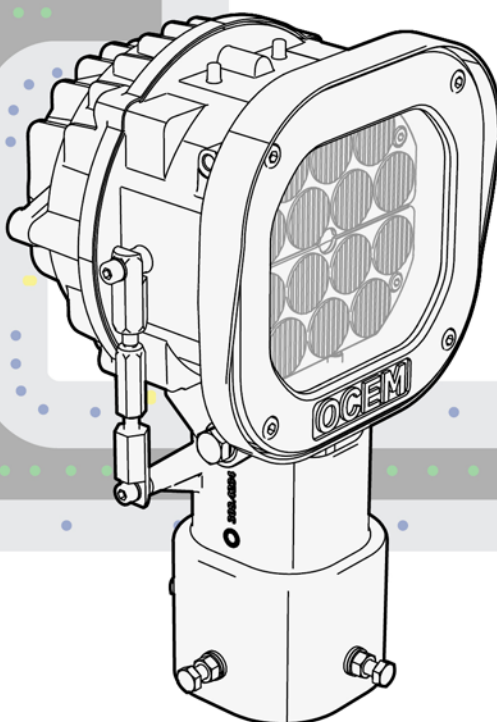


Use and Maintenance Manual

Translation of Original Instructions

Led Elevated Runway Approach

threshold,
threshold wing bar
and runway end light



Contact us

OCEM AT



+39 051 66 56 611



info@ocem.com

Editions

Revision	Date	Notes
1.0	18-12-2014	First edition
2.0	24-01-2023	Revision of the document
3.0	07-08-2023	Revision of the document
3.1	27-03-2024	Revision of the document

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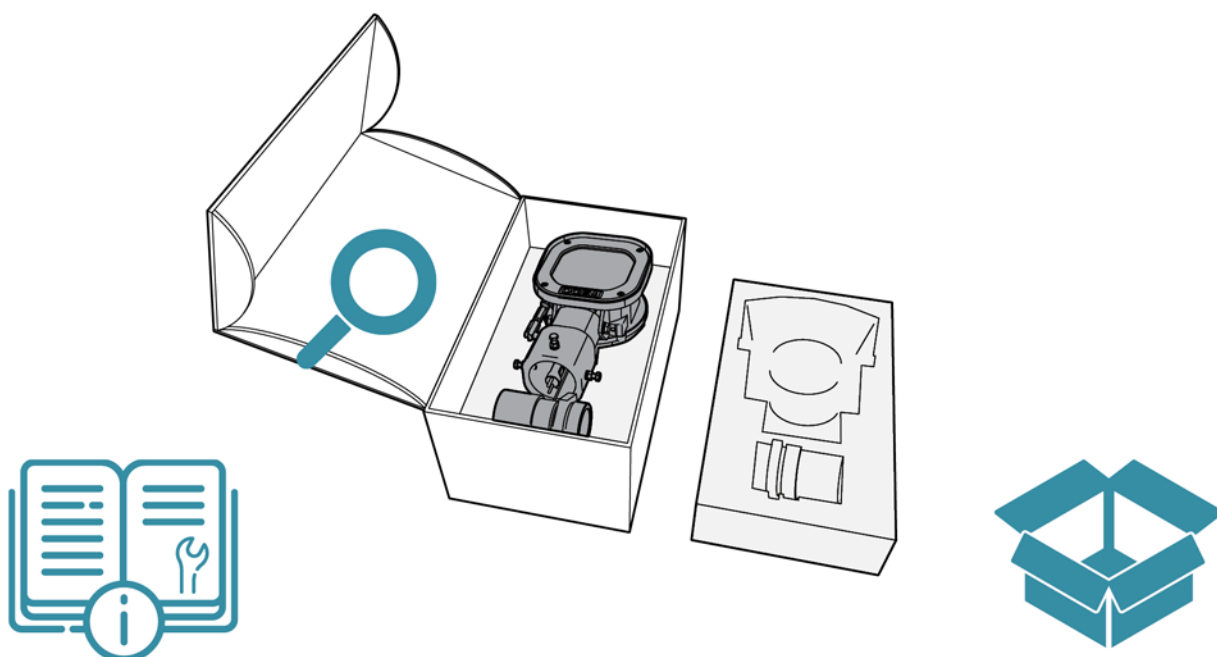
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1 GENERAL INFORMATION

1.1 Package content



The LERA of OCEM Airfield Technology is an elevated LED fixture, high intensity type, for unidirectional emissions and with steady light designed for the following use of:

- FAA: threshold/runway end;
- ICAO: approach, threshold, wing bars, runway end.

Immediately check for visible damages of the containing box. Carefully remove the device and check for visible damages. Before proceeding read all warnings on the packaging.



Store the device in its original packaging until the time of installation.
Do not lift the device from the supply cables to avoid damaging the cables or the watertightness of the device.



The fixtures described in this manual have been designed to be supplied with series circuits, through isolation transformers, connected to constant current regulators from 2,8 A to 6,6 A.

1.2 Manual reference guide

This document contains all the information related to the equipment and describes the procedures to follow during the installation of the product and during ordinary maintenance. The document is intended for all operators that must intervene on the equipment.

This document does not replace in any manner applicable laws, rules or regulations, included the standards FAA and ICAO.

The precautions provided in the manual are always preceded by a symbol as illustrated below:



Indicates the warnings, the notes, the suggestions and other points on which is intended to draw the attention of the reader.



Indicates the operations to be carried out mandatorily or the information which should be carefully read to avoid possible risks.



Indicates particular risks connected with the power supply. It reports the operations to be carried out mandatorily or the information which should be carefully read to avoid possible risks.

These precautions safeguard the personal security of everyone who work on and/or are in proximity of the equipment and of the relative supply circuits.

The failure to comply with the instructions (in particular those preceded by danger, warning, caution precautions) can cause serious injury or death.

1.3 Safety instructions



CAREFULLY READ THIS DOCUMENT.

The improper use of the equipment or the failure to comply all the precautions indicated implies life danger and serious injury to persons and damages to things.



HAZARD OF ELECTRICAL SHOCK, EXPLOSION OR ELECTRIC ARC

Carefully read the enclosed documentation before installing or starting to use the equipment. Do not install the equipment until the completion of all construction works required to carry out the work.



DO NOT OPERATE ON POWERED CIRCUITS

Do not carry out any operation on powered circuits.

Before every access, inspection or intervention on the equipment, ensure to have switched off the equipment by opening the main power switch and by removing the supply from the unit (open the power switch at the beginning of the line or switch off the constant current regulator).

The failure to comply all the precautions indicated implies life danger and serious injury to persons.

1.4 Safety symbols

The symbols illustrated in the following table are used in the user and maintenance manual and on the device. These symbols indicate the existence of any dangerous situations, to indicate obligations and prohibitions in relation to the situations that may represent an hazard for the operator or indicate the behaviour to adopt to minimize the risk for the operator.

Warning signs		Prohibition and obligation signs	
	W001 General warning sign		P001 General prohibition sign
	W004 Laser beam		M001 General mandatory sign
	W005 Non-ionizing radiation		M002 Refer to instruction manual/booklet
	W006 Magnetic field		M005 Connect an earth terminal to the ground
	W012 Electricity		M009 Wear protective gloves
	W017 Hot surface		M015 Wear high visibility clothing
	W027 Optical radiation		M021 Disconnect before carrying out maintenance or repair

1.5 Definition of operator

All operations on devices and on its internal parts must be performed by professional staff, properly formed and aware of the risks connected with the power supply and to the use of low and high voltage circuits.



Take all the precautions in compliance with the safety standards for the work carried out on electrical installations and however for the works carried out using electrical installations or in buffer zones of the installations and of the electrical devices.

All operations on equipments and on its internal parts must be performed by professional staff, properly trained for Cardio Pulmonary Resuscitation (CPR) techniques.



Never operate on devices if there is not at least another operator properly trained for CPR techniques.

Check that Operators do not operate outside their own specific fields of competence and responsibility. OCEM Airfield Technology declines any and all liability arising from wrong operations carried out by untrained personnel in the use of the devices, or deriving from the non compliance of general safety standards.

1.6 Limited warranty

OCEM Airfield Technology assures that all the LERA products marketed are free of manufacturing defects at the time of shipment. This limited warranty will be valid for the period indicated in the sales agreement. **THIS LIMITED WARRANTY IMMEDIATELY DECAYS IF THE PRODUCT IS USED FOR PURPOSES OTHER THAN ORIGINALLY INTENDED.**

This limited warranty is provided by OCEM Airfield Technology to the original purchaser of LERA products as identified by the documents issued at the time of purchase. This limited warranty can be transferred to the subsequent purchasers of the Product, only on condition that this Product is resold as NEW and with the original packaging.



Each change and/or tampering made to the product immediately terminates the warranty. OCEM Airfield Technology cannot be held responsible for any damage to items or persons deriving from the failure to comply with instructions relating to installation, use and maintenance of the product, and to the installation and storage environmental conditions stipulated by the Manufacturer or by applicable rules regarding electrical devices and systems.

In case of potential defects or non-usability of the Goods supplied, the applicable warranty that excludes any other legal warranty and agreement - applies to the defects of materials, in the design, and/or in the installation of the Goods supplied. The warranty consists, depending on the Supplier, in the repair or replacement, at the expense of the Supplier, of each faulty component or malfunctioning component from the beginning, but is not extended to damages arising from negligence or wear.

This warranty lasts for at least 12 months after the date on which the received Goods are put into service, but will not in any case exceed 24 months from the shipping date.

FAA

For FAA certified products this warranty lasts for at least 4 years after the date on which the received Goods are put into service, but will not in any case exceed 5 years from the shipping date.

The Supplier undertakes to repair or replace the components in the shortest possible time without prejudice to the fact that for the so called commercial components and more generally for the components supplied by third-party manufacturers, will only be applied the terms of the respective original manufacturer's warranties.

The warranty absolves from all liability the Supplier and does not apply to the damage of any kind, caused by: improper use by the Customer or by the Customer's staff, use of inadequate materials, or incorrect or insufficient treatments; installation of equipments or spare parts not approved by the Supplier; installation and operating working of the Goods received without following the indications and the instructions provided by the Supplier's Technical staff; improper or excessive use, insufficient maintenance, and/or works not carried out in compliance with the information provided in the use and maintenance instructions; any other reason not attributable to the Supplier. The Customer must shoulder, at its own cost and employing its own staff, without involving the Supplier, those repairs that on the base of the Supplier's opinion are considered compliant at a moderate level of technical know-how.

The Customer must, under penalty of expiration, communicate the complaint concerning the defect or the non-compliance to the Supplier **within 8 days from the date of discovery of the defect**, and must send a written request to activate the intervention under warranty. The intervention request under warranty must be sent to:

**OCEM Airfield Technology | via della Solidarietà, 2/1 | 40056 Valsamoggia BO (Italia)
info@ocem.com**

The Customer must bear the travel and accommodation costs borne by the technical staff of the Supplier that must complete on the installation site any intervention associated with the guarantee.

The warranty excludes any other damage, included those resulting from economic loss and from low production capacity; direct, indirect or consequential damages; and the Contract termination.

The Supplier is not in any manner responsible for any other compensation or indemnity, including damage derived from missed or reduced production, from the loss of chance, from the missed or reduced profit, from the loss of contracts, impossibility of use or in general the partial use, in addition to indirect and/or consequential damages.

1.7 CE marking



This equipment complies with the requirements of European legislation for the CE marking. The user should carefully read this document and respect all the requirements quoted.

This equipment meet the requirements in relation to health and safety of the main EC directives, and in particular of the EMC Directive on electromagnetic compatibility (2014/30/EU) and of the LV Directive relating to electrical equipment designed for use within certain voltage limits (2014/35/EU).

1.8 Confidentiality, industrial property rights

The Customer needs to adopt the maximum confidentiality with respect to all the information of technical nature (including, by way of example and not exhaustively, plans, programmes, documentation, formulas, recipes, setting and correspondence) received by the Supplier or in any case assimilated or gained during the conclusion of the Contract of sale.

Any right regarding intellectual and industrial property connected to equipment and to any other element included in the supplied Goods as indicated in the Contract remain exclusive property of the Supplier.

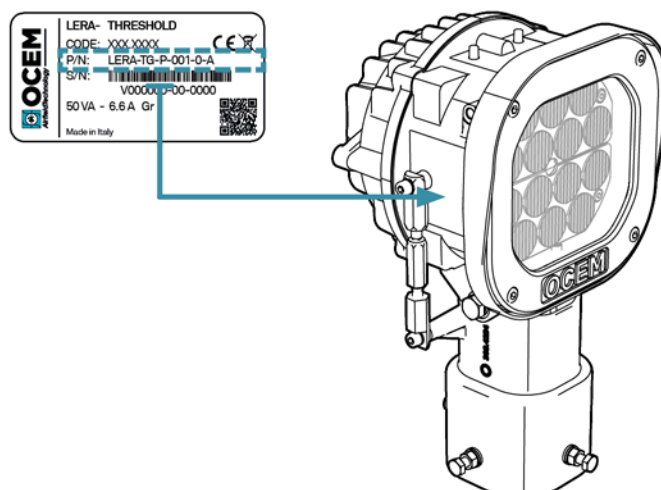
1.9 Disposal



At the end of use, the user must confer all the waste in suitable differentiated waste collection centres. It is the responsibility of the user the correct disposal of the equipment in accordance with the WEEE Directive and with the respective national laws in force at the time of disposal. These equipments must never be disposed of in the household waste.

1.10 Article identification

On each equipment there is an identification plate of the article, where the article code is reported; on the plate there are additional data: the name of the model, employments or use, power supply features, any trademarks and/or marks that attest the agreement of the equipment to specific regulations or legislations.



1.11 Photo-biological risk

The fixtures LERA are designed and manufactured in compliance with current regulations, but if used unsafely or without precautions, the light emitted by the fixture, reaching even high levels of intensity, can be harmful not only to those who use the light fixture locally, but for anyone within the light beam range.

The optical radiation issued by the equipment does not present any particular photo-biological risks, however can be harmful.



Don't look directly inside the light source during high intensity operation. Wear appropriate personal protective equipment (goggles or similar protections).

2 FIXTURE DESCRIPTION

2.1 General characteristics

The fixtures LERA are designed for the purpose of providing visual guidance to approaching, landing and take-off aircrafts on ICAO CAT I, II and III, FAA (IFR precision instrument), militar runways in the following applications:

- Approach: ICAO.
- Runway threshold: FAA AC150/5345-46 L-862E, ICAO.
- Wing bars: ICAO.
- Runway end: FAA AC150/5345-46 L-862E, ICAO.

The fixtures LERA can be also used on ICAO traffic routes in the following applications:

- Stop bar: FAA AC150/5345-46 L-862S, ICAO

The LERA is compliant with the rules:

ICAO (Annex 14 - Volume I [Fig. A2-1, A2-2, A2-3, A2-4, A2-8, A2-12]) **FAA** (AC150/5345-46, EB67 [L-862S])

IEC (TS 61827)

NATO (Stanag 3316)

CAA (CAP 168)

TCAA (TP312)

ENAC (Airport Construction Regulation)

EASA (CS-ADR-DSN - Volume I [figures U-5, U-6, U-7, U-8, U-12])

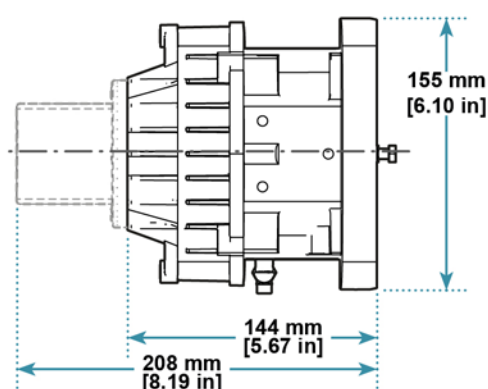
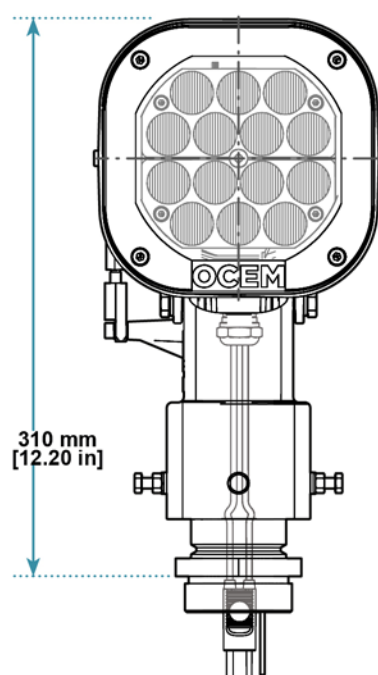
CASA (Manual of Standards Part 139)



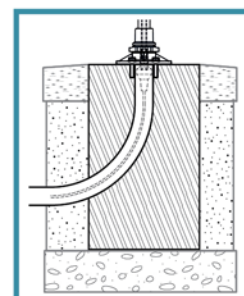
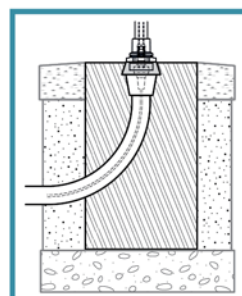
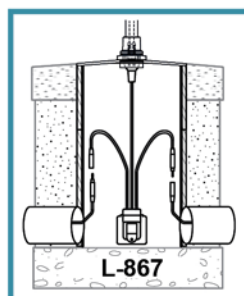
The fixtures LERA described in this manual have been designed to be installed on bases L-867 conforming to FAA AC 150/5345-42 mounting base plate included for elevated fixtures conforming to FAA AC 150/5345-46, on pipe (with threaded entrance) placed in the concrete base, on flange firmly anchored to the concrete base.



The supply circuits for the fixtures LERA can be positioned within the bases established (FAA L-867) or within plastic or metallic pipes permanently laid in the ground, equipped with appropriate coupling devices.



INGRESS PROTECTION



2.2 Use

The fixtures LERA are realised in different versions, to meet the requirements of the regulations depending on the use:

- Axis and bar approach: module 14 LED WHILE colour
- Side approach bars: module 14 LED RED colour
- Threshold: module 14 LED GREEN colour
- Wing bars: module 14 LED GREEN colour
- Runway end: module 7 LED (with separate lens) RED colour
- Stop bar (FAA): module 7 LED (with integrated lens) RED colour
- Stop bar (ICAO): module 7 LED (with integrated lens) RED colour

2.3 Configuration and assembling

The fixtures LERA are supplied in different configurations depending on the assembly mode provided for the device:

- Direct assembly: the fixtures are complete with frangible coupling (configuration/assembly: P-001). The body is directly installed on the coupling that is fastened to the anchorage (threading 2" GAS). The fixture in this configuration is completely assembled, with bipolar plug FAA L-823 Style
- Mounting on pole with frangible coupling: the fixtures are supplied without pole and without coupling (configuration: C). Depending on the configuration the fixtures can be supplied in the following configurations:
 - 000: fixture without power cable, suitable for the mounting on pole with frangible coupling. The bulkhead connector installed on the body of the fixture is equipped with connector which allows the connection to be made without opening the fixture. The parts required for assembly (bipolar cable and connector kit FAA L-823 Style 5, pole Ø 60 mm and frangible coupling) must be ordered separately. For further details, please refer to the mounting accessories table.
 - 050: fixture already assembled, complete with power supply cable (two unipolar conductors L = 500 mm with plug FAA L823 Style 4) and ground cable, suitable for the mounting on pole with frangible coupling of maximum height 300 mm. The parts required for assembly (pole Ø 60 mm and frangible coupling) must be ordered separately. For further details, please refer to the mounting accessories table.
 - 250: fixture semi-assembled, complete with power supply cable (bipolar cable L = 2500 mm) equipped with plug FAA L-823 Style 1 and ground cable, suitable for the mounting on pole with frangible coupling. The cable is supplied separately: it is possible to cut the cable to length and proceed to assembly. The bulkhead connector installed on the body of the fixture is equipped with connector which allows the connection to be made without opening the fixture. The parts required for assembly (pole Ø 60 mm and frangible coupling) must be ordered separately. For further details, please refer to the mounting accessories table.



The threshold, wing bars and runway end use fixtures are normally mounted on the frangible coupling (configuration/assembly: P-001).

Axis fixtures and approach bars are normally mounted on a pole with a frangible coupling (configuration: C | NOTE: actual pole length fixed by the installation project!).

The approach bars, side approach bars fixtures are normally mounted on folding poles (configuration: C | NOTE: actual pole length fixed by the installation project!).

M On request, a light emission source status monitoring module integrated in the device is supplied. In the event of a fault or failure it promptly returns the open circuit information to the secondary circuit of the isolation transformer.

A The arctic kit option meets the FAA specifications (Engineering Brief N.67) preventing the formation of ice on the protective transparent glass by heating the body of the fixture near the glass. The heater automatically activates when the temperature falls below -1 °C and is turned off when the detected temperature is higher than +10 °C.

example: LERA TG - P - 001 - 0 - A		
Use [Colour] AC = Axis and bar approach [White] AR = Side approach bars [Red] TG = Threshold [Green] WG = Wing bars [Green] ER = Runway end [Red] SB = Stop bar (FAA) [Red] BA = Stop bar ICAO [Red]		
Configuration P = Fixture complete with frangible coupling* C = Fixture without frangible coupling**		
Assembly (P) With coupling 001 = Complete fixture (C) Without coupling 000 = without cable 050 = with cable (0,50 m) 250 = with cable (2,50 m)***		
Monitoring option 0 = Without monitoring M = With monitoring		
Arctic kit option 0 = Without arctic kit A = With arctic kit		

*** Cable length available only for AC use (axis and bar approach) and AR (side approach bars)

In the example **LERA - TG -P-001 - 0 - A**: High intensity elevated LED fixture, LERA model configured for threshold use. Unidirectional fixture with green colour lamps. Complete system, equipped with special support, frangible coupling and cable with bipolar plug (L-823). Fixture not equipped with optional monitoring system. Arctic kit present.

2.7 Wiring

The LERA fixture can be connected through connectors FAA L-823 style 5/6 to an isolation transformer in series FAA L-830/L831 (60/50 Hz).

The consumption varies depending on the number of light sources installed and on the presence of any arctic kit. The nominal values related to the greater absorption configuration (measured during the operational phase at 6.6 A with toroidal isolation transformer 65 W) are given in the table below:

	Without Arctic Kit	With Arctic Kit
AC [W]	38 VA	55 VA
AR [R]	26 VA	43 VA
TG [G]	30 VA	47 VA
WG [G]	30 VA	47 VA
ER [R]	20 VA	37 VA
SB [R]	20 VA	37 VA
BA [R]	17 VA	34 VA

The power factor values are given in the table below:

	2.8 A	6.6 A
Without Arctic Kit	0.96	0.98
With Arctic Kit	0.98	0.98

2.8 Mounting system



Always respect the project quotas. Before proceeding with the installation and commissioning of the device, check the position and ground and elevation.

All fixtures installed on the pole (C configuration) are supplied without pole and without any frangible coupling. Installation elements must be ordered separately.

The aluminium pole (Ø 60 mm) is available in standard length versions from 0.15 to 2.0 m. The pole can be cut to size according to the installation project.

Code	Description	Features
315.3710	Support pole 150 mm	Support pole Ø 60 mm H = 150 mm
315.3711	Support pole 500 mm	Support pole Ø 60 mm H = 500 mm
315.3712	Support pole 1000 mm	Support pole Ø 60 mm H = 1000 mm
315.3713	Support pole 1500 mm	Support pole Ø 60 mm H = 1500 mm
315.3714	Support pole 2000 mm	Support pole Ø 60 mm H = 2000 mm
155.7200	Frangible coupling	Frangible coupling for pole Ø 60 mm (LERA configuration C-050/C-250)

3 INSTALLATION

3.1 Fixture placement

The signalling devices, in combination with horizontal and vertical fixtures, provide information to the pilots and therefore represent a fundamental driving aid.

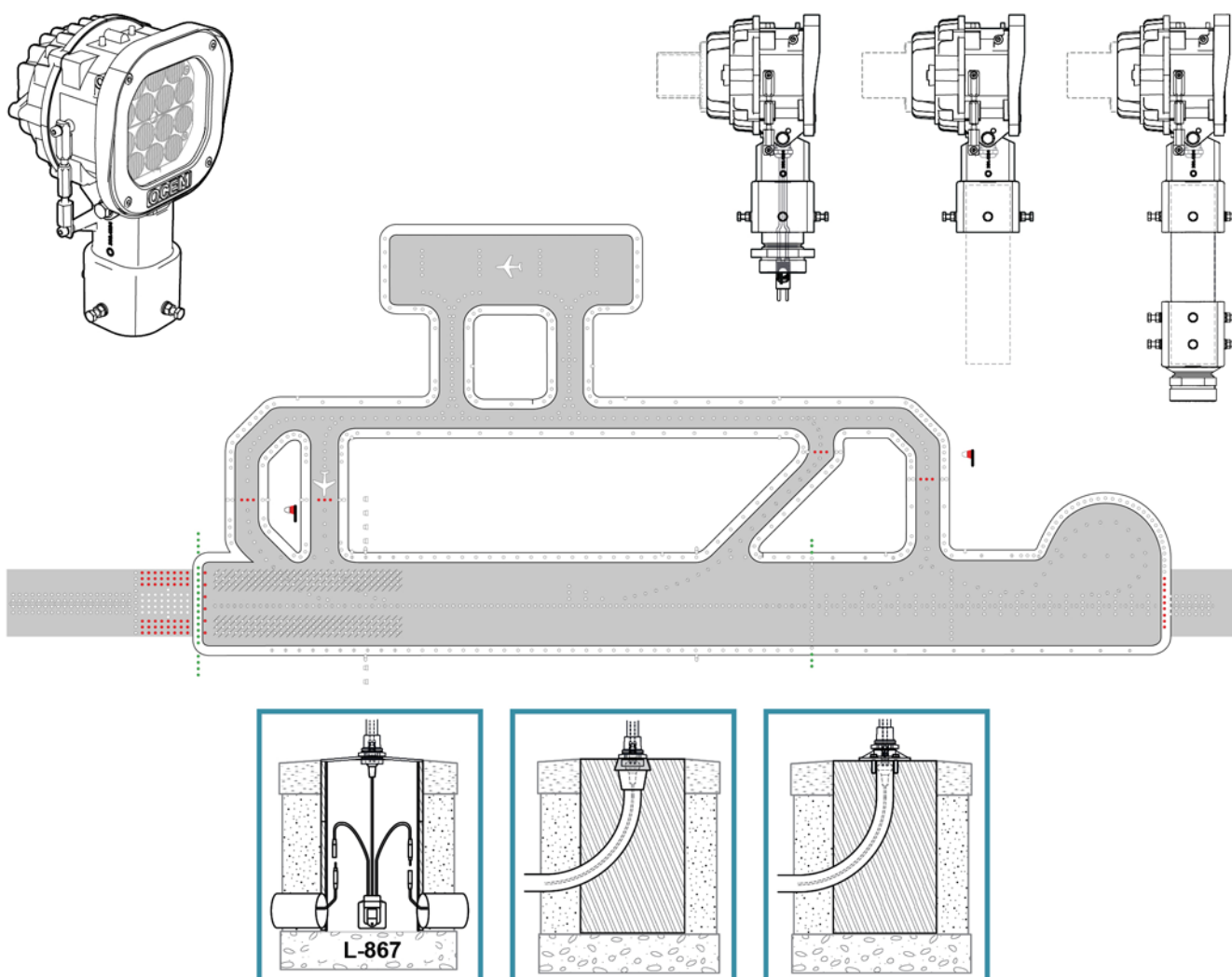
These devices must always be in operating condition and must be clean, maintained and, if necessary, replaced as soon as their visibility is affected.

