length of of 5-core cable coming from the FCU cabinet is available above the conduit elbow or the cover plate.
- b) Install the breakable coupling on the conduit elbow or cover plate.
- c) Remove the optical cartridge (1) by hinging it down, disconnecting the lamp connector and lifting the cartridge out of the hinge.
Insert the cable through the housing (3), and install the light without optical cartridge on the breakable coupling, without tightening the bracing clamp (5).
- d) Clamp the cable into the stress reliever (6).
- e) Cut the cable in the light fitting to the right length, maintaining sufficient slack to easily connect the cable to the connector.
Connect the cable to the connector.
- f) Adjust the position of the light unit, see § [Orientation and elevation settings](#) .
- g) Once the position of the light is correct, put the optical cartridge back in place.

- h) Insert the lamp connector back in place.
- i) Close the light fitting.

4.4.3 Illustration

The illustration below gives an overview of the procedure described above.



4.5 How to mount the UEL on a 60 mm O.D. conduit

4.5.1 Introduction

The UEL is mounted on a piece of aluminum conduit with 60 mm O.D., with a maximum length of 2 meters. The conduit is fastened in a breakable coupling, which in turn is screwed into a conduit elbow or on a base cover.

4.5.2 Procedure

1. UEL-1-150 steady burning light

The following table instructs you on how to install the UEL-1-150 on a 60 mm O.D. conduit:

- a) Before installing the light, prepare a two-core cable with plug, making sure that a sufficient length of cable is available above the conduit elbow or cover plate. Connect the plug of the two-core cable to the receptacle of the cable coming from the transformer.



Note

The transformer receptacle rests in the upper part of the conduit elbow or the cover plate.



CAUTION

Do not tape the plug/receptacle assembly in order to allow for quick disconnection in case of impact.

- b) Install the breakable coupling on the conduit elbow or cover plate, and the conduit on the breakable coupling.



CAUTION

Make sure that the conduit is perfectly vertical, using the screws of the breakable coupling for adjustment. Tighten the counter-nuts.

- c) Remove the optical cartridge (1) by hinging it down and lifting it out of the hinge.
Insert the two-core cable through the housing (3), and install the light without optical cartridge on the conduit, without tightening the bracing clamp (5).
- d) Clamp the cable into the stress reliever (6).



Note

In case of a top light, the two cables should be clamped into the cable stress reliever.

- e) Cut the two-core cable in the light fitting to the right length, maintaining sufficient slack to easily connect it to the lamp with the cartridge hinged down.
Crimp the "fast-on" connectors on the cores of the cable.
Slip the insulation sleeves over the cores of the cable.
- f) Adjust the position of the light unit, see § [Orientation and elevation settings](#) .
- g) Once the position of the light is correct, put the optical cartridge back in place.
- h) Connect the lamp to the fast-on connectors.



CAUTION

To avoid short-circuits, make sure to slip the insulation sleeves over the fast-on connectors.

- i) Close the light fitting.

2. UEL-1-120 flashing light

The following table instructs you on how to install the UEL-1-120 on a 60 mm O.D. conduit:

- a) Before installing the light, make sure that a sufficient length of 5-core cable coming from the FCU cabinet is available above the conduit elbow.
- b) Install the breakable coupling on the conduit elbow or cover plate, and the conduit on the breakable coupling.



WARNING

The conduit must be perfectly vertical, using the screws of the breakable coupling for adjustment. Tighten the counter-nuts.

- c) Remove the optical cartridge (1) by hinging it down, disconnecting the lamp connector and lifting the cartridge out of the hinge.
Insert the cable through the housing (3), and install the light without optical cartridge on the conduit, without tightening the bracing clamp (5).
- d) Clamp the cable into the stress reliever (6).
- e) Cut the cable in the light fitting to the right length, maintaining sufficient slack to easily connect the cable to the connector.

