als

AIRFIELD LIGHTING
SYSTEMS UK LTD

12 Inch LED Inset Runway Edge Light with Circular Guidance

Instruction Manual

Airfield Lighting Systems UK Limited
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User Manual

UM-2101, Rev. 1.01, 2021.9.16

Disclaimer and standard warranty

CE mark

The equipment marked CE means that the product complies with the essential requirements.

ICAO certification

The equipment complies with the essential requirements concerning ICAO Airfield regulations.

CAAC certification

The equipment complies with the requirements concerning CAAC standards.

Standard Products Guarantee

Products of ALS manufacture are guaranteed against mechanical, electrical, and physical defects which may occur during proper and normal use for a period of two years from the date of delivery ex-works.

Liability

Use of the equipment in ways other than described in the manual may result in personal injury, death, or property and equipment damage. Use this equipment only as described in the manual.

ALS cannot be held responsible for injuries or damages resulting from non-standard, unintended uses of its equipment. The equipment is designed and intended only for the purpose described in the manual. Uses not described in the manual are considered unintended uses and may result in serious personal injury, death or property damage.

Unintended uses, includes the following actions:

Making changes to equipment that have not been recommended or described in this manual or using parts that are not genuine ALS replacement parts or accessories.

Failing to make sure that auxiliary equipment complies with approval agency requirements, local codes, and all applicable safety standards.

Using materials or auxiliary equipment that are inappropriate or incompatible with your ALS equipment.

Allowing unskilled personnel to perform any task on or with the equipment.

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This manual could contain technical inaccuracies or typographical errors. ALS reserves the right to revise this manual from time to time in the contents thereof without obligation of ALS to notify any person of such revision or change. Details and values given in this manual are average values. They are not binding, however, and ALS disclaims any liability for damages or detriments suffered as a result of reliance on the information given herein or the use of products, processes or equipment to which this manual refers. No warranty is made that the use of the information or of the products, processes or equipment to which this manual refers will not infringe any third party's patents or rights.

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1. Safety

This section contains general safety instructions for installing and using ALS equipment.

1.1. Safety Symbols

Carefully read and observe all safety instructions in this manual, which alert you to safety hazards and conditions that may result in personal injury, death or property and equipment damage and are accompanied by the symbol shown below.

	WARNING Failure to observe a warning may result in personal injury, death or equipment damage.
	DANGER - Risk of electrical shock or ARC FLASH Disconnect equipment from line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage. ARC Flash may cause blindness, severe burns or death.
	CAUTION Failure to observe a caution may result in equipment damage.

1.2. Professional

Professional is defined as individuals who thoroughly understand the equipment and its safe operation, maintenance and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations and have been trained to safely install, operate, maintain and repair the equipment.

1.3. Introduction to safety

WARNING

This equipment may contain electrostatic devices and hazardous voltages.

- Read installation instructions in their entirety before starting installation.
- Become familiar with the general safety instructions in this section of the manual before installing, operating, maintaining or repairing this equipment.
- Make this manual available to personnel installing, operating, maintaining or repairing this equipment.
- Follow all applicable safety procedures required by your company, industry standards and government or other regulatory agencies.
- Install all electrical connections to local code.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local codes.
- Protect components from damage, wear, and harsh environment conditions.
- Protect equipment with safety devices as specified by applicable safety regulations
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning prior to returning power to the circuit.
- Never touch exposed electrical connections on equipment while the power is ON.

Failure to follow this instruction can result in serious injury or equipment damage

Electric Shock Hazard

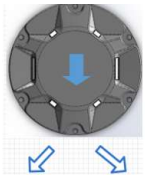
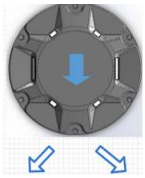
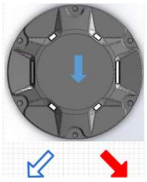
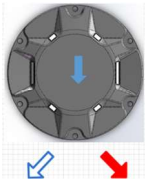
- Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component according to instructions provided in its manual.
- Live operation is not allowed.