The chromatic features of signalling optical devices must be compliant with the dispositions of competent bodies and with the regulations in force.



For the positioning of the fixtures always refer to the requirements of the relevant Standards:

- ICAO Annex 14 Volume I
- FAA 150/5345-46 for the construction and operation of airports;
- CASA MOS Civil Aviation Safety Authority Manual of Standards (Part 139);
- TCAA TP-312 (Aerodrome Standards and Recommended Practices).
- ENAC Airport Construction Regulation
- NATO Stanag 3316



3.2 Preliminary operations

Use the fixture only in combination with compatible supports. The fixture is normally installed on a concrete block.

Ensure the verticality of the upper part of the support.

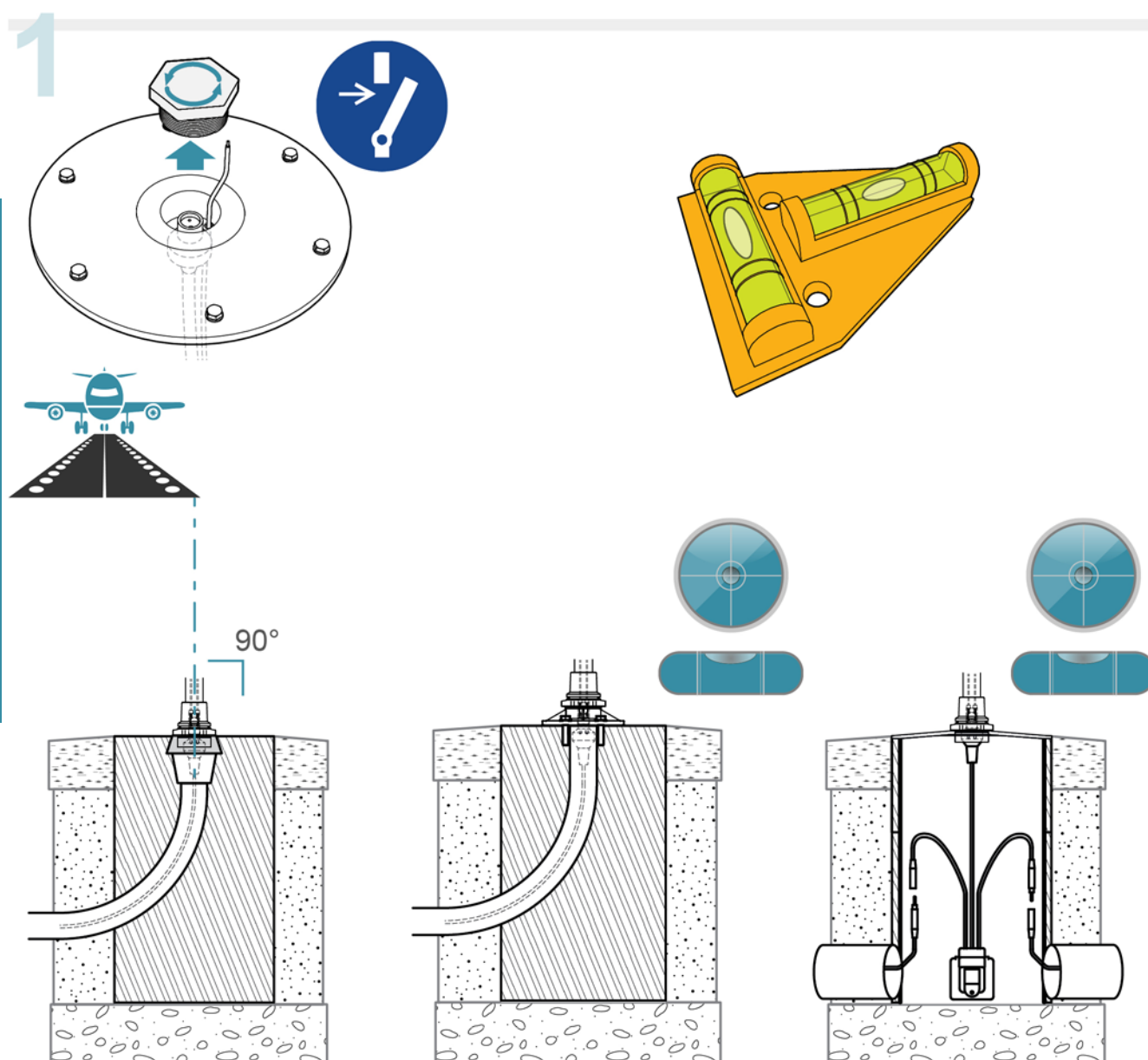


Using a bubble level check that the fastening surface of the flange (on the concrete or on the base plate) is perfectly at level.

In the case of an elbow pipe, ensure the verticality of the upper part of the pipe.



Do not proceed with installation if the supports are damaged or not aligned.



3.3 Bipolar cable connection



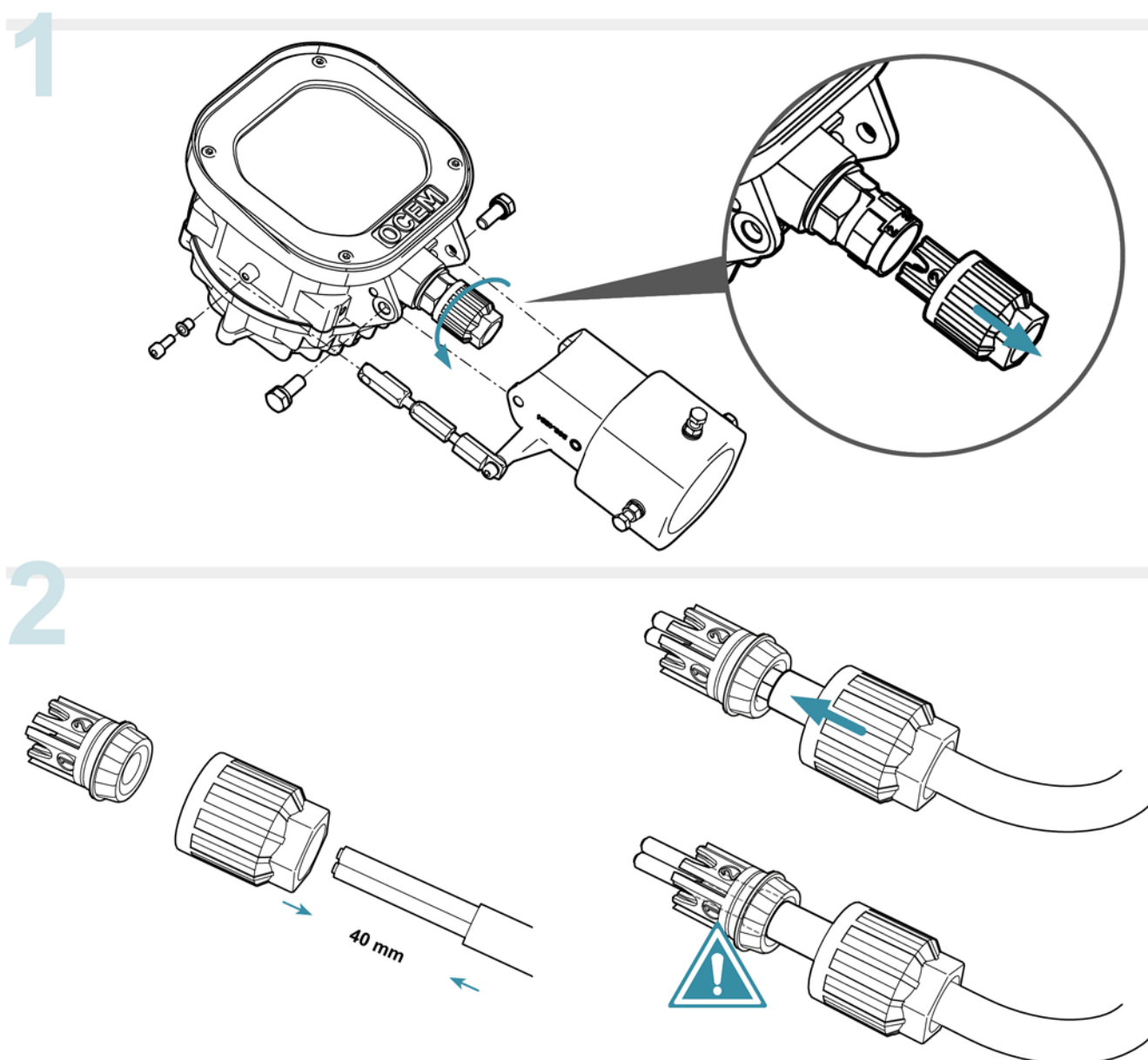
The assembly of the power supply cable must be performed only by professional staff, in compliance with all the safety requirements of the laws and regulations in force in the country of use.

Carry out operations on the bench, with all elements detached from energy sources. Never operate on potentially active components.

If necessary, disassemble the support. Unscrew the cable clip nut of the bulkhead coupling and remove it from the fixture.

Cut the cable to the desired length: the cable length shall be sufficient to allow the connection of the device on the type of support envisaged in the installation project. The length L of the cable must be approximately 150 mm greater than the height H of the support.

Remove an initial section of the sheathing of the cable to allow subsequent connection to the terminals and insert the cable in the connection coupling through the gasket.



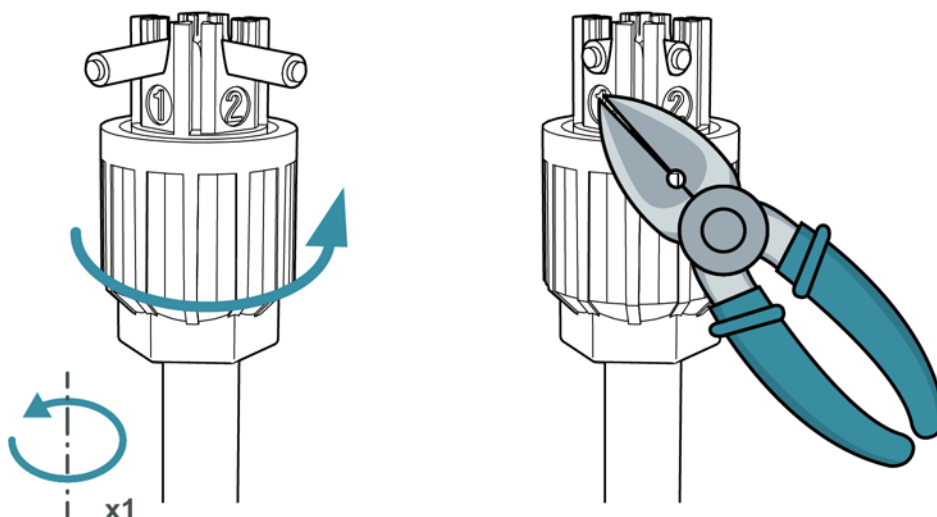
Slightly screw the cable clip nut: perform a single turn to secure the cable in position and insert the conductors in the terminals 1 (small PIN), 2 (big PIN). Cut off the part of the conductors in excess at the terminal.

Make the earth connection: connect the conductor to the ground screw located on the lower part of the body.

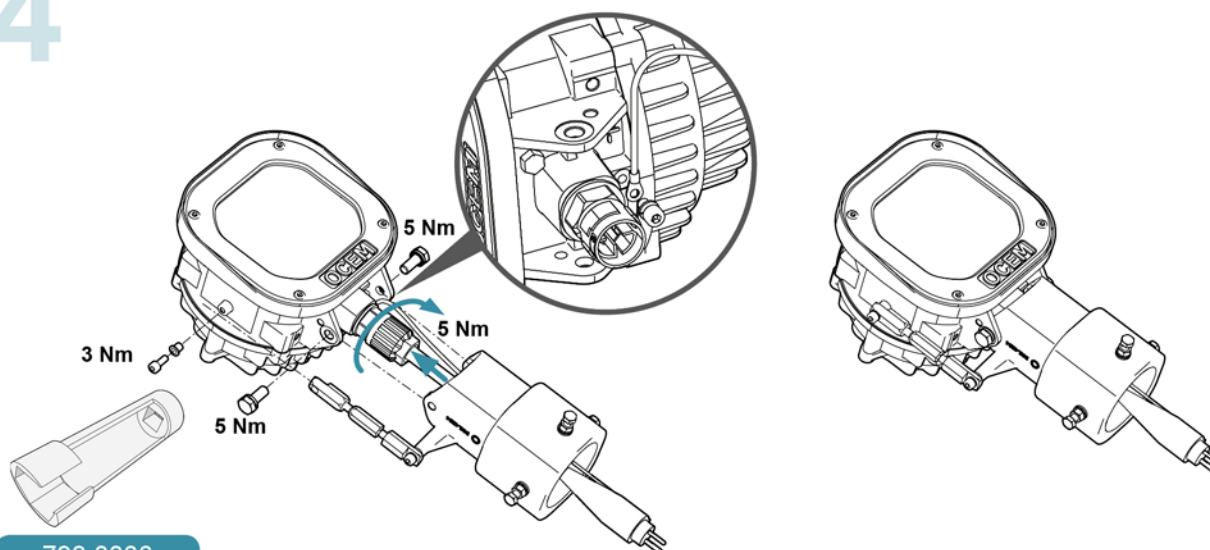
Pass the cable through the support and insert it into the bulkhead coupling, observing the numbering on the joint. Using the open hexagonal key (not included) completely tighten the cable clip nut with the indicated tightening torque.

Reassemble the support. Tighten the screws with the indicated tightening torque.

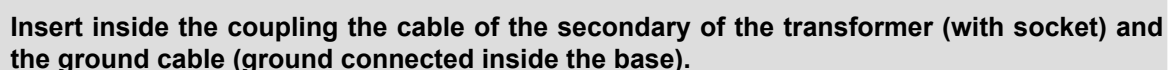
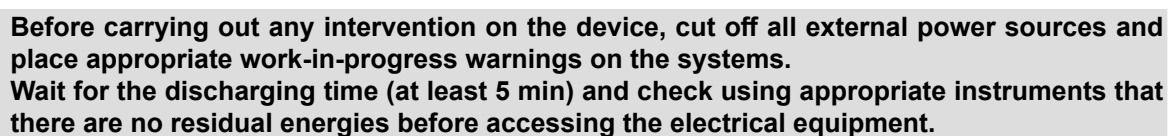
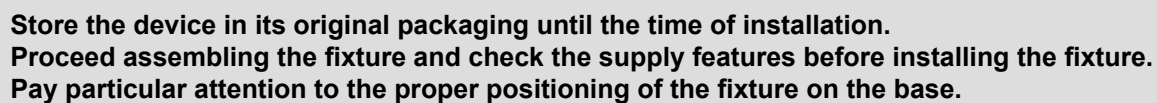
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4



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3.5 Installation of the light fixture directly on the pole (configuration C)



Store the device in its original packaging until the time of installation. Proceed assembling the fixture and check the supply features before installing the fixture. Pay particular attention to the proper positioning of the fixture on the base.

The fixtures installed on the pole (C configuration) are supplied without pole and without any frangible coupling. Use the fixture only in combination with compatible supports.

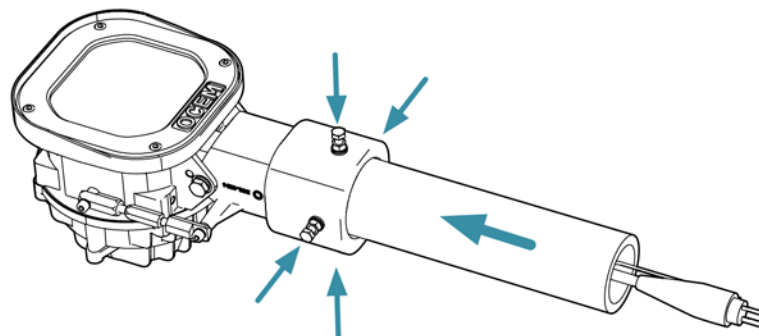
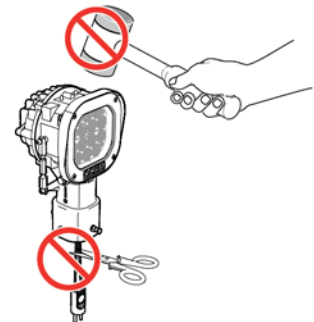
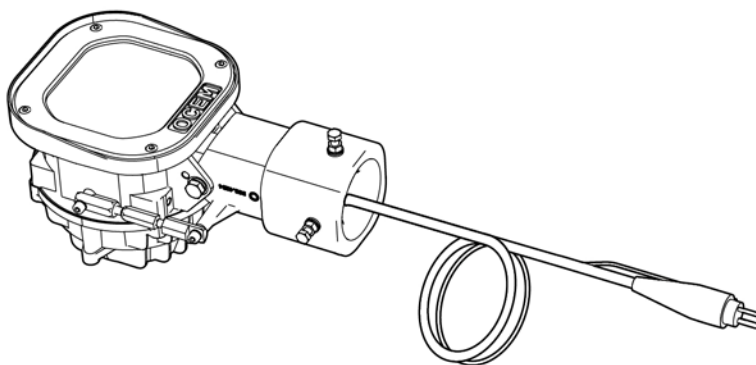


Before carrying out any intervention on the device, cut off all external power sources and place appropriate work-in-progress warnings on the systems. Wait for the discharging time (at least 5 min) and check using appropriate instruments that there are no residual energies before accessing the electrical equipment.

Insert inside the poles the power supply cable and the ground conductor, and insert the fixture on the pole (Ø 60 mm) of height in accordance with the project: the focus of the fixture is positioned 143 mm above the support system.

Tighten uniformly the screws present on the body of the fixture until stopping the fixture on the pole (without tightening) Install an adequate support system.

1



If foreseen, screw and tighten the frangible coupling to the base.

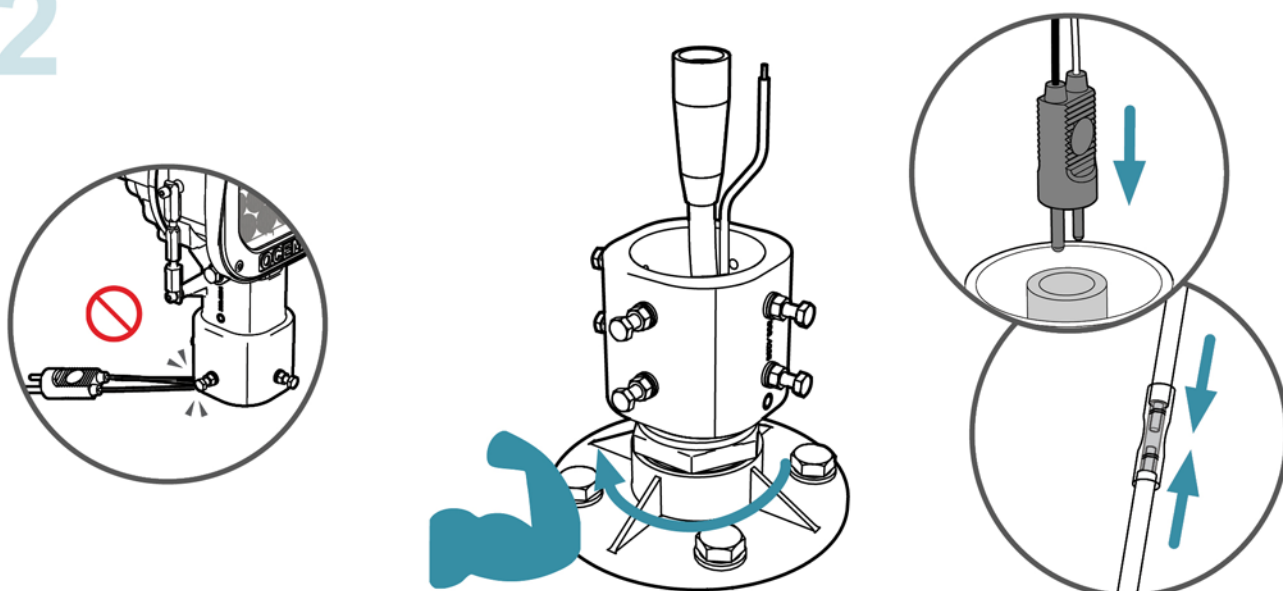


Insert inside the coupling the cable of the secondary of the transformer (with socket) and the ground cable (ground connected inside the base).

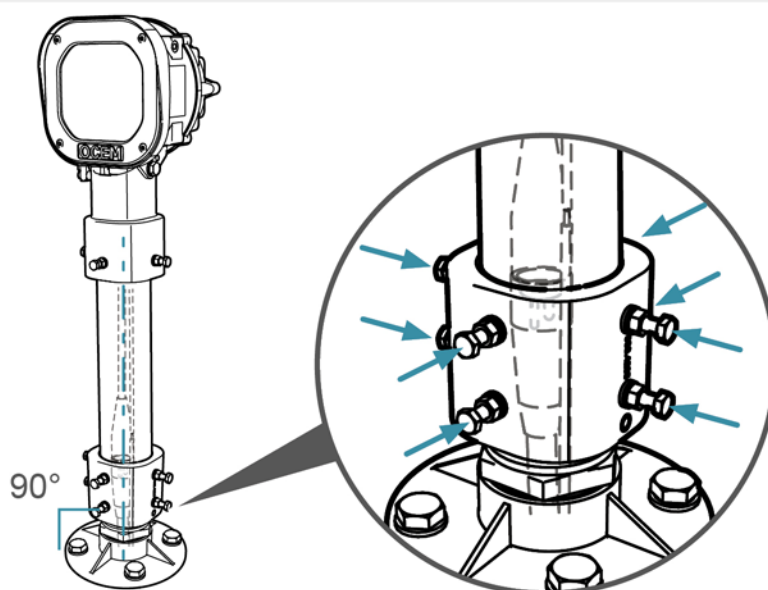
Make the electrical connections: insert the plug of the fixture in the socket coming from the transformer and joint the ground cable with the protective conductor coming from the base.

Insert the pole on the coupling and tighten the locking screws (respecting the verticality of the pole).

2



3



3.6 Installation of the light fixture on the folding pole (configuration C)



Store the device in its original packaging until the time of installation. Proceed assembling the fixture and check the supply features before installing the fixture. Pay particular attention to the proper positioning of the fixture on the base.

The fixtures installed on the pole (C configuration) are supplied without pole and without frangible coupling. Use the fixture only in combination with compatible supports.

