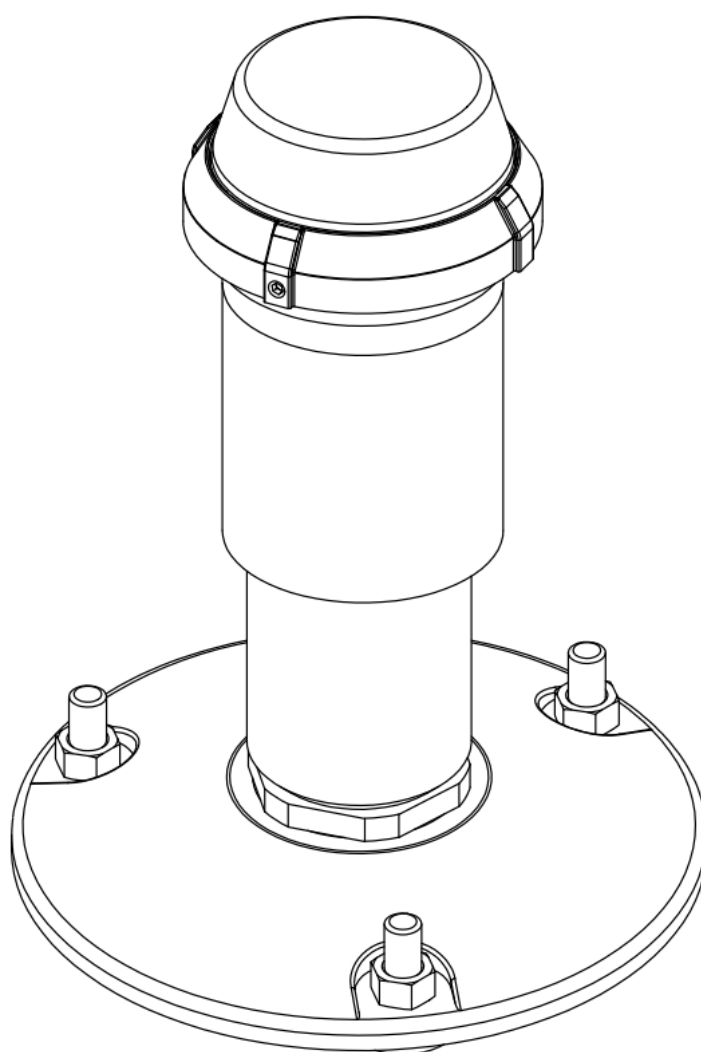


LED AIRFIELD LIGHTING



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Disclaimer/Standard Warranty

All products manufactured by Hangdakang mechanical & electrical technology (Wuhan) co. LTD, hereinafter referred to as HDK, meet the requirements of CAAC, ICAO and IEC. All warranties provided by HDK exclude all cases of gross negligence and handling of all products.

In case of avoidable defects or failure caused by mechanical, electrical or physical defects, the company will provide the necessary spare parts for repair.

The replacement and delivery of spare parts shall meet the requirements of proper storage, installation, and maintenance of the products, and shall submit the spare parts requirements to the Company in writing.

Hangdakang mechanical & electrical technology (Wuhan) co. LTD reserves the right to inspect the avoidable defective or damaged products in its own company facilities.

The obligations of Hangdakang Mechanical & Electrical technology (Wuhan) Co. LTD are limited to the labor cost required for disassembly and assembly of the product and the delivery of the corresponding products.

Hangdakang Mechanical & Electrical technology (Wuhan) co. LTD assumes no liability for injury or damage resulting from any incorrect use of the equipment. All products and their equipment are explicitly designed for their intended use only. Any other use outside the scope of the instructions is considered incorrect and excluded from the warranty.

Included are:

- ✓ Use HDK products outside of their intended operating use.
- ✓ Any changes or modifications to products that are not explicitly approved.
- ✓ Use of unauthorized, incompatible or unapproved tools by HDK or local regulations.

Local regulations on labour safety must always be followed in addition to those of HDK.

HDK reserves the right of interpretation within the scope permitted by law.

1. Safety

Airfield Ground Lighting is installed in high voltage series circuits, where the primary voltage is usually from several hundred to thousand volts and can be fatal if operated improperly. International or national standards referring to the electrical safety and safety of electrical operations should be strictly implemented during the operation and at any stage where powered lighting products are handled or maintained. Correct safety code must be followed during any operation in lighting circuit On and Off state conditions.