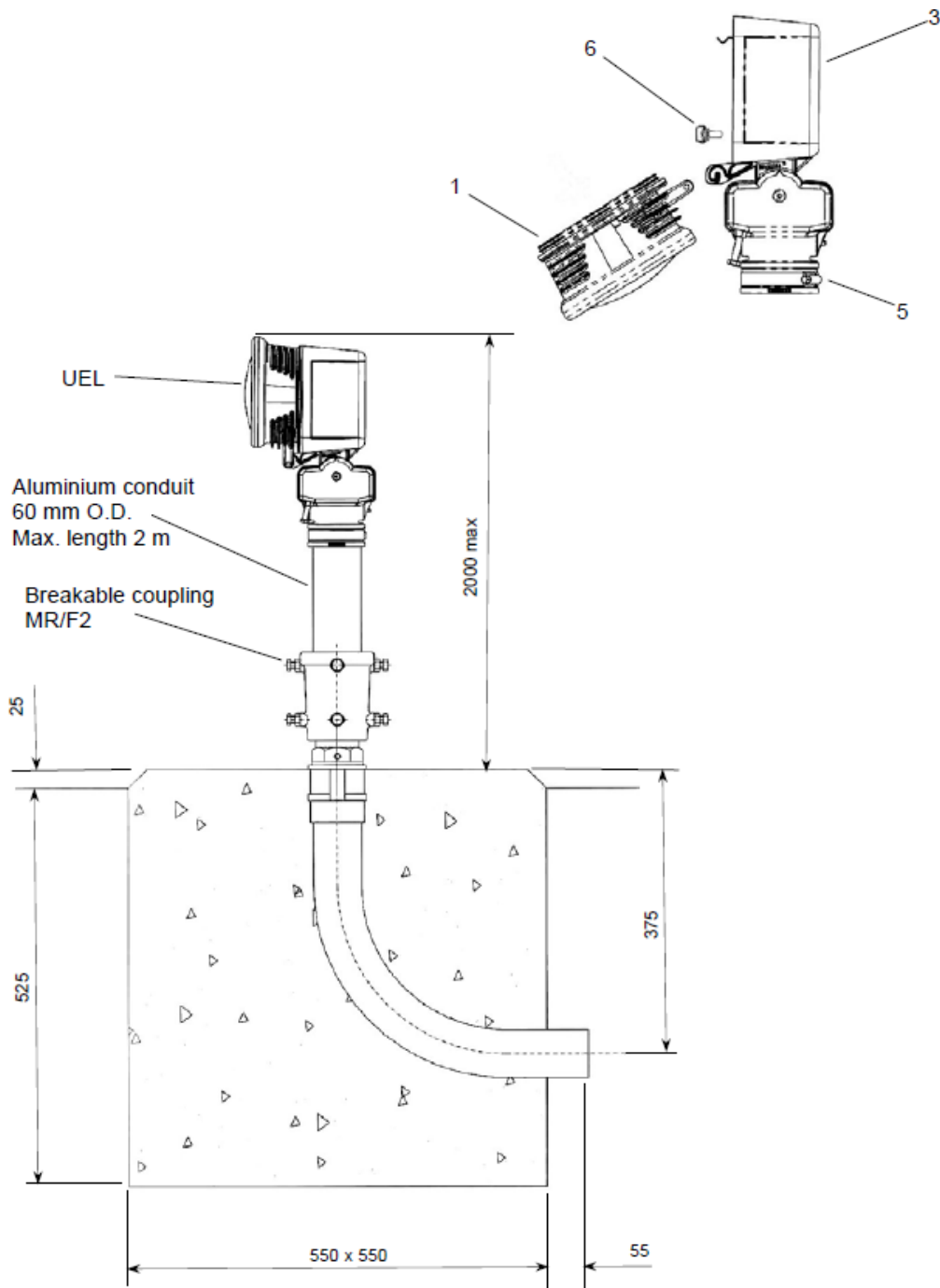
Connect the cable to the connector.

DRAWING showing the connection

- f) Adjust the position of the light unit, see § [Orientation and elevation settings](#) .
- g) Once the position of the light is correct, put the optical cartridge back in place.
- h) Insert the lamp connector back in place.
- i) Close the light fitting.

4.5.3 Illustration

The illustration below gives an overview of the procedure described above.



4.6 How to mount the UEL on a safety approach mast

4.6.1 Introduction

When the UEL has to be installed at more than 2 meters (6.7 feet) above ground level, a safety approach mast with a 60 mm O.D. top piece must be used.

4.6.2 Procedure

1. **UEL-1-150 steady burning light**

The following table instructs you on how to install the UEL-1-150 on a safety approach mast:

- a) Before installing the light, install a two-core secondary cable from the transformer to the top of the mast, according to the instructions of the manufacturer of the mast.



CAUTION

Make sure to provide sufficient slack in the cable so as to cope with possible height adjustment of the mast.

- b) Lower the mast.

Remove the optical cartridge by hinging it down and lifting it out of the hinge.

Insert the two-core cable through the housing (3), and install the light without optical cartridge on top of the mast, without tightening the bracing clamp.

- c) Clamp the cable into the stress reliever.



Note

In case of a top light, the two cables should be clamped into the cable stress reliever.

- d) Cut the two-core cable in the light fitting to the right length, maintaining sufficient slack to easily connect it to the lamp with the cartridge hinged down.

Crimp the "fast-on" connectors on the cores of the cable.

Slip the insulation sleeves over the cores of the cable.

- e) Adjust the position of the light unit as described in § [Orientation and elevation settings](#) .
- f) Once the position of the light is correct, put the optical cartridge back in place.
- g) Connect the lamp to the fast-on connectors.



CAUTION

To avoid short-circuits, make sure to slip the insulation sleeves over the fast-on connectors .

- h) Close the light fitting.

2. UEL-1-120 flashing light

The following table instructs you on how to install the UEL-1-120 on a safety approach mast:

- a) Before installing the light, install a 5-core cable coming from the FCU cabinet to the top of the mast, according to the instructions of the manufacturer of the mast.



CAUTION

Make sure to provide sufficient slack in the cable so as to cope with possible height adjustment of the mast.

- b) Lower the mast.

Remove the optical cartridge (1) by hinging it down, disconnecting the lamp connector and lifting the cartridge out of the hinge.

Insert the cable through the housing (3), and install the light without optical cartridge on top of the mast, without tightening the bracing clamp(5).

- c) Clamp the cable into the stress reliever (6).
- d) Cut the cable in the light fitting to the right length, maintaining sufficient slack to easily connect the cable to the connector.
Connect the cable to the connector.
- e) Adjust the position of the light unit, see § [Orientation and elevation settings](#) .
- f) Once the position of the light is correct, put the optical cartridge back in place.

- g) Insert the lamp connector back in place.
- h) Close the light fitting.

5.0 Orientation and elevation settings

5.1 Introduction

In this chapter the orientation and elevation settings for an UEL light are described.