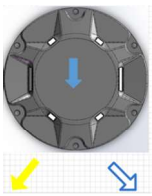
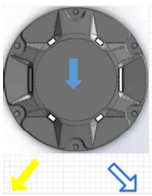
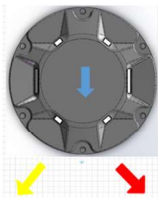
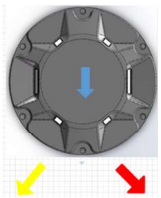
Failure to follow this instruction can result in serious injury or equipment damage

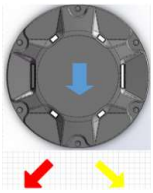
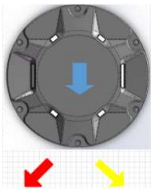
2. Equipment Information

2.1. Fixtures in this manual

This manual covers the following 12-inch fixtures:

Light Fixture	Ordering Code	Optical Toe-in	Color	Sketch
Runway Edge Light （width of runway is 45m）	RB/IN-WW(L) -C	Toe-in 3.5°	White, White	
Runway Edge Light （width of runway is 60m）	RB/IN-WW(L) -C	Toe-in 4.5°	White, White	
Runway Edge Light （width of runway is 45m）	RB/IN-WR(L) -C	Toe-in 3.5°	White, Red	
Runway Edge Light （width of runway is 60m）	RB/IN-WR(L) -C	Toe-in 4.5°	White, Red	
Runway Edge Light （width of runway is 45m）	RB/IN-RW(L) -C	Toe-in 3.5°	Red ,White,	

Runway Edge Light（width of runway is 60m）	RB/IN-RW(L) -C	Toe-in 4.5°	Red ,White,	
Runway Edge Light（width of runway is 45m）	RB/IN-WY(L) -C	Toe-in 3.5°	White, Yellow	
RunwayEdge Light（width of runway is 60m）	RB/IN-WY(L) -C	Toe-in 4.5°	White, Yellow	
Runway Edge Light（width of runway is 45m）	RB/IN-YW(L)-C	Toe-in 3.5°	Yellow ,White	
Runway Edge Light（width of runway is 60m）	RB/IN-YW(L)-C	Toe-in 4.5°	Yellow ,White	
Runway Edge Light（width of runway is 45m）	RB/IN-YR(L)-C	Toe-in 3.5°	Yellow, Red	
Runway Edge Light（width of runway is 60m）	RB/IN-YR(L)-C	Toe-in 4.5°	Yellow, Red	

Runway Edge Light（width of runway is 45m）	RB/IN-RY(L)-C	Toe-in 3.5°	Red,Yellow	
Runway Edge Light（width of runway is 60m）	RB/IN-RY(L)-C	Toe-in 4.5°	Red,Yellow	

2.2. Compliance with standards

ICAO Annex 14 Volume 1
IEC TS 61827
FAA AC 150/5345-46
FAA Engineering Brief No. 67
EASA CS-ADR-DSN
NATO STANAG 3316
CAAC AC-137-CA-2015-01
CAAC AC-137-CA-2015-03
CAAC AC-137-CA-2017-03

2.3. Features

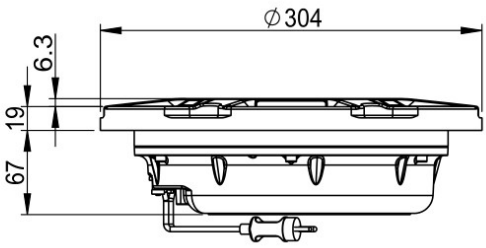
- Low protrusion of less than 6.3mm above ground level
- Modulized electrical driver and LED assembly for simplicity of maintenance
- Efficient and stable optical output, suitable for operation with 6.6A and 2.2A CCRs
- Unique optical design, ensuring luminous efficacy and color consistency
- At any brightness level, the intensity of circling guidance beam is no less than 50cd
- Strict thermal management solution increasing life expectancy
- Highly conductive aluminum mechanical components with special treatment suitable for various weather conditions

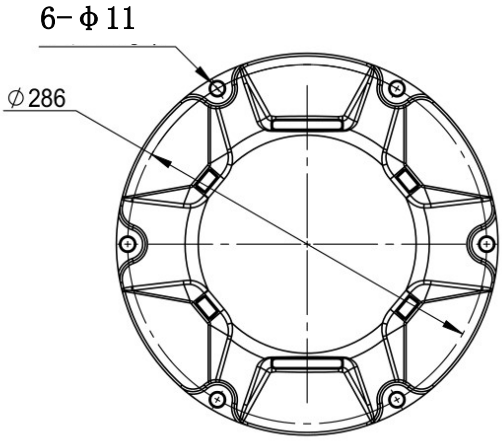
- Built-in surge protection
- Optional omnidirectional beam
- Optional Fail Open System