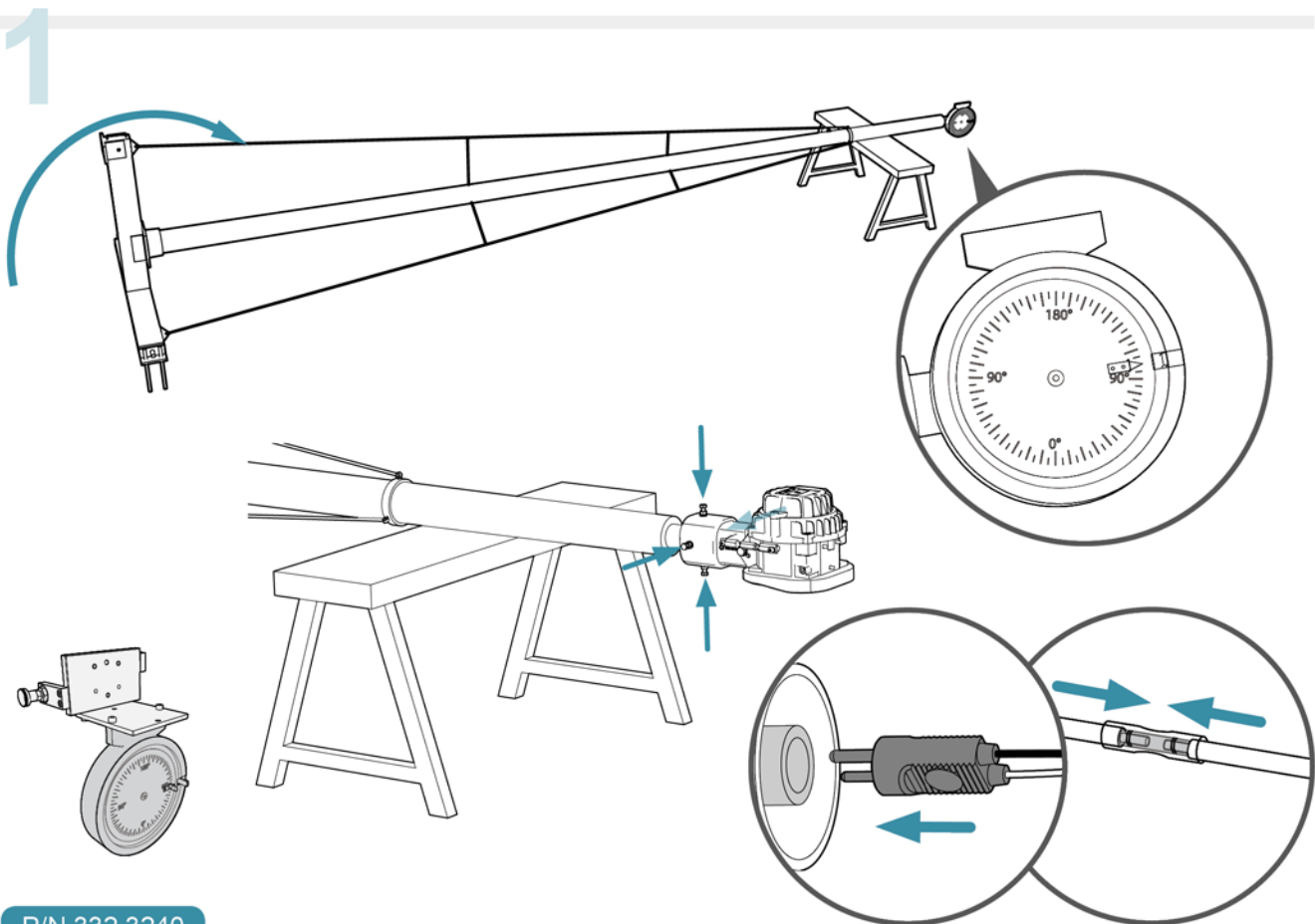


Before carrying out any intervention on the device, cut off all external power sources and place appropriate work-in-progress warnings on the systems. Wait for the discharging time (at least 5 min) and check using appropriate instruments that there are no residual energies before accessing the electrical equipment.

The frangible pole must be prepared for installation operations: following the manufacturer's instructions, lower the pole, by placing it on a perfectly level support if provided. Apply the pendulum goniometer to the upper part of the pole and detect the angle of repose of the pole and take note (in the example 10°).

Make the electrical connections: insert the plug of the fixture in the socket coming from the transformer and joint the ground cable with the protective conductor.

Tighten uniformly the screws present on the body of the fixture until stopping the fixture on the support (without tightening).



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Align the fixture.



Place a post as a pointing reference.

Rotate the knob to unlock the azimuthal convergence adjuster of the optical pointer and set the angle defined by the standards. Turn the knob to lock the pointer in position.



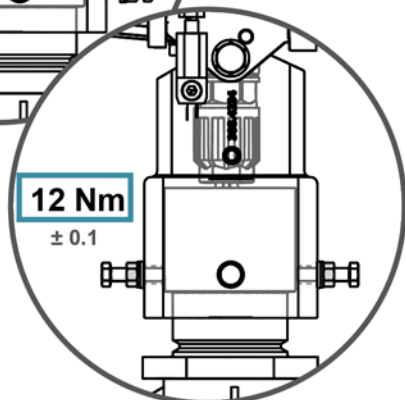
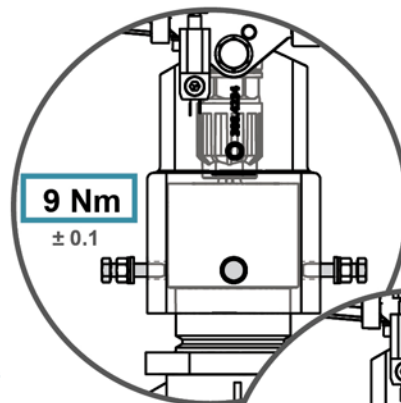
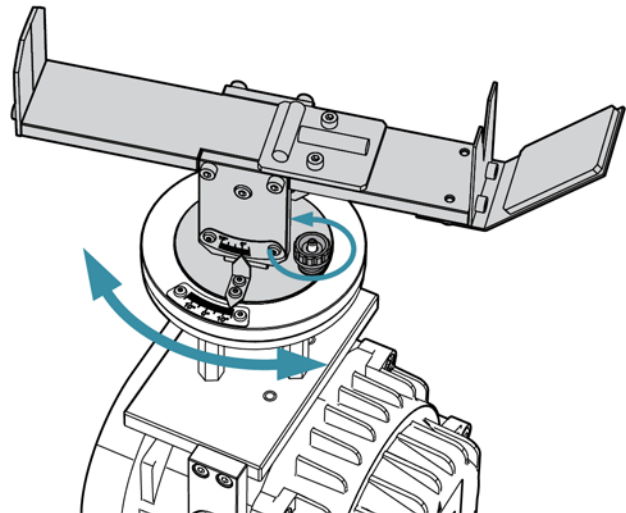
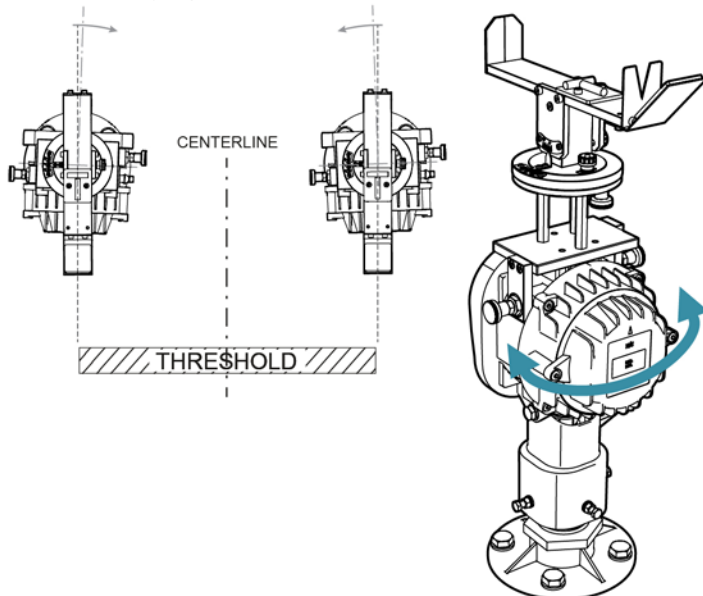
Use the optical pointer to correctly align the light beams.
Make small movements until reaching the right position.

Keeping the alignment fixed, tighten the screws present on the coupling to the indicated torque paying attention not to send the locking nut to stroke on the coupling. Therefore tighten the nuts to the indicated torque.

3

	HORIZONTAL POINTING
Approach <i>runway edge and transverse bars*</i>	
Threshold up to 315 m	0°
from 316 to 475 m	0°
from 476 to 640 m	0°
from 641 m to the end	0°
Approach <i>side rows</i>	
Threshold up to 15 m	+2.0°
from 116 to 215 m	+2.0°
216 m and over	+2.0°
Threshold	+3.5°
Wing bars	+2.0°
Runway end	0°

* the approach-transverse bars fixtures positioned more than 22.5 m from the runway edge must be oriented to +2°



Level the fixture.

Rotate the knob to unlock the zenith adjuster of the optical pointer and set the angle defined by the standards. Turn the knob to lock the pointer in position.

Loosen the locking screws of the fixture. Act on the adjustment tie rod and proceed to fine adjustments of the zenith pointing. After adjustment, tighten the screws present on the support to the indicated torque.



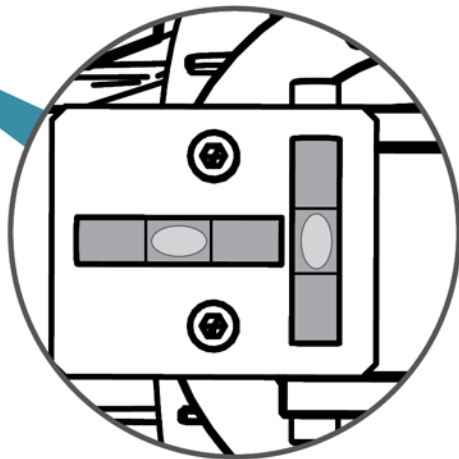
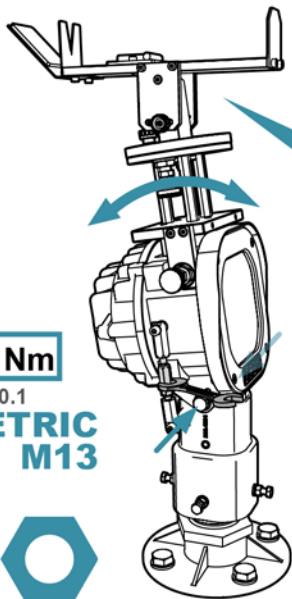
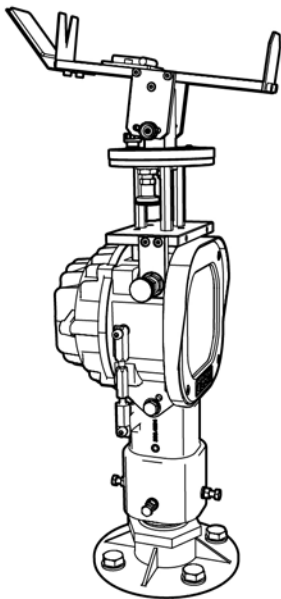
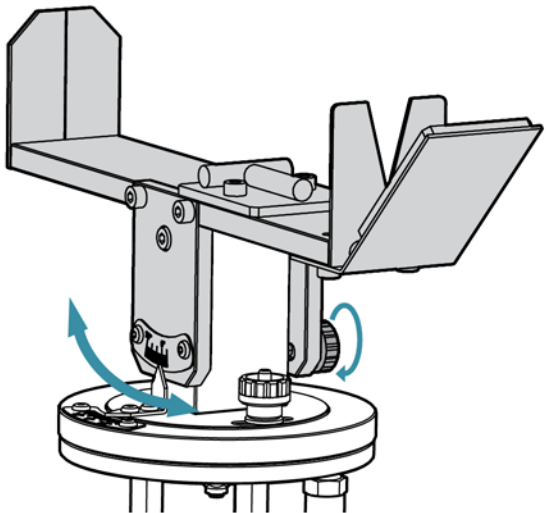
Use the level present on the pointing tool to correctly align the fixture.
Make small movements until reaching the right position.

At the end of the operations remove the tool and complete the installation.

4

	VERTICAL POINTING
Approach runway edge and transverse bars*	
Threshold up to 315 m	+5.5°
from 316 to 475 m	+6.0°
from 476 to 640 m	+7.0°
from 641 m to the end	+8.0°
Approach side rows	
Threshold up to 15 m	+5.5°
from 116 to 215 m	+6.0°
216 m and over	+6.5°
Threshold	+5.5°
Wing bars	+5.5°
Runway end	+2.5°

* the approach-transverse bars fixtures positioned more than 22.5 m from the runway edge must be oriented to +2°



3.8 Pointing and alignment on folding pole



The positioning of the light elements varies depending on the use.
Ensure that the device is used correctly for its intended purpose, in accordance with the installation project and the regulations in force.
For correct evaluation of angles, take into account the orientation of the support pole.

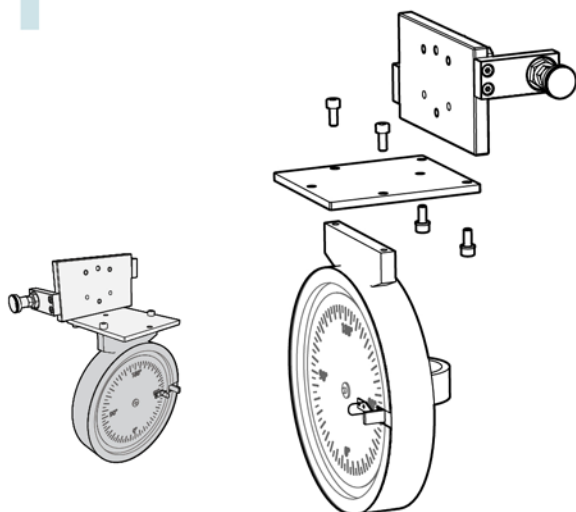
Install the pointing tool on the body of the fixture and proceed to adjust the light beam.



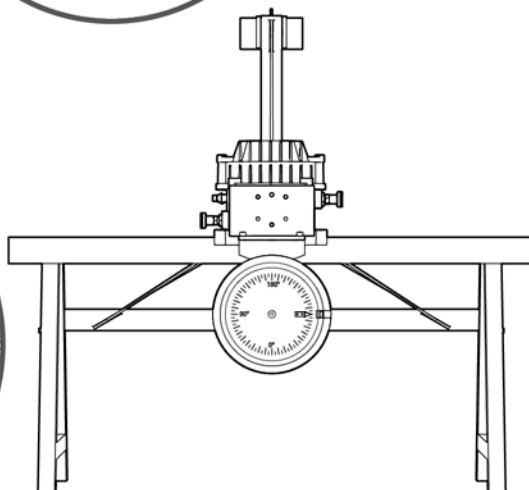
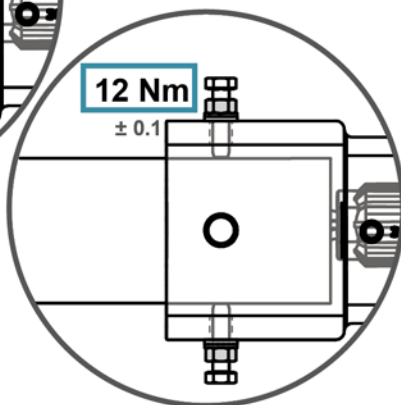
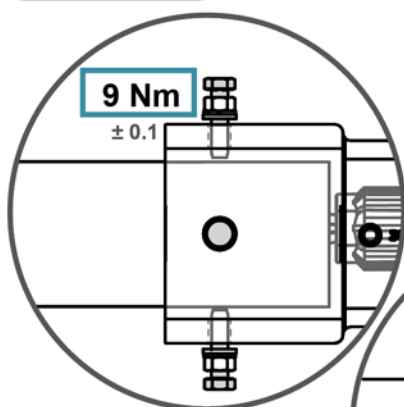
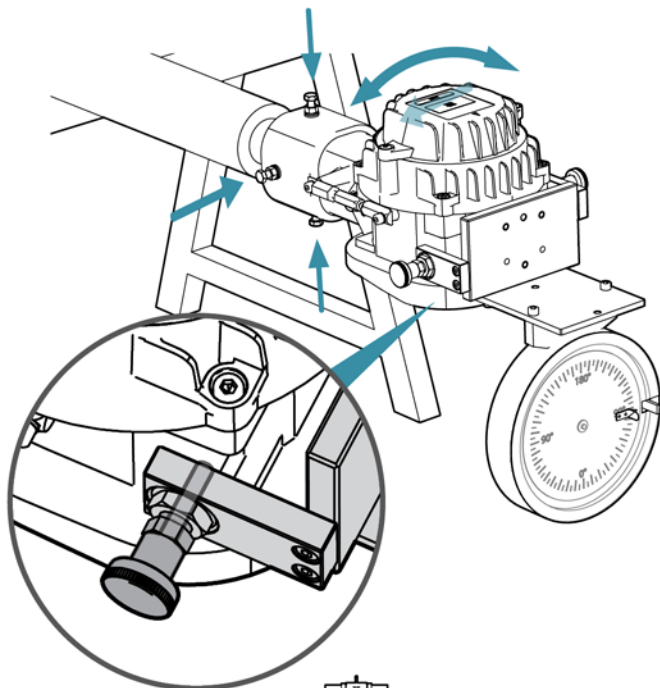
Use the pendulum goniometer to correctly align the fixture.
Make small movements until reaching the right position.

Keeping the alignment fixed, tighten the screws present on the coupling to the indicated torque paying attention not to send the locking nut to stroke on the coupling. Therefore tighten the nuts to the indicated torque.

1



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Position the goniometer to detect the zenith orientation and adjust the light beam.

Loosen the locking screws of the fixture. Act on the adjustment tie rod and proceed to fine adjustments of the zenith pointing. After adjustment, tighten the screws present on the support to the indicated torque.



**Use the level present on the pointing tool to correctly align the fixture.
Make small movements until reaching the right position.**

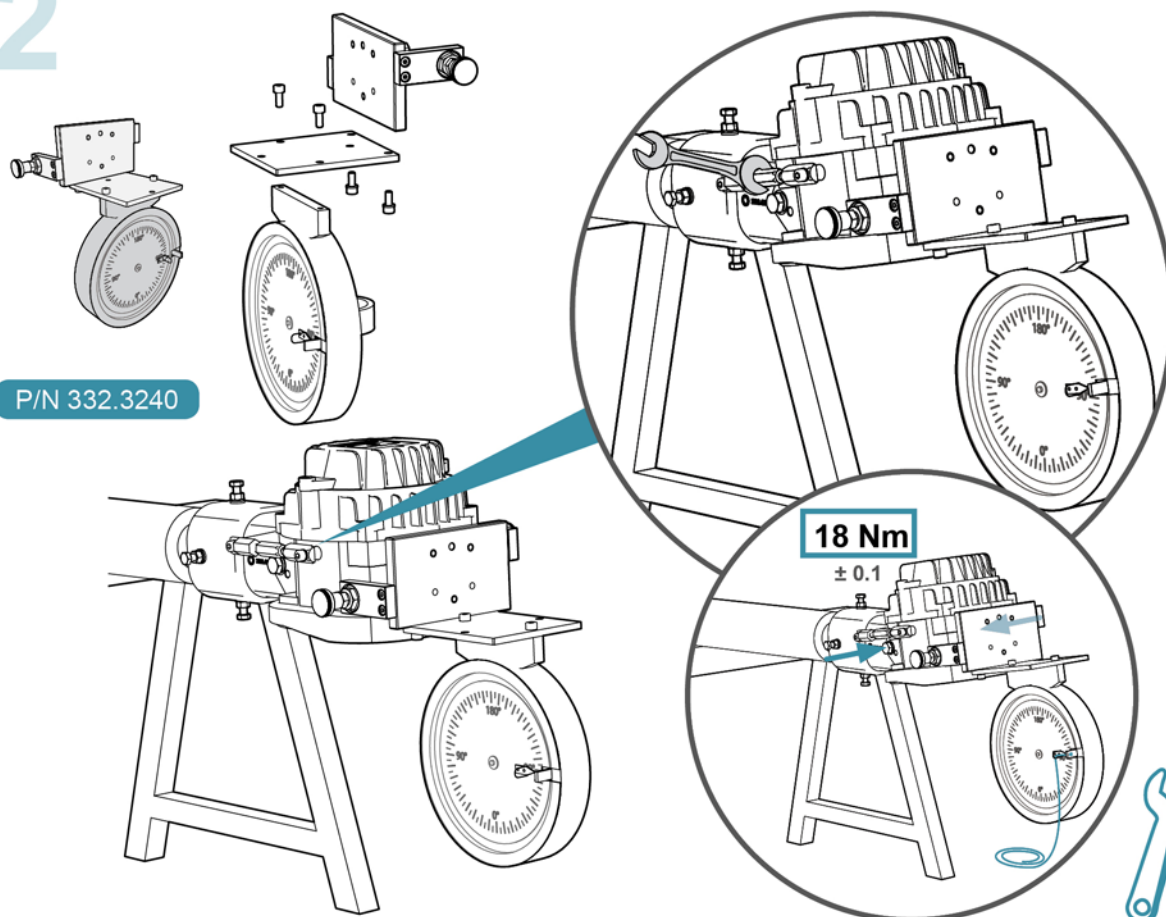
carry out the verification of the pointing (see following paragraph).



Example:
angle of repose detected: 10°; elevation angle: 8°.
Pointing angle (to be read on the goniometer when locking): $90^\circ - 10^\circ - 8^\circ = 72^\circ$

At the end of the operations remove the tool and complete the installation.

2



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18 Nm

± 0.1

**METRIC
M13**



Verification of the pointing of the fixture on pole head

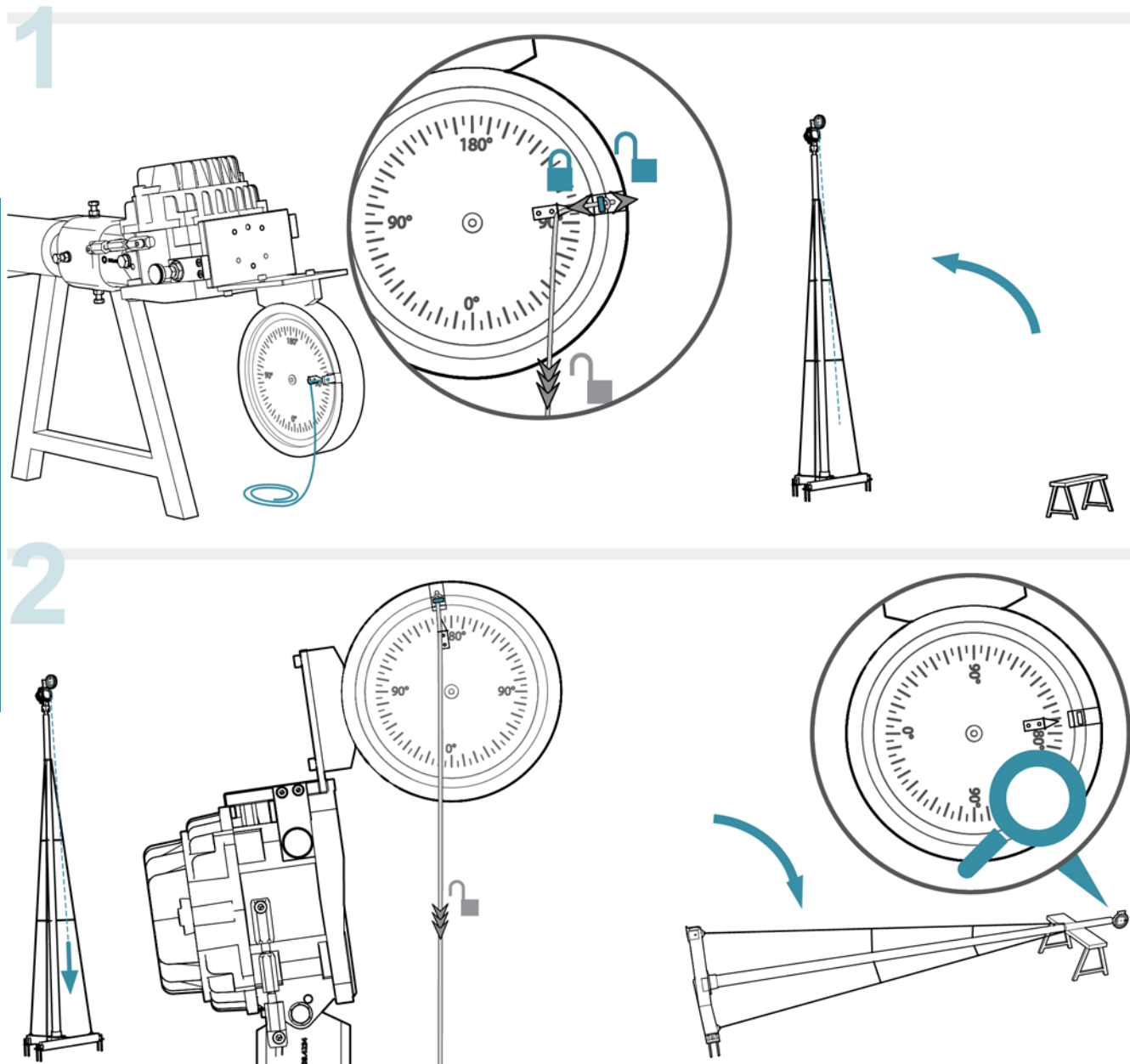


After each pointing operation, check that the fixture setting is correct.

Act on the lever to lock the rotation of the goniometer and connect the nylon string. Lift the pole to the working position.

When the pole is in position, act on the string to temporarily unlock the goniometer and detect the actual angle. Wait for the goniometer to settle then release the string to lock the goniometer again.

Proceed to lower the pole. Read the measured value and check that it corresponds to the project angle. If necessary, make required adjustments and repeat the verification.