5.2 Standard levelling device

5.2.1 Introduction

This system is suited for ground mounted lights or pole mounted lights up to 2 meters. It consists of a support, which is secured on the light unit, in the place of the optical cartridge, and which is equipped with a elevation angle setting device, a sighting device (both with a graduated scale) and a spirit level.

The elevation angle setting device is graduated from 0 to 25°.

For the azimuthal setting, the system can be rotated around a vertical axis, and has 4 set positions that allow aiming at reference points (generally other lights) in a direction parallel or perpendicular to the center line. The sighting device is graduated from -4 to +4 ° to allow for toe-in angles. Two additional set positions at -15 and +15° permit the setting of RTILS lights.

5.2.2 Procedure

The following table instructs you on how to work with the device:

1. Assemble the system.
2. Remove the optical cartridge and install the leveling device in its place.
Tighten the securing screw.
3. Set the elevation angle on the setting device and the azimuth (toe-in) angle on the sighting device.



Note

Refer to ICAO Annex 14 to know the correct elevation and toe-in angles in function of the light and its position.

4. Level the light approximately to allow the azimuth orientation of the light.
5. Set the light in the correct direction using the sighting device, aiming at the next or former light in the same alignment.

For lights in a barrette, a side row or a wing bar, aiming laterally at another light is possible. For this purpose release the two locking levers, turn the system by 90° until a distinct click can be felt, and re-tighten the locking levers.



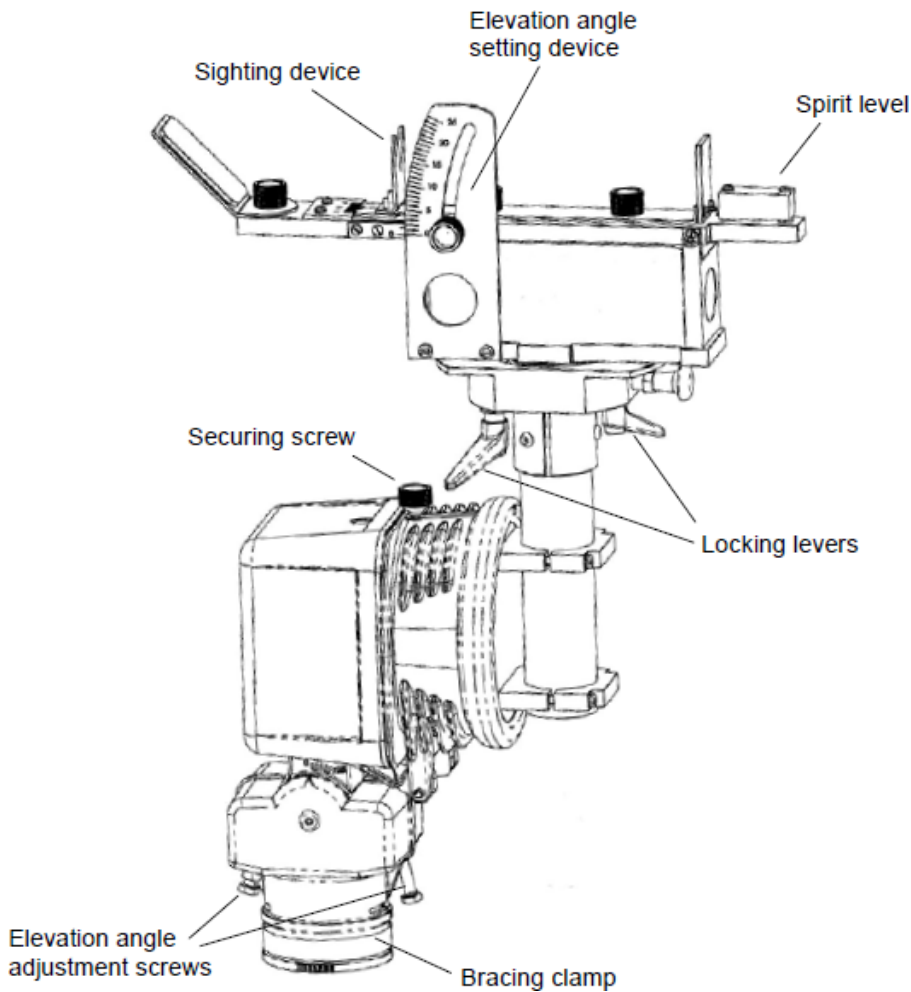
Note

If there is no light in the same alignment, use a reference pole.

6. Secure the bracing clamp of the light.
7. Use the spirit level to set the light at the correct elevation by unscrewing/ tightening slightly the two opposite screws.
Tighten the screws sufficiently to avoid any play, but do not overtighten them. Once this is done, secure the two counter-nuts.
8. Remove the device. Put the optical cartridge back in place, without forgetting to connect the lamp.

5.2.3 Illustration

The drawing below illustrates the procedure described above:



5.3 Electronic leveling device

5.3.1 Introduction

This system is suited for fittings mounted on safety approach masts, when it is not possible to get access to the top of the mast in its standing position.

5.3.2 Composition

The system consists of a support similar to the one used with the standard simplified leveling device, see § [Standard levelling device](#) . However, the support is equipped with a sensor activated with a switch, with a 10 meters long cable. The operator can then operate the sensor from the ground, and read the elevation angle measurement when the mast is tilted to the ground.