2.4. Power and power factor

Light Fixture	Ordering Code	Power	Power factor
Runway Edge Light	RB/IN-WW(L)-C	65VA	>0.90
Runway Edge Light	RB/IN-WR(L)-C	54VA	>0.90
Runway Edge Light	RB/IN-RW(L)-C	54VA	>0.90
Runway Edge Light	RB/IN-WY(L)-C	62VA	>0.90
Runway Edge Light	RB/IN-YW(L)-C	62VA	>0.90
Runway Edge Light	RB/IN-YR(L)-C	48VA	>0.90
Runway Edge Light	RB/IN-RY(L)-C	48VA	>0.90

2.5. Dimensions and Weight





Packing Data

Dimensions : 354mm (L) X324mm (W) X135mm (H)

Net Weight : 6.9kg Gross Weight : 7.2kg

* Packaging is subject to upgradation. Above data are reference values.

3. Installation

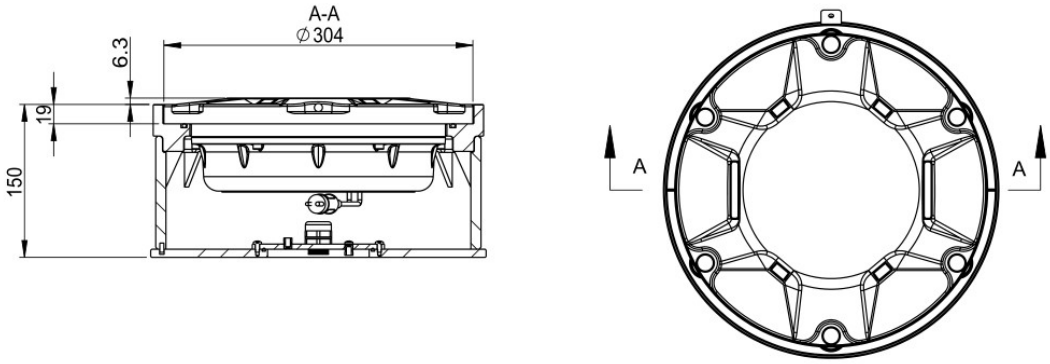
3.1. Tools and Material

- Spanner 17 mm
- Torque wrench with a 16/17 mm socket
- Brush or cloth
- Six M10×25 bolts
- Sixφ10 Locking washers

3.2. Installation steps

The installation process of light fixtures includes locating installation holes on the pavement, wiring, base embedding and mounting of lights. The installation of light fixture has a great influence on the function and service life of the lights. Proper and adequate trainings are recommended by the manufacturer to all installation personnel.

Drawings of light fixture



Direction of installation

There are color and direction indication marks near the window of light output channel on each light to provide information on the main beam.

Select correct light categories and beam directions in accordance to the specific regulations of ICAO, FAA and CAAC

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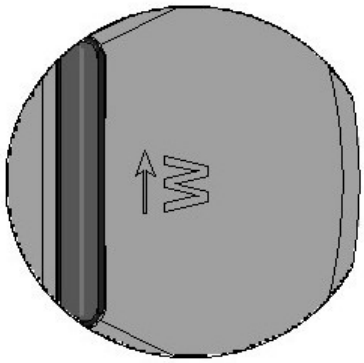
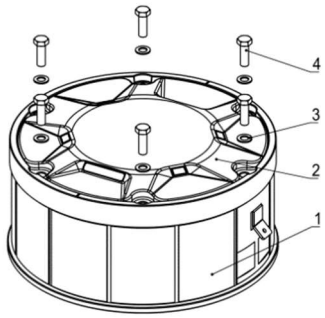
The letter indicates the light color of this window:
W-White, R-Red, Y-Yellow

The arrow indicates the toe-in direction of the main beam (the figure on the right indicates toe-in left). No arrow indicates no toe-in.



Installation Steps

1-12-in shallow base
2-light fixture
3-Ø10 lock-washers
4-M10×30 bolt



1. Carefully clean all contact surfaces of the light fixture and the base.
2. Put the O-ring gasket in the gasket track on the base.
3. Connect the connector(s) of the light fixture to the base supply cable(s). Check that the A- and B-side are connected to corresponding circuit if two connectors are used.
4. Place the connector under the light fixture and install in the base.
5. For an installation on bases, use a torque limiting box spanner of 16/17 mm, install and tighten the six fixing bolts or nuts to a torque value according to specification. For other base manufacturers, refer to their specifications.
6. After installation, make sure that each light fixture functions properly.