3.9 Removal of the light fixture

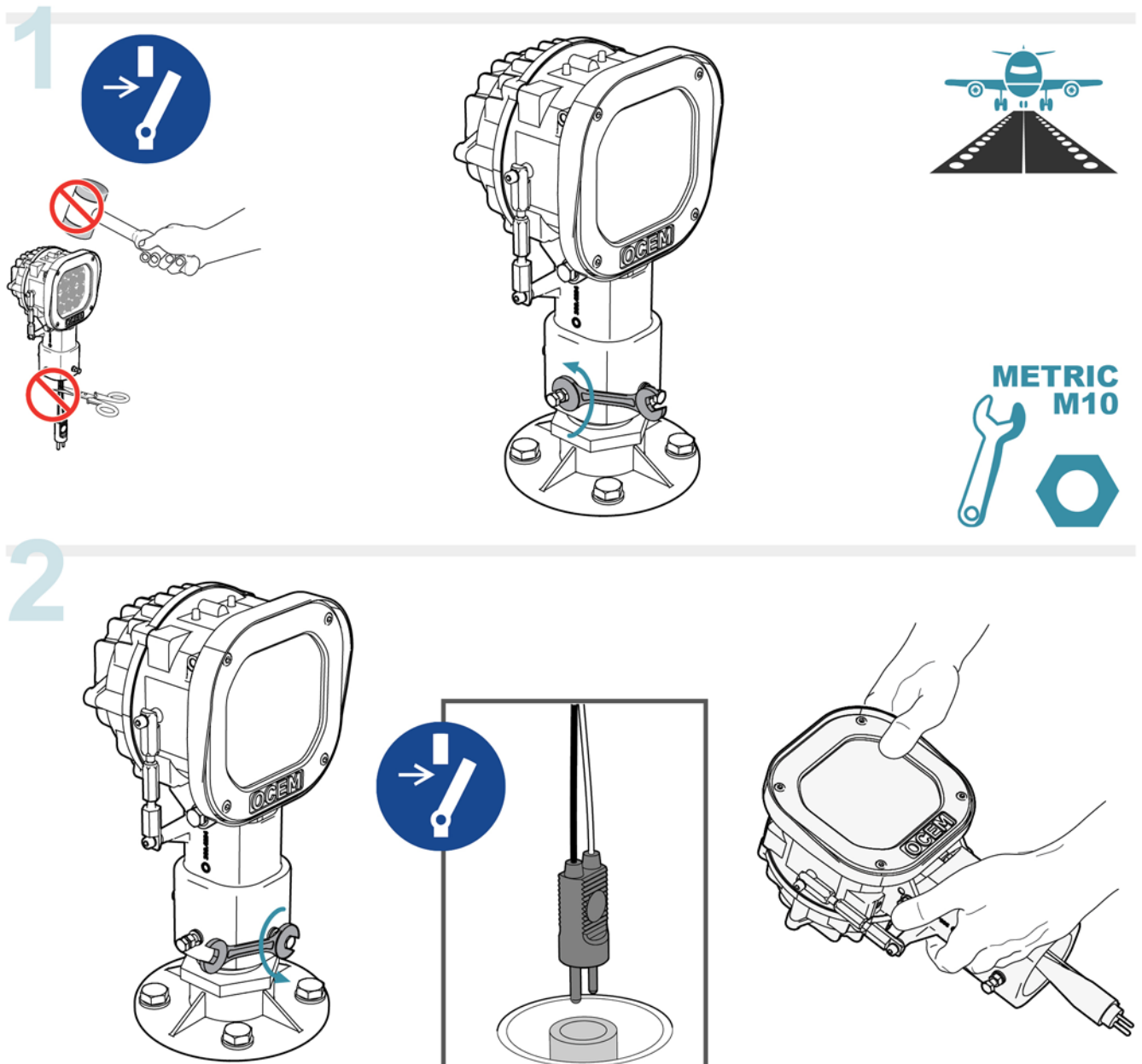


Ensure that the energy sources are cut before proceeding.

Do not try to remove the fixture from the base by using different tools of the extraction equipments indicated by OCEM Airfield Technology.



Before carrying out any intervention on the device, cut off all external power sources and place appropriate work-in-progress warnings on the systems. Wait for the discharging time (at least 5 min) and check using appropriate instruments that there are no residual energies before accessing the electrical equipment.



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3 ADJUSTMENTS AND MAINTENANCE



Before carrying out any intervention on the device, cut off all external power sources and place appropriate work-in-progress warnings on the systems. Wait for the discharging time (at least 5 min) and check using appropriate instruments that there are no residual energies before accessing the electrical equipment.

To minimize operations, always pay the greatest attention to handling and storage of devices and carry out installation procedures with extreme precision.

3.1 Scheduled maintenance

In accordance with the suggestions contained in the documents FAA AC 150/5340-26C and ICAO Airport Service Manual Part 9: Airport Maintenance Practices, LERA fixtures must be subjected to regular maintenance. We remark that the frequency of checks may vary from facility to facility and from runway to runway depending upon the amount of traffic and age of the fixtures.

In order to assure the proper functioning of the fixture and the maximum duration of the operating lifetime of the device all the checks and periodical audits must be carried out and, if necessary, the necessary corrective procedures must be activated to restore and ensure operative safety levels foreseen by the standards.



Do not let running devices not properly maintained or fixtures presenting signs of damage or fault.

Each maintenance operation carried out on the devices must be noted on the maintenance register.

Frequenza	Descrizione
every day	Check correct operation of the fixture.
	Visual check broken components and cleanliness of lenses in the installed fixture. Repair/ Replace as necessary. ⁽¹⁾⁽²⁾⁽³⁾
monthly	External cleaning of the prisms/lenses of the runway fixtures.
	External cleaning of the prisms/lenses of the taxiway fixtures.
	Check correct setting/installation of the light. Fix/re-align if needed.
semi-annually	Check photometric performance.
annually	Visual check of the installation condition (integrity of resin, poles, breakable joints,...).
	Check for the presence of water inside the installation base. ⁽¹⁾
	Check for possible water ingress and corrosion. ⁽¹⁾⁽²⁾⁽³⁾
unscheduled	After unusual atmospheric precipitation, check the light condition and remove any luminous beam obstructions.
	Removal of snow / vegetation from around light when necessary. ⁽⁴⁾
	After snow removal, check for possible damaged light fixtures. Repair/Replace as necessary. ⁽¹⁾⁽²⁾⁽³⁾

(1) Replace the external gasket(s) between the inset fixture and the base every time the light is removed from the base and re-installed. Visual check of the integrity of the power cable and the electrical connections every time the elevated or inset light is removed and re-installed.

(2) Replace the internal mounting seal(s) every time the light is opened for check or repair.

(3) Replace the prism/lens gasket every time the component is removed for check or repair.

(4) Techniques for snow removal are described in the ICAO Airport Service Manual - Part-9: Airport Maintenance Practices and in the FAA AC 150/5200-30 specifications.

3.1 Fixture opening



Every time that the fixture body is opened, all the seals must be replaced: use only original spare parts by OCEM Airfield Technology.

Whenever the LERA fixture is opened, it must be ensured that:

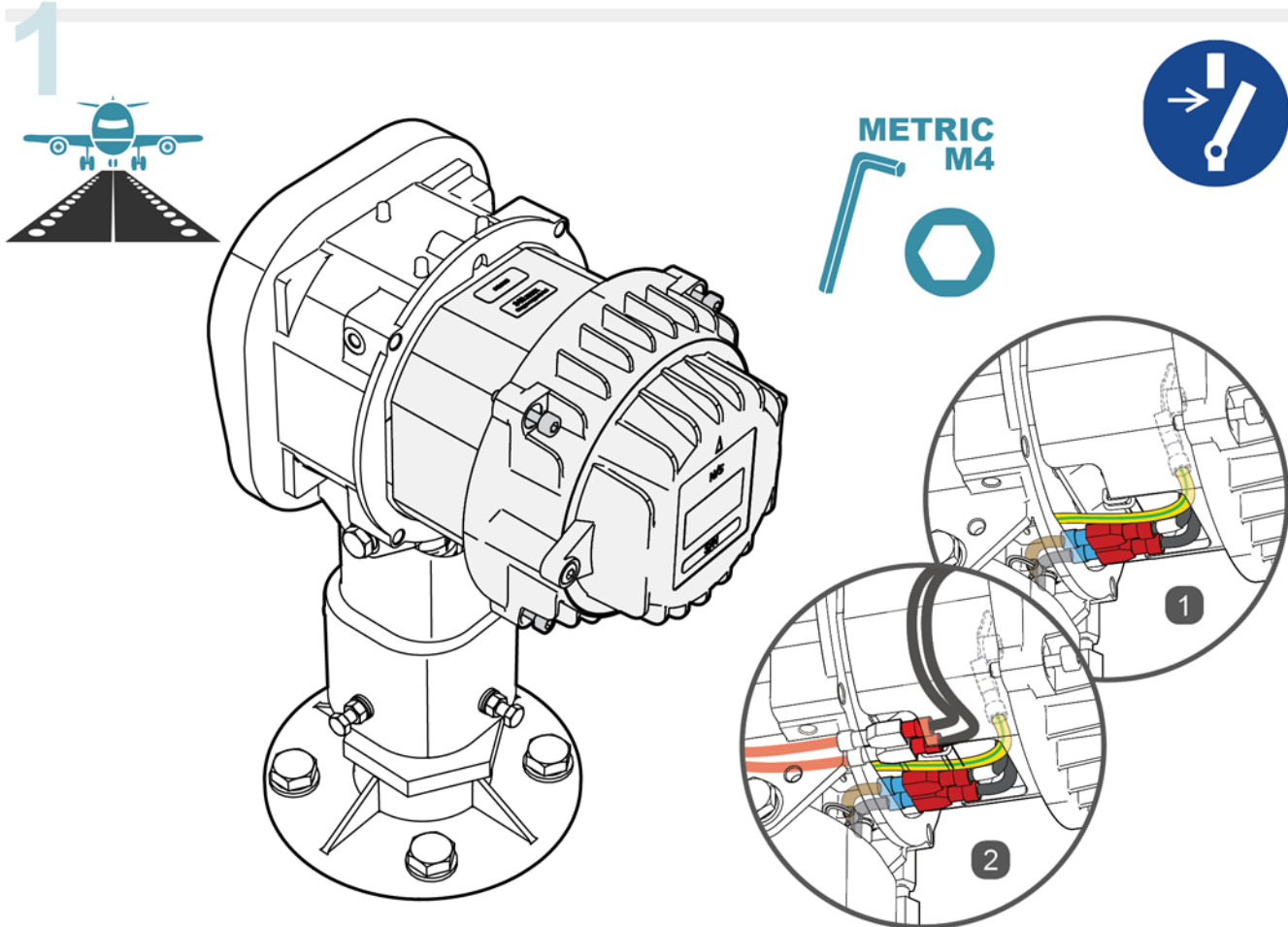
- the optical unit is undamaged and clean;
- there are no infiltration;
- the supply cables and the connectors are undamaged and do not have breakdowns or abrasions.

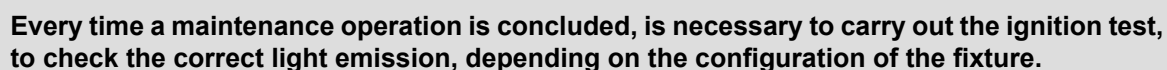
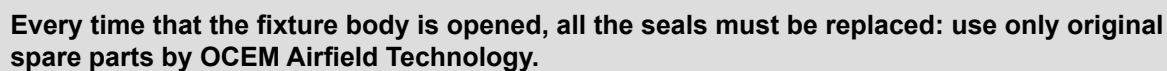
Unscrew the four captive screws and open the fixture. Disconnect the supply cables and the ground cable (1). If present, disconnect the supply cables of the resistance of the arctic kit (2). Remove the light assembly.



We recommend to immediately replace the light assembly with a functioning spare part. No further adjustments are necessary when commissioning the new device.

Carry out any work necessary to restore normal operation of the light assembly in the maintenance centre.





3.1 Cleaning the front glass



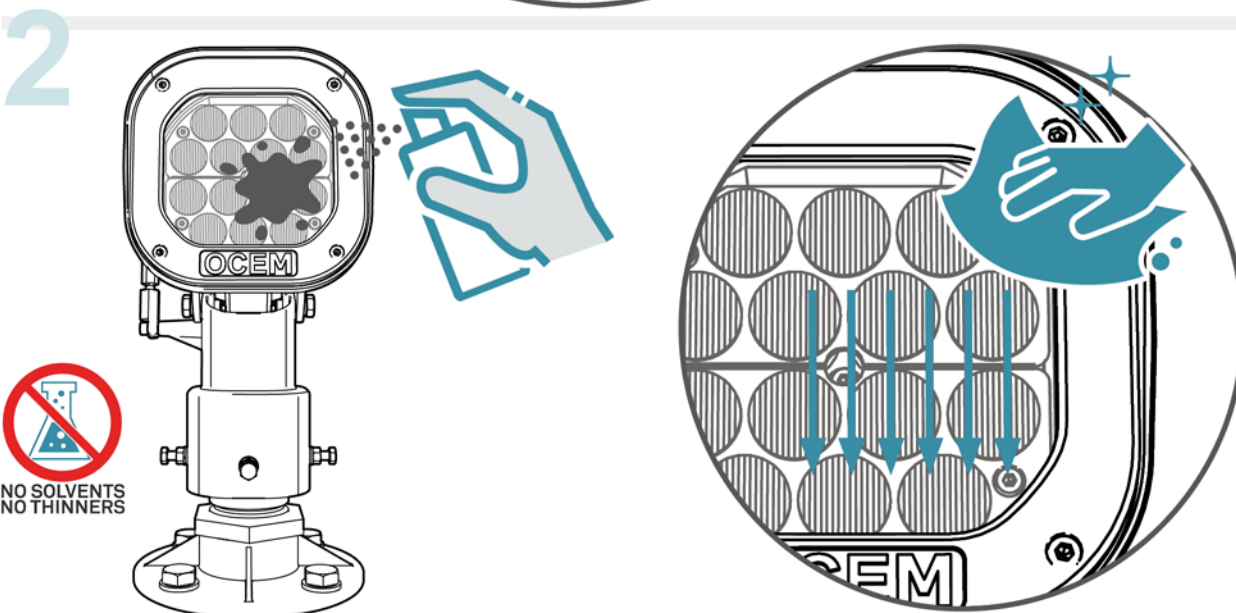
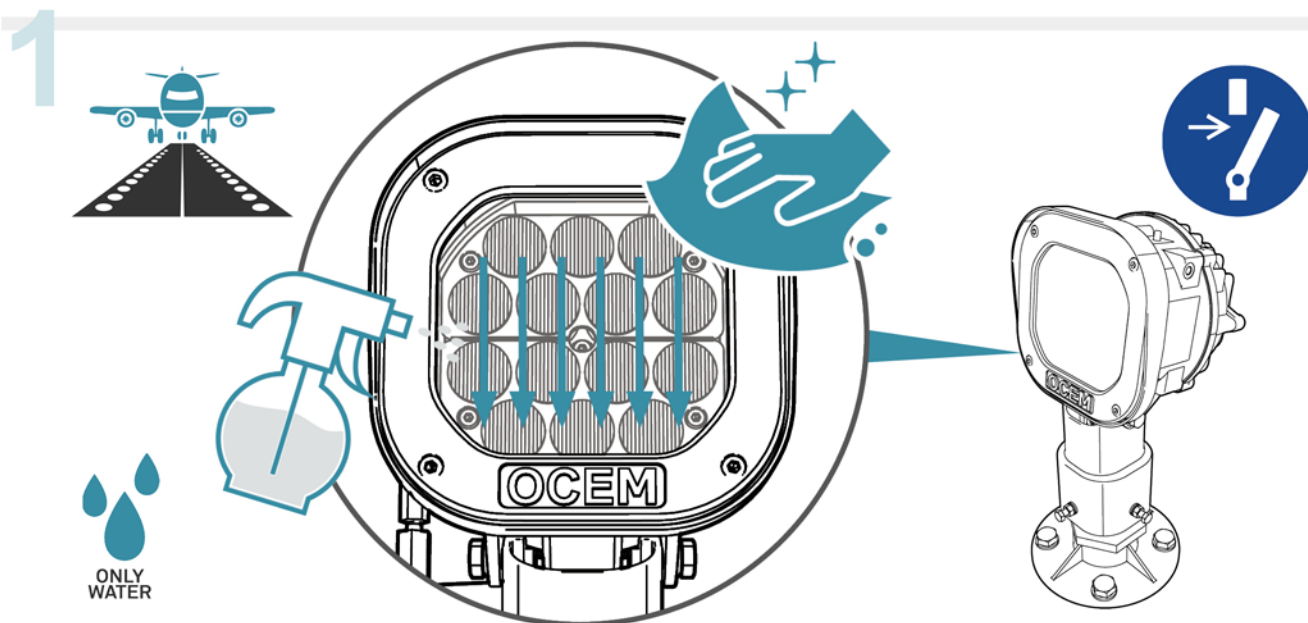
Before carrying out any intervention on the fixture, cut off all external power sources and place appropriate work-in-progress warnings on the systems.
Wait for the discharging time (at least 5 minutes) and check using appropriate instruments that there are no residual energies before accessing the electrical equipment.

Clean the external surface of the front protective glass with neutral and non-abrasive products using clean clothes.

The external cleaning operation of the glass take place directly on the runway and do not require the removal or the opening of the fixture. In normal conditions of use it is not necessary to clean the protective glass or the lens internally.



Do not use solvent or diluent products to avoid damaging the glass elements.
In case the glass or the lens are damaged, replace them.



3.2 Replacement of the front glass

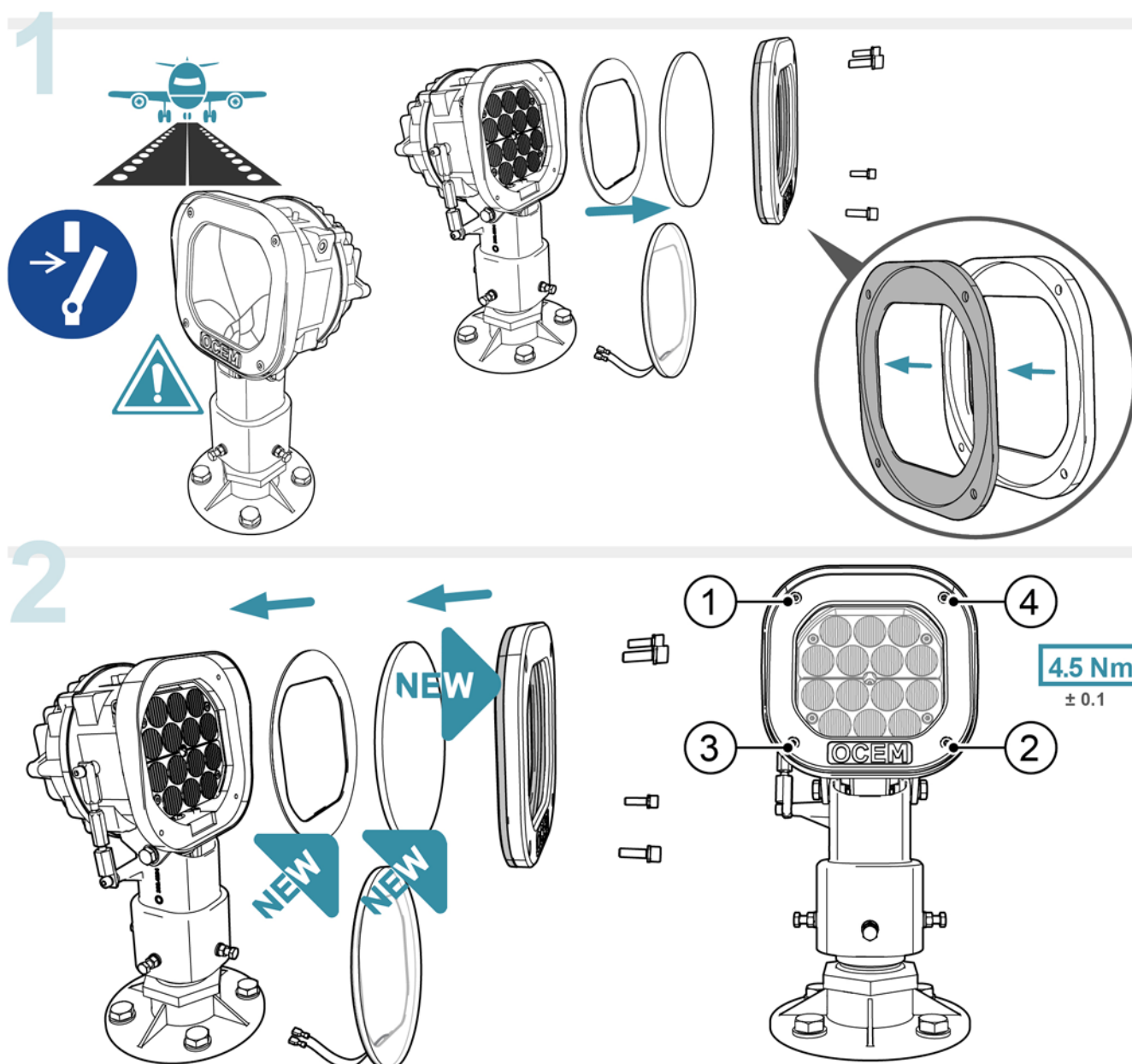


Before carrying out any intervention on the fixture, cut off all external power sources and place appropriate work-in-progress warnings on the systems. Wait for the discharging time (at least 5 minutes) and check using appropriate instruments that there are no residual energies before accessing the electrical equipment.

If the glass shows signs of damage or breakdowns, proceed with replacement. Unscrew the four screws and remove the frame unit (complete with gasket). Remove the front glass.

Replace the gaskets (lower -if any- and upper). Position the new glass.

Position the frame unit (complete with gasket) on the body, paying attention not to crush the connection cables. Screw the four screws alternately until the expected tightening torque is reached.



3.1 Replacement of the power cable

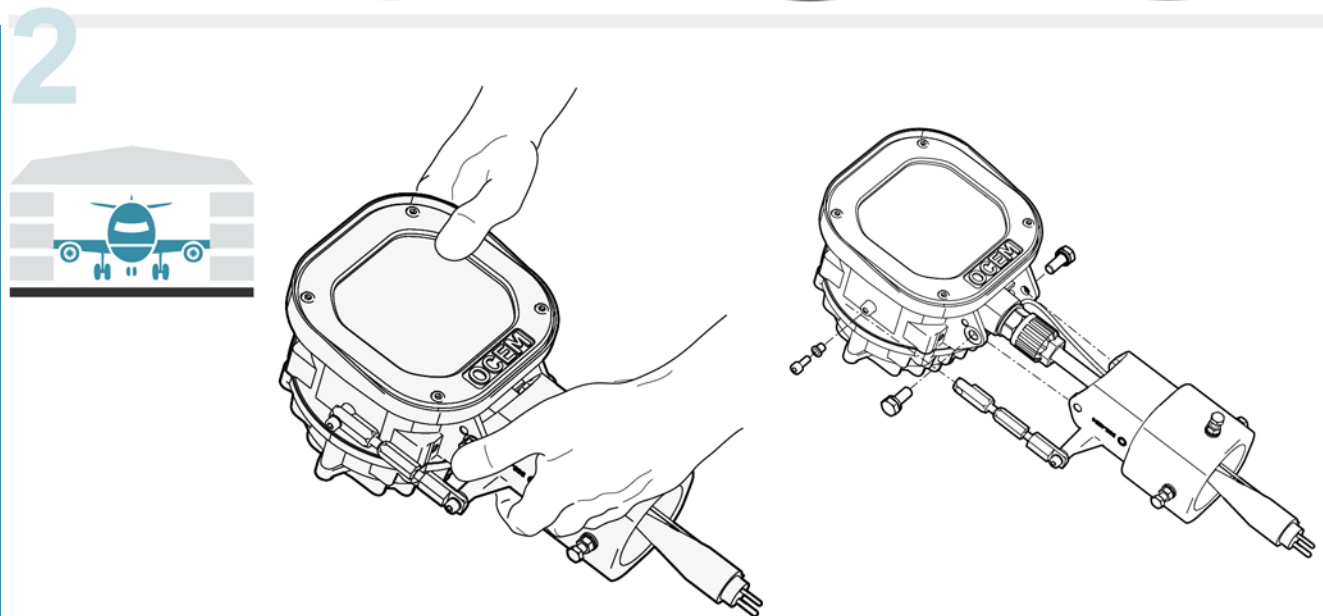
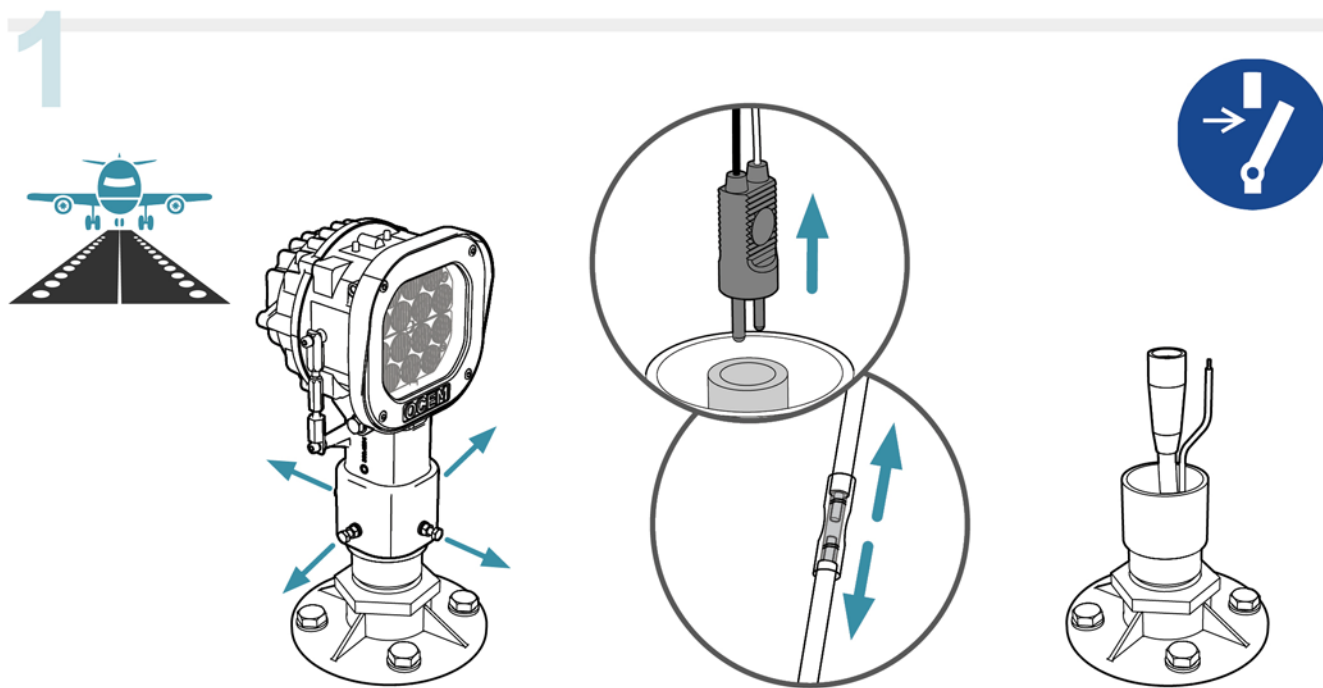


Before carrying out any intervention on the device, cut off all external power sources and place appropriate work-in-progress warnings on the systems.
Wait for the discharging time (at least 5 minutes) and check using appropriate instruments that there are no residual energies before accessing the electrical equipment.

