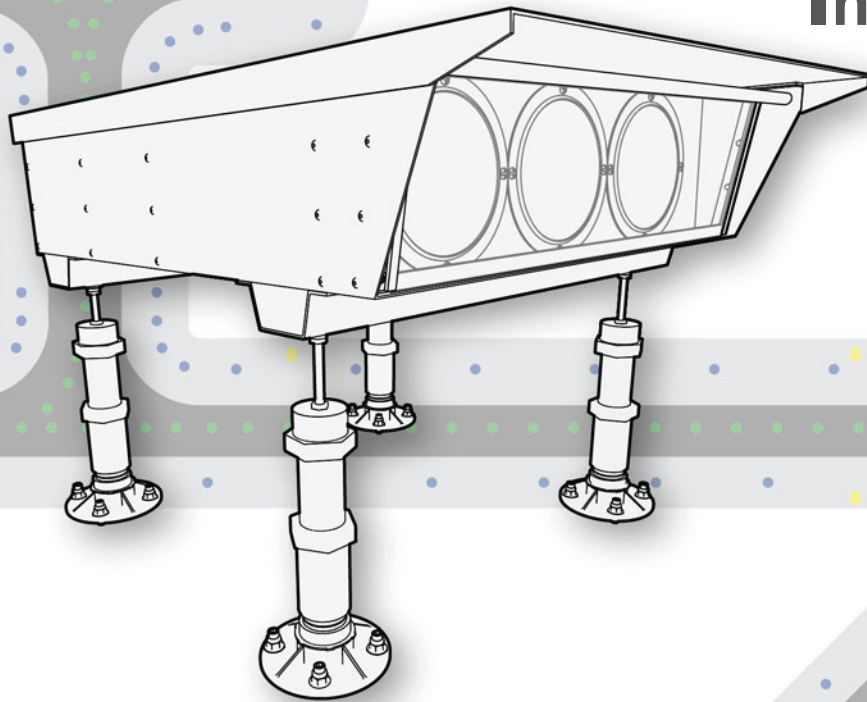


Use and Maintenance Manual

Translation of Original Instructions

HALO Precision Approach Path Indicator



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187325-2015-AE-ITA-ACCREDIA

UT-MT-0970_1.3_06-06-2025 (EN)

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1.1	09-10-2023	Installation update and initial inspection
1.2	22-04-2024	Update spares
1.3	06-06-2025	Update spares

UT-MT-0970_1.3_06-06-2025 (EN) | These specifications may be subject to change.
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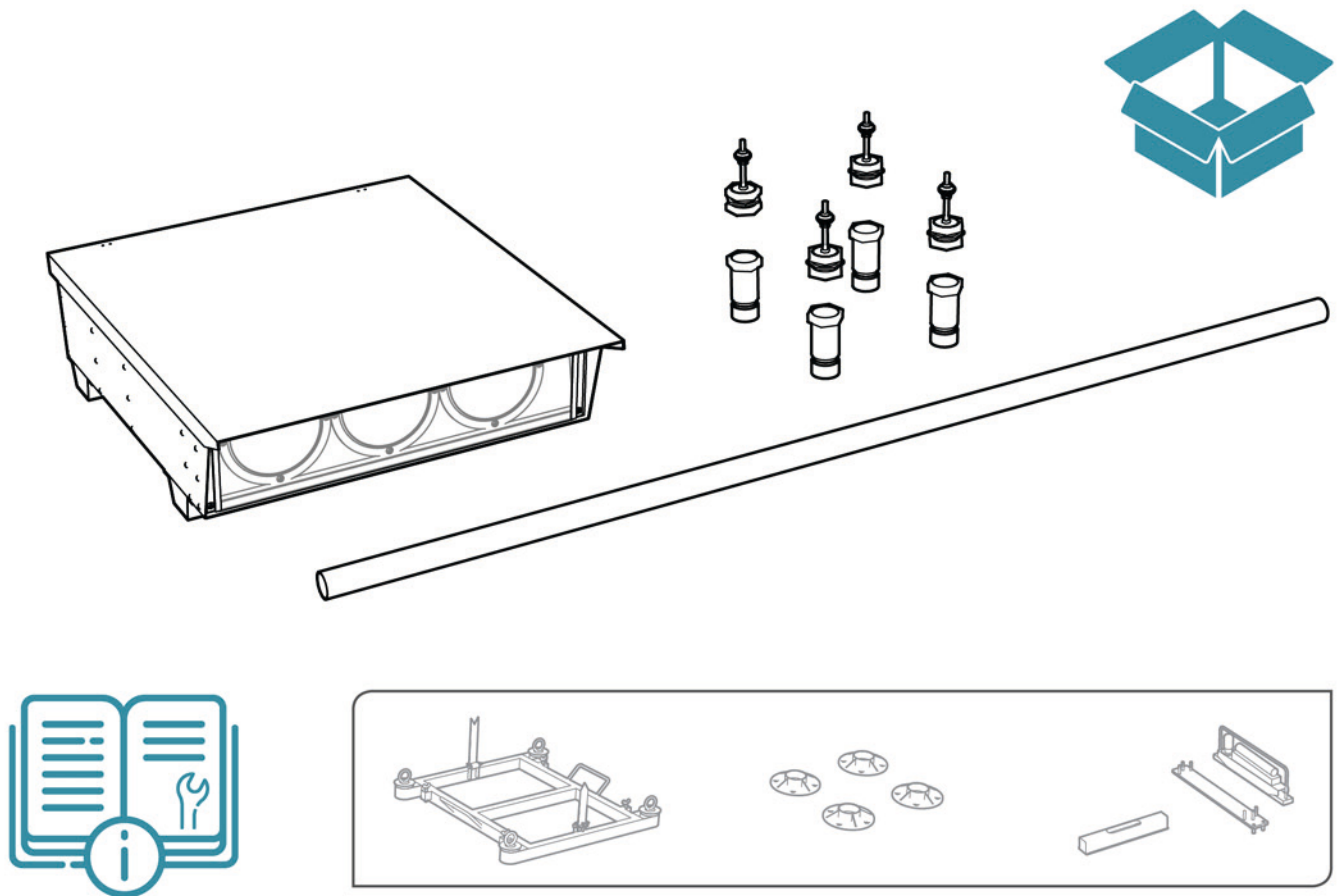
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1 GENERAL INFORMATION

1.1 Package content



The PAPI of OCEM Airfield Technology is an elevated signalling system PAPI type to indicate to approaching aircrafts the vertical position with respect to the optimal value. The device is designed in compliance with:

- ICAO Annex 14 - Volume I (Paragraph 5.3.5) and Aerodrome Design Manual (Part 4): Precision Approach Path indicator (PAPI) and Abbreviated PAPI (A-PAPI);
- CASA: Manual of Standards Part 139;
- NATO: Stanag 3316;
- ENAC (Italian Civil Aviation Authority): ENAC Airport Construction Regulation.

Immediately check for visible damages of the container. Carefully remove the device and check for visible damages. Check the presence of all accessories that can be ordered separately (EMT 2" pipe) and any assembly tool (optionals). Before proceeding read all warnings on the packaging.



Store all the components in the original packaging until the time of installation.
Pay attention not to damage the cables, the pipes or the watertightness of the components.



The device described in this manual has been designed to be powered by series circuits, powered by constant current regulators from 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 PAPI 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 PAPI 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.



**For more details on warranty conditions, please refer to the document “General Sales Conditions” updated to latest version.
Please see online: <https://ocem.com/en/terms-conditions/>**



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

CE 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.

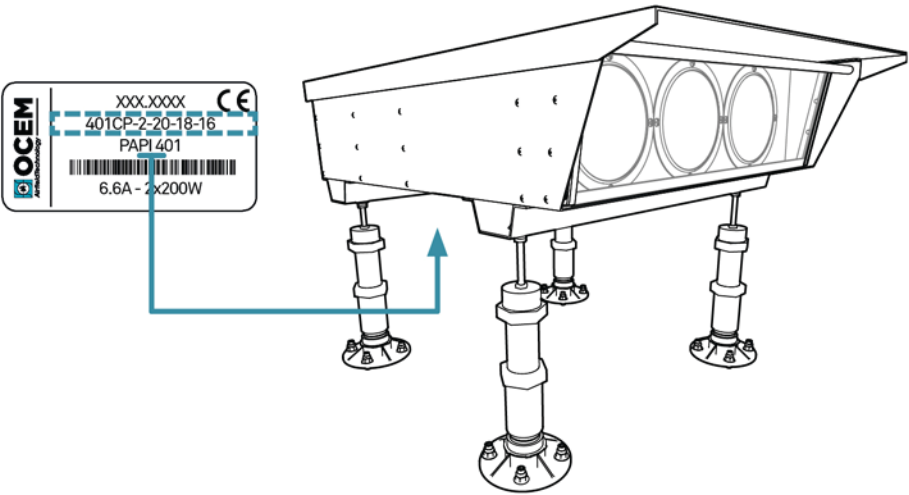
1.9 Disposal



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 PAPI 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).

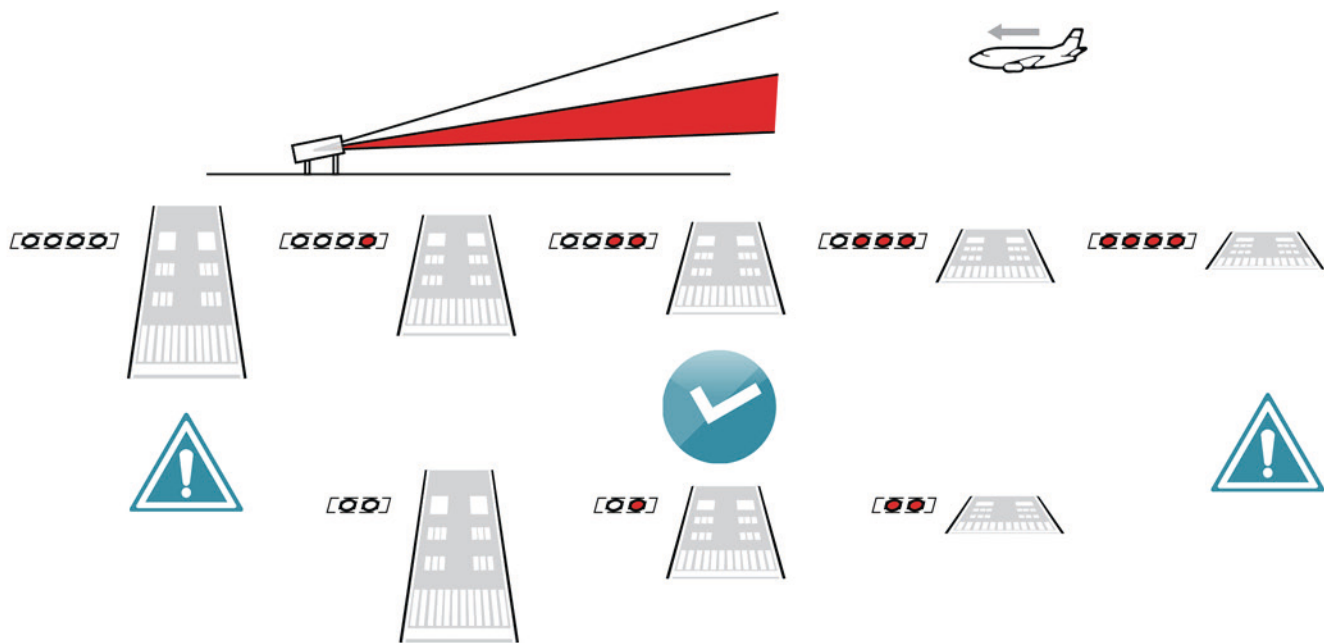
2 **FIXTURE DESCRIPTION**

2.1 **General characteristics**

The PAPI fixtures are designed for the purpose of providing visual guidance to aircrafts in the bichromatic approach flash signalling:

- Four-light PAPI: the system (in use in commercial and military airports) consists of 4 units each equipped with 2 or 3 lamps (200 W), current-powered in environments with temperatures between -55 °C [-67 F] and +55 °C [+131 F].
- Two-light PAPI: the system (in use in commercial airports or heliports) consists of 2 units each equipped with 2 lamps (100 or 200 W), current-powered in environments with temperatures between -55 °C [-67 F] and +55 °C [+131 F].

The halogen lamps installed allow to minimize maintenance costs. Optics, made up of an aluminium parabolic reflector, a filter and a lens assure uniform intensity and the red/white rapid transition to provide the pilot with an accurate reporting on the glideslope approaching the runway. The PAPI fixture is a device able to offer in the same optics visible and infrared operating states.



The fixtures, positioned on the left of the landing area, project stable light beams and depending on the approach angle there can be different combinations:

PAPI	Glideslope
○ ○ ○ ○	Very high glideslope
○ ○ ○ ●	Slightly high glideslope
○ ○ ● ●	Appropriate approach glideslope
○ ● ● ●	Slightly low glideslope
● ● ● ●	Very low glideslope

A-PAPI	Glideslope
○ ○	High glideslope
○ ●	Appropriate approach glideslope
● ●	Low glideslope

Available with supports for fixed installation with controlled frangible coupling, the PAPI system is designed to be installed on concrete bases properly dimensioned.

The PAPI is compliant with the rules:

ICAO Annex 14 - Volume I (Paragraph 5.3.5) and Aerodrome **CASA** Manual of Standards Part 139 Design Manual (Part 4)

NATO Stanag 3316

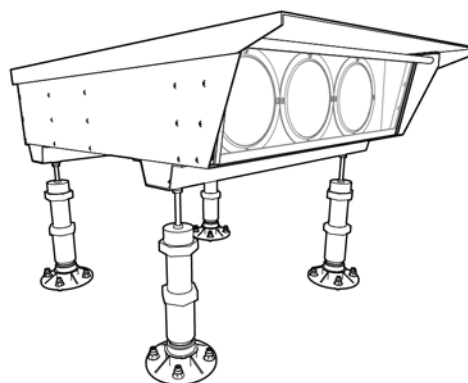
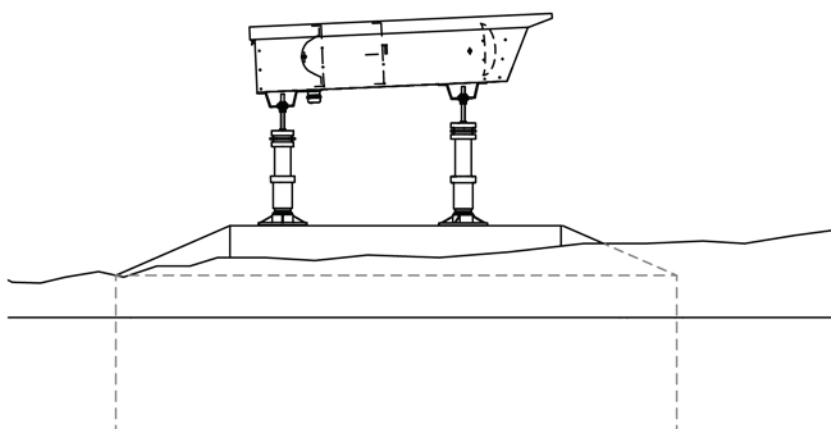
ENAC Airport Construction Regulation



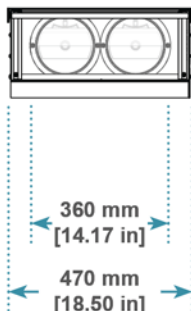
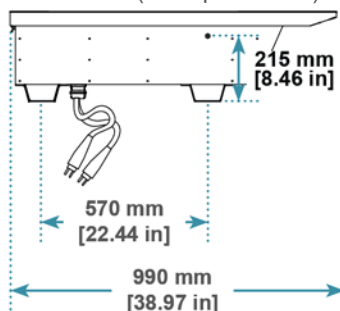
The fixtures PAPI described in this manual have been designed to be installed on the concrete basis of suitable dimension.
The threaded fastening system must be installed in the right position.