5.3.3 Procedure

The following table instructs you on how to work with the device.

1. Lower the mast.



Note

See instruction manual of the supplied masts.

2. If the mast has been correctly installed, i.e. its tilting axis is perpendicular to the center line, a light with 0° toe-in will have its front surface fully horizontal when the mast is tilted over 90° (down to the horizontal). With the mast in this position, adjust the light by turning it around the tube, and then tighten the bracing clamp.

For lights with a toe-in, first adjust the light for 0° toe-in. Make a reference mark on the tube just below the zero mark at the bottom of the slip fitter. Using the graduated scale, turn the light around the tube to the desired toe-in, and tighten the bracing clamp.

3. Remove the optical cartridge and install the leveling device in its place.
Tighten the securing screw.
4. Raise the mast. Operate the switch to take a measurement.
5. Lower the mast and read the angle indicated on the digital display.
Calculate the difference between the real angle and the required one.
6. If necessary, adjust the elevation angle by unscrewing/tightening slightly the two opposite screws. Tighten the screws sufficiently to avoid any play, but do not overtighten them. Once this is done, secure the two counter-nuts.



Note

While doing the correction, two measurements means are usable:

- The elevation scale on the side of the light body (coarse measurement);
- The leveling device itself, by taking a measurement before and after correction (fine measurement).

7. Raise the mast and repeat the operation 6 until the adjustment is correct.
8. Lower the mast and remove the device. Put the optical cartridge back in place, without forgetting to connect the lamp.

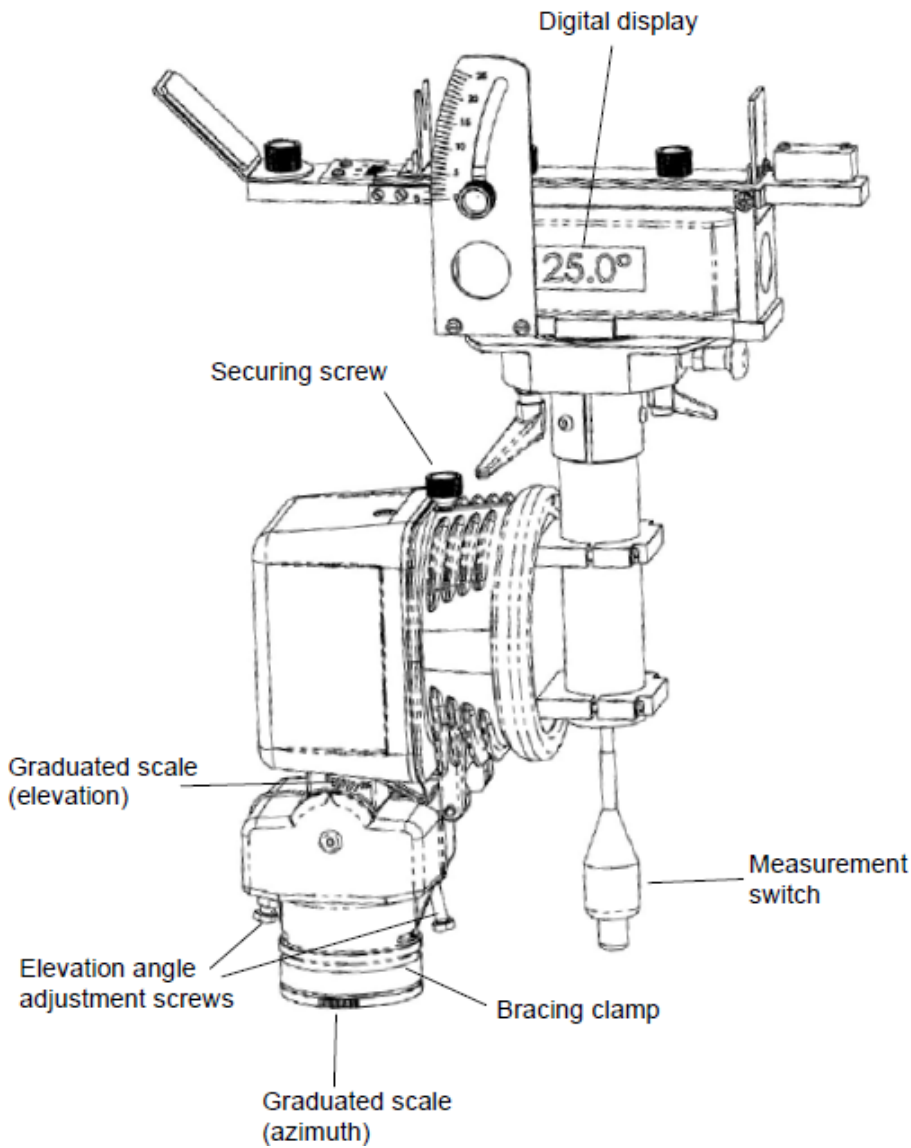


Note

During the installation of the approach line, a quicker method is to use a platform at the light level for an easy initial adjustment.

5.3.4 Illustration

The drawing below illustrates the procedure described above:



5.4 Commissioning

5.4.1 Final check

A flight check shall be performed to detect gross misalignment in the approach and runway threshold lighting system.



WARNING

Errors shall be corrected and the system shall not be put in operation until it has been found satisfactory during the flight test.