Unscrew the screws present on the fixture body until free the fixture from the anchorage.

Disconnect the electrical connections: disconnect the plug of the fixture from the socket coming from the transformer and separate the ground cable with the protective conductor coming from the base.

Remove the fixture from the base and bring it to the workshop to remove the support and to complete maintenance.





The assembly of the power supply cable must be performed only by professional staff, in compliance with all the safety requirements of the laws and regulations in force in the country of use.

Carry out operations on the bench, with all elements detached from energy sources. Never operate on potentially active components.

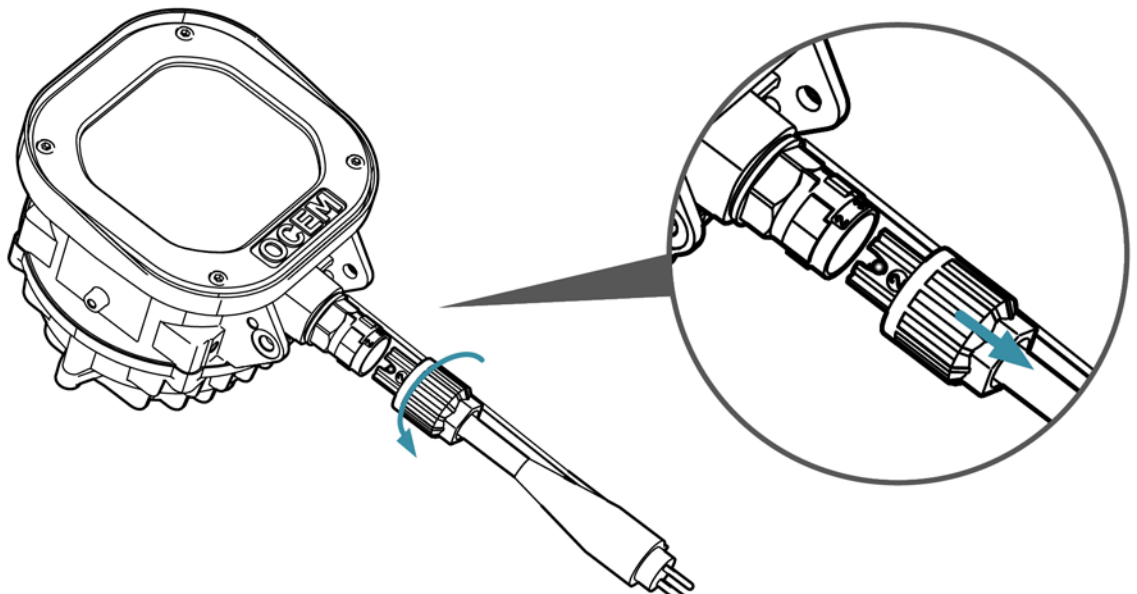
Unscrew the cable clip nut of the bulkhead coupling and remove it from the fixture.

Remove the cables from the terminals unthread the cable from the terminal block, paying attention not to damage the gasket.

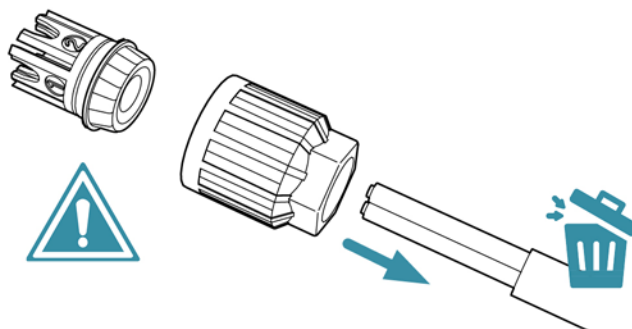


The bulkhead can be reused for a maximum of 10 times with connectors of same dimensions. If necessary, proceed to open the fixture and to replace the bulkhead.

3



4



Cut the cable to the desired length: the cable length shall be sufficient to allow the connection of the device on the type of support envisaged in the installation project. The length L of the cable must be approximately 150 mm greater than the height H of the support.

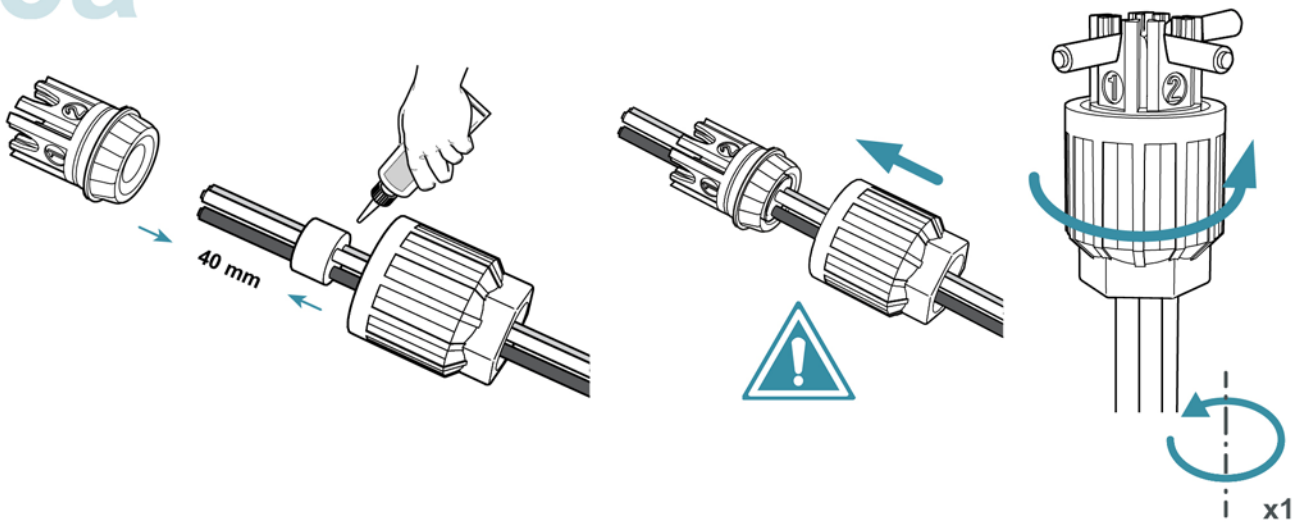
If the power supply cable replacement kit is composed by unipolar cables attested to a Style 6 plug and ground cable, insert the cables in the three wires cable gland gasket. Lubricate the cables with alcohol.

Slightly screw the cable clip nut: perform a single turn to secure the cables in position and insert the conductors in the terminals 1 (small PIN), 2 (big PIN) and $\perp$ (ground cable).

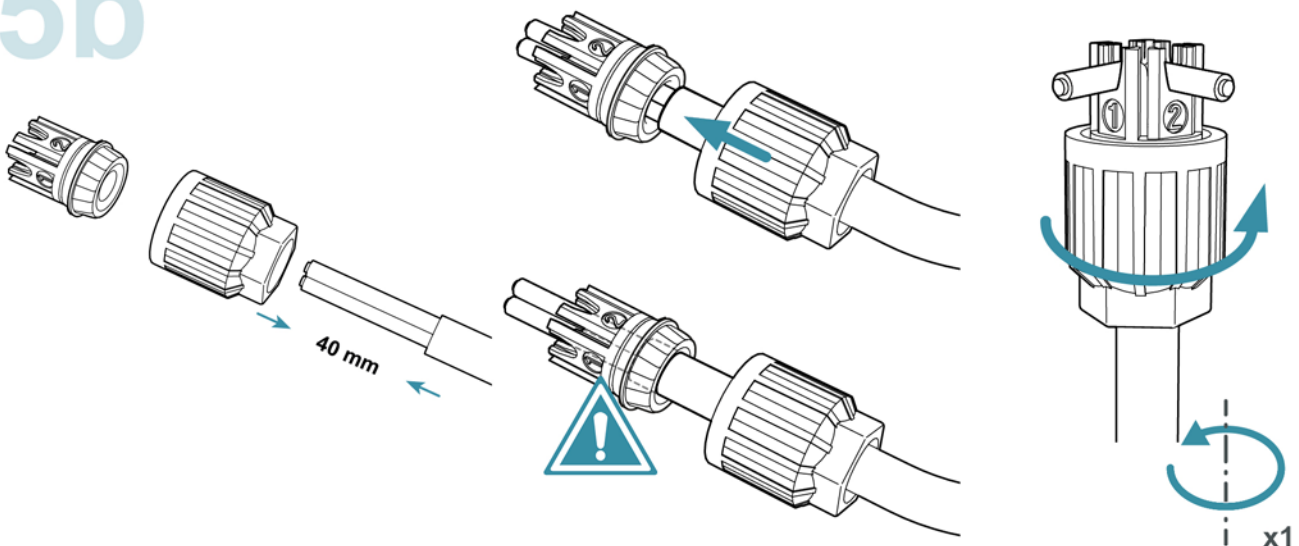
If the power supply cable replacement kit is composed by an attested bipolar cable to a Style 1 plug and ground cable, insert the cables in the cable gland gasket.

Slightly screw the cable clip nut: perform a single turn to secure the cable in position and insert the conductors in the terminals 1 (small PIN), 2 (big PIN).

5a



5b



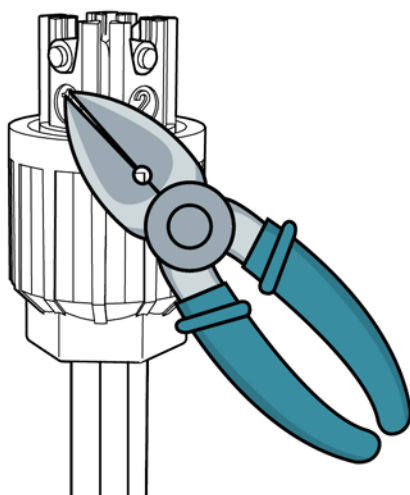
Cut off the part of the conductors in excess at the terminal.

Make the earth connection: connect the conductor to the predisposed ground screw located on the lower part of the body.

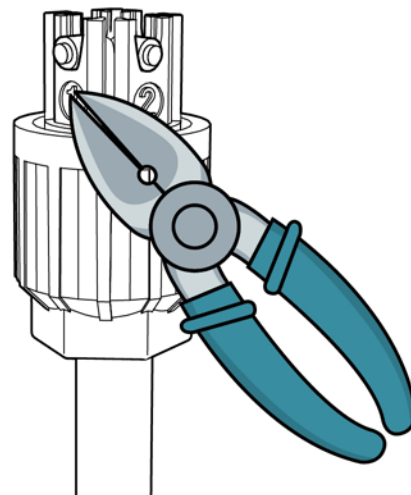
Pass the cable through the support and insert it into the bulkhead coupling, observing the numbering on the joint. Using the open hexagonal key (not included) completely tighten the cable clip nut with the indicated tightening torque.

Reassemble the support. Tighten the screws with the indicated tightening torque.

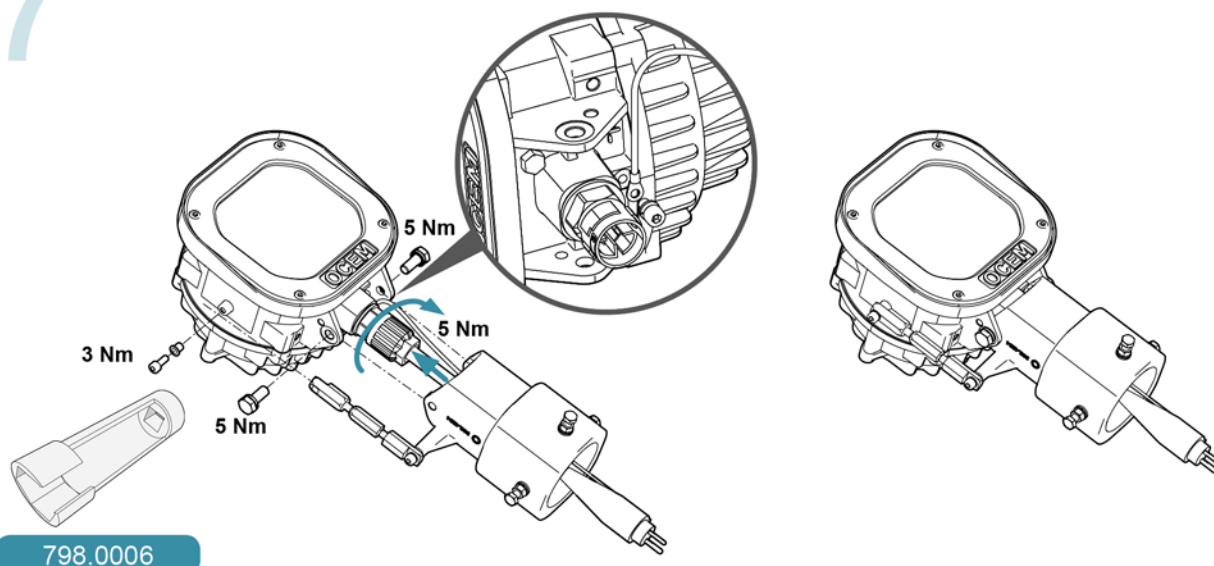
6a



6b



7



798.0006

3.1 Replacement of the LED module



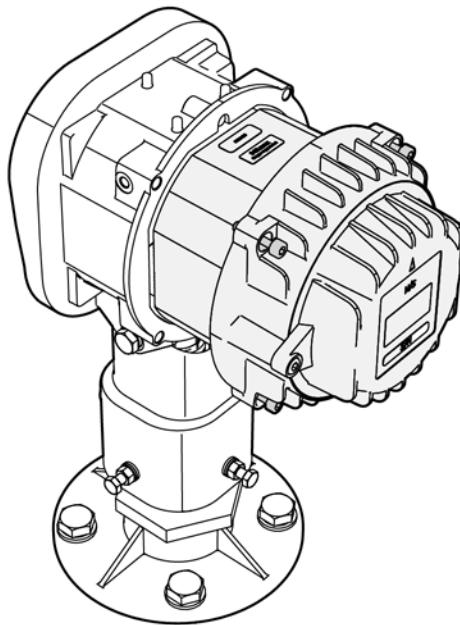
Before carrying out any intervention on the device, cut off all external power sources and place appropriate work-in-progress warnings on the systems.
Wait for the discharging time (at least 5 minutes) and check using appropriate instruments that there are no residual energies before accessing the electrical equipment.

Open the fixture and remove the light assembly from the base (see the related paragraph in the chapter "INSTALLATION") and bring it to the workshop to complete maintenance.



Check that the replacement LED module match the desired use/colour configuration.
If necessary, replace the lens with spare parts matching the original configuration.

1



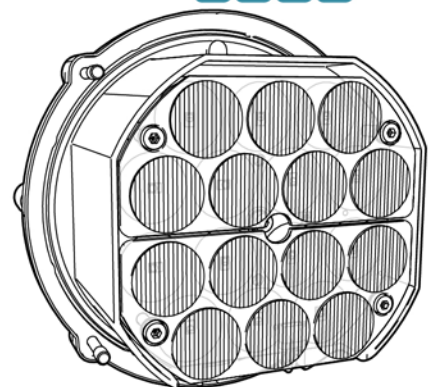
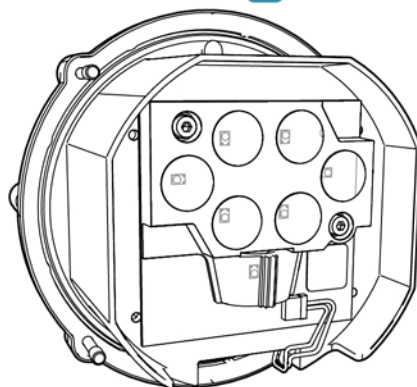
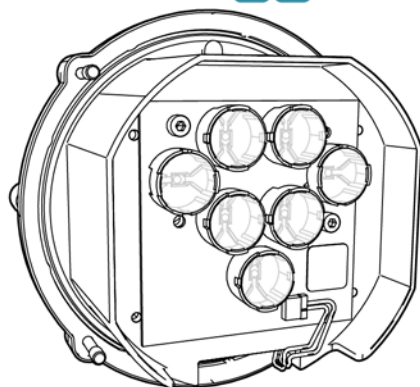
2



SBBA

ER

ACARTGWG



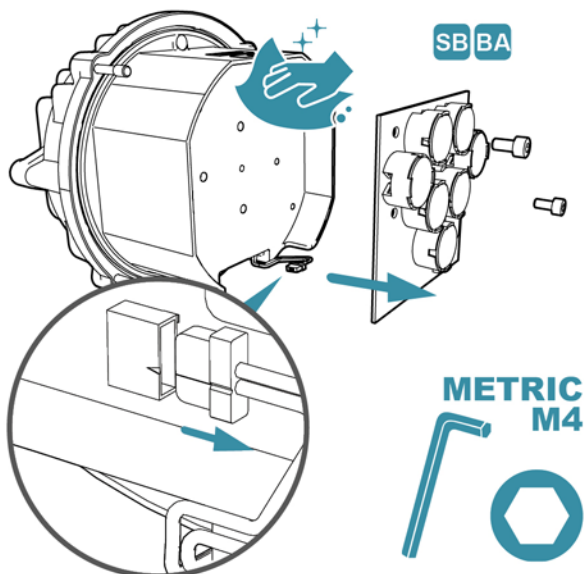
Disconnect the connector and remove the LED module to be replaced and the thermal pad. Check that the lens are not damaged.

Clean the installation site of the LED module.

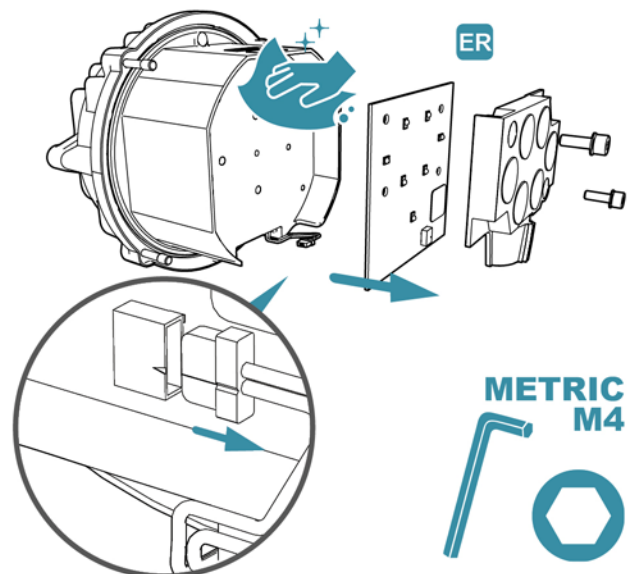


**Do not use solvent or diluent products to avoid damaging the materials.
Dry thoroughly the internal sides of the device.**

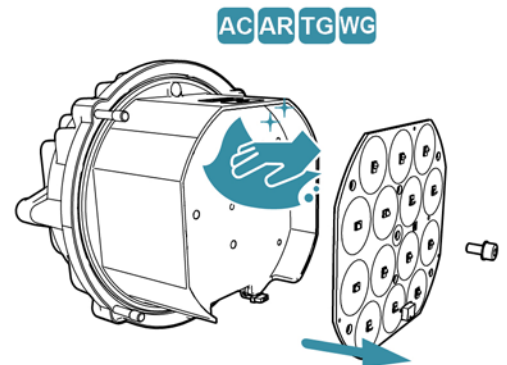
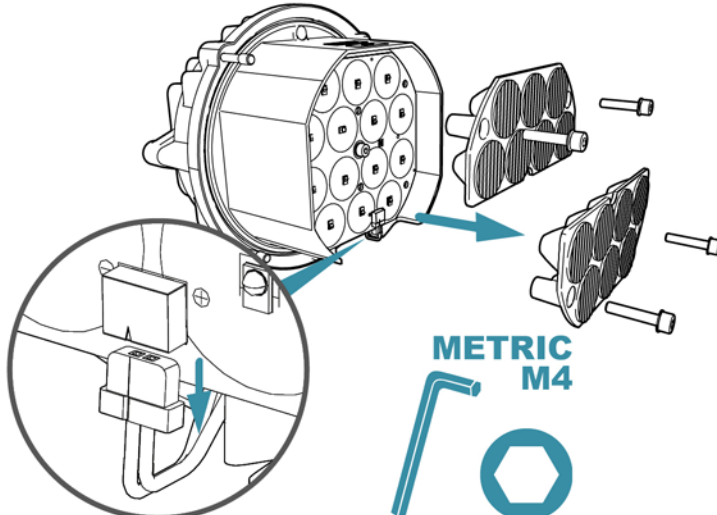
3a



3b



3c





Check that the replacement LED module match the desired colour configuration.
If necessary, replace the lens with spare parts matching the original configuration.

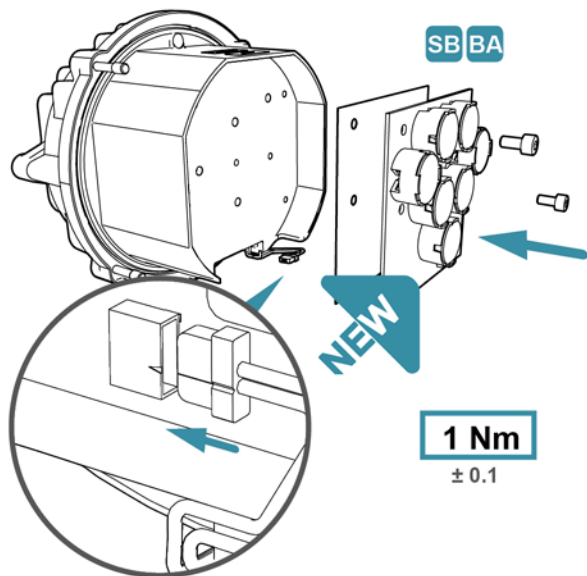
Position the LED module, complete with thermal pad, centring it on the predisposed holes. Position the lenses, if foreseen.



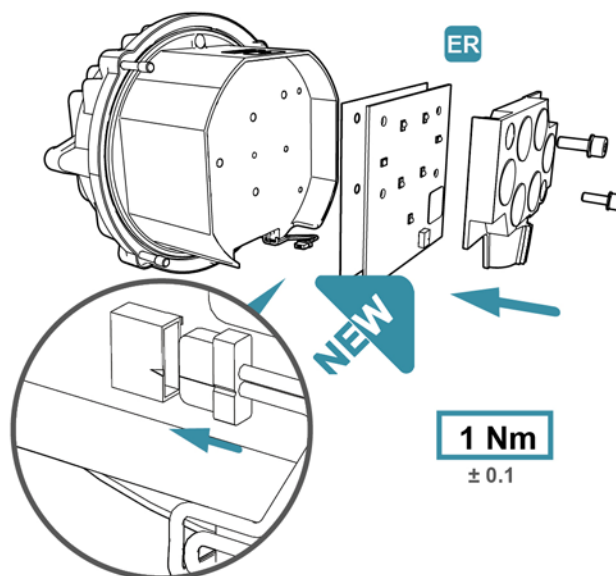
Check that the lens (if foreseen) package is perfectly installed on the LED module.
Tighten the screws with the indicated torque values.

Connect the connector.