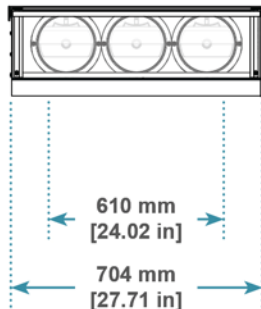
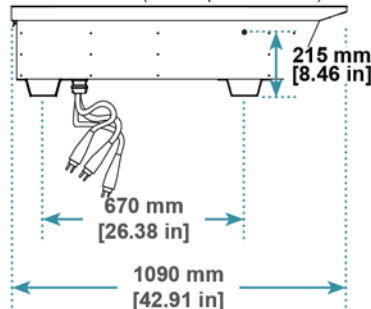
The supply circuits for the light(s) fixtures (one for each lamp) can be positioned within plastic or metallic pipes permanently laid in the ground, equipped with appropriate coupling devices.



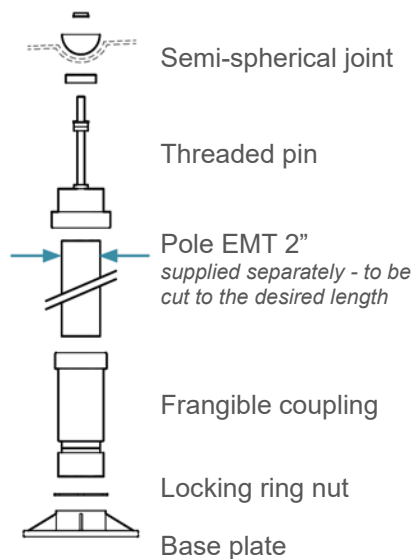
PAPI 401C/H (2 lamps version)



PAPI 401C/M (3 lamps version)



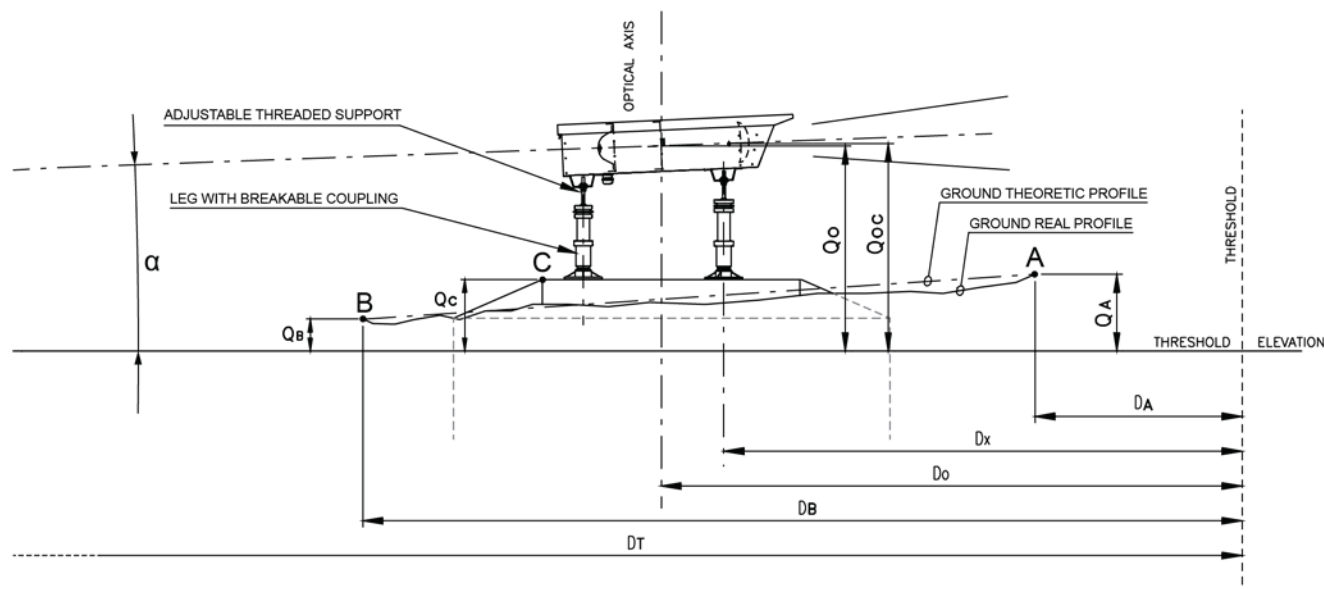
SUPPORT



The installation of a PAPI (or A-PAPI) system requires specific design correctly assessing the positioning, orientation and inclination of devices according to the characteristics of airfield-helipad:

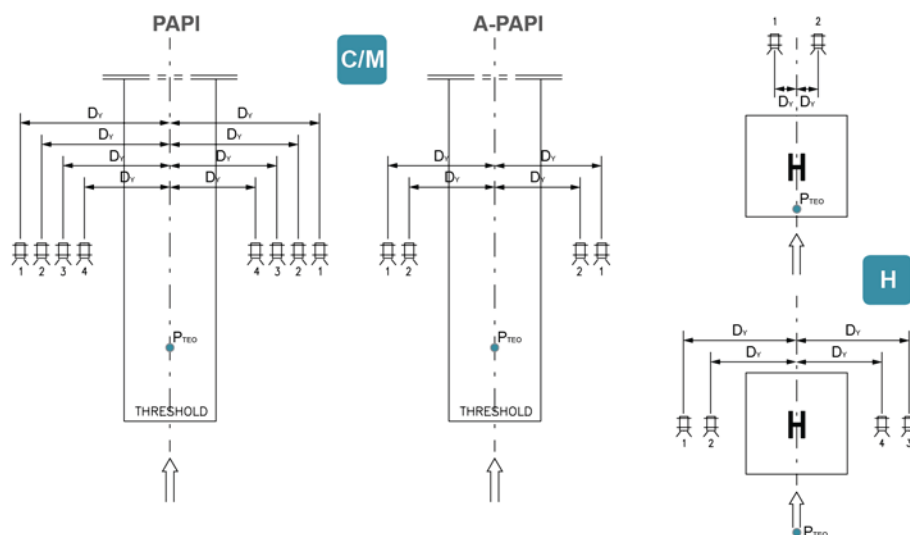
- Conformation of the landing runway or of the helipad;
- The elevation of the installation points (compared with the threshold or to the centre of the platform TLOF);
- The approach angle;
- The minimum height of the line of sight of the pilot above the threshold or the helipad.

If a structure is equipped with Instrument Landing System (ILS), it must be taken into consideration also the distance between the origin of the glide path and the threshold.

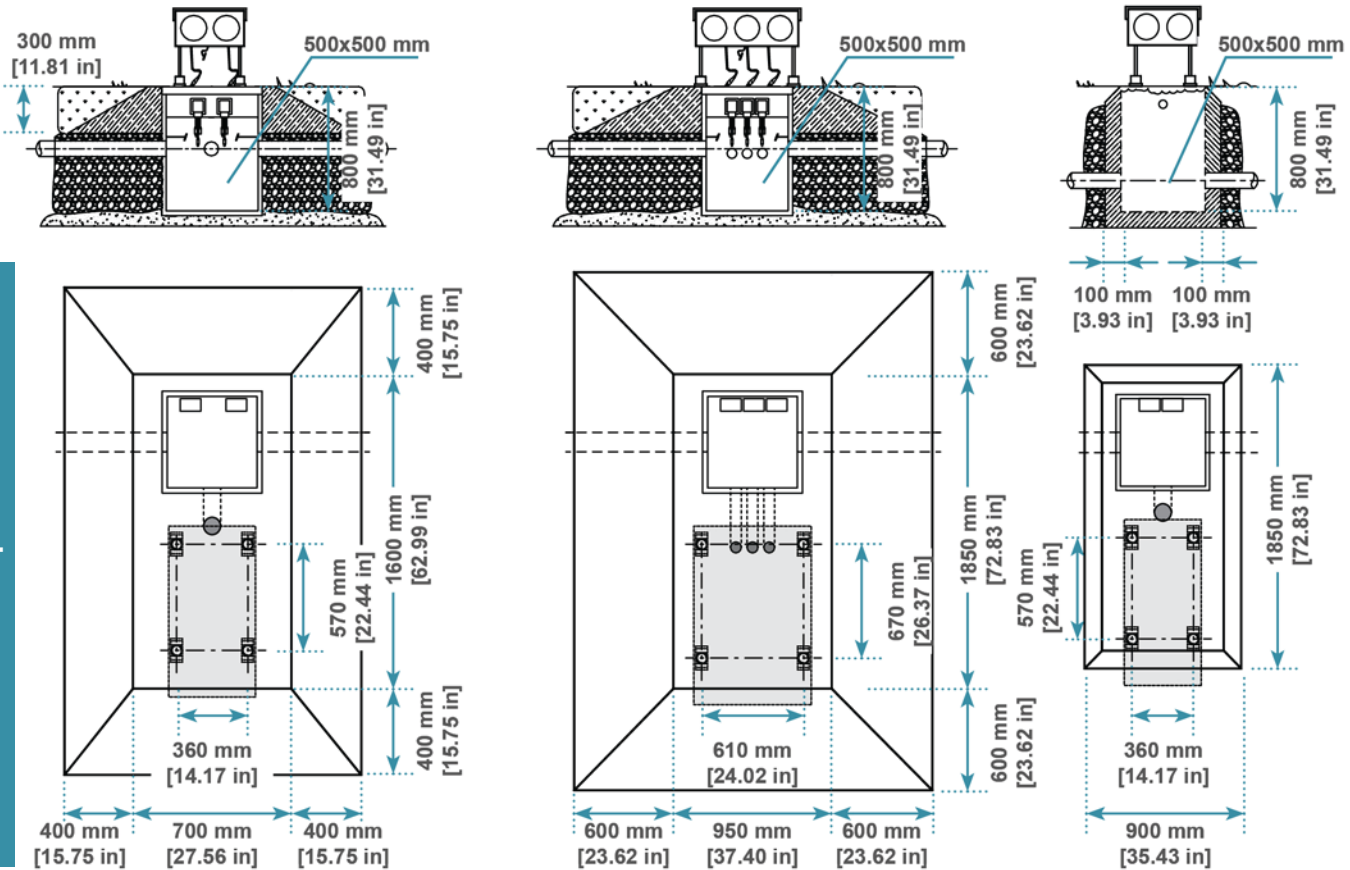


The example shows the main measures to be evaluated for proper design of the PAPI (or A-PAPI) system:

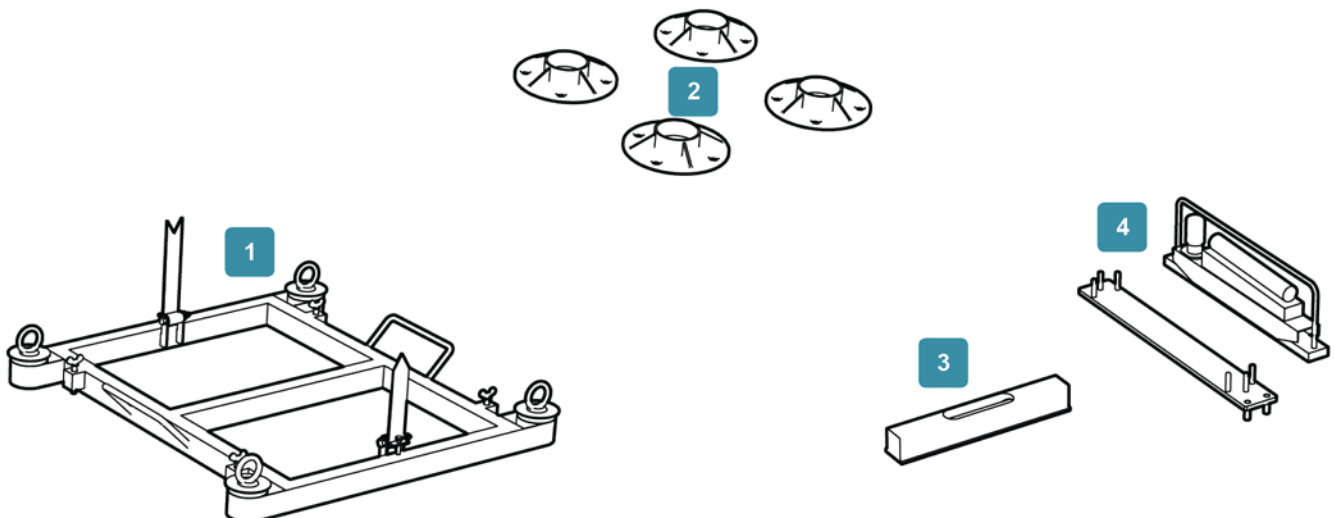
D _T : Theoretical threshold - Distance of the optical axis	Q _B : Elevation measurement of the point B
D _Y : Distance between the centre of the landing runway/helipad and longitudinal axis of the unit	D _O : Actual threshold - Distance of the optical axis
α: Elevation angle of the unit (compared with the threshold)	D _X : Actual threshold - Distance of the front support
D _A : Distance of the point A (in front of the unit)	Q _O : Actual elevation of the optical axis
Q _A : Elevation measurement of the point A	Q _{OC} : Conventional actual elevation of the optical axis
D _B : Distance of the point B (behind the unit)	Q _C : Actual elevation of the base
	P _{TEO} : Theodolite survey point (as specified in the design)



The concrete base must respect all the indications for their proper implementation.



For the proper installation of the PAPI system (optional) equipments are available for installation, pointing and fixtures adjustment: a template (1) for the positioning of the ground anchorage (diversified for the 2 or 3 lamps model), the threaded anchorage flanges (2) (2" 11-GAS), a linear level gauge (3) for the fixture alignment, an analogue clinometer (4) with related support bracket to adjust the units. For further information on the use of the mounting accessories, please refer to the respective manuals.



2.2 Article number

example: 401CP - 2 - 20 - 18-16	
Standard	
C = ICAO/CASA	
M = NATO*	
H = Heliport (ICAO)**	
System	
P = PAPI system (4 units)	
A = A-PAPI system (2 units)	
U = Single unit	
Number of lamps	
2 = Two lamps unit	
3 = Three lamps unit	
Type of installed lamp	
10 = 100 W 6.6 A PK 30/d ⁺	
20 = 200 W 6.6 A PK 30/d	
Option	
16 = Front glass (always present)	
18 = Flexible sheathing for power cable protection	
ANT = Anti-condensation heater	

* NATO system configurable only with 3 lamps unit
 ** Heliport system (ICAO) configurable only with 2 lamps unit
 + Lamp 100 W available only for PAPI systems for Heliport

In the example **401CP - 2 - 20 - 18-16**: 4 light units PAPI system for airports compliant with ICAO standard. 2 200 W lamps fixtures (6.6 A PK 30/d), equipped with protective front glass and adaptable support system (note: Pole EMT 2" not provided, to be ordered separately). System equipped with flexible sheathings for power cable protection.

Description

2.3 Wiring

The PAPI 401 system must be powered by a circuit airport series (6.6 A).