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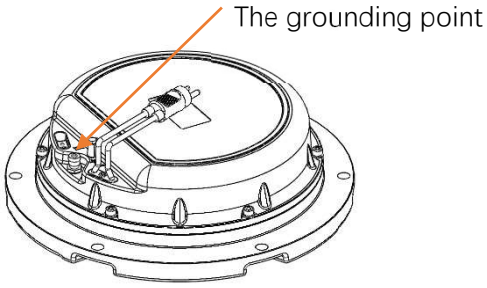
7. In order to bond the light fixture to ground, use the supplied screw to attach the braided ground strap to the grounding point on the light fixture. The grounding point is indicated by a grounding symbol and located on the bottom side.



3.3 Installation Bolt Torque

●Use fully threaded A2-70(or A4-70) M10x1.5 bolts .

●Use Model TL10 Top-Lock lock-washers .
●Mounting base holes must be degreased, cleaned, and dried prior to bolt installation.
●Base-to-fixture mating surfaces must be degreased, cleaned, and dried prior to installation. .
●Install the M10 bolts with lock-washers per lock-washer manufacturer's guidelines.
●See Section 2 for Top-Lock installation guidelines.
●Achieve a full final torque of 26.9 Nm. （Use GTP600 lubricants to 33 Nm.）with a calibrated torque wrench.

●Impact wrenches are not recommended as installation tools.
●Check torque and re-torque all bolts within 2 weeks of initial installation.
●If other lubricants or thread locking compounds are used (not recommended), torque must be recalculated based on K factor provided by lubricant or compound manufacturer.
●New bolts and lock-washers shall be used each time a light unit is removed from its base.

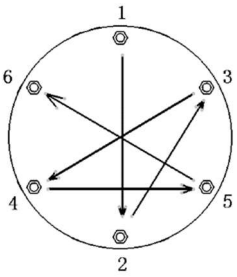
3.4Top-Lock Installation Guidelines

Step1: Hand tighten to ensure that 2-3 threads extend beyond the nut on through-bolt applications.
Step2: Tighten each bolt to 9 Nm.（Use GTP600 lubricants to 11 Nm.） torque following the pattern as shown below.

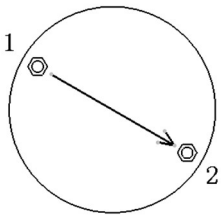
Step3: Increase the torque to 17.9 Nm. （Use GTP600 lubricant to 22 Nm.） following the pattern shown below.

Step4: Increase the torque to 26.9 Nm. （Use GTP600 lubricant to 33 Nm.） following the pattern shown below.

Step5: Perform one final pass on each bolt working clockwise from bolt 1, at 26.9 Nm. （Use GTP600 lubricant at 33 Nm.） torque.



12-inch Inset Light



8-inch Inset Light

WARNING

The inset lights are designed to withstand a maximum torque of 31.2 Nm. (**Use GTP600 lubricant to 38.3 Nm.**) **per bolt, assuming appropriate superior-grade M10 hardware and lubricant, however other components within the light fixture installation (i.e. base-can, extension rings, spacer rings, etc.) may not be capable of supporting such a load. We recommend following the installation bolt torque values and methodology outlined in this Section.**

4. Maintenance

This section describes the steps of lamp maintenance. Be sure to read and understand the safety instructions before starting maintenance. If a new lamp is used to replace an existing lamp, it is necessary to confirm whether the lamp model is correct through the label at the bottom of the lamp before replacement. If the internal parts of the lamp need to be replaced, it is also necessary to confirm that the model of the replaced parts is the same as the prototype number. For more information, please refer to the spare parts list in the manual or contact our company for assistance.

CAUTION

Using incorrect combination of washer, bolt and nut will cause serious damage to product installation and cause a variety of safety risks.

Ignoring these warnings may result in equipment damage or airport foreign objects.

CAUTION

When a light fixture is removed from the base, a cover or a spare lamp must be put in its place.

ICAO, Airport Services Manual Part 9, Airport Maintenance Practice and FAA AC 150/5340-26, Maintenance of airport visual aids facilities.