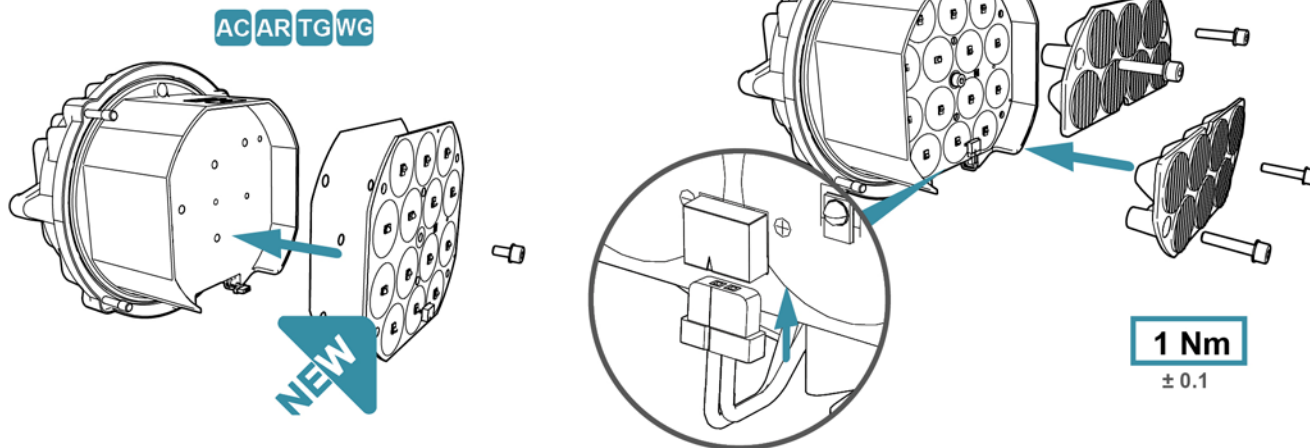
4a



4b



4c



Monitoring reset

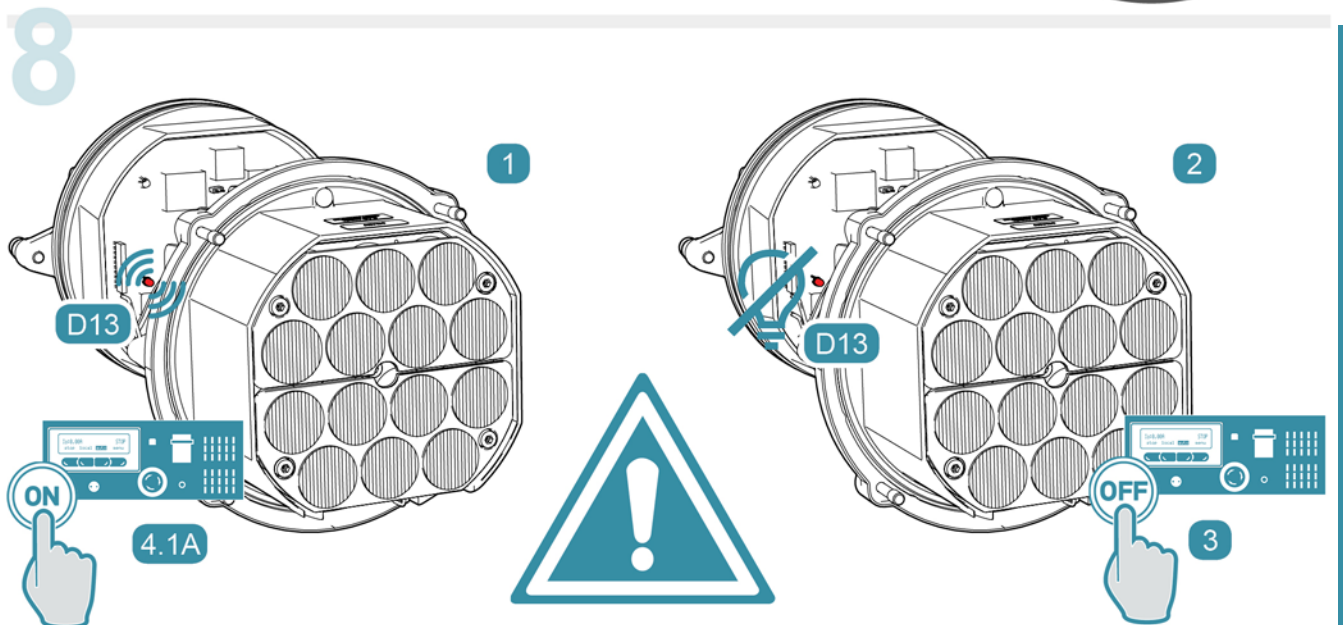
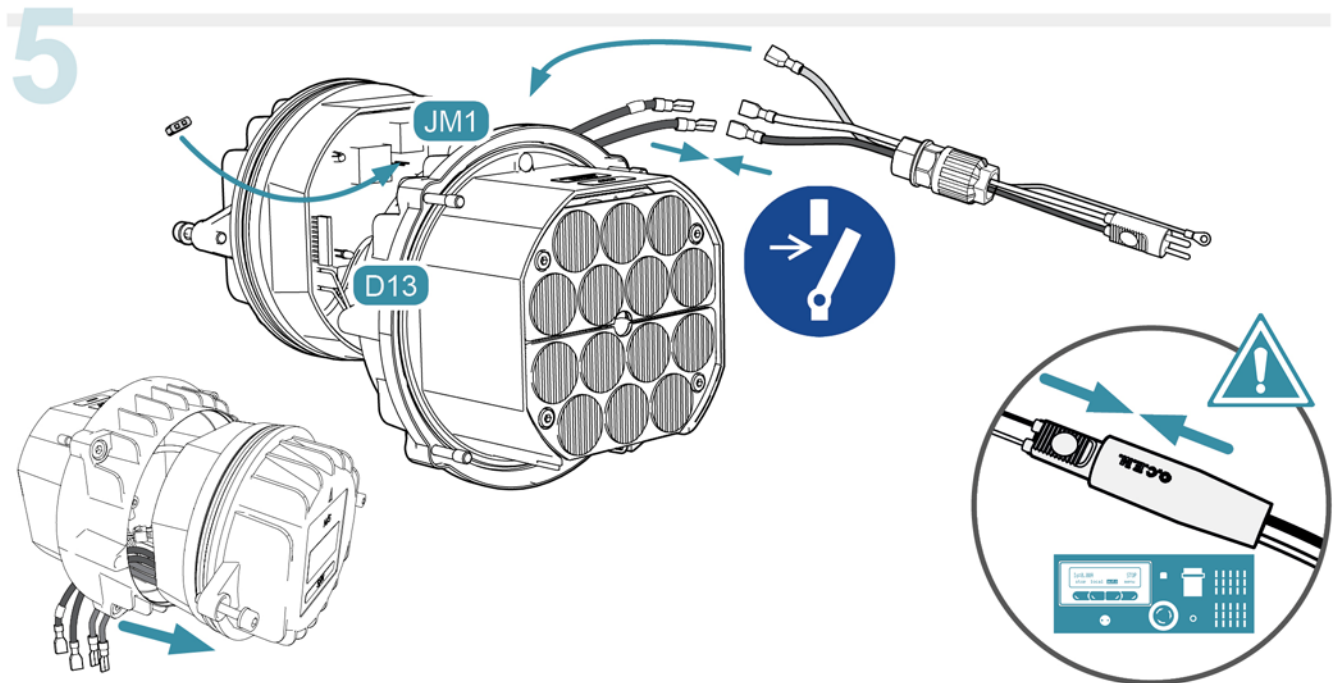


If the fixture is equipped with monitoring device, restore the monitoring circuit before proceeding to close the fixture.

Unscrew the two captive screws and open the rear cover. Remove the resinated electronic unit, paying attention not to damage the cables and the internal connections of the fixture.

Access the internal resinated body. Position the JUMPER on the JM1 pins present on the resinated body.

Connect with a supply cable to the fixture and connect the unit to the supply test. Set the current to 4.1 A (step 3). Power the fixture and wait that the LED D13 switches off. Interrupt the supply test.



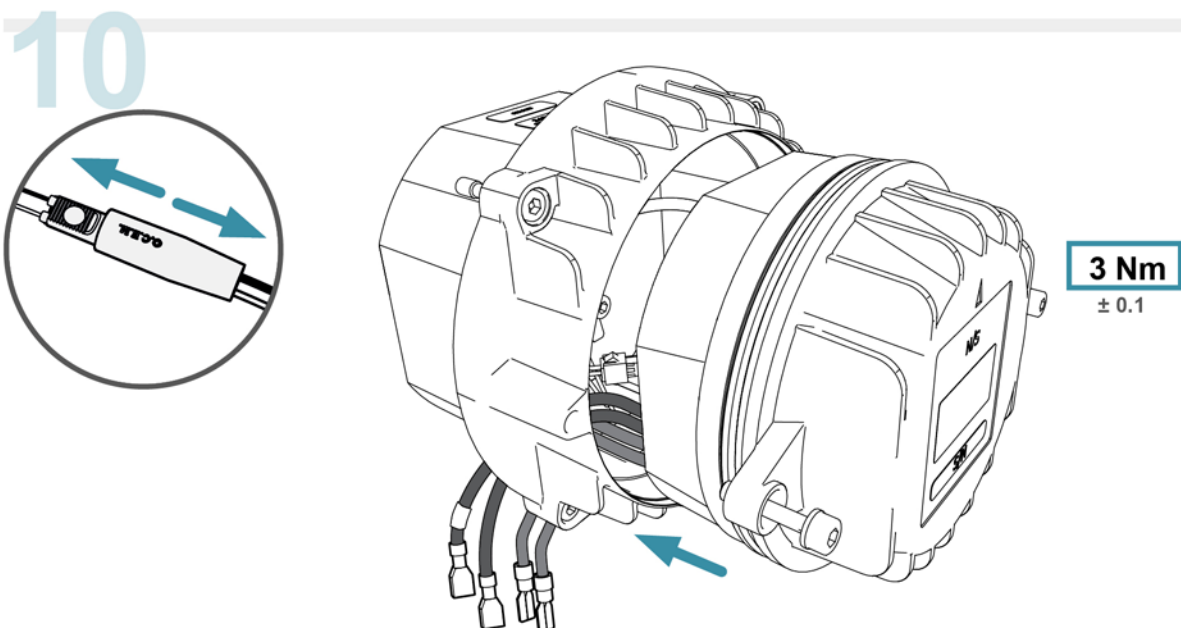
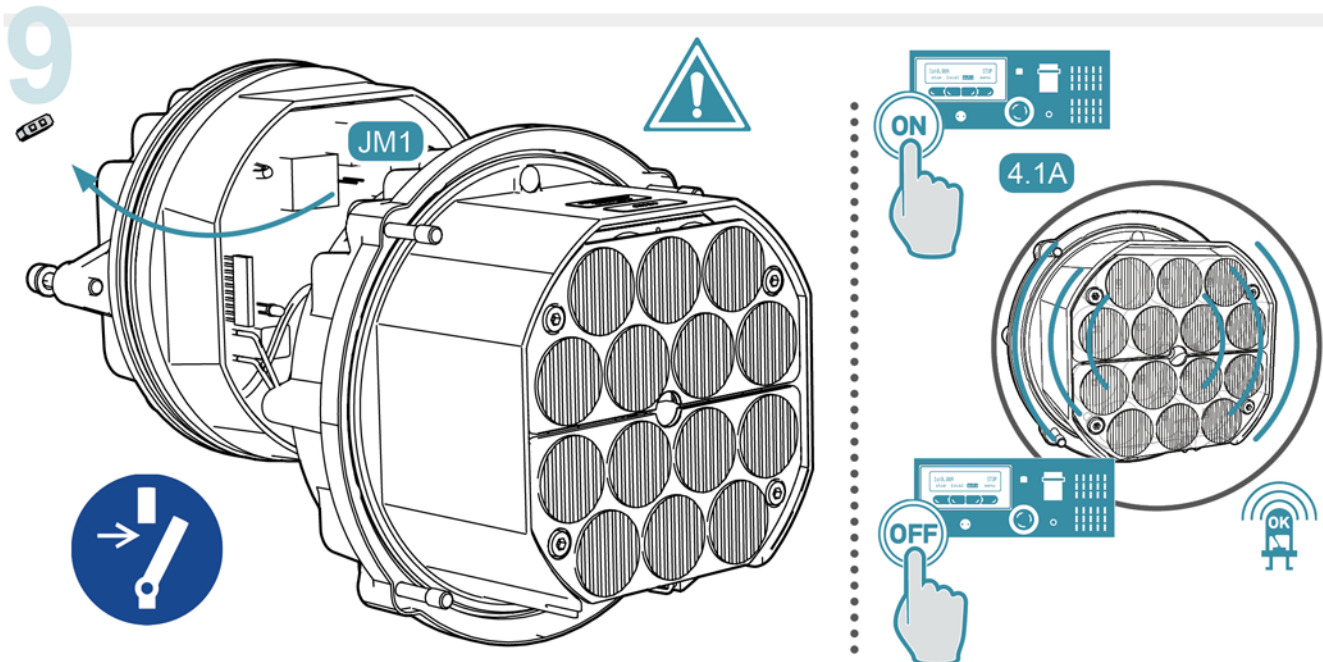
Remove the JUMPER from the JM1 pins present on the resinated body.

Power the fixture and check that the LED light up correctly. Interrupt the test feed and disconnect the fixture.

Reassemble the unit. The device now is ready for the installation on the runway.



The fixture will self-calibrate during the first test ignition of the circuit: keep the circuit powered with a constant current of 6.6 A for at least 10 consecutive minutes.



3.1 Replacement of the Driver Board

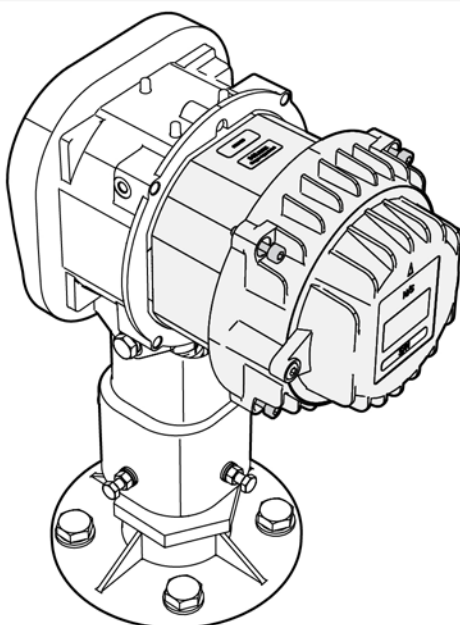


Before carrying out any intervention on the device, cut off all external power sources and place appropriate work-in-progress warnings on the systems. Wait for the discharging time (at least 5 minutes) and check using appropriate instruments that there are no residual energies before accessing the electrical equipment.

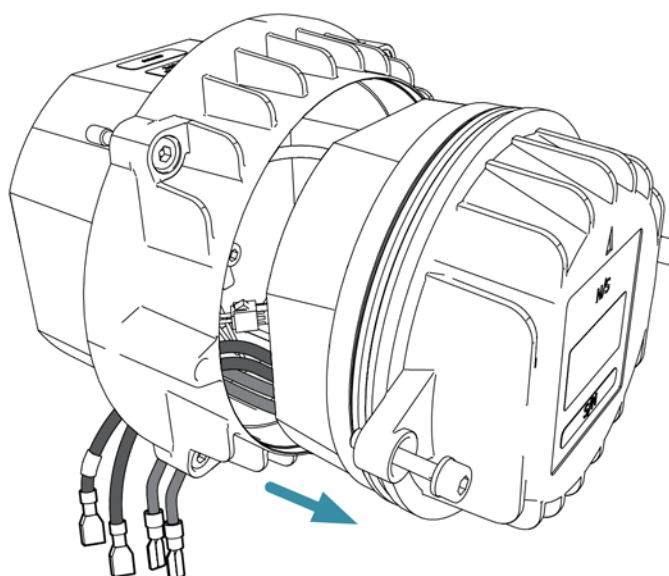
Open the fixture and remove the light assembly from the base (see the related paragraph in the chapter "INSTALLATION") and bring it to the workshop to complete maintenance.

Unscrew the two captive screws and open the rear cover. Remove the resinated electronic unit, paying attention not to damage the cables and the internal connections of the fixture.

1



2



Pay particular attention to the disconnection phase of the power cable of the LED module (1). According to the version the positioning of the connectors may differ.



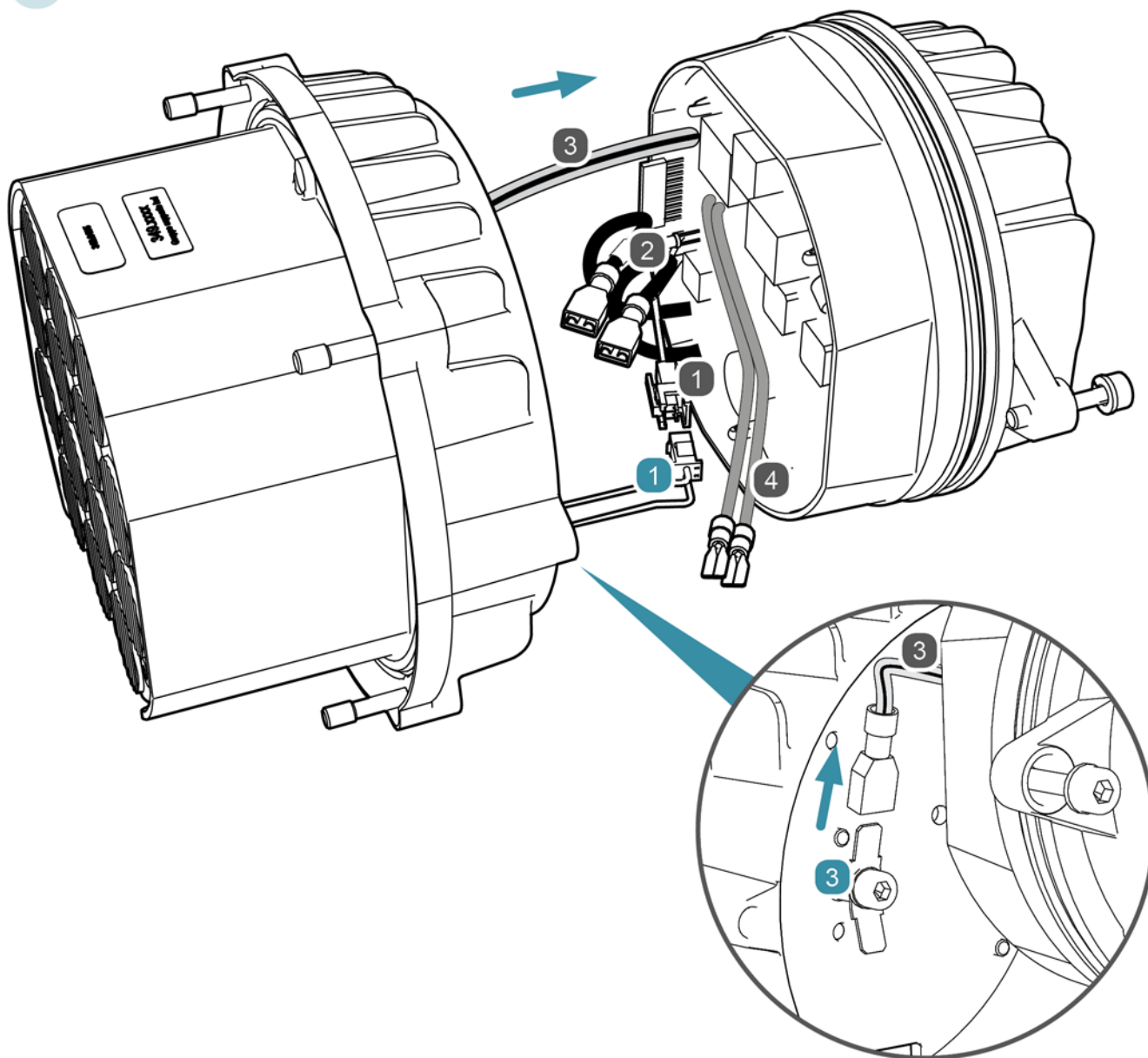
**In case of damage, replace the power cable of the LED module.
Do not reconnect connectors or damaged cables.**

Unthread the supply cables (2) of the fixture from the support of the LED module. Disconnect the ground cable (3) from the terminal block positioned inside the support of the LED module. If present, unthread the supply cables of the resistance of the arctic kit (4) from the support of the LED module.



**Check that the Driver Board spare part matches the component installed on the fixture.
ATTENTION: Check the product codes before reconnecting the component.**

3





Check that the driver board spare part matches the desired configuration.

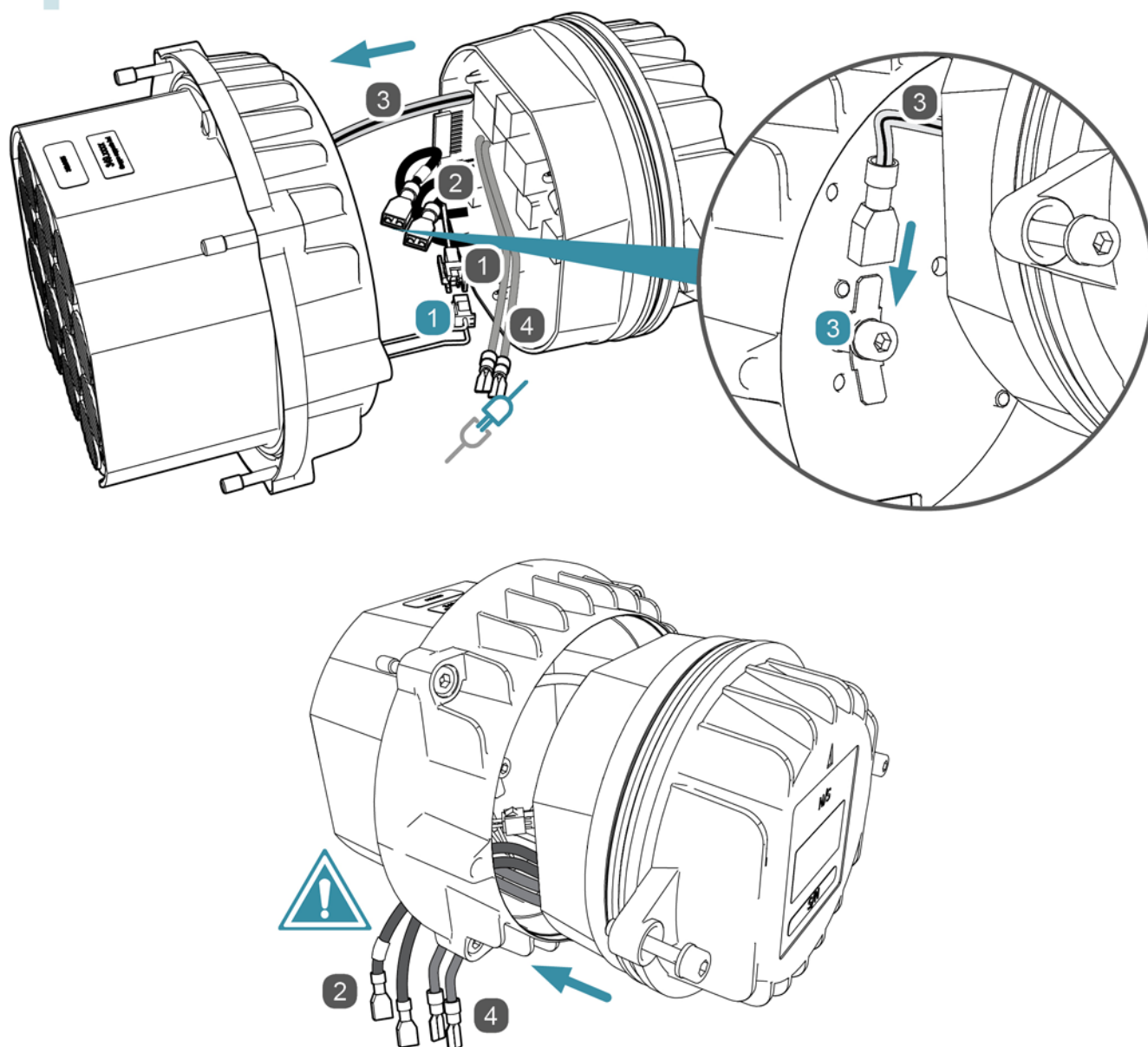
Bring the driver board spare part close to the LED module support and connect the power supply cable to the LED module (1). Insert the supply cables (2) of the fixture in the lower opening of the LED module. Connect the ground cable (3) inside the support of the LED module. If present, insert the supply cables of the resistance of the arctic kit (4) from the support of the LED module.



Respect the direction of the driver board during assembly phase. Please refer to the indications on the rear cover.

check the proper functioning of the gasket. Close the light unit and screw the two captive screws.

4



3.1 Replacement of the arctic kit

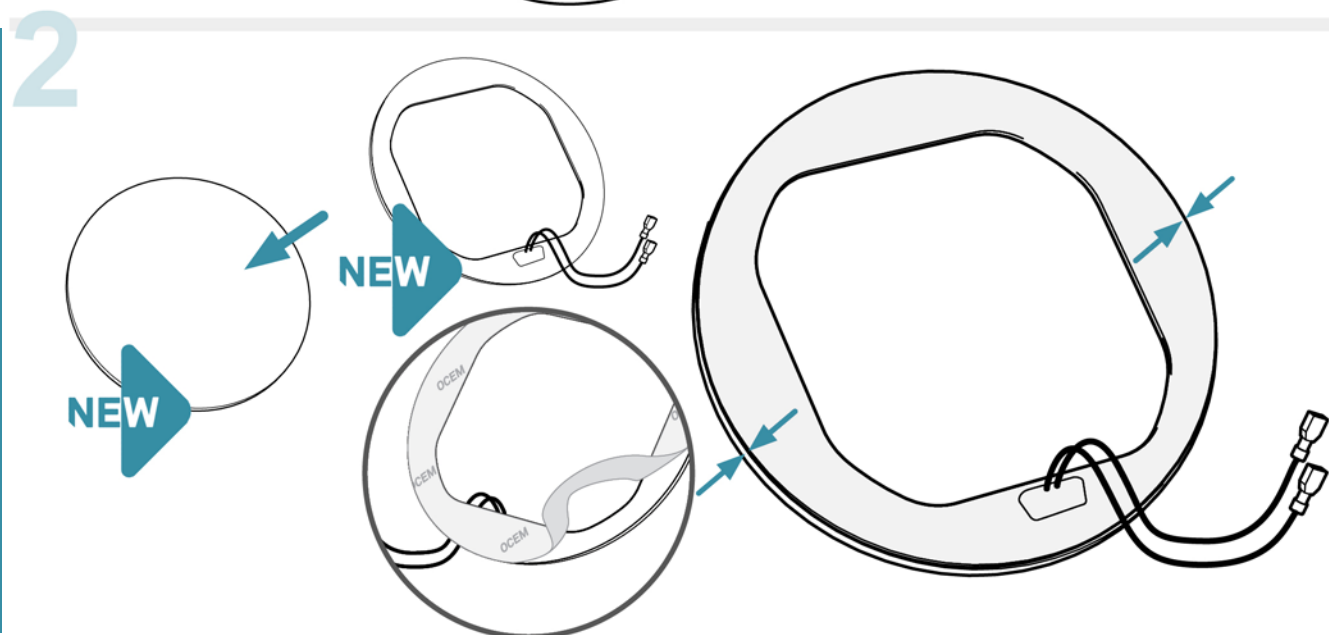
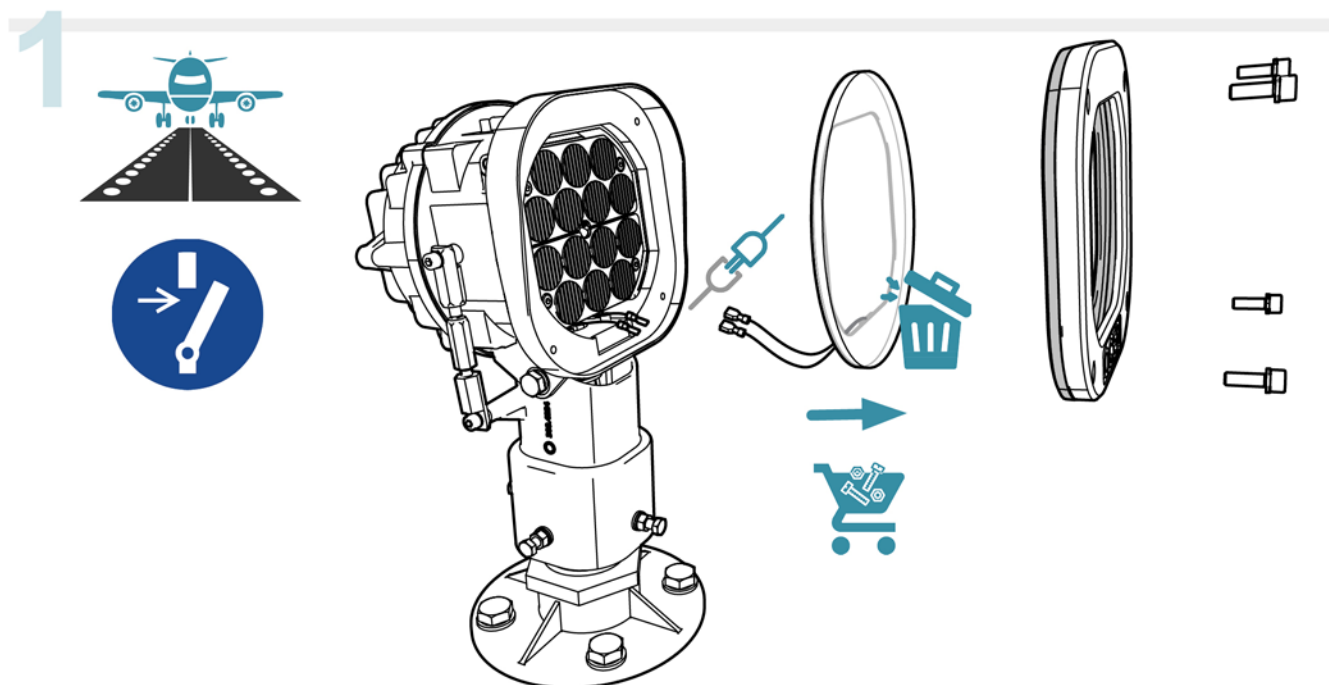
3.1.1 Replacement of the resistance



Before carrying out any intervention on the device, cut off all external power sources and place appropriate work-in-progress warnings on the systems.
Wait for the discharging time (at least 5 minutes) and check using appropriate instruments that there are no residual energies before accessing the electrical equipment.