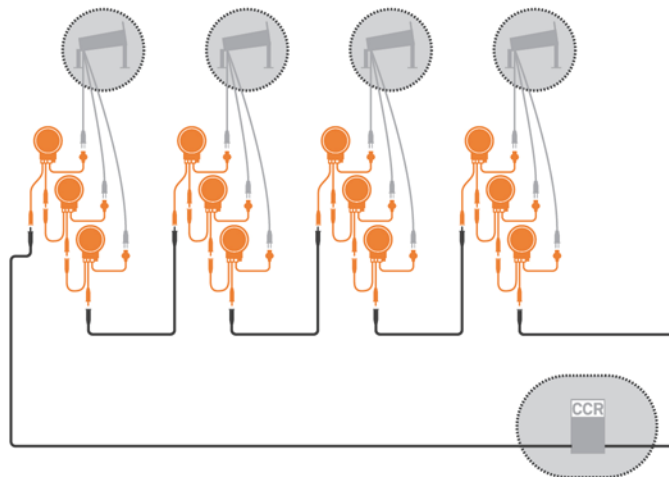


In case of double PAPI system, installed both right and left of the landing runway (or of the helipad), each branch should be powered by a different series circuit. Thus configured, the failure of a power supply circuit causes the failure to function on only one of the two blocks. In case of single PAPI system, installed only on the right and on the left of the landing runway (or in front of the helipad), is appropriate to use a single circuit to power the unit.



Using two different circuits to power the lamps of a single unit, the fault of a circuit can generate a misreading of the fixture inducing the pilot into error.

CCR
supply



+55°C
+131°F
-55°C
-67°F

OPERATING
TEMPERATURE

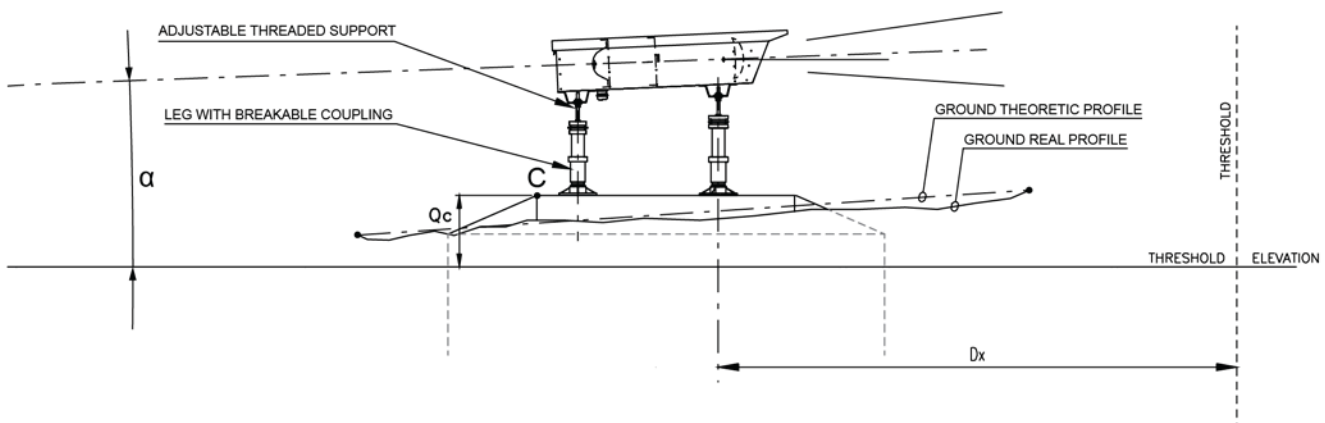


INGRESS
PROTECTION

2.4 Method of calculation of the installation parameter

To properly install the PAPI 401 system the following parameters must be assessed:

- Dx: actual distance of the front leg in relation to the threshold
- Qc: elevation of the concrete platform in relation to the threshold



The theoretical distance D_T between the optical axis of the unit or the centre of the TLOF platform can be calculated with the following formula:

$$D_T = H_{min} \times \cot M$$

where the M angle is equivalent to the approach angle minus 2 minutes of arc. The approach angle depends on the installation type:

- Airfield: $M = (\vartheta - 10') - 2'$ (angle referred to the second unit on the side of the runway)
- Airfield with ILS system (Instrument Landing System): $M_{ILS} = (\vartheta - 15') - 2'$ (angle referred to the second unit on the side of the runway)
- Airfield with MLS system (Microwave Landing System): $M_{MLS} = (\vartheta - 15') - 2'$ (angle referred to the second unit on the side of the runway)
- Helipad: $M_H = (\vartheta - 22'30'') - 2'$ (angle referred to the left side, from the point of view of the pilot approaching)

The actual distance of the optical axis D_O of the unit in relation to the threshold can be calculated with the following formula (distances expressed in m):

$$D_O = \frac{D_T \times \tan M - (Q_B + 0.375) + D_B \times \frac{(Q_B + 0.375) - (Q_A + 0.375)}{D_B - D_A}}{\tan M + \frac{(Q_B + 0.375) - (Q_A + 0.375)}{D_B - D_A}}$$

The actual elevation of the optical axis Q_{OC} in relation to the threshold or to the axis of the platform TLOF can be calculated with the following formula (distances expressed in m):

$$Q_{OC} = (D_T - D_O) \times \tan M + 0.235 \times \sin \vartheta$$



For more information on the meaning of the symbols, please refer to the previous paragraphs.

After completion of the value of the actual distance D_O and of the actual elevation Q_{OC} is possible to obtain the value of the parameters required for civil works.

The actual distance of the front leg D_X in relation to the threshold or to the axis of the platform TLOF can be calculated with the following formula (distances expressed in m):

$$D_X = D_O - 0.230$$

The elevation of the concrete platform C_X in relation to the threshold can be calculated with the following formula (distances expressed in m):

$$Q_C = Q_{OC} - (0.360 + L - 0.095)$$

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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.

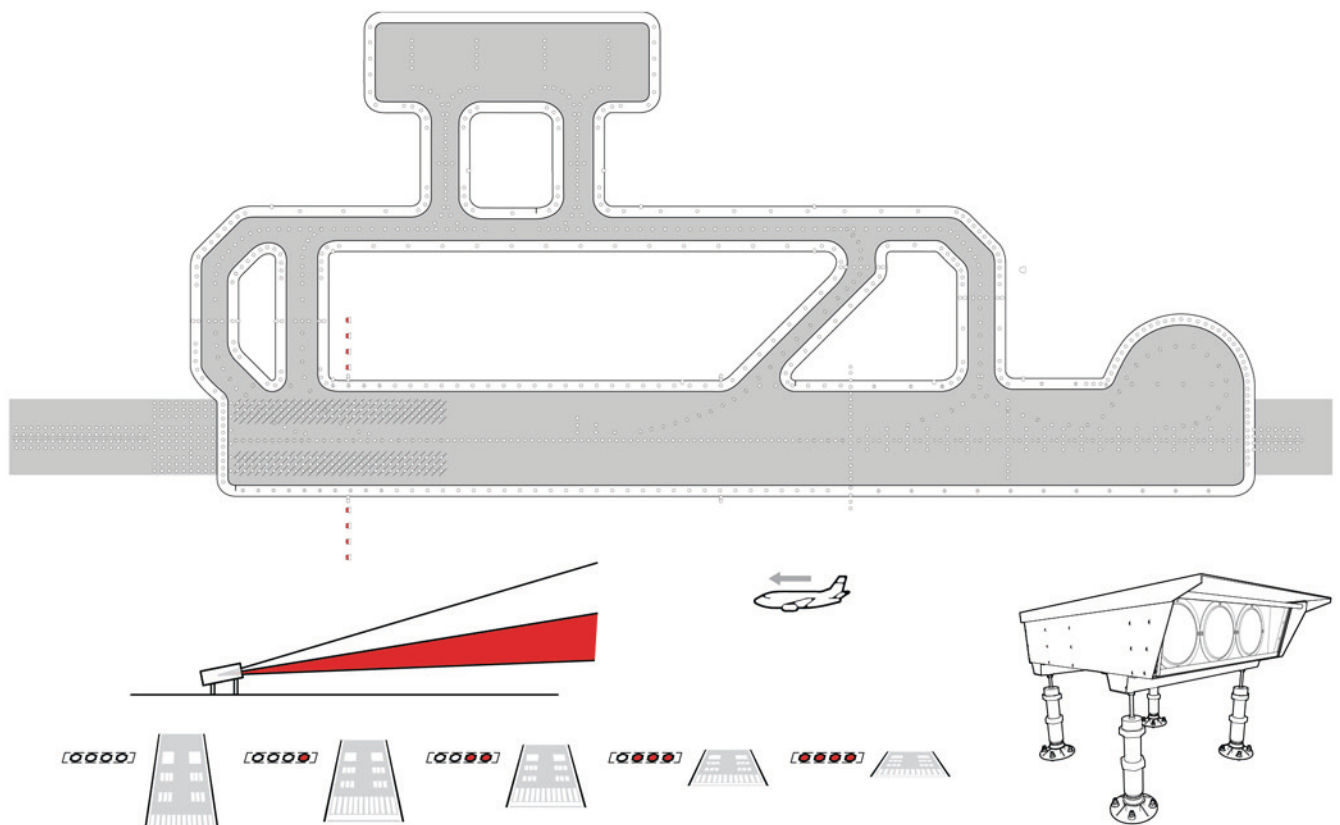
These devices must always be in operating condition and must be clean, maintained and, if necessary, replaced as soon as their visibility is affected.

The light sources must be positioned according to the legislative provisions near the runway oriented towards the approach direction to the landing runway. The optical axis of the unit must be parallel to the runway edge. The positioning of the light units of the runway must be in compliance with current regulations.



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

- ICAO Annex 14 Part 1 5.3.5 - PAPI and APAPI



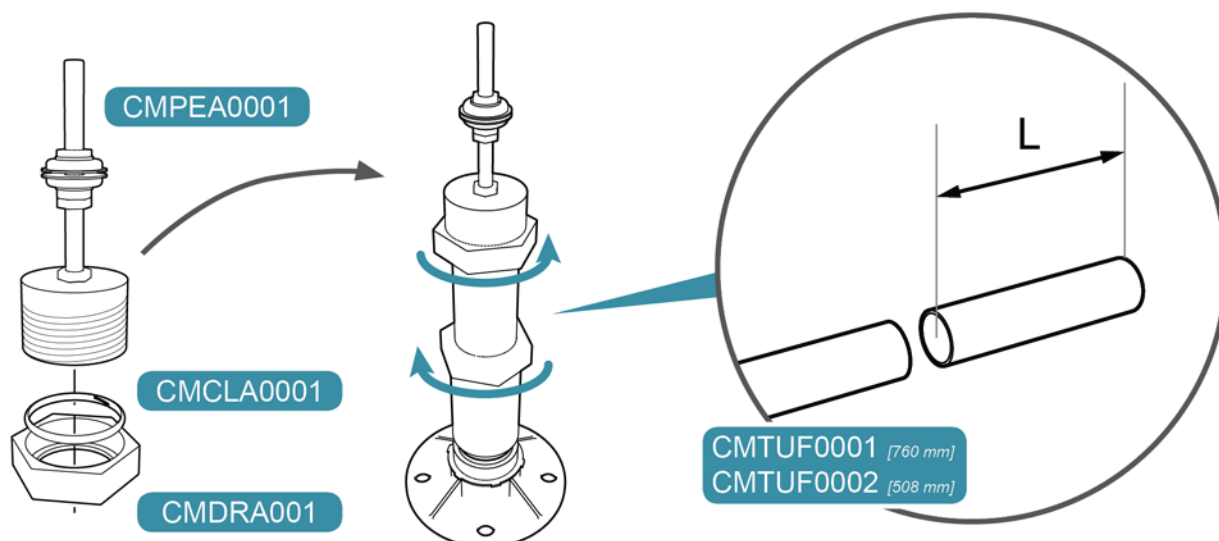
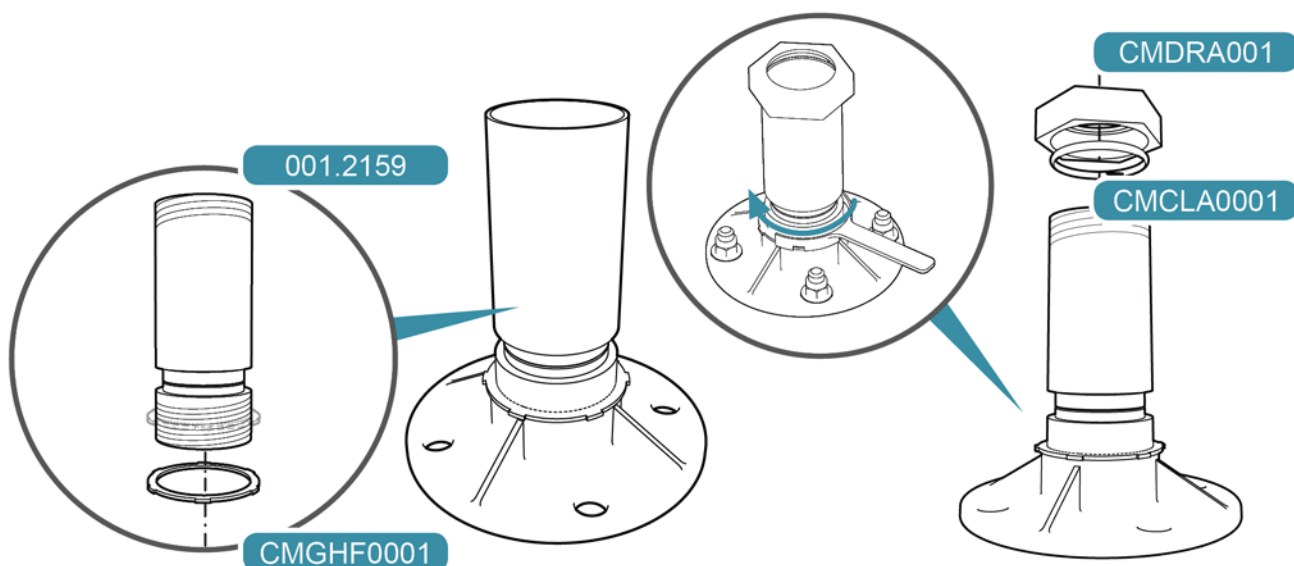
3.2 Foot assembly



Store all the components in the original packaging until the time of installation.

Screw the ring nut to the frangible coupling for about 2 thread turns. Screw the coupling on the plate until tightening. Insert the ring inside the seat and screw the nut on the frangible coupling without tightening (make maximum 3 turns).

Insert the ring inside the seat and screw the nut on the threaded pin without tightening (make maximum 3 turns). Cut the EMT 2" pipe to the length envisaged in the project. Insert the tube in the joint and tighten the nut. Position the threaded pin and tighten the nut.



3.3 Unit permanent installation



Store the device in its original packaging until the time of installation.
Proceed assembling the fixture.
Pay particular attention to the proper positioning of the fixture on the base.