The light fixture is designed for outdoor operation, however storing the light fixture outside without using it is a risk for damage to light fixture components. For a longer storage time (more than a week), it is recommended to store the light fixture indoors in a dry and dust free environment and at room temperature. Proper storage ensures trouble free replacement procedures. It is strongly recommended not to store any electrical equipment outside.

4.1 Basic Maintenance Program

Weekly	Visual inspection of the light fixture.
	Removal of dust from external surfaces of the light fixture.

Monthly	Check of the optical window, check for mechanical damage. Check for proper fixing of the light fixture in its base.
Yearly	Detailed inspection of the light fixture. Check of the body resistance, check for mechanical damage (for example cracks around prism windows). Clean of the optical windows.

4.2 Workshop Maintenance

The workshop maintenance includes the following:

- Replacement of light fixtures
- Checking water tightness
- Replacement of a prism and its gasket
- Replacement of LED module

CAUTION:

Be sure to read and understand the safety instructions before you start.

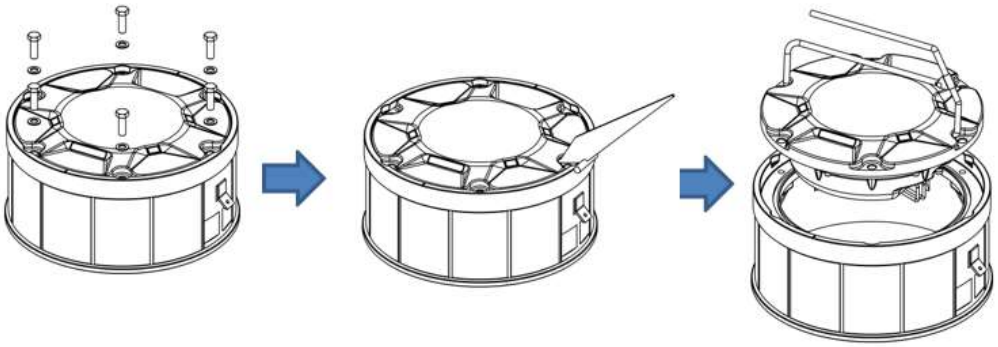
4.2.1 Tools and accessories

The following standard tools and accessories are required for maintenance of the unit:

- One angled socket spanner of 16 or 17 mm
- One Torque limiting spanner with 16 or 17 mm socket
- One hexagonal key (Allen key) of 3, 4, and 5 mm
- Torx 10, 20, 25, and 30
- Two large flat blade screwdrivers
- Silicone grease
- CC-Patron grease
- One brush or cloth
- Non-alcohol based cleaner

4.2.2 Remove a light fixture from its base

1. Use a torque socket wrench to remove the M10×30 bolts, spring washer and flat washer.
2. Pry up the lighting fixture with the 8 inches lighting fixture pry bar.
3. After the light fixture and base are separated, vertically lift the light fixture with the light fixture handle and dismount the ground lead with the cross screwdriver, then disconnect the secondary cable connectors.



4.2.3 Remove and replace light source

1. Place the light fixture upside down, remove the six m5 × 16 hexagon screws, and separate the upper cover from the bottom cover (if the upper cover and the bottom cover are adhered too tightly, pry it open with the help of a large slotted screwdriver).

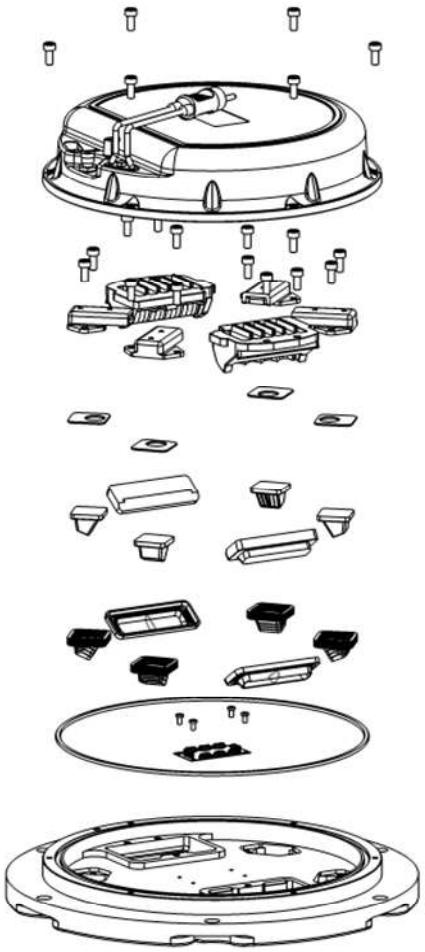
2. Unplug the connector between the LED module and the electrical driver and separate the upper cover and the bottom cover.