Unscrew the four screws and remove the front frame complete with lower gasket and glass. Disconnect the supply cables of the resistance.

Remove the film and glue the new resistance on the new glass, taking care to position it correctly so that it does not come out of the edge



Place the glass complete with gasket in the front gasket seat (fastened to the frame).



Respect the direction of the glass during assembly phase. Match the supply point with the lower part of the front frame (in correspondence of OCEM logo).

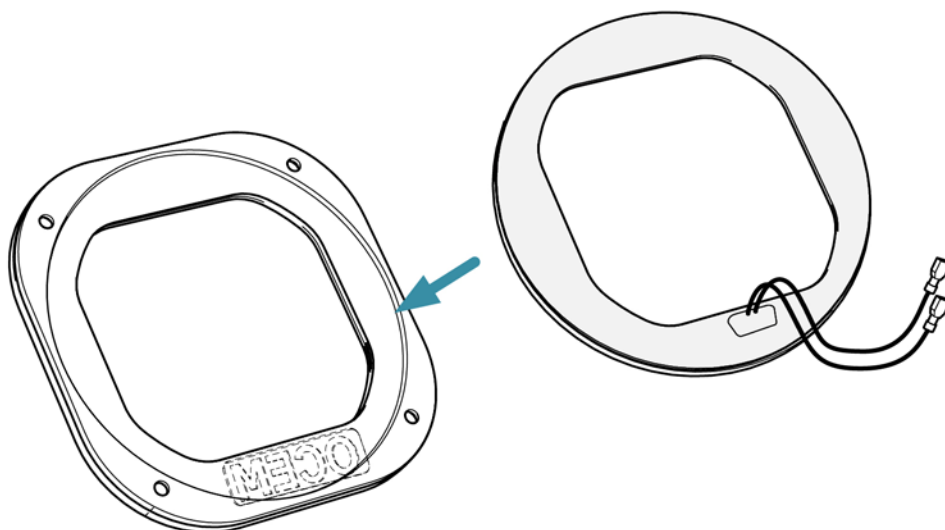
Bring the front frame closer to the fixture body and connect the supply cables of the resistance. Insert the cables in the lower opening of the LED module and close the fixture.



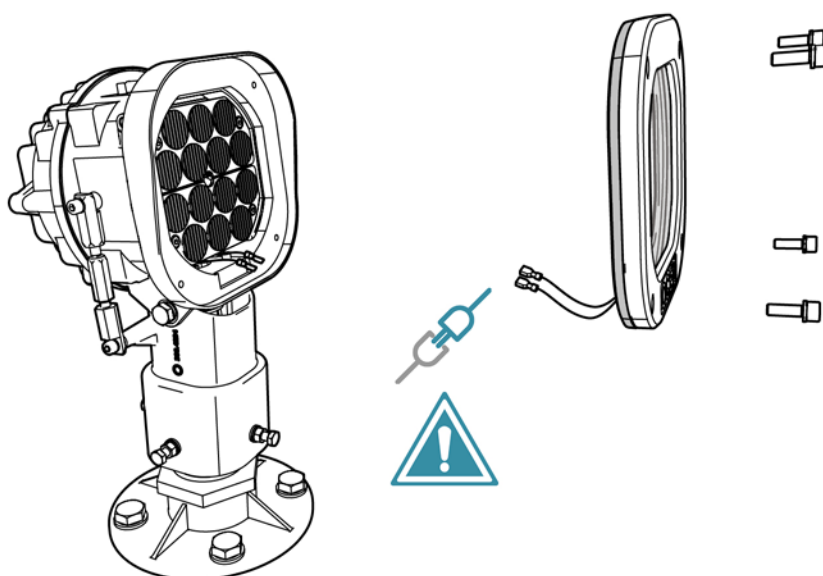
**Completely insert the cables inside the cavity when coupling the parts.
Do not touch the inner part of the glass to avoid leaving dirt or residue.
Check that the gasket and the glass do not move from their location during closing operations.**

Screw the four locking screws and tighten to the indicated tightening torque.

3



4



3.1.2 Replacement of the thermostat

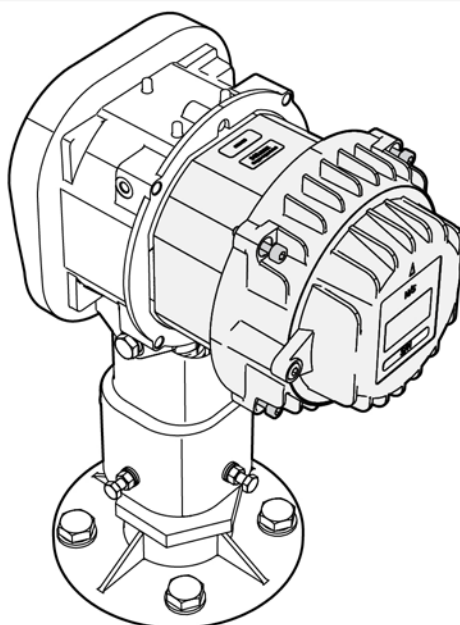


Before carrying out any intervention on the device, cut off all external power sources and place appropriate work-in-progress warnings on the systems. Wait for the discharging time (at least 5 minutes) and check using appropriate instruments that there are no residual energies before accessing the electrical equipment.

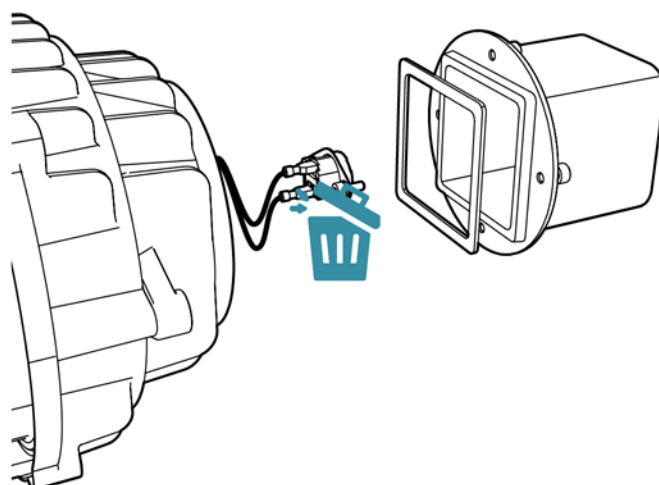
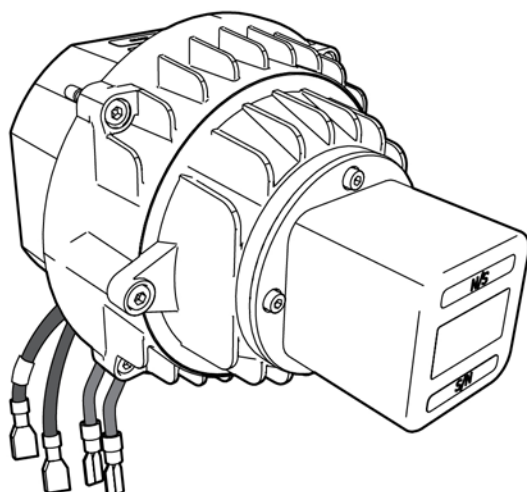
Open the fixture and remove the light assembly from the base (see the related paragraph in the chapter "INSTALLATION") and bring it to the workshop to complete maintenance.

Unscrew the four screws and open the rear compartment. Unscrew the two screws holding the thermostat in place inside the rear cover and disconnect the cables.

1



2



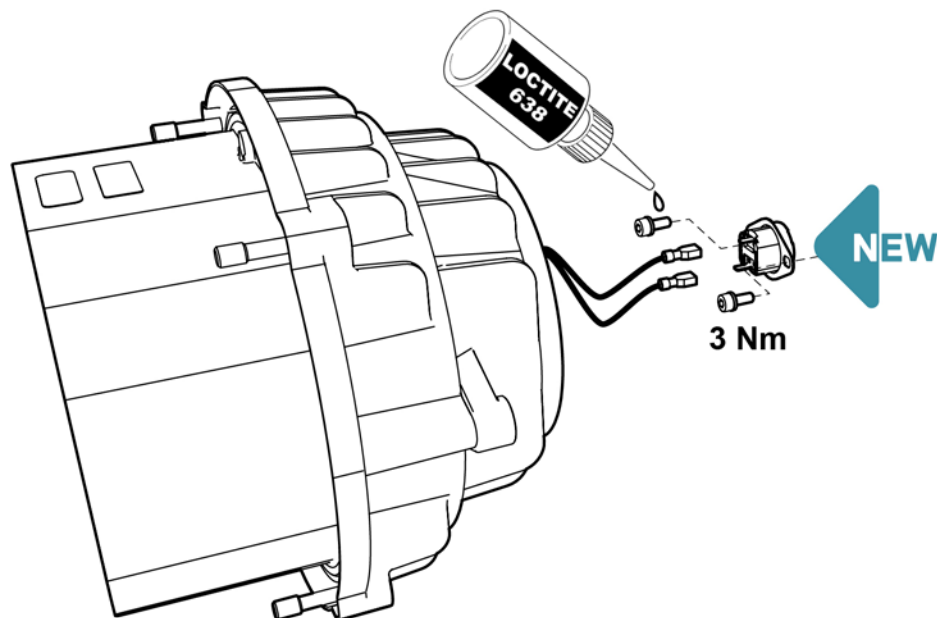
Connect the new thermostat and place it inside the cover using the locking screws.



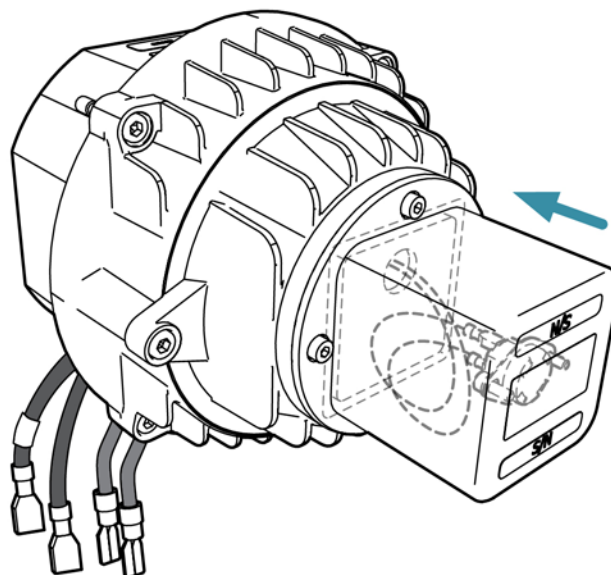
Tighten the screws with the indicated torque values.

check the proper functioning of the gasket. Position the cover without damaging the cables of the thermostat and screw the four screws.

5



6



3.1 Replacement of the support



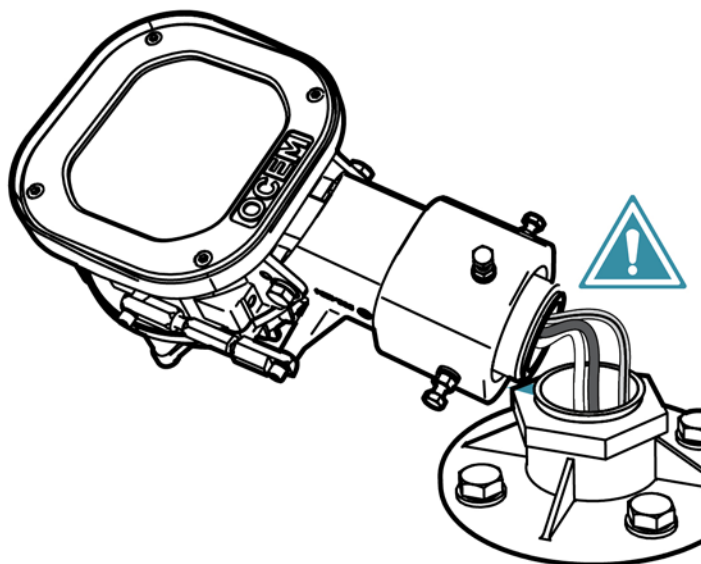
Before carrying out any intervention on the fixture, cut off all external power sources and place appropriate work-in-progress warnings on the systems. Wait for the discharging time (at least 5 minutes) and check using appropriate instruments that there are no residual energies before accessing the electrical equipment.

The frangible coupling and the relevant installation accessories are provided as spare parts.

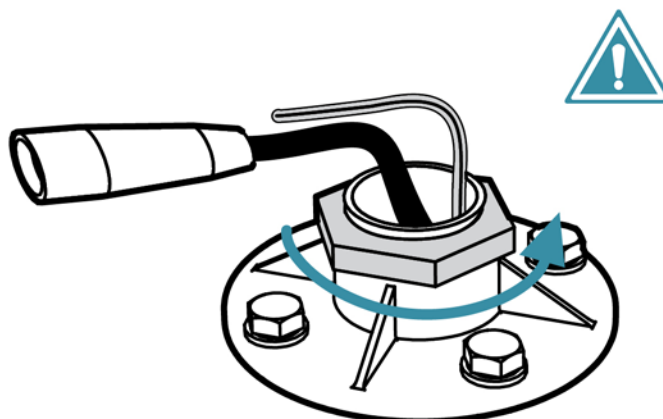
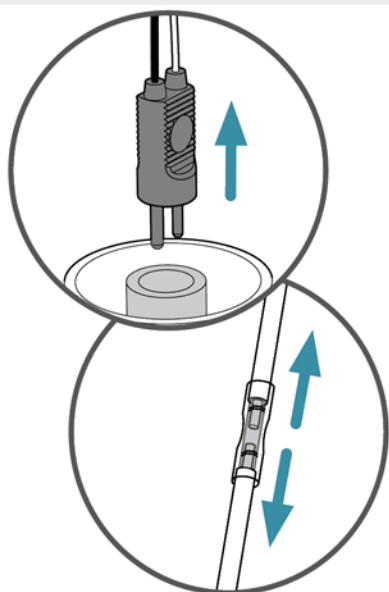
Disconnect the supply cables of the unit.

Loosen and remove the ring nut. Grab the damaged support with an adjustable wrench in correspondence of the base of the breakable coupling element. Rotate counterclockwise and remove the support of the fastening flange.

1



2



Screw and tighten the frangible coupling to the base.



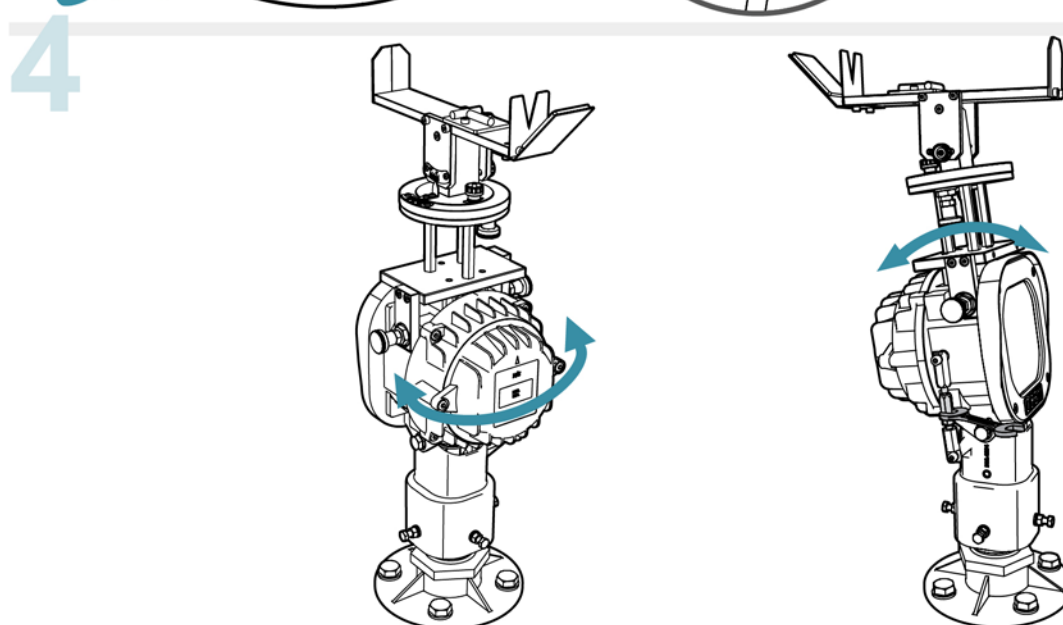
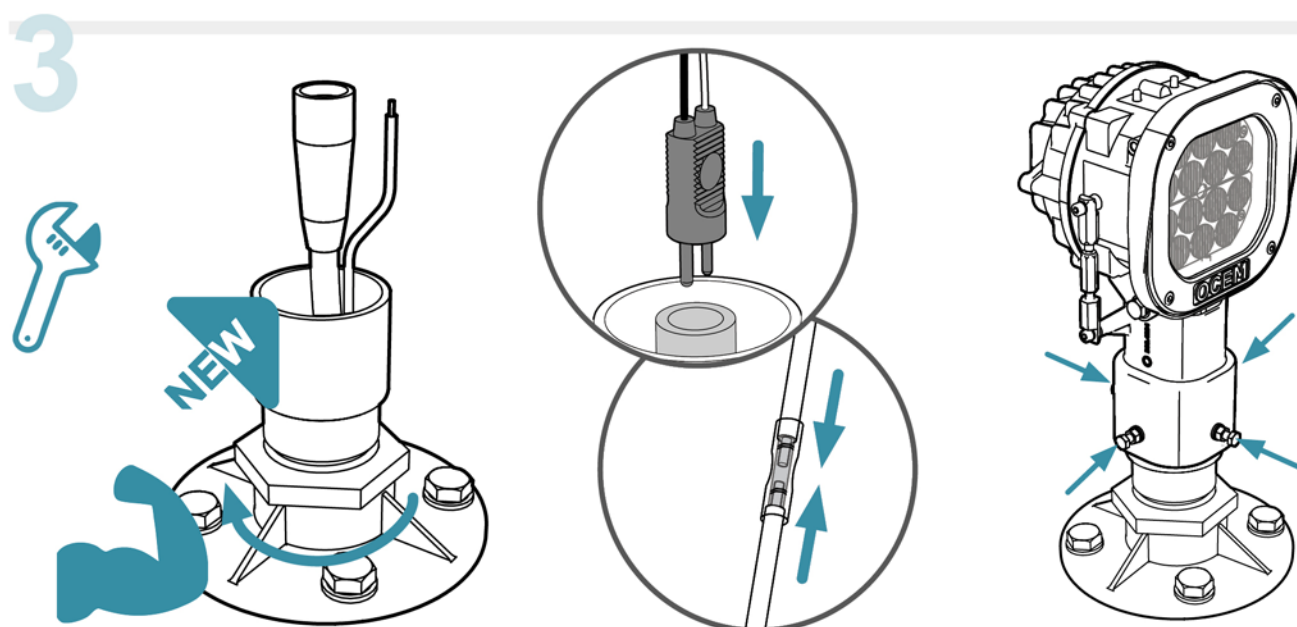
Insert inside the coupling the cable of the secondary of the transformer (with socket) and the ground cable (ground connected inside the base).

Make the electrical connections: insert the plug of the fixture in the socket coming from the transformer and joint the ground cable with the protective conductor coming from the base.

Tighten uniformly the screws present on the body of the fixture until stopping the fixture on the pole (without tightening).

Check the proper alignment of the fixture (see the related paragraph in the chapter "INSTALLATION").

After completion of operations, check the operation of all light(s) fixtures.



3.1 Troubleshooting



Carefully read the manual, and in particular safety information, before proceeding with the resolution of common faults.

Problem	Possible cause	Solution
When the fixture is powered, the light flow appears distorted.	The lens could be broken or damaged.	Replace the damaged lens.
When the fixture is powered, the light flow appears weak.	The primary circuit may have a partial short-circuit.	Check the status of the power cable and, if necessary, restore the connection.
	The isolation transformer could be faulty.	Check the status of the isolation transformer with appropriate instruments and, if necessary, replace the damaged component. For further details, please refer to the use and maintenance manual of the damaged component.
	The protective glass could be dirty or damaged.	Clean the protective glass.
	If the fixture is not equipped with monitoring circuit, the LED module could be faulty or short-circuited.	Replace the damaged LED module.
	If the fixture has recently been under maintenance, the electronic board installed could not be correct.	Check that the original configuration of the device matches the one actually installed. when an error occurs replace the electronic board with the correct spare part.

Problem	Possible cause	Solution
When the fixture is powered, the LEDs do not light up.	If the fixture is not equipped with monitoring circuit, the LED module could be faulty or short-circuited.	Replace the damaged LED module.
	The installed electronic board could be faulty.	Replace the electronic board.
	Humidity may be present inside the fixture.	Check the presence of humidity inside the fixture. Clean and dry all internal parts inside the fixture. Check the status of the gaskets. If necessary replace the gaskets and reassemble the fixture.
	The primary circuit may have a partial short-circuit.	Check the status of the power cable and, if necessary, restore the connection.
	The isolation transformer could be faulty.	Check the status of the isolation transformer with appropriate instruments and, if necessary, replace the damaged component. For further details, please refer to the use and maintenance manual of the damaged component.
	If the fixture is equipped with monitoring circuit and has recently been under maintenance for the LED module replacement, the monitoring device may not have been restored.	Restore the monitoring device.

Problem	Possible cause	Solution
During periodic inspection is detected the presence of humidity or condensation inside the fixture.	The gaskets could be damaged.	Clean and dry all internal parts inside the fixture. Check the status of the gaskets. If necessary replace the gaskets and reassemble the fixture.
	The cables could be damaged: the presence of cracks or holes in the cable insulation and the breaking of the rubber of the cable gland could allow humidity to enter the fixture.	Clean and dry all internal parts inside the fixture. Check the status of the power cable and, if necessary, restore the connection.



If after trying the proposed solutions the problem persists, contact OCEM technical support. Do not let running fixtures presenting signs of damage or fault.