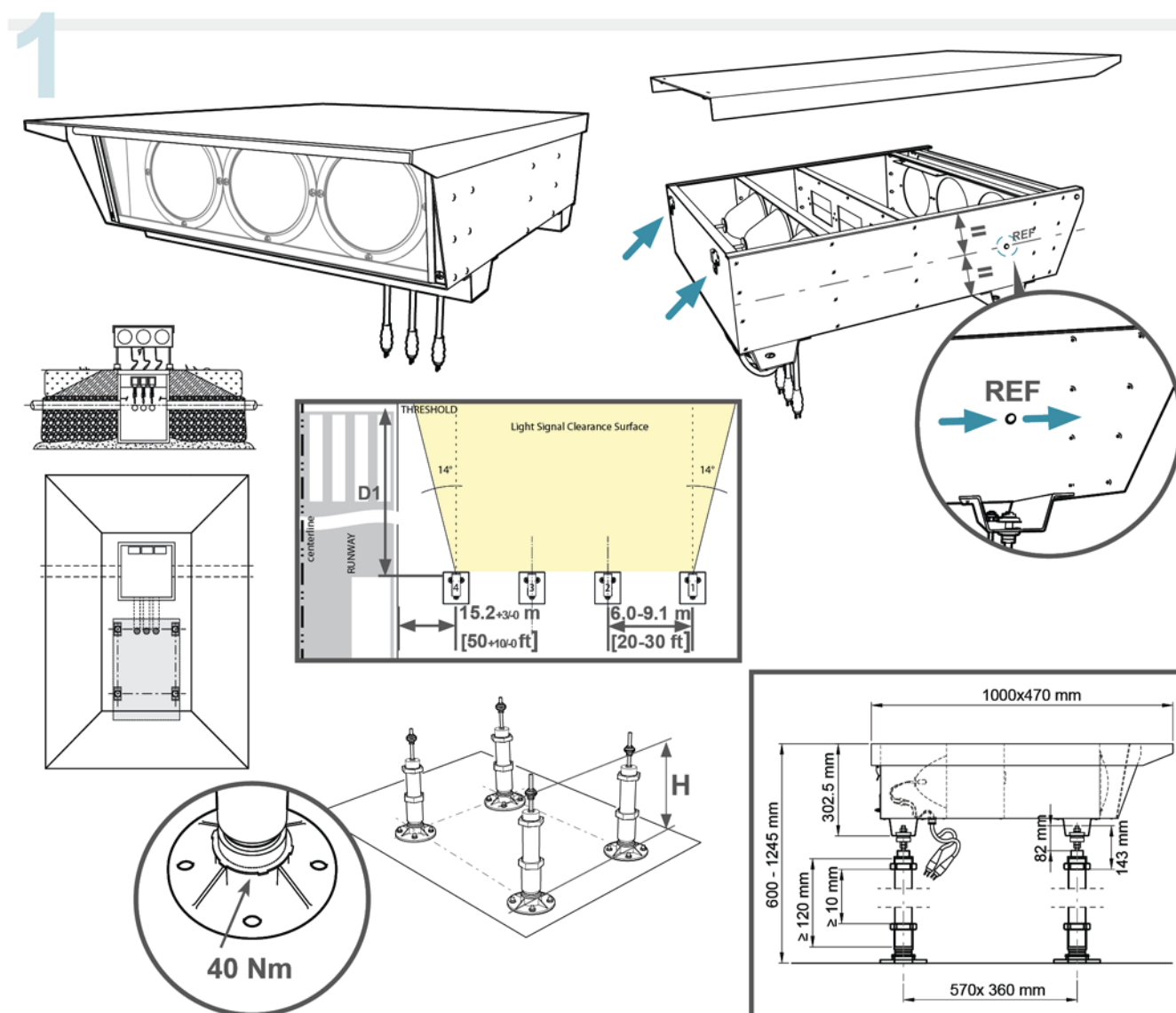
Use the fixture only in combination with concrete foundations with adequate characteristics (in accordance to specifications FAA and ICAO). At the end of installation check the proper alignment of the fixture. In case of incorrect positioning optical misalignments of light beams may occur.

The installer is the solely responsible of the proper positioning of the devices, in accordance to the specific regulation of the different regulatory agencies.



Before carrying out any intervention on the device, cut off all external power sources and place appropriate work-in-progress warnings on the systems.
Check using appropriate instruments that there are no residual energies before accessing the electrical equipment.

On the left side of the fixture there is the reference (REF) of the optical axis to be used in pointing phase.



Position the fixture above the supports taking care to position the semi-spherical joint above and below the support of the body of the fixture.

Slightly screw the upper nut leaving the fixture free to move for the purpose of correct pointing.



To correctly carry out the pointing operations, equip yourself with an optical leveller (not supplied).

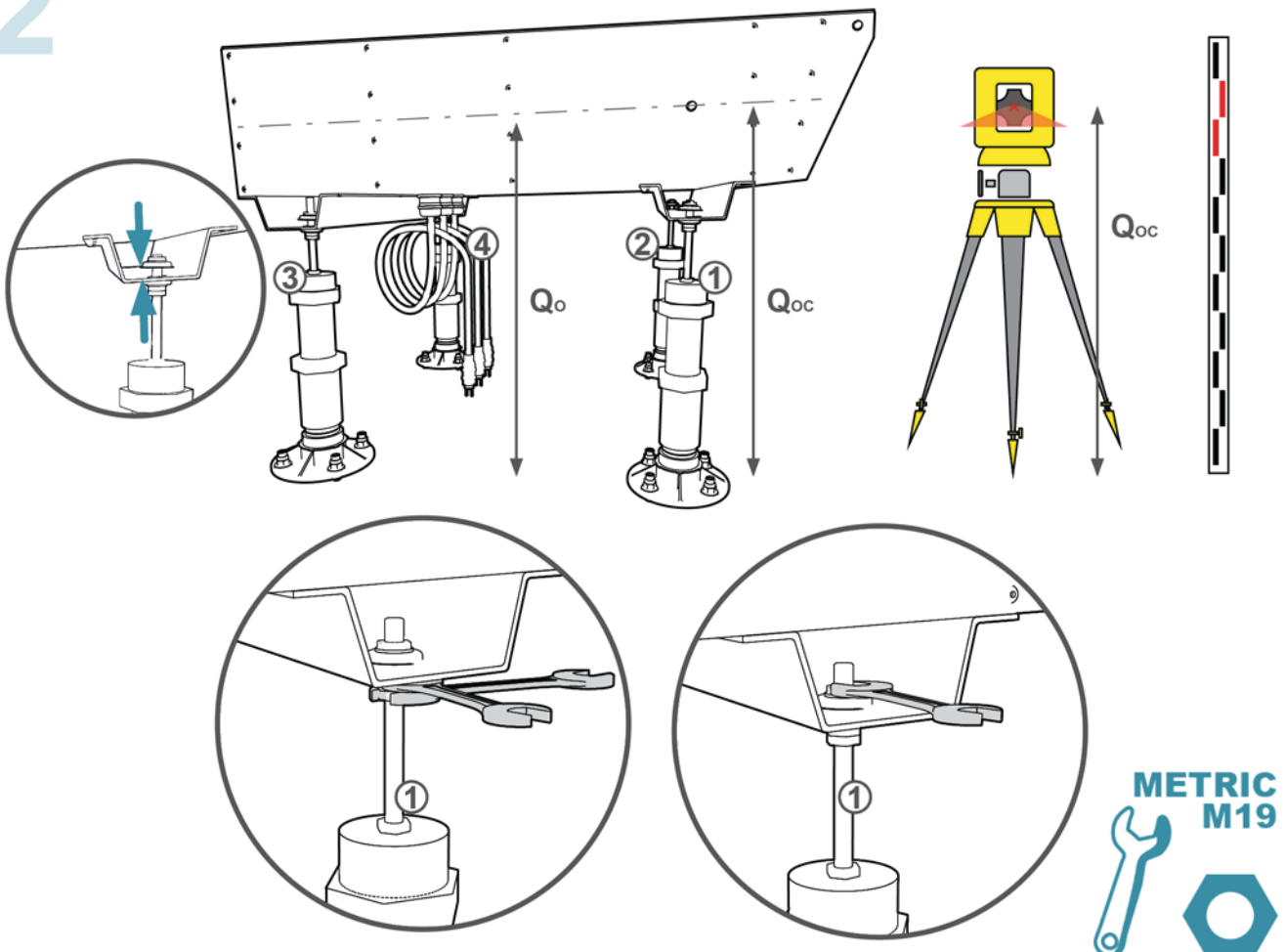
Start adjustment by acting on the front support (1). Loosen the counternut and act on the lower nut until bringing the optical axis to the quota Q_{oc} envisaged in the project. Once reached the desired position, tighten the counternut and screw the upper screw to lock the fixture in position, without tightening.



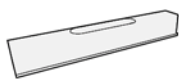
Using the levelling check systems, adjust the height of all supports in sequence, as shown in the figure.
At the end of adjustment check again all the alignments and, if necessary, repeat the operations until reaching the desired configuration.

At the end of the operations remove the tools and close the fixture. Therefore tighten the nuts with the indicated torque and connect the fixture to the supply line.

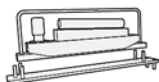
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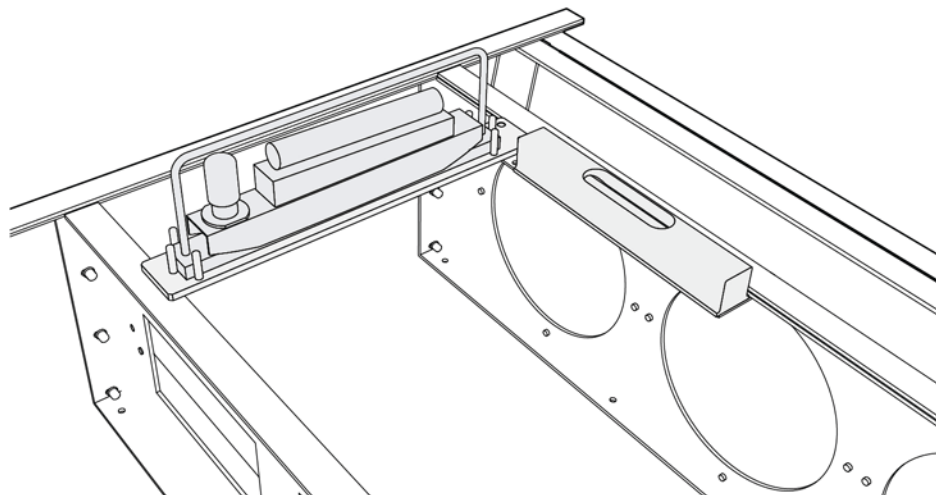
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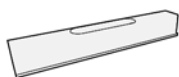
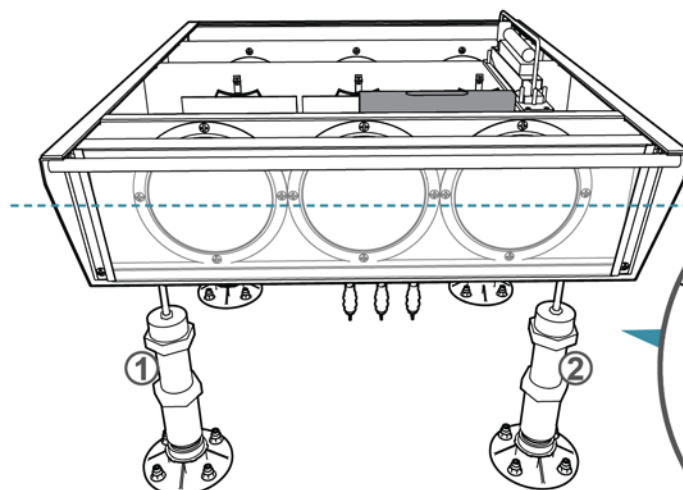
738.2007



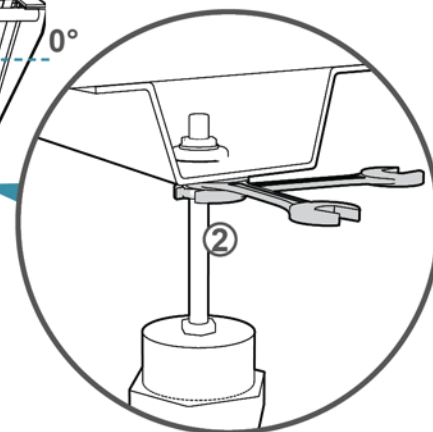
332.3390



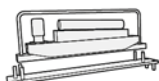
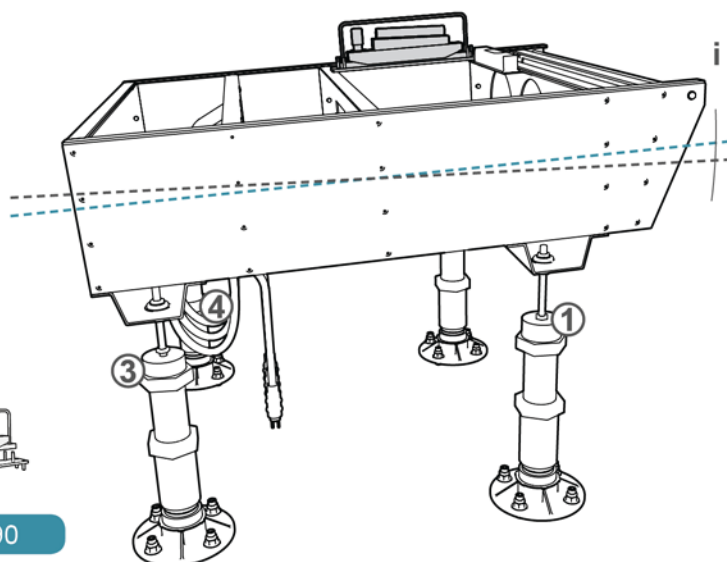
4



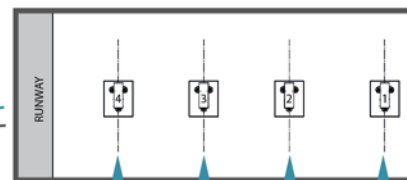
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5



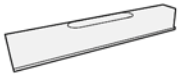
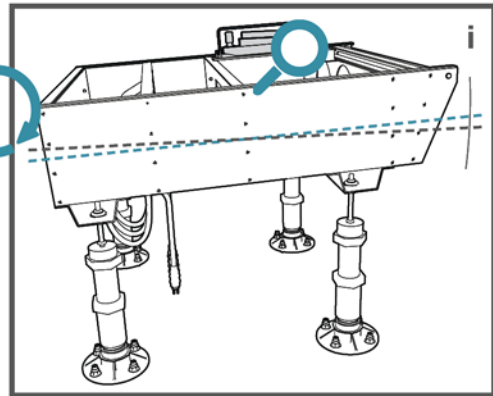
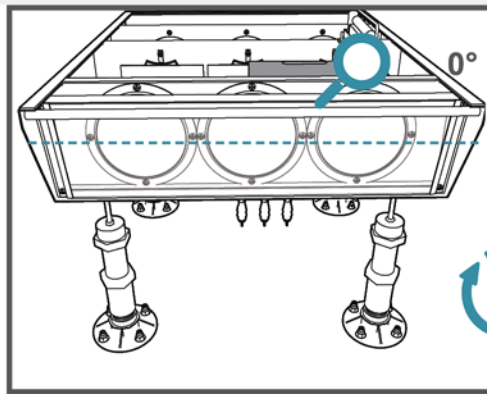
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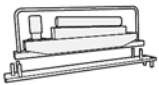
#	i [°]	
	standard runway	large runway with ILS
1	2° 30' (2,50°)	2° 25' (2,42°)
2	2° 50' (2,83°)	2° 45' (2,75°)
3	3° 10' (3,17°)	3° 15' (3,25°)
4	3° 30' (3,50°)	3° 35' (3,58°)

allowed tolerance:
+3' (+0,05°)/-0' (-0,00°)