3. Remove the four M4 × 10 cross pan head screws and get out the LED light source assembly.

4. Attach the new LED assembly on the prism pressing block in diagonal order with four m4 × 10 cross pan head screws. (Confirm that the color and model of the light source are consistent with the removed light source),

5. Connect the connector LED module to the electrical driver in the bottom cover. Align the bottom cover with the pin hole on the upper cover, and screw in the six m5 × 16 inner hexagon cap screw to fasten firmly.

6. Perform water-tightness test. If air leaks out of the light fixture, locate the leaking point and open the lamp for repair. After rechecking, assemble the light fixture and perform the water-tightness test again.



4.2.4 Replace the prism and its sealing gasket

1. Place the light fixture upside down, remove the six m5 × 16 hexagon screws, and separate the upper cover from the bottom cover (if the upper cover and the bottom cover are adhered too tightly, pry it open with the help of a large slotted screwdriver).

2. Unplug the connector between the LED module and the electrical driver and separate the upper cover and the bottom cover.

3. Remove the six M5 × 16 hexagon screws, and take out the prism pressing plate and prism gasket.

4. Attach the prism pressing plate and prism gasket. (Confirm that the specifications of the prism and the replaced prism are consistent).

5. Install the prism gasket and prism pressing plate on the upper cover, and tighten with six m5 × 16 hexagon socket screws.

6. Connect the connector LED module to the electrical driver in the bottom cover. Align the bottom cover with the pin hole on the upper cover, and screw in the six m5 × 16 inner hexagon cap screw to fasten firmly.

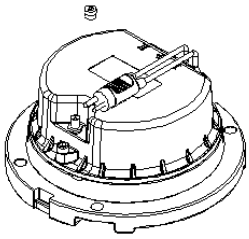
7. Perform water-tightness test. If air leaks out of the light fixture, locate the leaking point and open the lamp for repair. After rechecking, assemble the light fixture and perform the water-tightness test again.

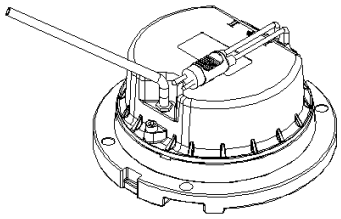
4.2.5 Waterproof test

Prepare

1. Remove the gas valve cap at the bottom of the light.

2. Use air compressor to inject air into the lamp (the test air pressure shall not be less than 130kpa).



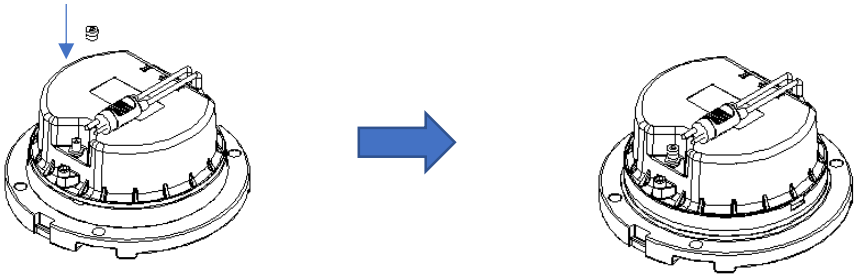


Test

1. Put the light fixture in water, keep the water level above the lamp, wait 3 minutes and observe if air leaks out of the light fixture.

1) If air leaks out continuously (between bottom cover and upper cover or between prism and upper plate or between gas valve and bottom cover), the light fixture is not watertight and must be repaired. Release the air from the light. Disassemble the light fixture and re-check the mating surfaces, prism, prism gasket and O-ring. Replace the damaged parts. Assemble the light fixture and perform the water-tightness test again.

2) If no air leaks out continuously, the light fixture is water-tight. Release the compressed air from the light fixture and assemble the cap on the valve.



The light fixture that passes the water-tight test is ready to be installed and used in the field.