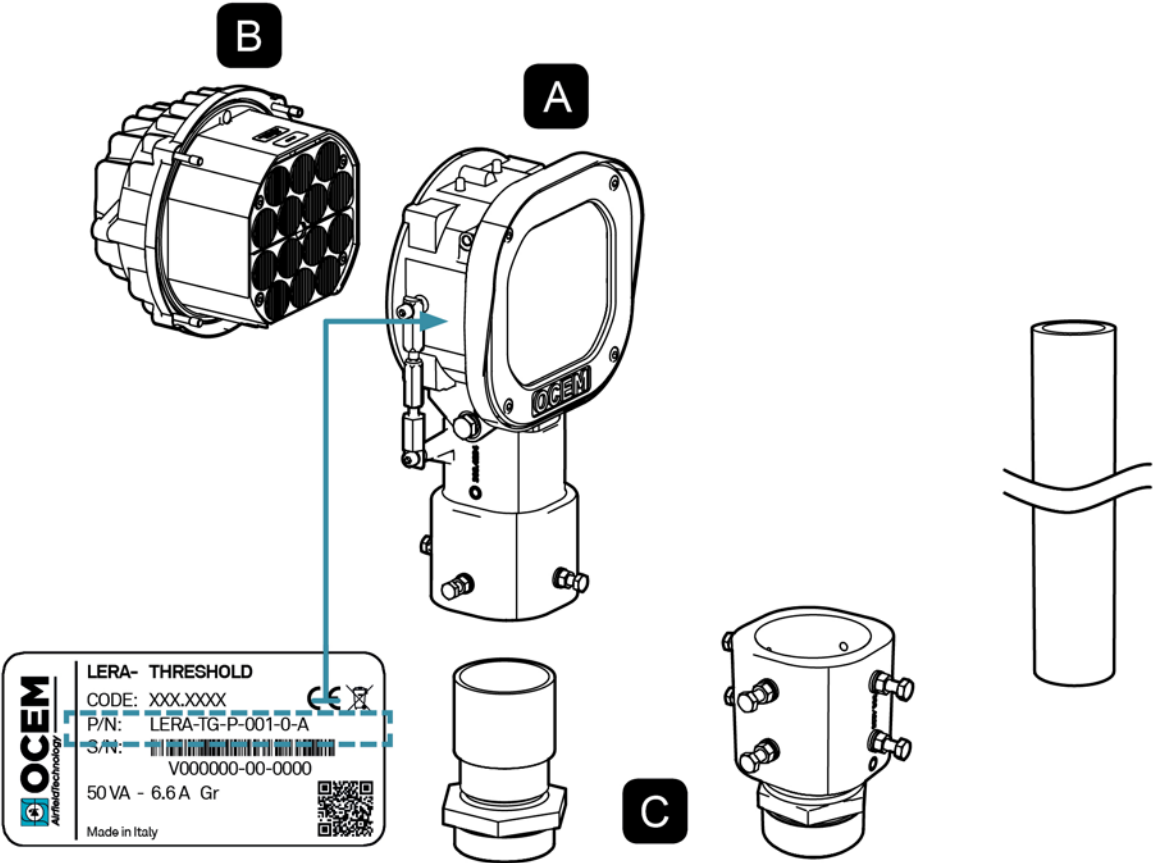
3.1 Spare parts



Always check the version of the fixture installed and the accessories present.

LERA fixture	
A	Special support
B	LED light assembly
C	Fastening System

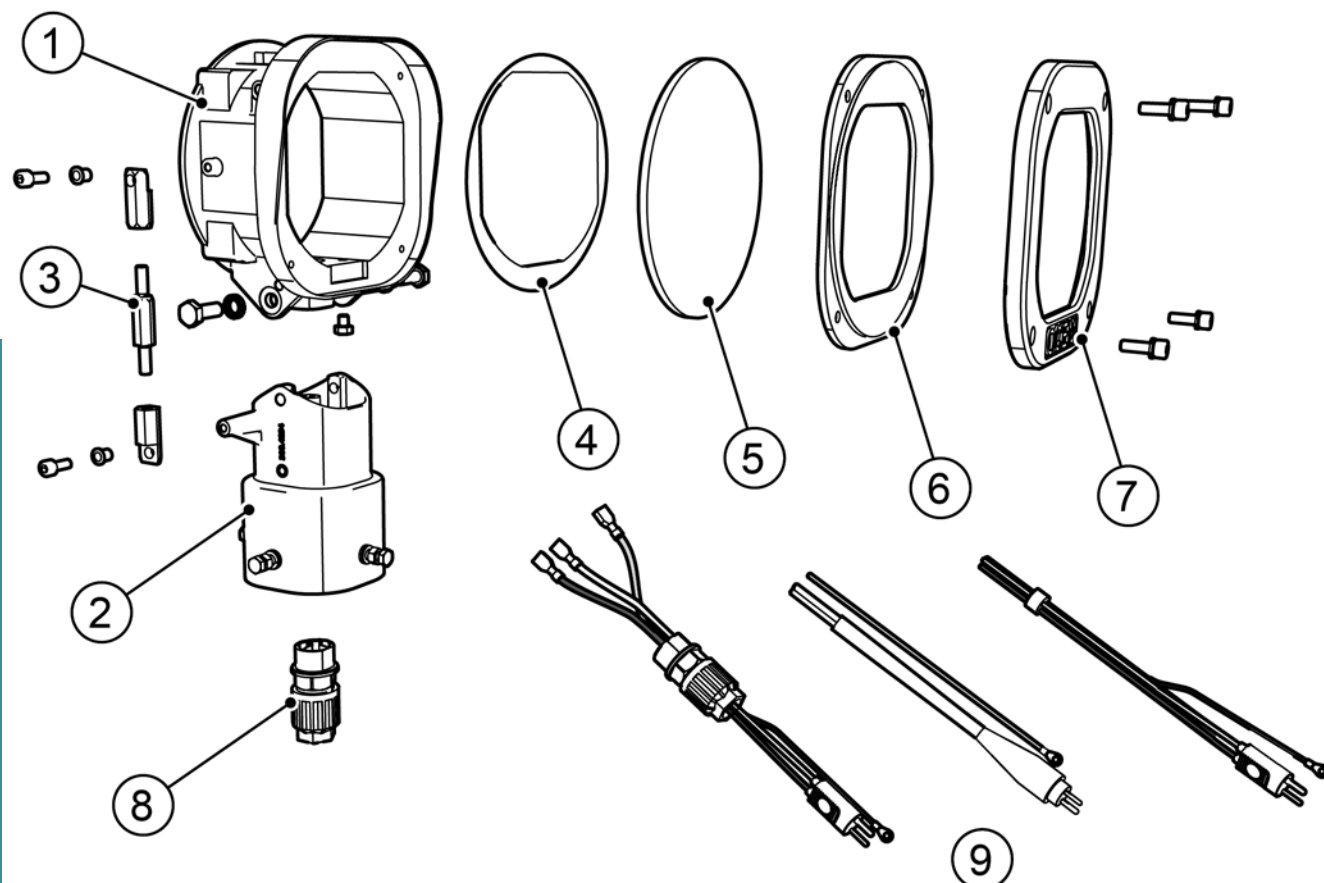
Accessories		Code Art.
	Grease for gaskets	752.1014



3.1.1 Special support

Pos	Description	Fixture Code	Code Art.
1	Support body	always valid	RISLF0092
2	Support	always valid	RISLF0063
3	Complete tie rod	always valid	RISLF0062
4	Lower gasket (in gaskets kit)	- - - - - 0	RISLF0018
5	Transparent glass front panel	always valid	RISLF0027
	Transparent plexiglass front panel	always valid*	RISLF0017
6	Upper gasket (in gaskets kit)	always valid	RISLF0018
7	Closing frame (the kit includes the gaskets)	AC - - - - -	RISLF0059
		AR - - - - -	RISLF0060
		ER - - - - -	
		SB - - - - -	
		BA - - - - -	RISLF0061
		TG - - - - -	
		WG - - - - -	
8	Bulkhead	always valid	RISLF0090
9	Power cable (L=500 mm)	- P - 0 0 1 - -	RISLF0064
		- C - 0 0 1 - -	
		- C - 0 5 0 - -	
	Power cable (L=2500 mm)	CE - C - 2 5 0 - -	RISLF0065
	Bench power cable	always valid	PAACK0077

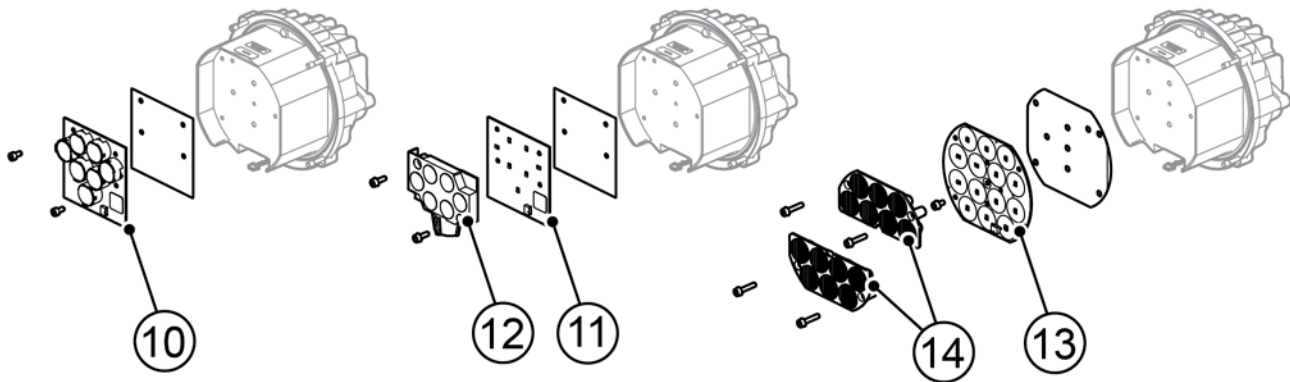
* only for fixtures produced before 2023



3.1.2 LED light assembly

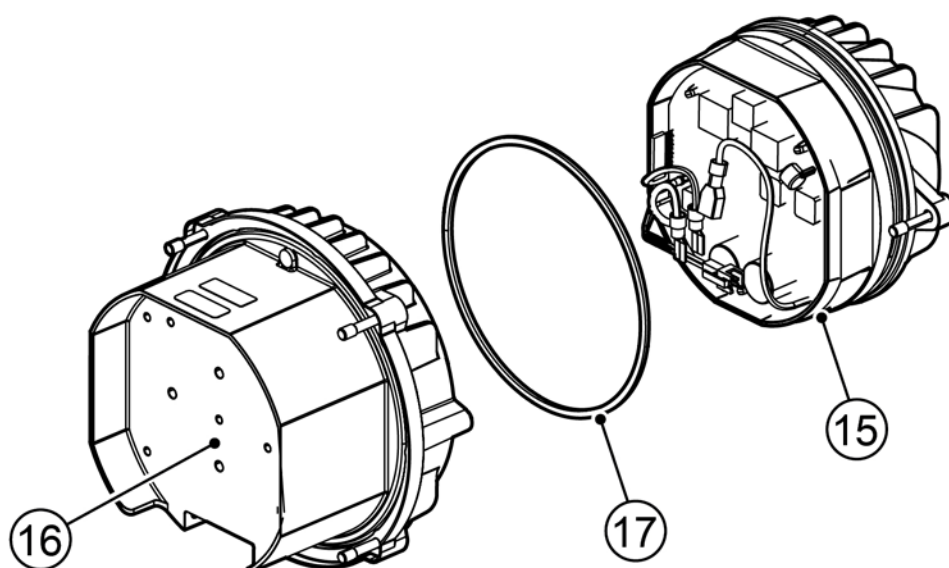
LED module

Pos	Description	Fixture Code	Code Art.
10	Module 7 LED (Red)	S B - - - - -	RISLF0053
		B A - - - - -	RISLF0054
11	Module 7 LED (Red)	E R - - - - -	RISLF0055
12	Optical system	E R - - - - -	RISLF0057
13	Module 12 LED (White)	A C - - - - -	RISLF0050
	Module 12 LED (Red)	A R - - - - -	RISLF0051
	Module 12 LED (Green)	T G - - - - - W G - - - - -	RISLF0052
14	Lenses	A C - - - - - A R - - - - - T G - - - - - W G - - - - -	RISLF0056

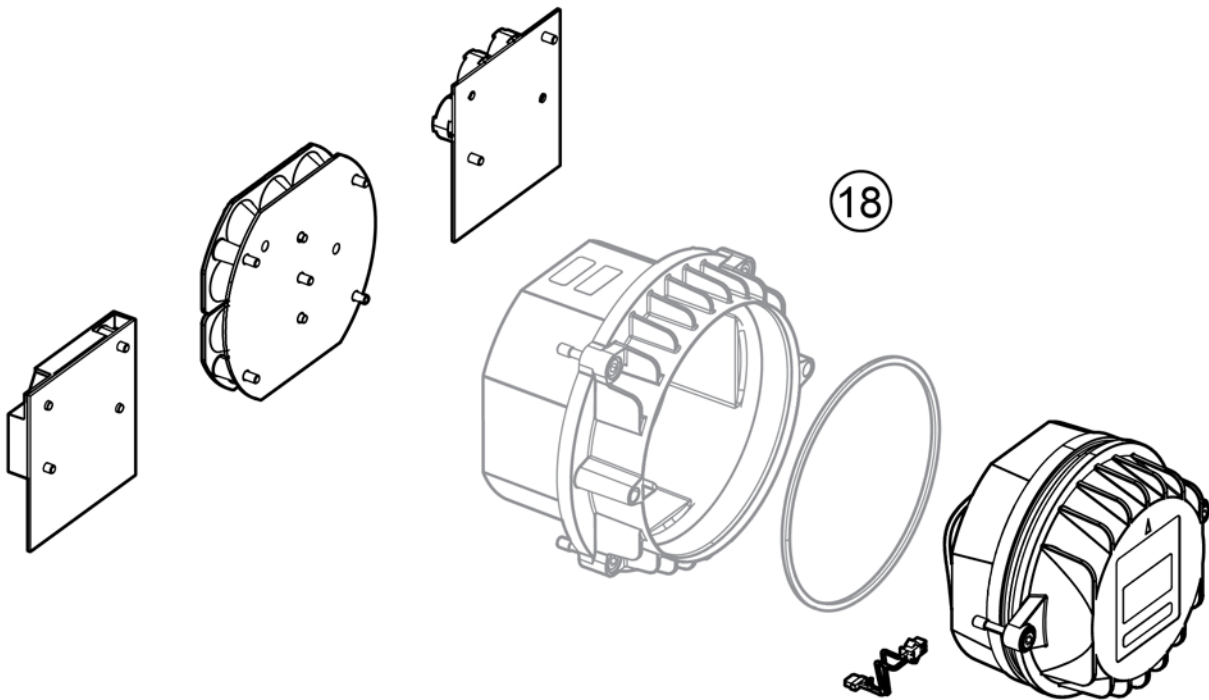


Electronic module

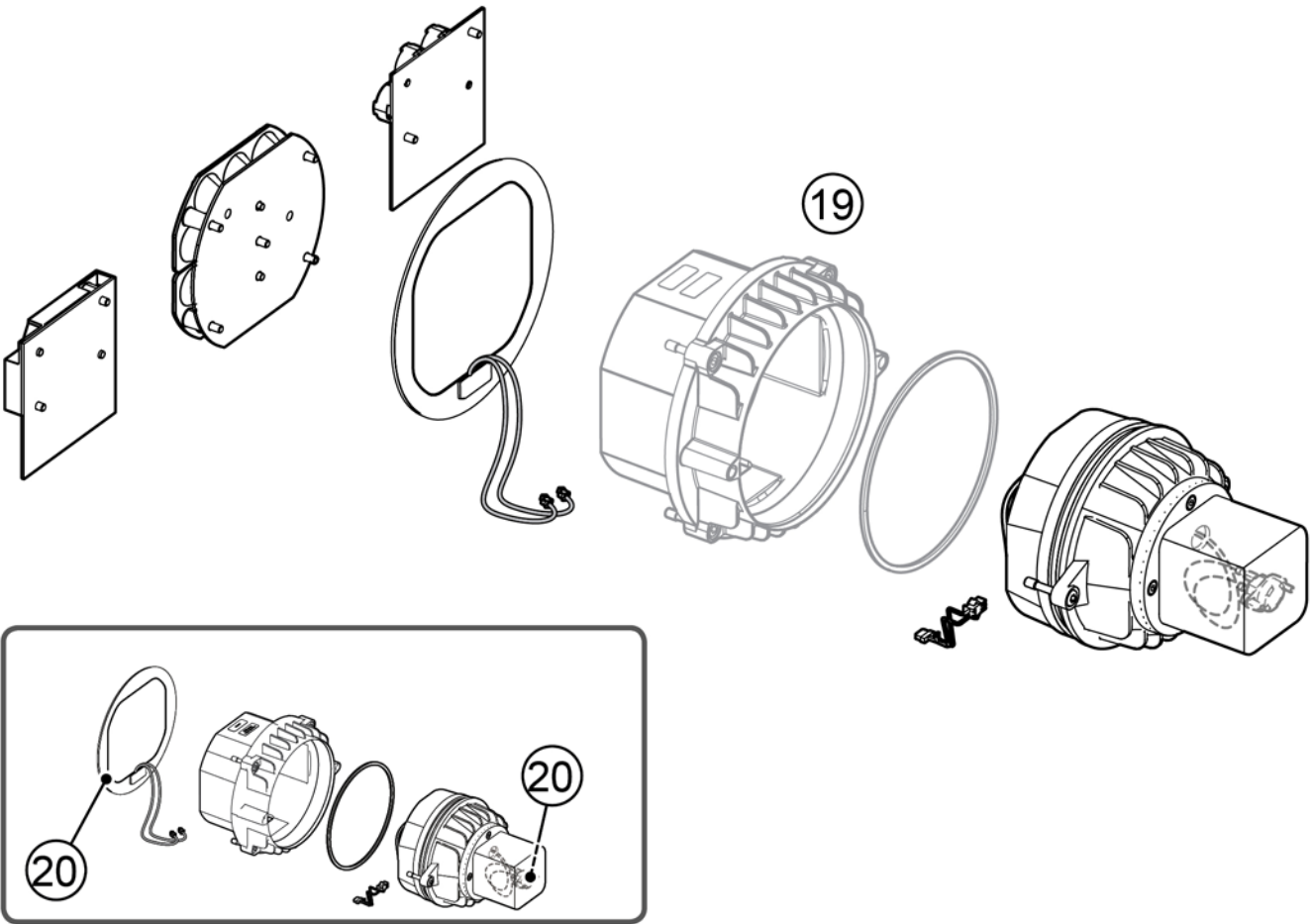
Pos	Description	Fixture Code	Code Art.
15	Resinated body (without monitoring)	S B - - - - 0 - 0	RISLF0038
		E R - - - - 0 - 0	
		B A - - - - 0 - 0	
		A R - - - - 0 - 0	RISLF0039
		T G - - - - 0 - 0	
		W G - - - - 0 - 0	
		A C - - - - 0 - 0	RISLF0040
	Resinated body (with monitoring)	S B - - - - M - 0	RISLF0041
		E R - - - - M - 0	
		B A - - - - M - 0	
		A R - - - - M - 0	RISLF0042
		T G - - - - M - 0	
		W G - - - - M - 0	
		A C - - - - M - 0	RISLF0043
	Resinated body with arctic kit (without monitoring)	S B - - - - 0 - 0	RISLF0044
		E R - - - - 0 - 0	
		B A - - - - 0 - 0	
		A R - - - - 0 - 0	RISLF0045
		T G - - - - 0 - 0	
		W G - - - - 0 - 0	
		A C - - - - 0 - 0	RISLF0046
	Resinated body with arctic kit (with monitoring)	S B - - - - M - 0	RISLF0047
		E R - - - - M - 0	
		B A - - - - M - 0	
		A R - - - - M - 0	RISLF0048
		T G - - - - M - 0	
		W G - - - - M - 0	
		A C - - - - M - 0	RISLF0049
16	LED driver board support unit	always valid	RISLF0058
17	Resinated body gasket (in gasket kit)	always valid	RISLF0018



Pos	Description	Fixture Code	Code Art.
18	Resinated body assembly (with monitoring) equipped with LED module	AC - - - - -M-0	RISLF0066
		AR - - - - -M-0	RISLF0067
		TG - - - - -M-0	RISLF0068
		WG - - - - -M-0	
		ER - - - - -M-0	RISLF0069
		SB - - - - -M-0	RISLF0070
	Resinated body assembly (without monitoring) equipped with LED module	BA - - - - -M-0	RISLF0071
		AC - - - - -0-0	RISLF0072
		AR - - - - -0-0	RISLF0073
		TG - - - - -0-0	RISLF0074
		WG - - - - -0-0	
		ER - - - - -0-0	RISLF0075
		SB - - - - -0-0	RISLF0076
		BA - - - - -0-0	RISLF0077

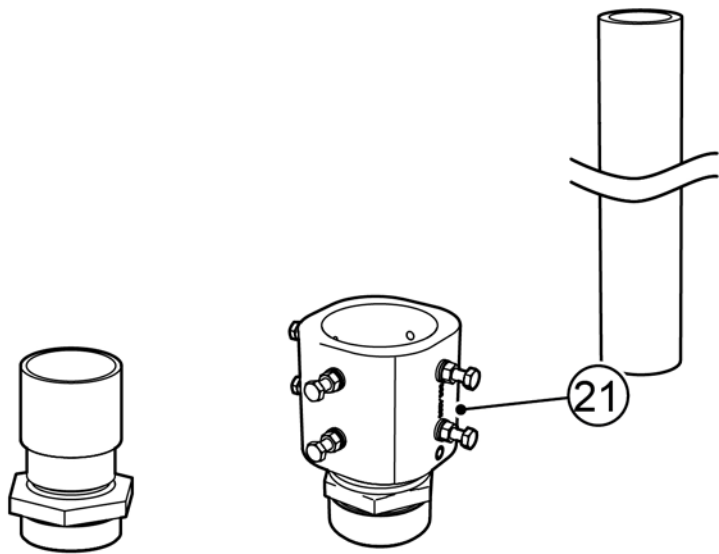


Pos	Description	Fixture Code	Code Art.
19	Resinated body assembly with arctic kit (with monitoring) equipped with LED module	AC - - - - M - A	RISLF0078
		AR - - - - M - A	RISLF0079
		TG - - - - M - A	RISLF0080
		WG - - - - M - A	
		ER - - - - M - A	RISLF0081
		SB - - - - M - A	RISLF0082
	Resinated body assembly with arctic kit (without monitoring) equipped with LED module	BA - - - - M - A	RISLF0083
		AC - - - - 0 - A	RISLF0084
		AR - - - - 0 - A	RISLF0085
		TG - - - - 0 - A	RISLF0086
		WG - - - - 0 - A	
		ER - - - - 0 - A	RISLF0087
20	Arctic kit	SB - - - - 0 - A	RISLF0088
		BA - - - - 0 - A	RISLF0089
		- - - - - A	RISLF0093



3.1.3 Fastening system

Pos	Description	Fixture Code	Code Art.
21	Frangible coupling for pole	always valid	RISLF0091



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Contact us

OCEM AT

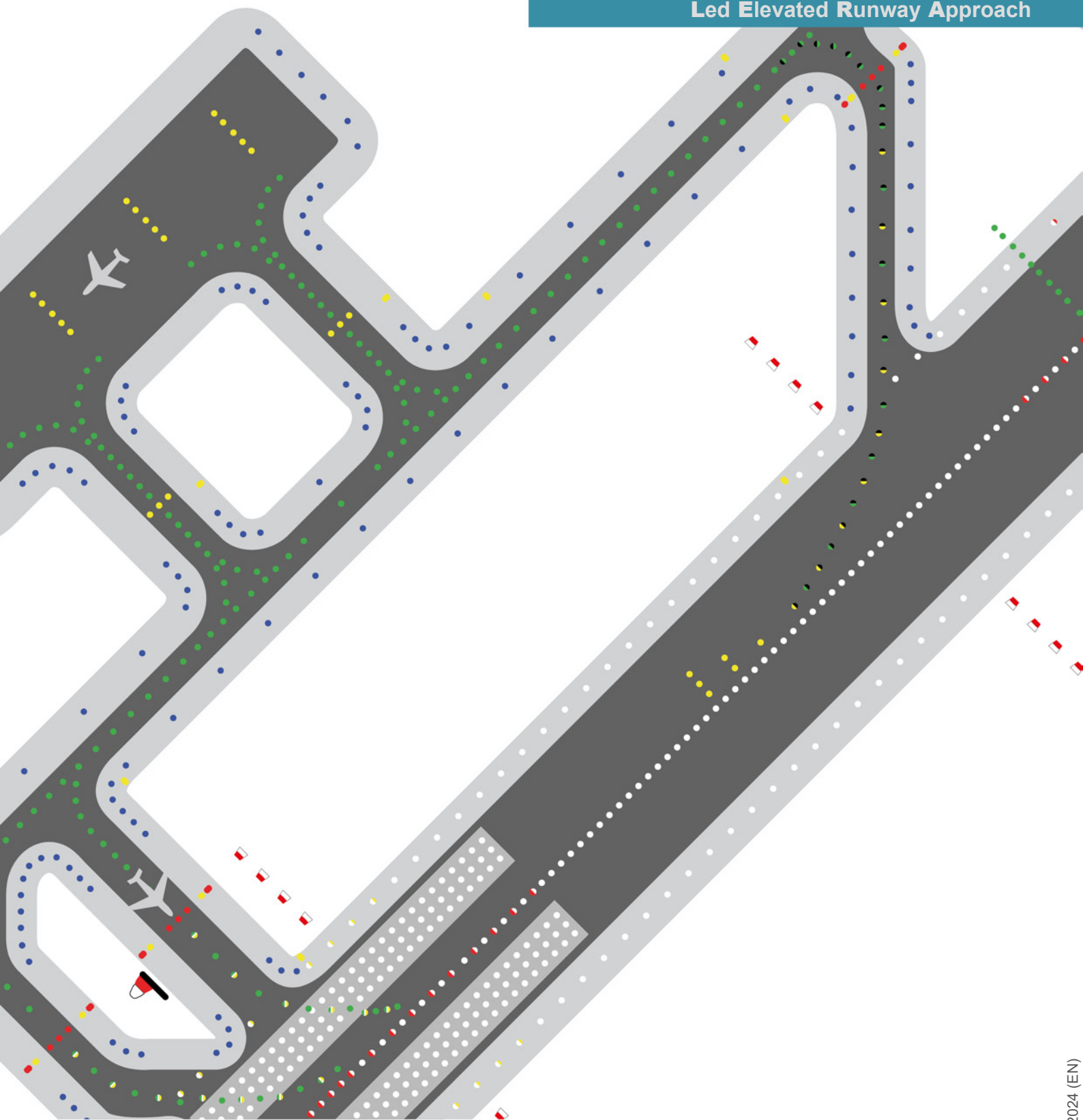


+39 051 66 56 611



info@ocem.com

Led Elevated Runway Approach



AirfieldTechnology

OCEM AT a division of ENERGY TECHNOLOGY S.r.l.
Via della Solidarietà, 2/1 - 40056 Valsamoggia (Bologna) - Italy

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