6

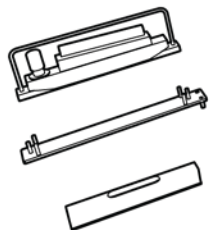
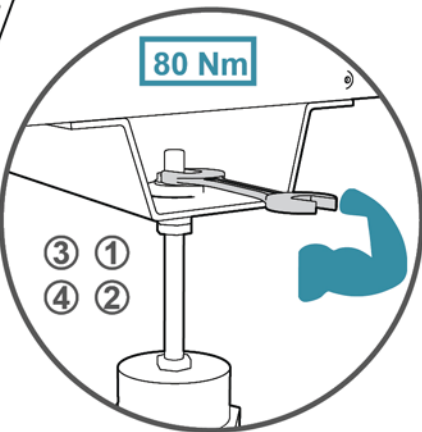
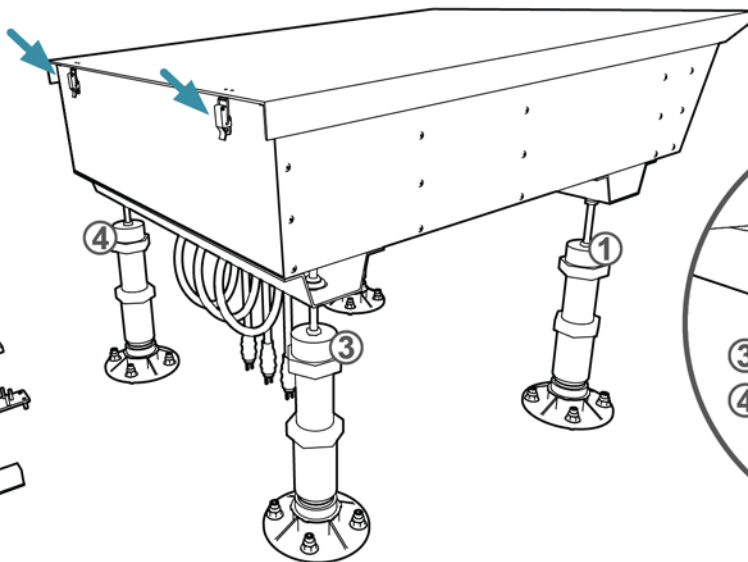


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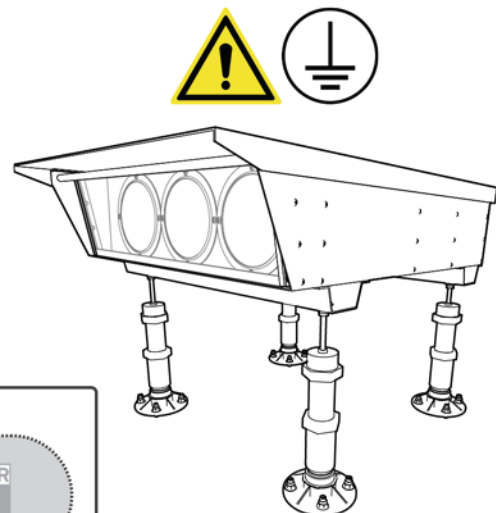
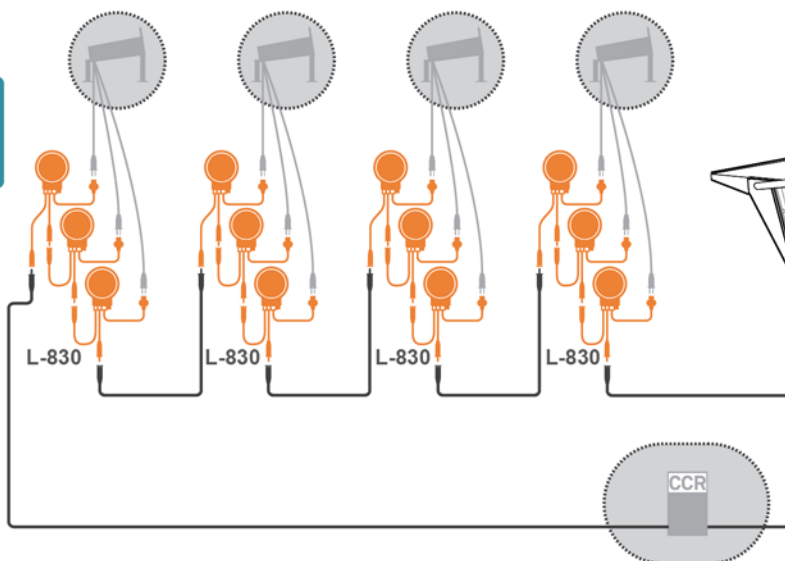
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7



8

CCR
supply



3.4 Initial inspection

After installation and connection of all the equipment, check the proper alignment of the optical axis of all the fixtures on the field (place measuring tool on the reference point P_{TEO} painted on the runway as specified in the installation project) and check the operation of all the light fixtures.



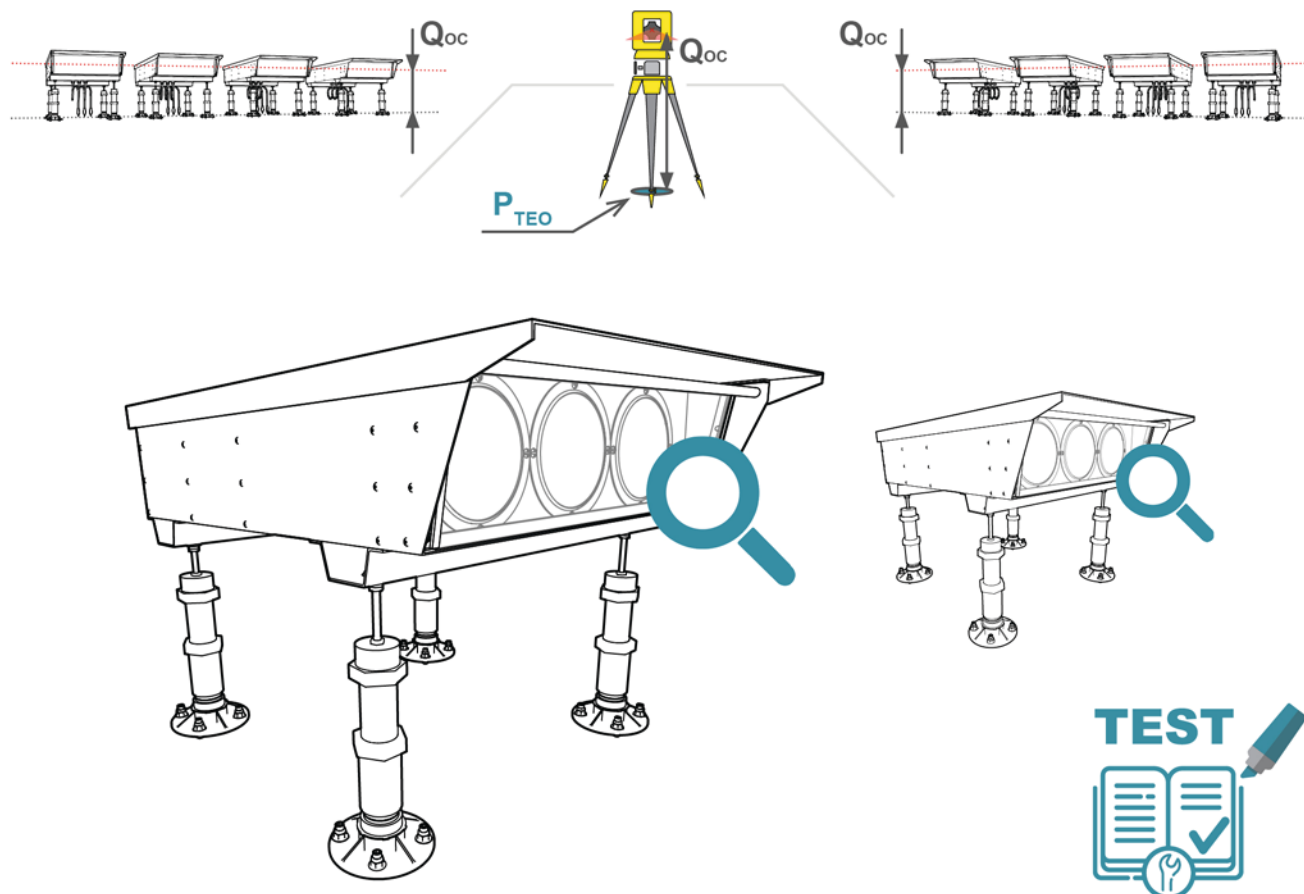
**Never look directly the light sources when in operation from a close distance.
The light fixtures can emit light beams in the visible and infrared spectrum causing potential danger to eyesight.**

Before the commissioning of the system it is necessary to submit it to an inspection by the competent authority, that should ensure that operation have been carried out correctly (Aerodrome Design Manual - Part 4).

The inspection includes various checks and measures:

- Check the light beam
- Check inclination and alignment
- Check brightness
- Check the compatibility with ILS/MLS system (if present)

1



INSTALLATION

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4 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.

4.1 Scheduled maintenance

In accordance with the suggestions contained in the document FAA AC 150 5340-30, PAPI 401 fixtures must be subjected to regular maintenance.

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.

Frequency	Description
every day	Check of the normal operation of the fixture.
monthly	Command control.
	Check of the general conditions to identify any damages caused by service vehicles or aircrafts
	External cleaning of the protective glass and, if necessary, of the lens and of the filters.
	Check of the mechanical parts to identify any damages.
	Check the status of the protective devices (dischargers).
	Search for any damage caused by seepage of water and by insect infestations
	Search for presence of rodents.
	Verification of the alignment and pointing of the units
every 4 months	Integrity check of the OCS buffer zone (obstacle-free) in approach direction.
every 6 months	Verification of the insulation resistance of the underground cables.
	Verification of the earth resistance of the system.
every year	Check the stability of the civil works.
unscheduled	Replacement of fixtures presenting breakdowns or malfunctions.
	Check of the electrical connections and of the isolation degree of the system (to be carried out during intervention requiring the removal of the fixture cover).
	Check of the mounting gaskets (to be carried out during intervention requiring the removal of the fixture cover).
	Check of the integrity of the electric cables (to be carried out during intervention requiring the removal of the fixture cover).
	Removal of snow (when necessary).

4.2 Removal of the cover



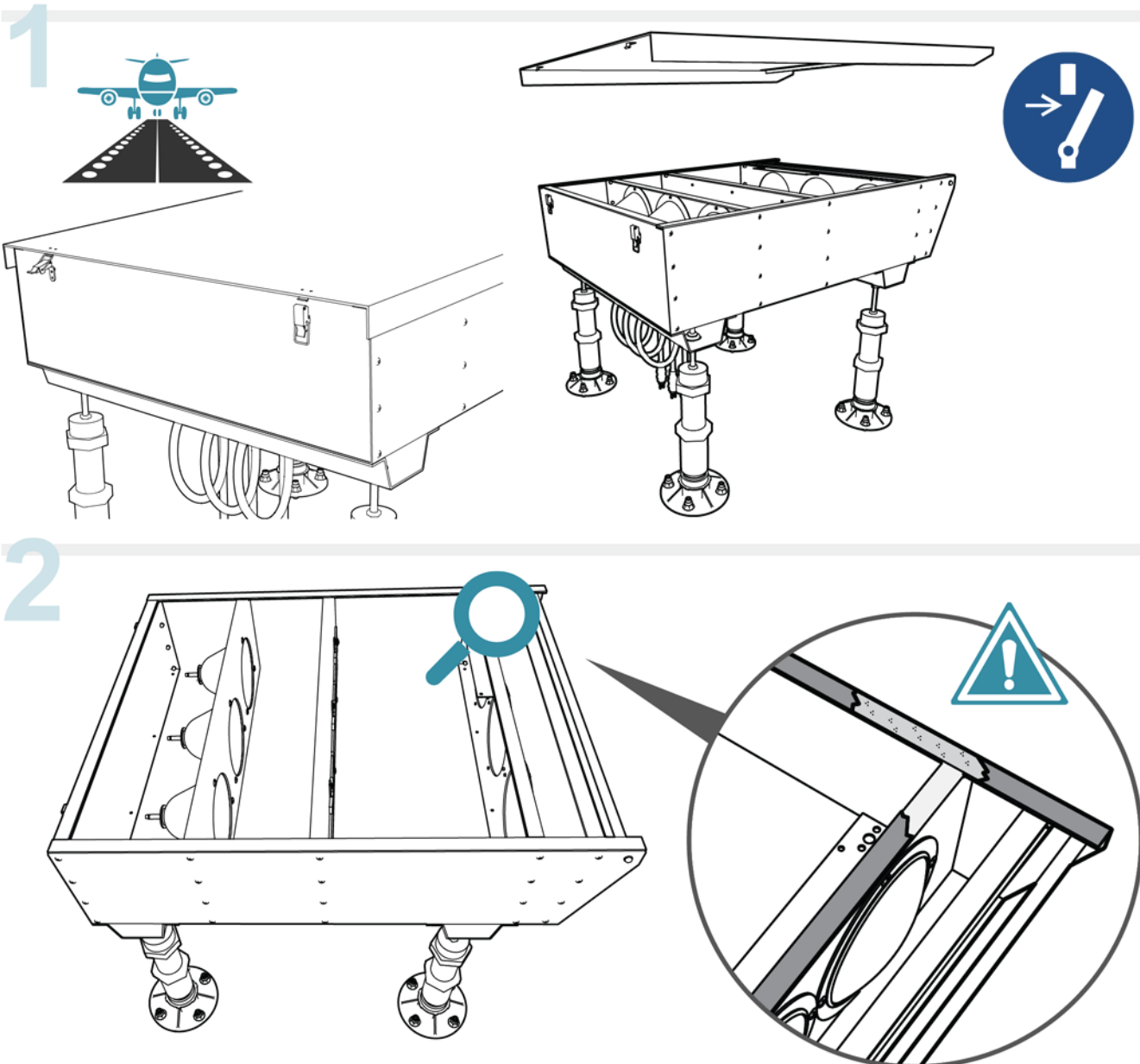
Before carrying out any intervention on the fixture, cut off all external power sources and place appropriate work-in-progress warnings on the systems. Wait for the discharging time (at least 5 minutes) and check using appropriate instruments that there are no residual energies before accessing the electrical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



Every time that the fixture body is opened, all cables must be checked. If necessary, use only original spare parts by OCEM Airfield Technology.

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

- the optical unit is undamaged and clean;
- the gaskets do not have breakdowns;
- the supply cables and the connectors are undamaged and do not have breakdowns or abrasions.