6.0 Maintenance

6.1 Overview

6.1.1 Introduction

In this chapter, maintenance of the UEL light is described as well as the procedures of how to replace the lamp and the optical cartridge.

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 runway is used (i.e. climate, traffic, etc.). The recommended practices for maintenance are described in the FAA Advisory Circular no. AC 150/5340-26.



Note

For the numbering of the components mentioned in this chapter, refer to the exploded view on § [Exploded views](#).

6.2 Preventive maintenance tasks

In the table below you will find a checklist of preventive maintenance tasks.



CAUTION

Before attempting to service, de-energize and lockout the circuit or the regulator so that the fixture can not be energized by remote means.

Interval	Check	Action
Daily	Lamp failure	Replace lamp.
	Dimly burning lamp	Replace lamp if discolored, blackened or distorted.
	Broken lens	Replace optical cartridge.
Weekly	Obtrusion of the light beam by vegetation	<ol style="list-style-type: none"> 1. Remove vegetation. 2. Use weed killer.
	Dirty lens	Clean with glass cleaner.
Monthly	Fixture misalignment	Straighten level and align fixture.
Semi-annually	Presence of water in optical cartridge	Inspection of the light: check drain holes and status of the lens and gaskets.
	Paint flaking off	Paint anew.
Annually	Cracks, corrosion, shorts	Repair or replace.
	Dirty contacts	Clean when system is deactivated.
	Loose connections	Tighten loose connections.
In prediction of heavy snowfall		Mark location of low mounted fixtures (use red flags or sticks) to facilitate snow removal and lessen the risk of damage to the fixtures by snow removal equipment.

Notes

* More frequently during rainy seasons.

6.3 How to replace the lamp

6.3.1 Procedure

Lamp replacement can be performed preferably in the maintenance base, or on site, at the location of installation. The following table instructs you on how to replace a lamp in the maintenance base:

1. Open the fitting by hinging down the optical cartridge (1).
2. *(UEL-1-150)*: Slide the insulating sleeves away from the "fast-on" connectors and disconnect the lamp (2) from the cable wires.
(UEL-1-120): Disconnect the cable from the lamp (2).
3. Remove the optical cartridge and replace it by another one of the same model, in overhauled condition. If damaged, replace the insulation sleeves.
4. *(UEL-1-150)*: Reconnect the lamp. Apply a light coat of silicone grease on the fast-on connectors. Slide the insulating sleeves back in place over the fast - on connectors
(UEL-1-150): Re-connect the lamp cable
5. Close the optical cartridge.
6. Back in the maintenance base:
 - a) Remove the lamp (on the UEL-1-120, by unscrewing the four fixation screws)
 - b) Clean the cartridge and especially the front glass (1b), check the condition of the reflector (1c), the gaskets (1a and 1d) and the spring (7), and replace if needed.
 - c) Carefully install the new lamp in the keyed aperture at the rear of the optical cartridge (on the UEL-1-120, retighten the four screws).
The optical cartridge is now ready to be used again.

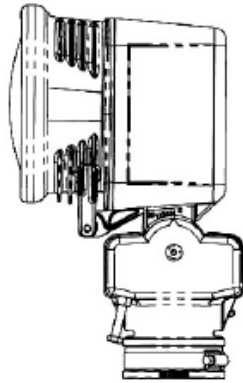


CAUTION

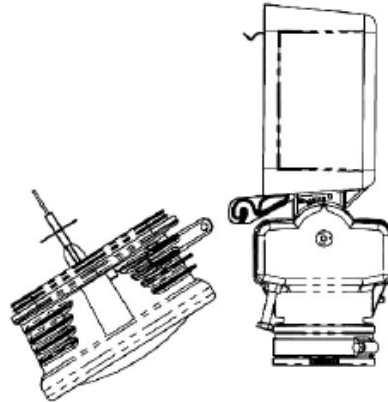
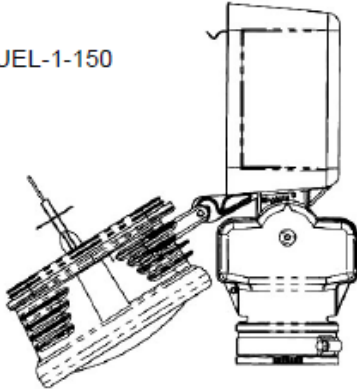
1. In case of relamping executed in the field, the lamp can be changed without removing the optical cartridge from the light. The quality of the result can be affected, most of all in case of night work, rain or cold conditions.
 2. Touching the quartz bulb with bare fingers may seriously shorten the lamp's life. If the bulb has been touched, wipe it carefully with a piece of lens cleaning tissue or similar material moistened with alcohol.
-

6.3.2 Illustration

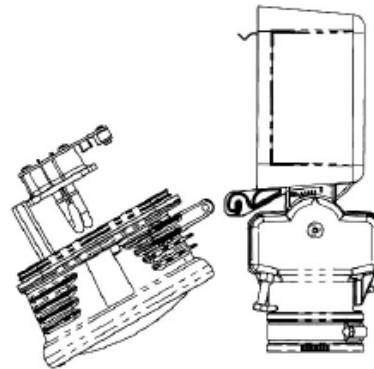
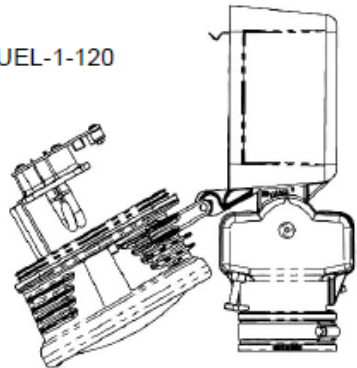
The illustration below clarifies the procedure described above.