5. Spare Parts

The table in this chapter lists the components, spare articles and accessories of this product and relevant ordering information. Spare articles and accessories of this product needs to be ordered additionally, and the manufacturer accepts the order in assembly mode and separate order of components. When ordering, please contact the manufacturer or any distributer according to order number listed in the table. The manufacturer suggests that some important components should be purchased from original factory to ensure various indicators of the lighting fixtures.

List of components and spare articles:

No.	Name	Order type	Description
1	Upper cover	UC-12-RBC33	Upper cover for inset runway edge lights
2	Circuit board	CB-C01	Only used for nset runway edge lights which provides circling guidance windows
3	Upper cover gasket	OR-12	O-ring
4	Prism gasket-1	PG-RM01	Prism gasket for prism-1
5	Prism gasket-2	PG-C01	Prism gasket for prism-2
6	Prism-1	Prism-RM01	Prism for main beam
7	Prism-2	Prism-C01	Prism for circling guidance beam
8	Plastic cushion	PC-C01	Plastic cushion for LED assembly-2
9	LED assembly-1	LA-RM01-W	LED Color: White (for main beam)
		LA-RM01-R	LED Color: Red (for main beam)
		LA-RM01-Y	LED Color: Yellow (for main beam)
10	LED assembly-2	LA-C01-W	LED Color: White (for circling guidance beam)
11	Bottom cover	BC-12-I-WW	Used for RB/IN-WW(L) (1 plug)
		BC-12-I-CW	Used for RB/IN-WR(L), RB/IN-RW(L), RB/IN-WY(L) or RB/IN-YW(L) (1 plug)
		BC-12-I-CC	Used for RB/IN-YR(L) or RB/IN-RY(L) (1 plug)

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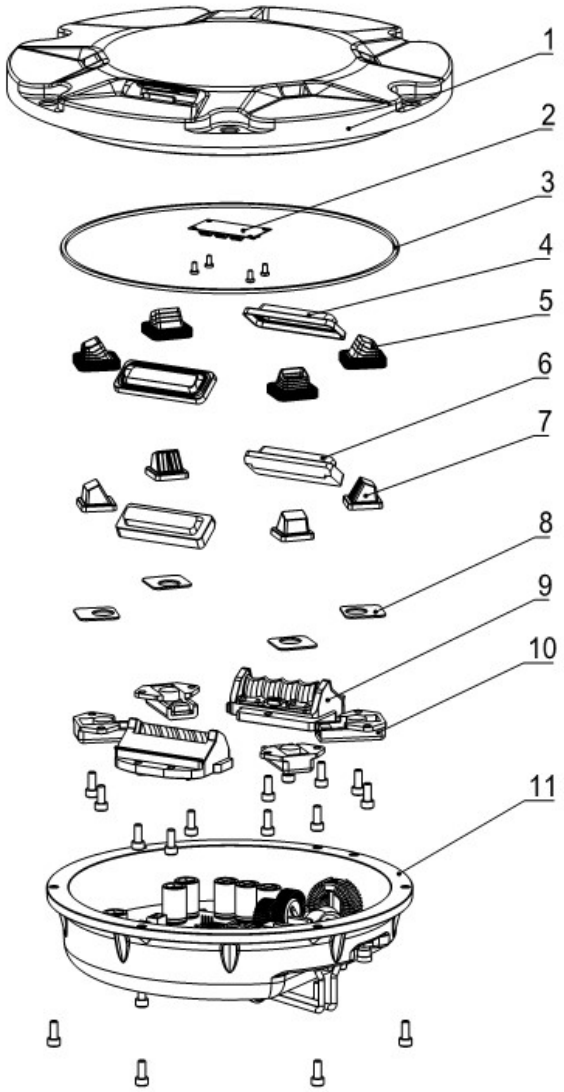
		BC-12-II-WW	Used for RB/IN-WW(L) (2 plugs)
		BC-12-II-CW	Used for RB/IN-WR(L), RB/IN-RW(L), RB/IN-WY(L) or RB/IN-YW(L) (2 plugs)
		BC-12-II-CC	Used for RB/IN-YR(L) or RB/IN-RY(L) (2 plugs)



1- Upper cover

2-Circuit board

3-Upper cover gasket

4-Prism gasket-1

5-Prism gasket-2

6-Prism-1

7-Prism-2

8-Plastic cushion

9-LED assembly-1

10-LED assembly-2

11-Bottom cover

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