4.3 Cleaning the front glass



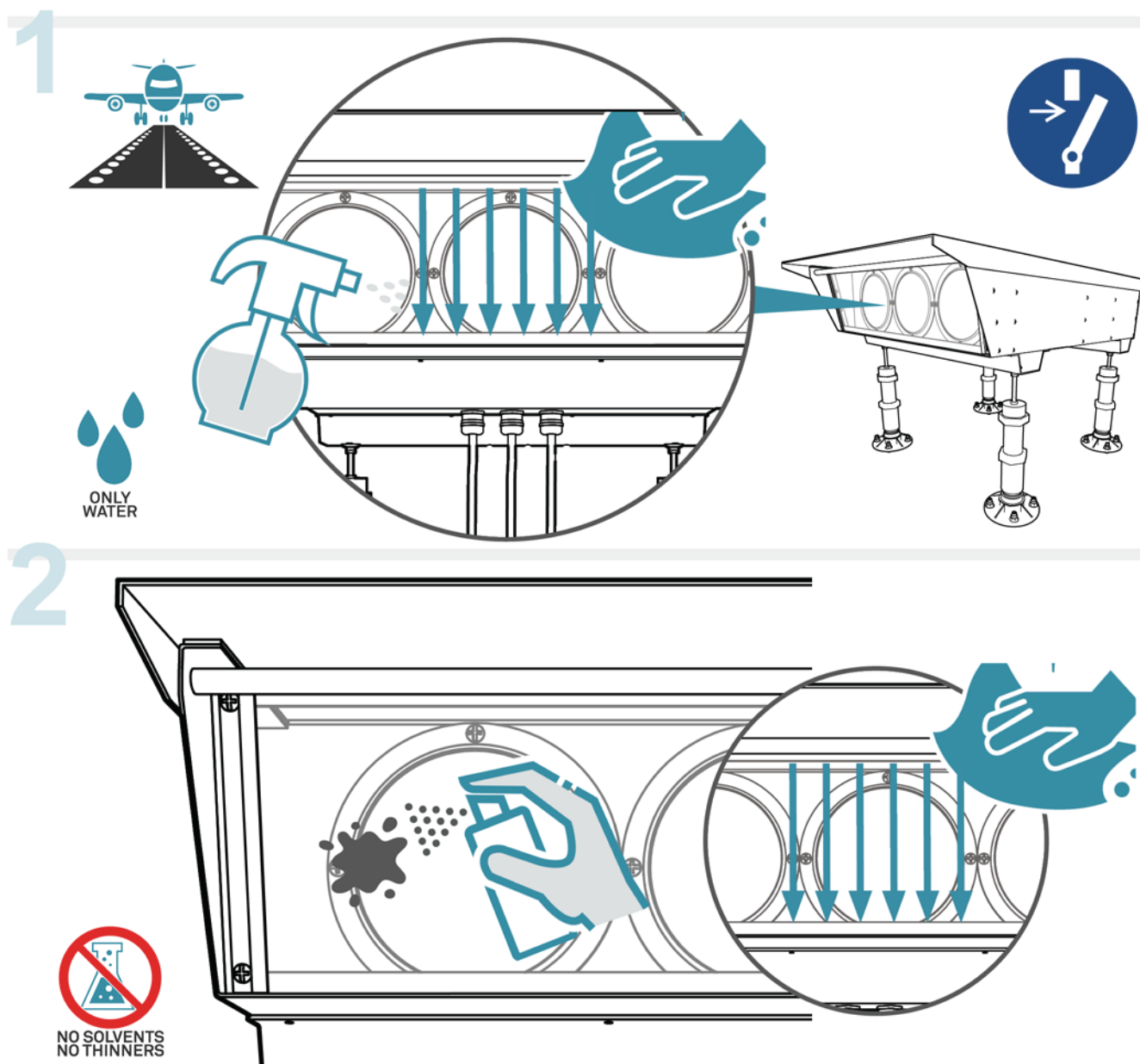
Before carrying out any intervention on the fixture, cut off all external power sources and place appropriate work-in-progress warnings on the systems. Wait for the discharging time (at least 5 minutes) and check using appropriate instruments that there are no residual energies before accessing the electrical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



4.4 Replacement of the lamp

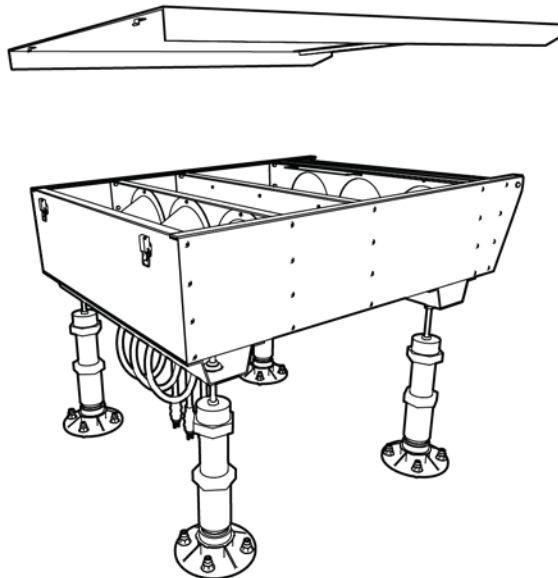


Before carrying out any intervention on the fixture, cut off all external power sources and place appropriate work-in-progress warnings on the systems. Wait for the discharging time (at least 5 minutes) and check using appropriate instruments that there are no residual energies before accessing the electrical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

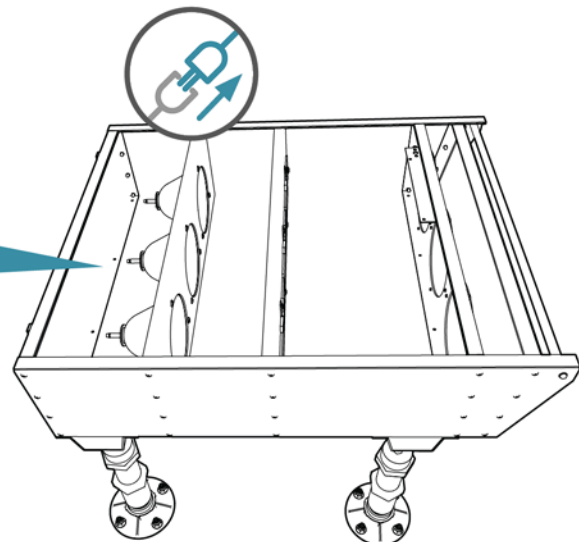
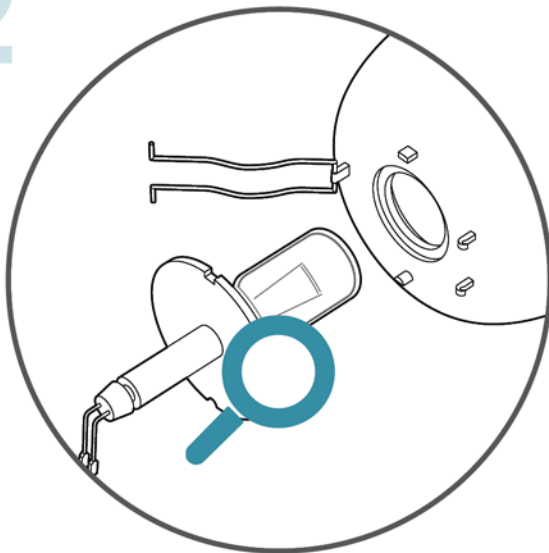
The replacement procedure of the lamp is valid for all the light sources. Lamp lifetime depends on the actual use conditions: working time, brightness level and number of ignitions. The lamp must be replaced when brightness drops below 50% of the originally emitted light flow. It is suggested to replace the lamp when the light bulb reaches 80% of the working life (depending on the rated current).

Remove the upper cover of the fixture and access the lamps (see related paragraph in the chapter “ADJUSTMENTS AND MAINTENANCE”). Disconnect and remove the burnt lamp.

1



2





Check the replacement lamp is identical to the lamp to be replaced.
Insert the lamp in the correct orientation indicated through references. Do not force the lamp during insertion.

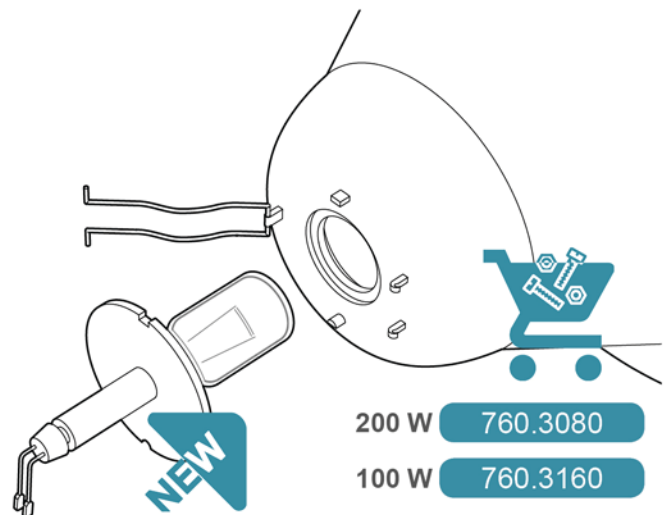
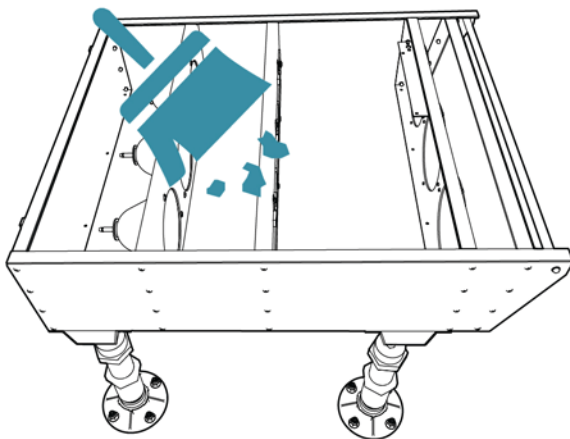


Do not touch the halogen lamp with bare hands.
If the lamp is touched with bare hands, before proceeding with installation, clean the bulb with a lens cleaning wipe soaked in isopropyl alcohol.
Carefully dry the bulb before proceeding with assembly.

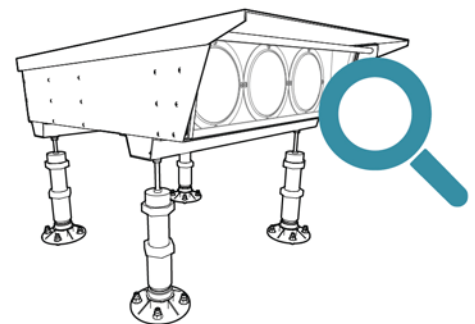
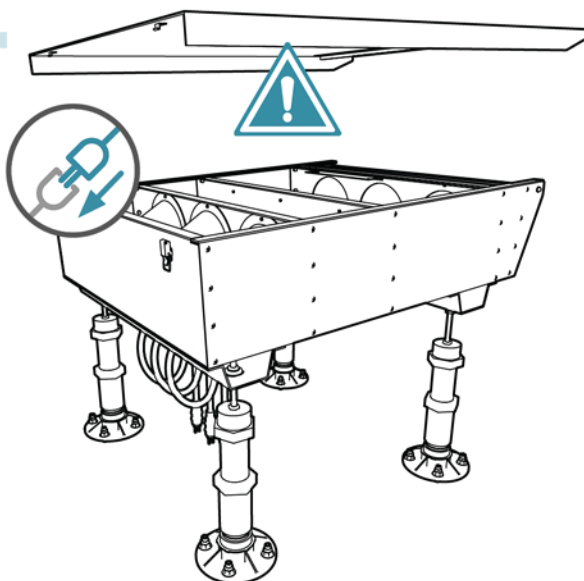
Insert the new lamp and connect the cables to the power connectors respecting the original connections.

Reassemble the unit and carry out the verification of the light beam.

3



4



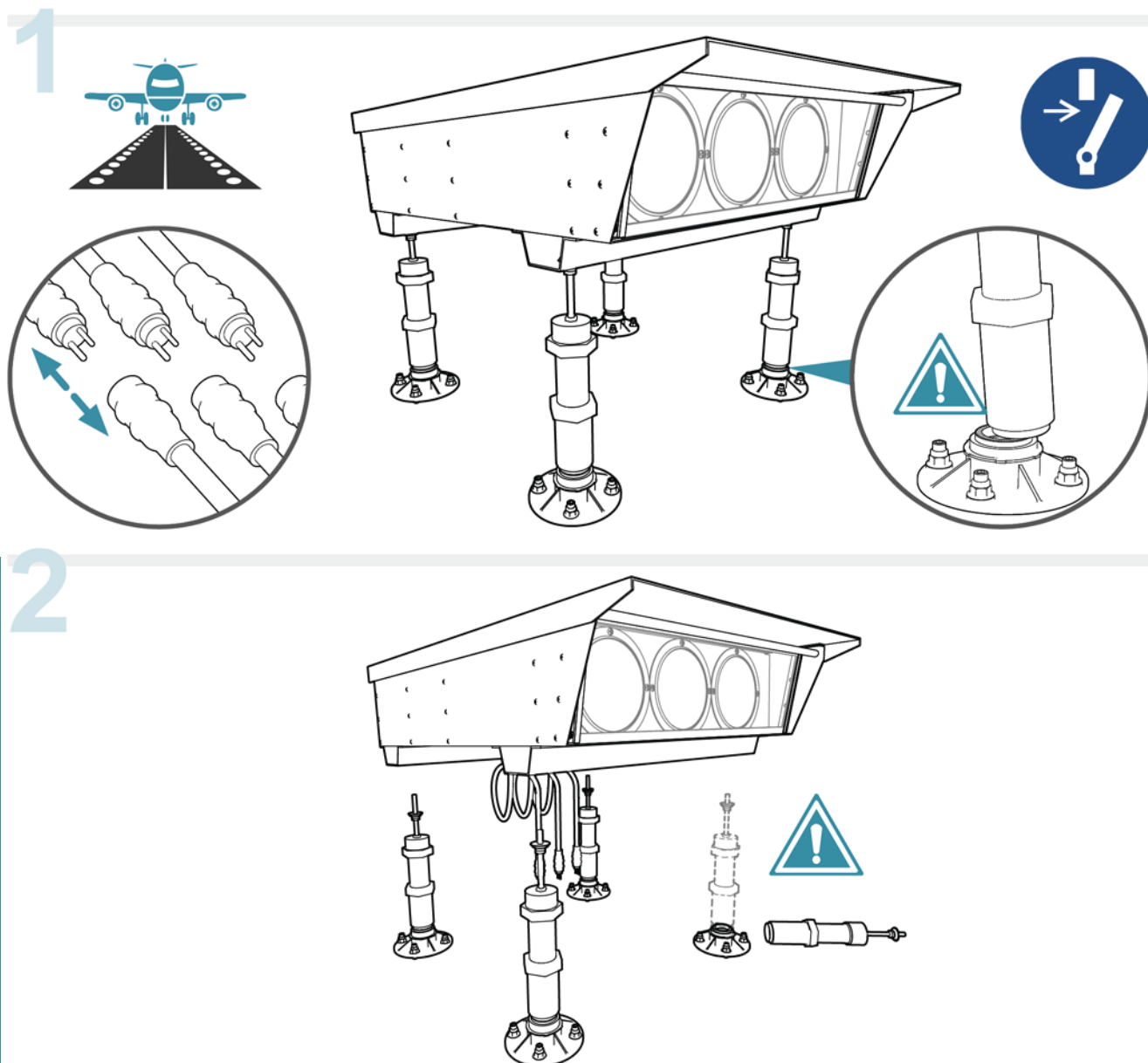
4.5 Replacement of the support



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 complete support, diversified depending on the type and position (fixed installation or mobile installation, front or rear support) or the frangible coupling are provided as spare parts. If necessary, assemble the new spare part support (see related paragraph in the chapter "INSTALLATION"). Disconnect the supply cables of the unit.

Unscrew the upper locking nuts and extract the spherical washers. Remove the supports.