UEL-1-150



UEL-1-120



6.4 How to dismantle the optical assembly

6.4.1 Procedure

The following table instructs you on how to dismantle the optical assembly (to be done in the maintenance base):

1. Remove the optical cartridge (1) from the light.
2. Remove the lamp (2).
3. Slide the front gasket (1a) around the front of the cartridge. This releases the reflector (1c) and the front glass (1b).
4. Reassembly is done in the opposite order.



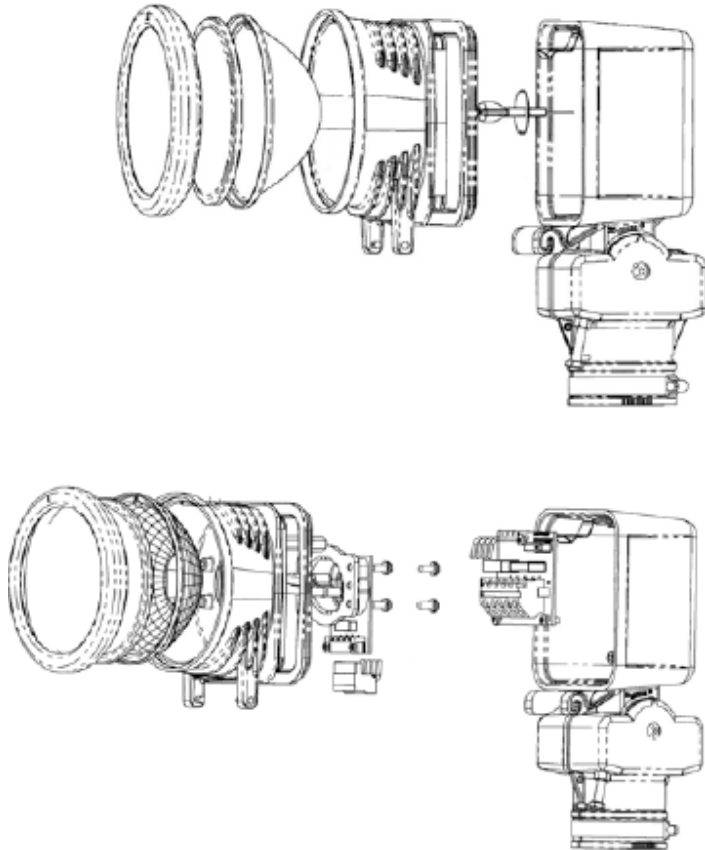
CAUTION

As the reflector used in the optical assembly is not symmetrical, correct positioning is necessary and will be obtained when the hole in the reflector corresponds with the positioning pin of the optical cartridge.

The clear front glass has a structure spreading the light, created by lines on the internal surface. Therefore, it is important that those lines be positioned vertically and not horizontally.

6.4.2 Illustration

The illustrations below clarify the procedure described above.



7.0 Troubleshooting

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:



CAUTION

Before attempting to service, de-energize and lockout the series circuit or the regulator so that the fixture can not be energized by remote means.

Problem	Possible cause	Solution
Lamp does not energize.	Lamp defective	Replace lamp.
	Loose or broken contact or connector	Tighten or replace the contacts or connector.
	Moisture present in fixture	Open up and dry, inspect lens for cracks. Check the gaskets. Check that the drainage hole, in the bottom of the optical cartridge, is not obstructed.
	Deteriorated wire insulation	Replace wires.
	Defective isolation transformer	Check transformer secondary current (in short-circuit) with true RMS Ammeter.
Short lamp life	<i>(UEL-1-150)</i> : Too high current (lamp will have black burns)	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 assembly	Open up and dry, inspect lens for cracks. Check the gaskets. Check that the drainage hole, in the bottom of the optical cartridge, is not obstructed.
	Defective lamp or lamp bulb touched with bare fingers (lamp interior will have a yellow-white powdery appearance if air has entered through a hole or crack)	Replace lamp.

8.2.3 Spare Parts and numbers

In the table below you will find all parts of the UEL-1-150 and UEL-1-120 lights.

References related to exploded view		UEL White	UEL Red	UEL Green	UEL flash
Complete fitting (with or without L.I. top light)		(*)	(*)	(*)	(*)
1	Optical front cartridge assy. (aviation yellow) Optical front cartridge for:	4072.00.920		4072.00.971	4072.00.980
	Aprr.side rows		4072.00.951		
	Runway end		4072.04.941		
	Suppl stop bars		4072.04.951		
1a	Lens / reflector seal	4071.95.943	4071.95.943	4071.95.943	4071.95.943
1b	Front glass or lens	1408.21.201		1408.20.220	1408.20.230
	Approach (150W)		1408.20.211		
	End (100W)		1408.20.240		
	Suppl. Stop bar (45W)		1408.20.250		
1c	Reflector	4071.99.450	4071.99.450	4071.99.450	4071.98.151
1d	Front cartridge gasket	4071.95.953	4071.95.953	4071.95.953	4071.95.953
2	Lamp PK30D				
	Halogen 45W-6.6A		2990.48.330		
	Halogen 100W-6.6A		2990.48.325		
	Halogen 150W-6.6A	2990.48.340	2990.48.340	2990.48.340	-
	Flashing lamp 400V 60J	-	-	-	SP011868
	Lamp Connection Kit	6120.00.010	6120.00.010	6120.00.010	-
	Flasher Trigger PCB	-	-	-	-
4a	Leveling screw M6 x 40 Stainless steel DIN 933	7100.08.593	7100.08.593	7100.08.593	7100.08.593
	Cable clamp	4071.95.992	4071.95.992	4071.95.992	4071.95.992
5	Bracing clamp with screw	1409.07.100	1409.07.100	1409.07.100	1409.07.100