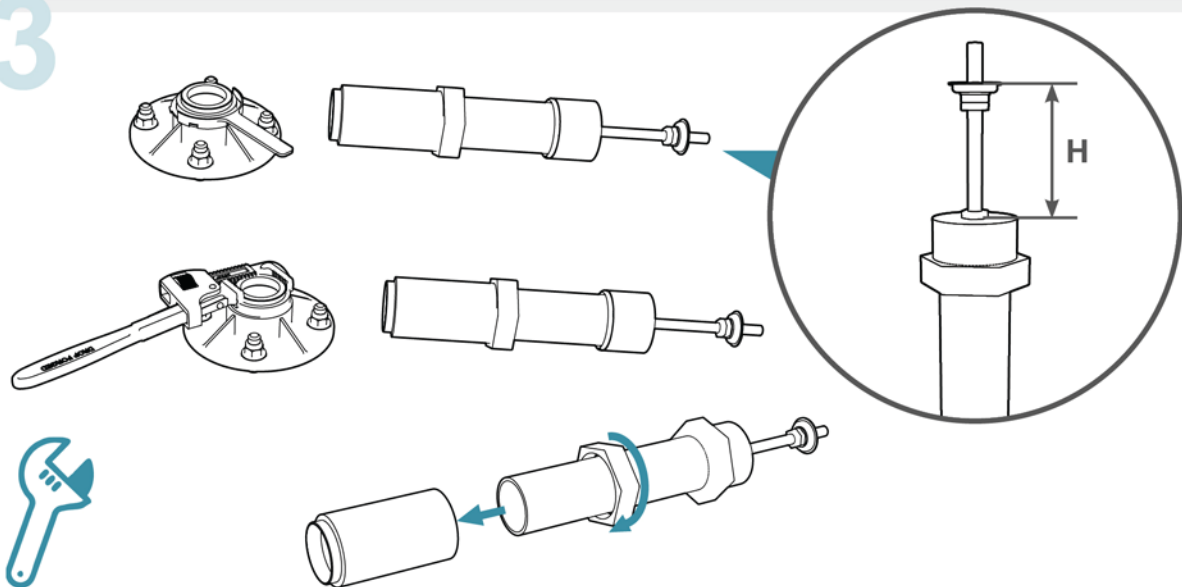
Before disconnecting, proceed with the operation, detect and record the position of the lower support nut to simplify the pointing operations.

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.

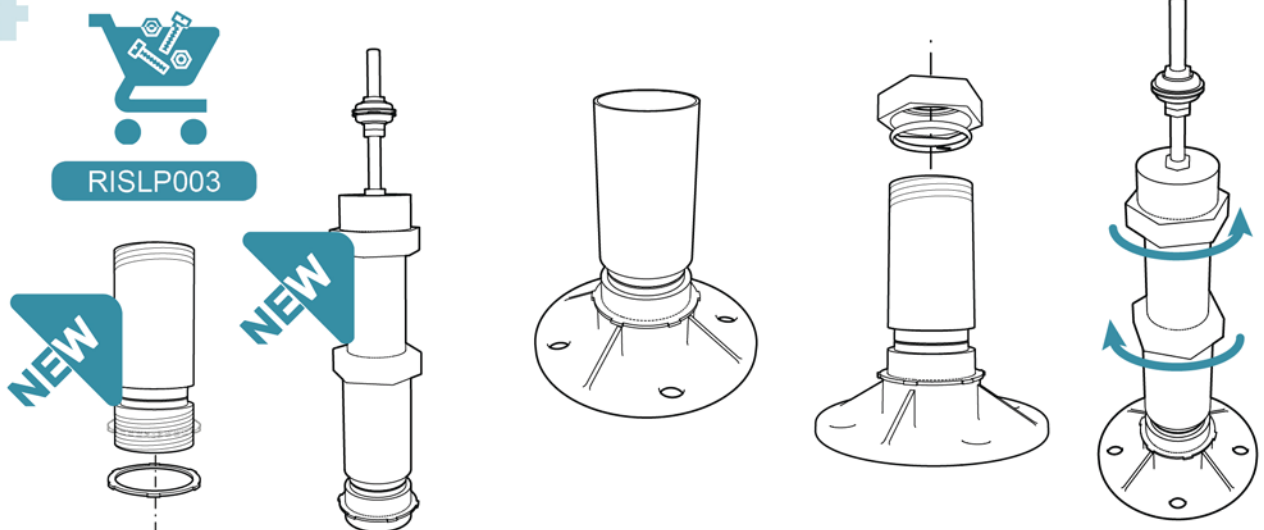
Screw the ring nut to the frangible coupling for about 2 thread turns. Screw the coupling on the plate until tightening. Insert the ring inside the seat and screw the nut on the frangible coupling without tightening (make maximum 3 turns).

Insert the ring inside the seat and screw the nut on the threaded pin without tightening (make maximum 3 turns). Loosen the nut and remove the support from the pipe. Position the threaded pin on the base and tighten the nut.

3



4



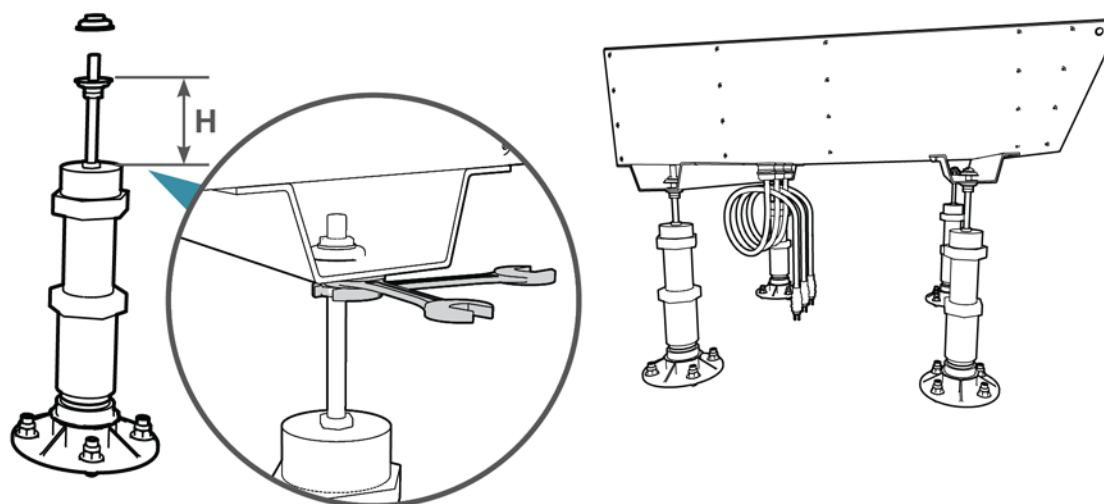
Unscrew the upper locking nut and adjust the lower nut to the correct height, previously detected.

Position the unit on the supports and put the spherical washers. Tighten the upper locking nuts.

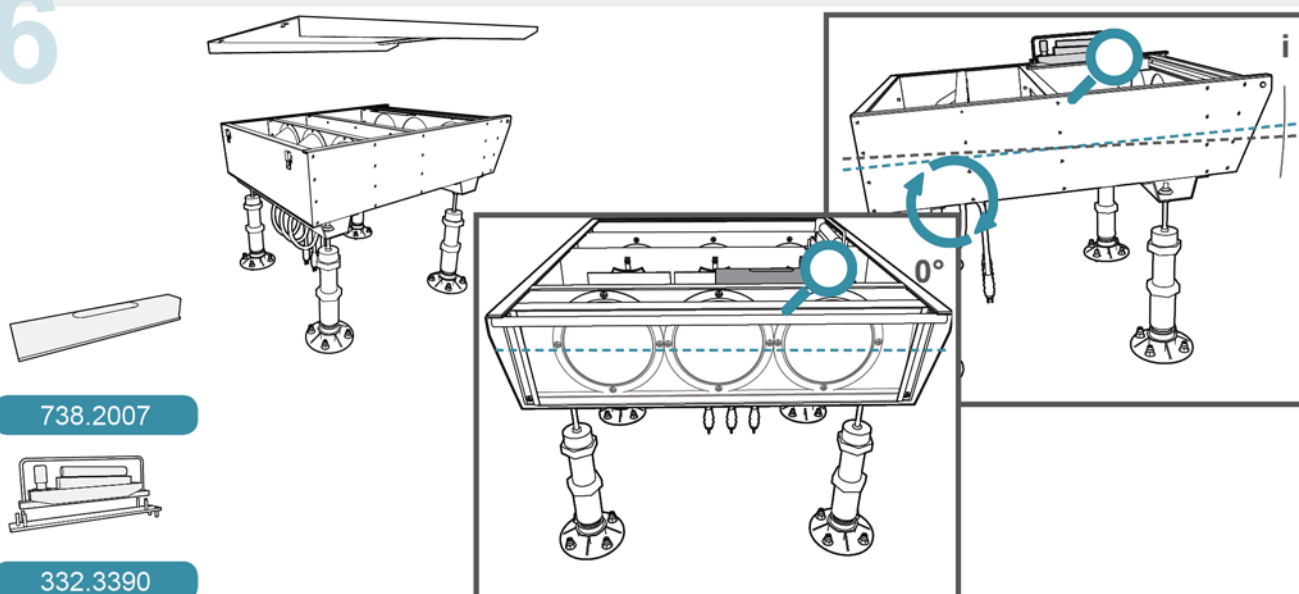
Check the proper alignment of the fixture (see the related paragraph in the chapter "ADJUSTMENTS AND MAINTENANCE").

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

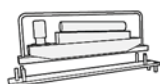
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4.6 Troubleshooting



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

Problems		
Possible causes		Possible solutions
No light emission from the units		
	Fault on the supply line	Access the connection box and disconnect the cable that supply the unit: using suitable tools, check the proper functioning of the supply line. ⚠ ATTENTION: do not perform maintenance activities with powered devices. If the detected values do not comply, the connection cable may be damaged. If necessary, replace it. If the values are correct, there may be a fault in the wiring inside the unit.
If after trying the proposed solutions the problem persists, contact OCEM technical support.		
No light emission from a single unit		
	Fault on the connection cable between transformer and unit	Access the connection box and disconnect the cable that supply the unit: using suitable tools, check the proper functioning of the connection line between transformer and unit. If the detected values do not comply, the connection cable may be damaged. If necessary, replace it. If the values are correct, there may be a fault in the wiring inside the unit.
	Fault in the internal wiring of the unit	Disconnect the supply cable of the unit. ⚠ ATTENTION: do not perform maintenance activities with powered devices. Remove the external cover of the fixture. Check all the connections and verify that there are no terminals or connectors loosened. Check the integrity of the cables and of the connections using a multimeter: measure the continuity of each connection cable. If problems in connections are identified, replace the damaged parts with certified spare parts. If the problem persists, it may be necessary to replace the damaged lamps.

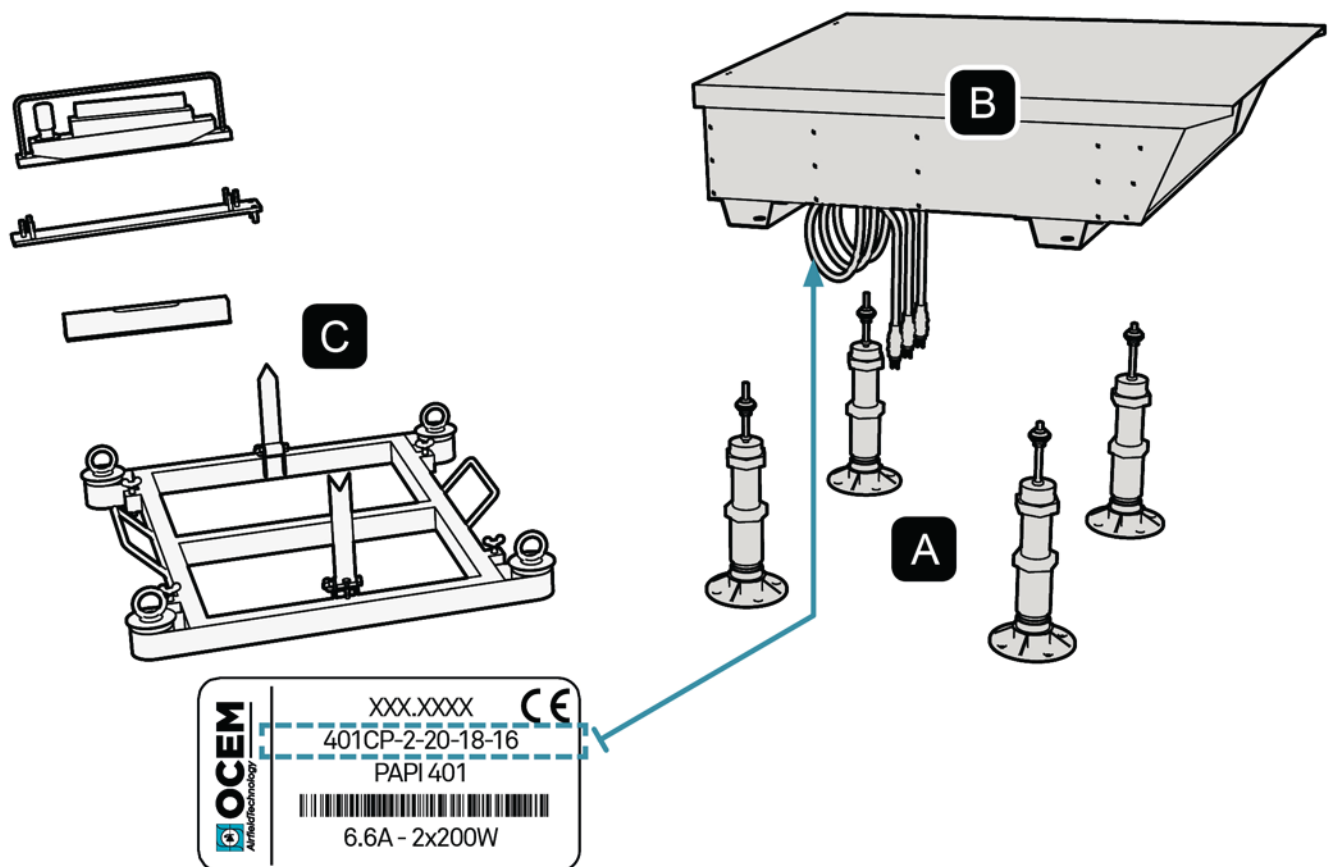
Problems		
Possible causes		Possible solutions
The unit emits a reduced light flow		
	Burnt lamp	Disconnect the supply cable of the unit.  ATTENTION: do not perform maintenance activities with powered devices. Remove the external cover of the fixture. Replace the lamp.
The unit once installed failed the light flow checks.		
	Immediately replace the unit and contact OCEM technical support: send the unit to the calibration repair centre.	

4.7 Spare parts



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

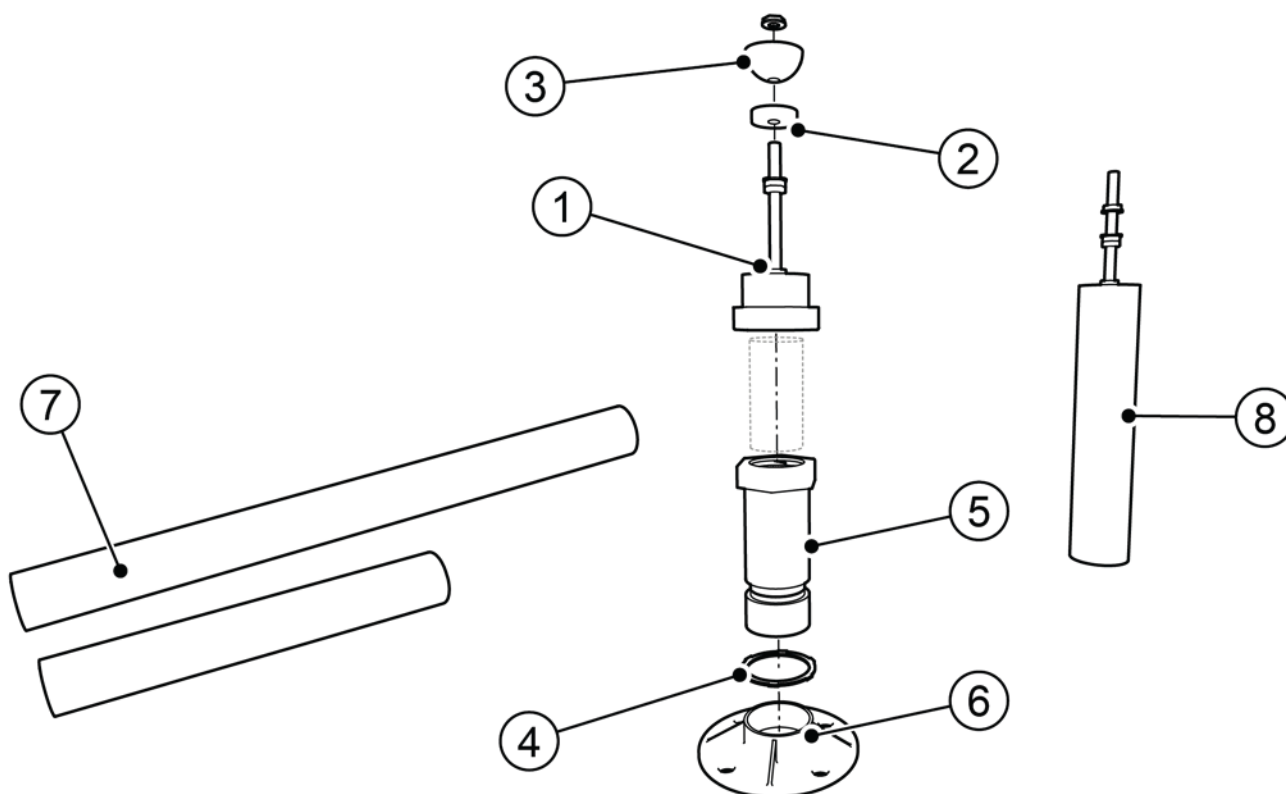
PAPI fixture	
A	Supports
B	Light unit
C	Accessories



4.7.1 Support units

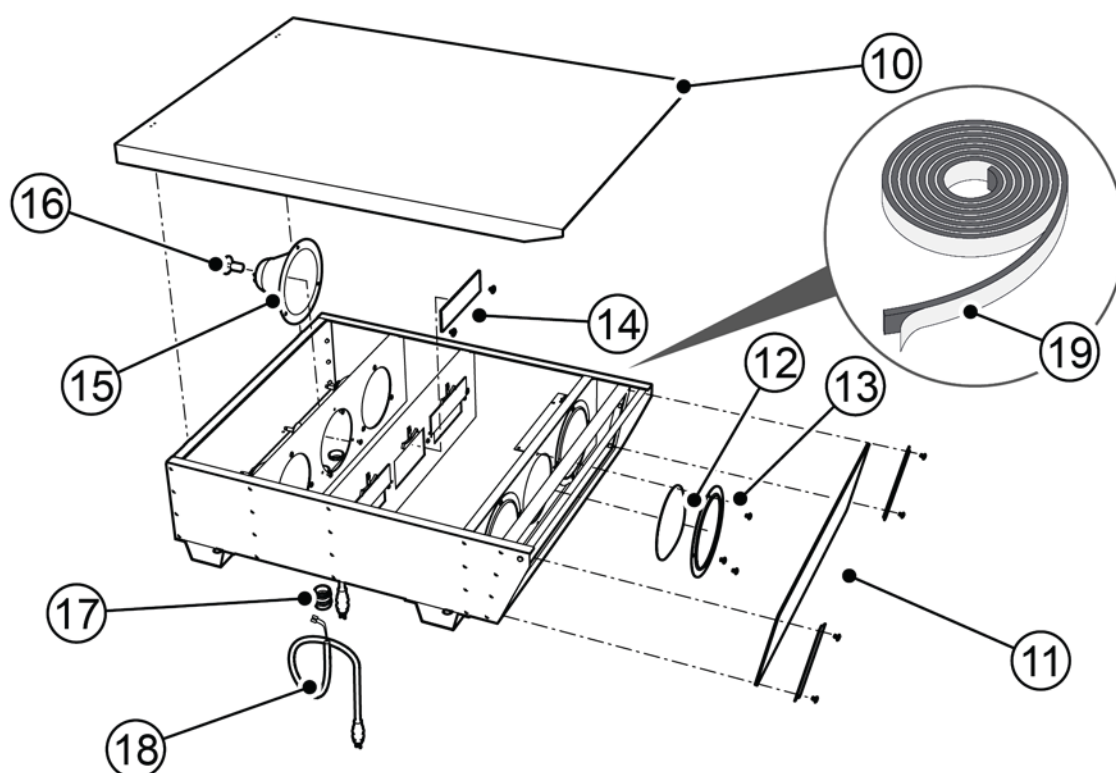
Pos	Description	Fixture Code	Code Art.
1	Front/rear threaded rod	C - - - - -	334.5840
	Rear threaded rod	M - - - - -	
	Front threaded rod	H - - - - -	334.5841
2	Hemispherical washer	always valid	RISLP0009
3	Hemispherical cup		
4	Threaded ring nut for leg locking	always valid	768.1001
5	Complete joint	always valid	RISLP0003
6	Threaded masonry 2"	previous models*	315.4100
	Threaded anchorage flange 2"-11 GAS	previous models*	303.7350
	Threaded anchorage flange 2" NPT H85 Fe/Acc	always valid	PAFDF0006
7	Pole EMT 2" L=508 mm	always valid	CMTUF0003
	Pole EMT 2" L=762 mm	always valid	CMTUF0004
8	Standard leg with breaking groove (L=95 mm)	previous models*	339.0010
	Increased leg with breaking groove (L=145 mm)	previous models*	334.5900
	Increased leg with breaking groove (L=195 mm)	previous models*	334.5905
	Increased leg with breaking groove (L=245 mm)	previous models*	334.5910
	Increased leg with breaking groove (L=295 mm)	previous models*	334.5915
	Increased leg with breaking groove (L=345 mm)	previous models*	334.5920
	Increased leg with breaking groove (L=395 mm)	previous models*	334.5925
	Increased leg with breaking groove (L=445 mm)	previous models*	334.5930
	Increased leg with breaking groove (L=495 mm)	previous models*	334.5935
	Increased leg with breaking groove (L=545 mm)	previous models*	334.5940
	Increased leg with breaking groove (L=595 mm)	previous models*	334.5945
	Increased leg with breaking groove (L=645 mm)	previous models*	334.5950
9	KIT 4 adaptable legs (without pole EMT)	always valid	PAACK0057

* Spare part compatible with older models only (fixtures equipped with legs with con breaking groove - see spare part 8)



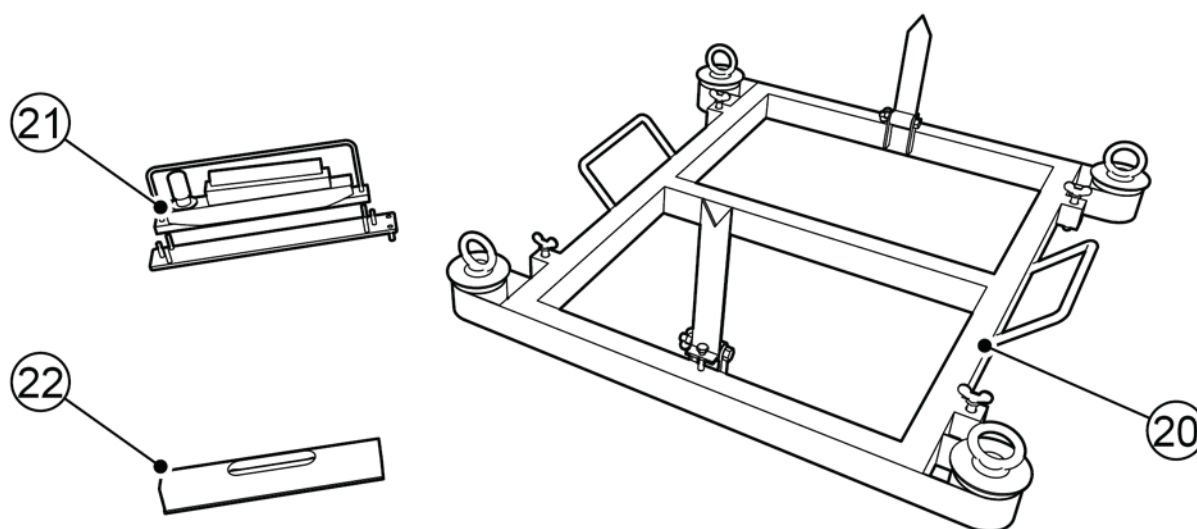
4.7.2 Optical unit

Pos	Description	Fixture Code	Code Art.
10	Upper cover (2 lamps)	□ □ - 2 - □ □ - □ □	334.6090
	Upper cover (3 lamps)	□ □ - 3 - □ □ - □ □	334.6100
11	Front tempered glass (2 lamps)	□ □ - 2 - □ □ - □ □	319.3210
	Front tempered glass (3 lamps)	□ □ - 3 - □ □ - □ □	319.3220
12	Lens	always valid	810.2001
13	Lens locking ring	always valid	321.4110
14	Red tempered filter	C - - - - -	318.4140
	Red tempered filter (military use)	M - - - - -	318.4150
15	Reflector with lamp holder small plate	C - - - - -	162.4040
	Reflector with lamp holder small plate (military use)	M - - - - -	162.4000
16	Halogen lamp PK30d (6.6 A/200 W)	□ □ - - 2 0 - □ □	760.3080
	Halogen lamp PK30d (6.6 A/100 W)	□ □ - - 1 0 - □ □	760.3160
17	Cable gland 1/2" with counternut	always valid	324.4010
18	Power cable with plug	always valid	323.2360
19	Rubber profile for sealing	always valid	RISLP0004
20	Silicone sealant cartridge (300 cc)	always valid	712.3010



4.7.3 Accessories

Pos	Description	Fixture Code	Code Art.
20	Installation Template Kit (thread 2" NPT - 2 lamps)	■ ■ - 2 - ■ ■	PAACK0071
	Installation Template Kit (thread 2" NPT - 3 lamps)	■ ■ - 3 - ■ ■	PAACK0072
21	Clinometer with reference plate	always valid	332.3390
22	Linear level gauge	always valid	738.2007
23	Installation Template of masonries for airports (2 lamps)	previous models	332.3300
	Installation Template of masonries for heliports (2 lamps)	previous models	332.3430
	Installation Template of masonries (3 lamps)	previous models	332.3420
24	Base plate for L-867 base (2 entrances) with gasket and plug support small plates	■ ■ - 2 - ■ ■	013.0023
	Base plate for L-867 base (3 entrances) with gasket and plug support small plates	■ ■ - 3 - ■ ■	013.0024
25	Zinc-coated steel pipe elbow (with threaded upper entrance 2" GAS)	always valid	013.0008
	Zinc-coated steel pipe elbow (with both threaded entrances 2" GAS)	always valid	315.3210
26	Two-ring set (ryton) for transformer socket support within pipe elbow	always valid	013.0010
27	Base L-867, Class IA, size B (depth: 610 mm)	always valid	315.1228



Contact us

OCEM AT

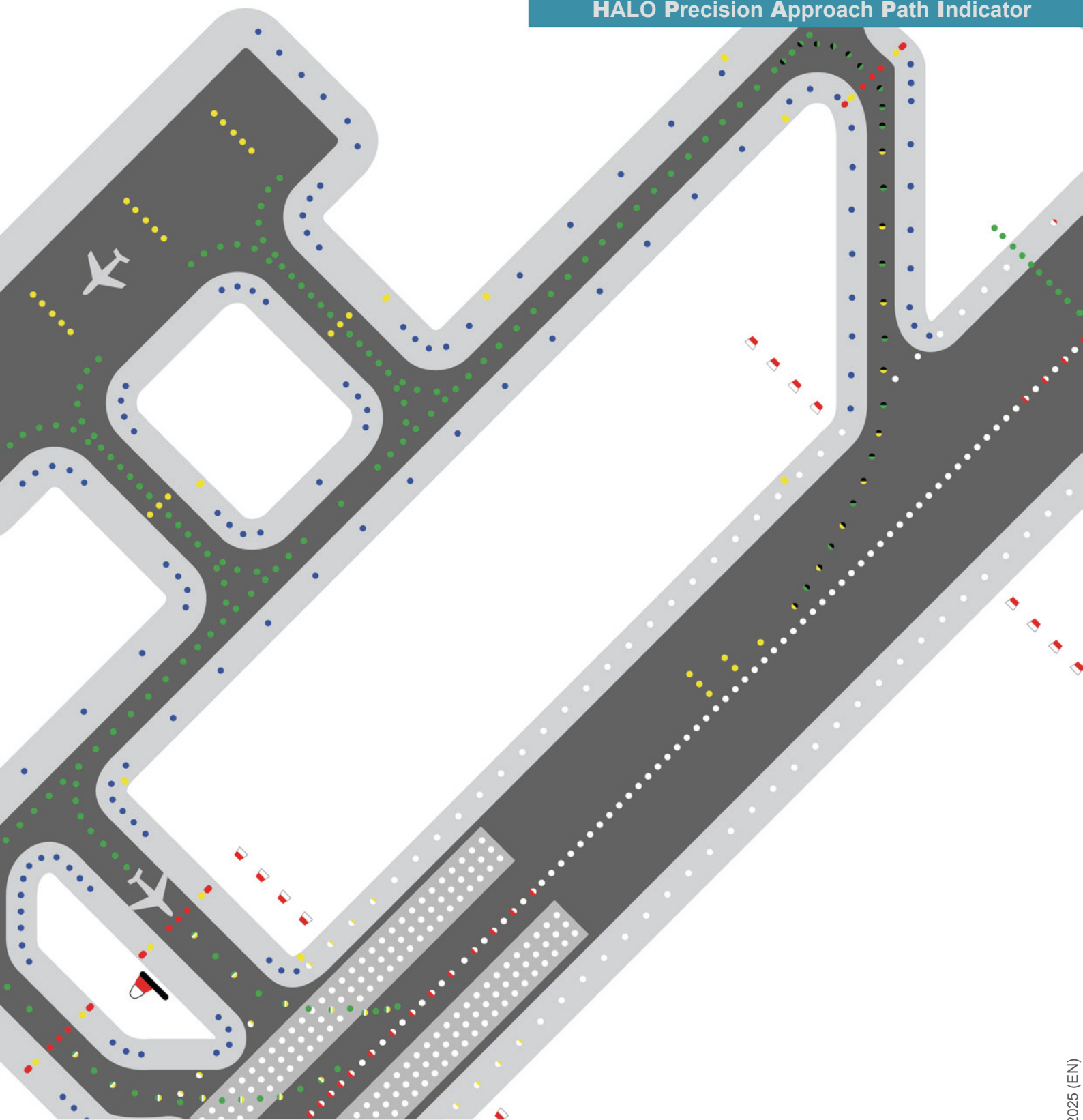


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HALO Precision Approach Path Indicator



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