Notes

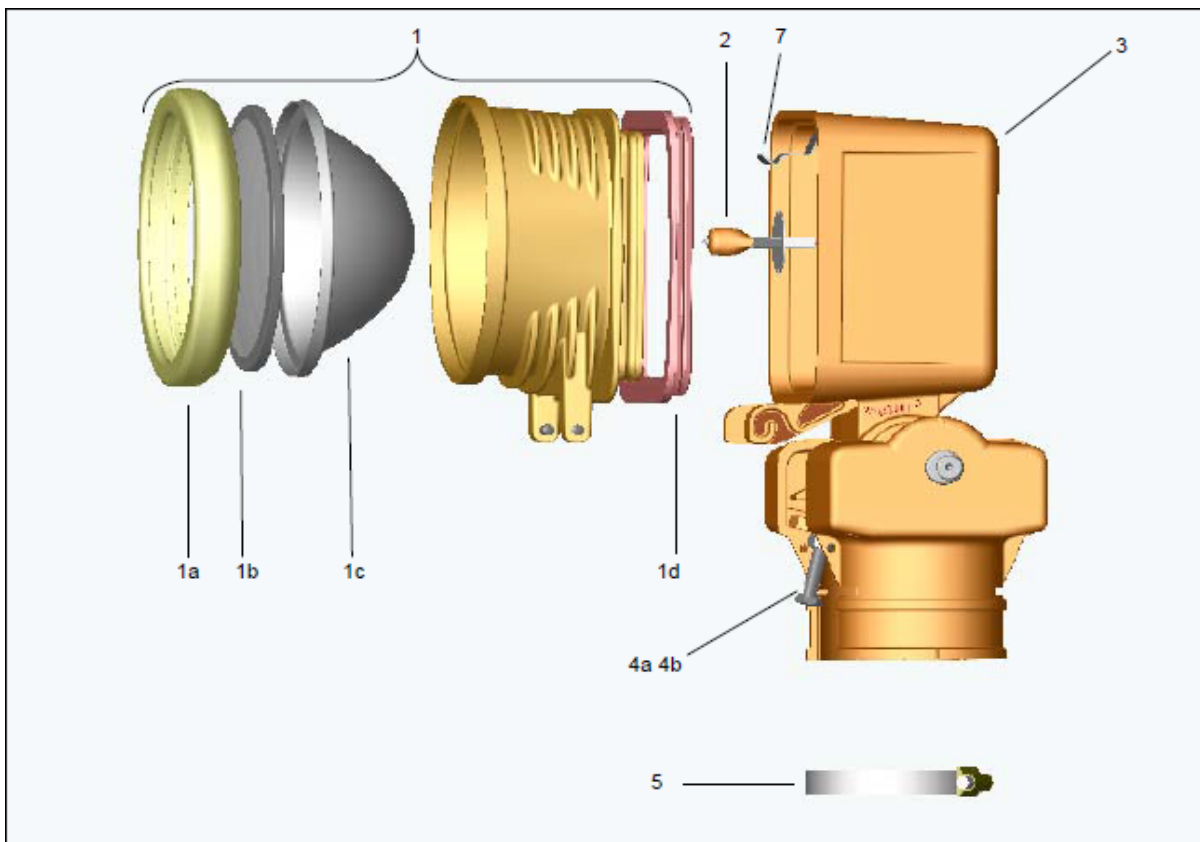
(*) For ordering codes, see § [Ordering code UEL](#)

Optional items	UEL-1-150	Quantity/ order
Secondary cable with moulded-on L823 style 1 2-pole connector, 0.5 m for ground mounting	1MC3DA050 C01	1
Red lens assy, for LI top light	1480.03.315	1
Clear lens assy, for LI top light	1480.03.295	1
Lamp for L.I. top light Gy 9.5 45W 6.6A	2990.40.820	1
Lamp socket for L.I. top light	6114.00.080	1
6-pole plug with leads for UEL with top light	6104.40.200	1

8.3 Exploded views

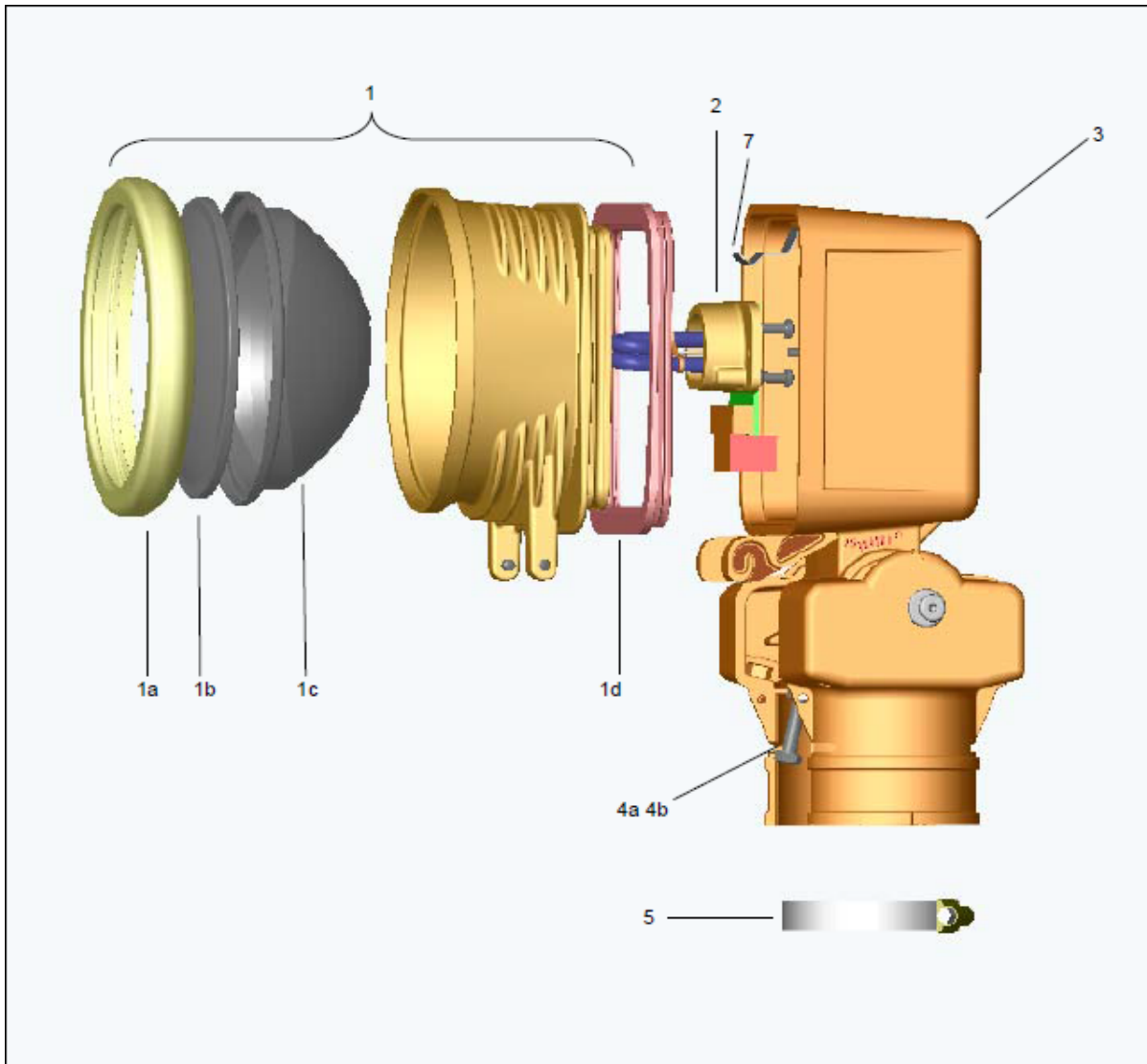
8.3.1 UEL-1-150

The illustration below shows the exploded view of the UEL-1-150.



8.3.2 UEL-1-120

The illustration below shows the exploded views of the UEL-1-120.



Appendix A: SUPPORT

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

ADB SAFEGATE Support

Live Technical Support - Americas

If at any time you have a question or concern about your product, just contact ADB SAFEGATE's technical service department. Trained in all areas of system issues, troubleshooting, quality control and technical assistance, our highly experienced Technical support specialists are available 24 hours a day, seven days a week to provide assistance over the phone.

ADB SAFEGATE **Americas Technical Service & Support (US & Canada): +1-800-545-4157**

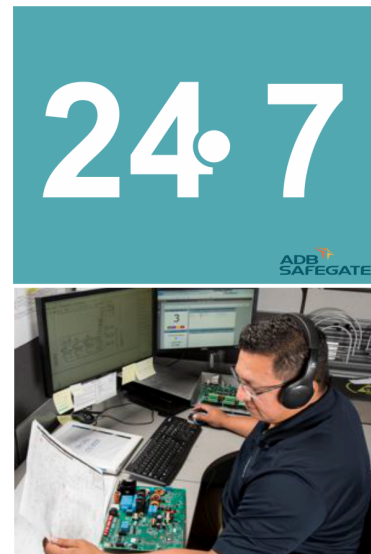
ADB SAFEGATE Americas Technical Service & Support (International): +1-614-861-1304

During regular business hours, you can also Chat with a Service Technician. We look forward to working with you!

Before You Call

When you have an airfield lighting or system control system problem it is our goal to support airfield maintenance staff as quickly as possible. To support this effort we ask that you have the following information ready before calling.

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



Note

For more information, see www.adbsafegate.com, or contact ADB SAFEGATE Support via email at support@adbsafegate.com or

Brussels: +32 2 722 17 11

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

Americas: +1 614 861 1304. Press 3 for technical service or press 4 for sales support.

China: +86 (10) 8476 0106

A.1 ADB SAFEGATE Website

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

A.2 Recycling

A.2.1 Local Authority Recycling

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

A.2.2 ADB SAFEGATE Recycling

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

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

All items returned must be clearly labeled as follows:

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

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

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