Pay attention to all safety instructions in this user manual. Negligence in following safety practices and instructions can result in serious injury, accident, or death. Safety instructions are categorized following the IEC standard and accompanied by an icon accordingly. Safety instructions and icons are listed and explained below:

DANGER:

Risk of electrical shock or flashover. Before any operations disconnect the equipment from line voltage, never connect or disconnect live circuits. Failure to observe "Danger" may result in severe injury, death, or equipment damage.

WARNING:

Failure to observe "Warning" may result in personal injury, death or equipment damage.

CAUTION:

Ignoring or violating "Caution" may cause damage to equipment.

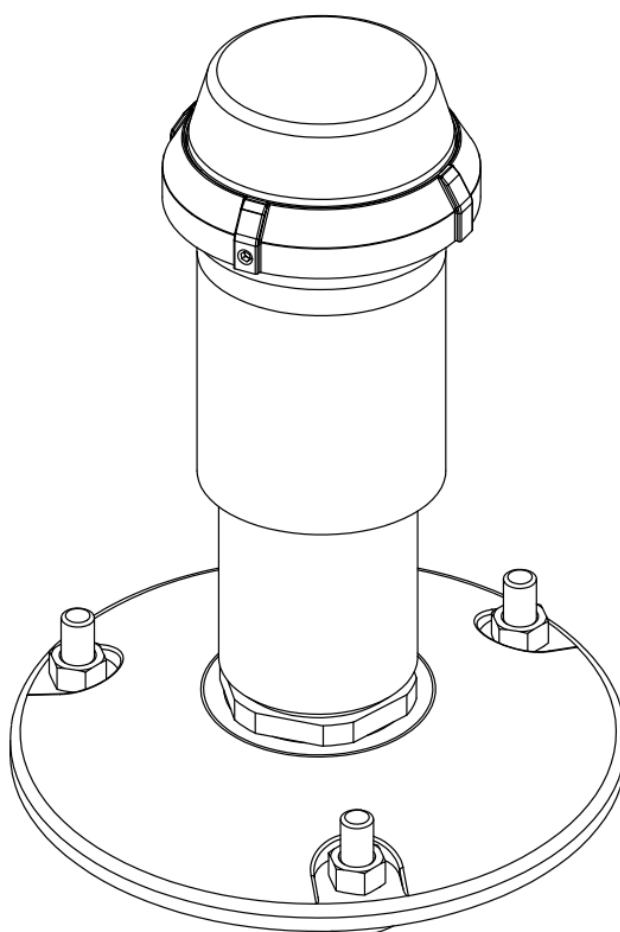
Note:

Explanations and supplements to parts of the description.

2. Introduction

The omnidirectional elevated light series produced by HDK can be applied to airfields with various conditions. The product has met the requirements of ICAO, CAAC, IEC and FAA standard and is famous for its ultra-durable structure, extreme elegant design as well as long maintenance-free period. The light source itself is made from energy-saving and long-life LED.

Figure 1 - Omnidirectional Elevated Light Series



2.1. Models & Variants

This manual is applicable to the omnidirectional elevated light series produced by HDK. The models and variants are shown in Table 1 :

Table 1 List of the Light Series

Application	Model	Glowing Direction/ Color	CAAC Type	ICAO Type	FAA Type
Taxiway Edge	ELC-TWE-B(L)	Omnidirection / Blue	L-3R	5.3.18	L-861T
Landing Direction Indicator	ELC-TSL-W(L)	Omnidirection / White			
Runway Turn Pad Edge	ELC-RPT-B(L)	Omnidirection / Blue	L-3R	5.3.18	L-861T

Note: This manual is also applicable to the installation and maintenance of some



“ELC-TWE(L)” taxiway edge.

2.2. Product Features

The main components of the light fixture include top cover, light fixture body, optical components, driver module and so on. Aluminum alloy high pressure casting technique is adopted in the making of light fixture body and the transparent top cover is made of high- strength scratch-resistant material. The overall design logic of the light fixture is for stable installation and heat dissipation.

The light source of the product is OSRAM LED. The optical components of the product adopt a fully universal design.

This series of LED light fixture can be used on the existing AC series circuit. A dimming control of 5 light intensity levels can also be performed with the equipped isolation transformer in corresponding power.

The light fixture is equipped with secondary cables and L-823 electrical connection plugs that comply with FAA standards. Also, the light fixture can be mounted on flange using a frangible mast or on the top cover of an isolated transformer box.

The performance parameters of the light fixture meet the following standards:

(current version)

- CAAC AC-137-CA-2015-01~04 & MH 5001
- ICAO Annex 14, Volume 1, & Aerodrome Design Manual
- EASA CS-ADR-DSN
- FAA AC150/5345-46 & Engineering Brief No. 67
- IEC TS 61827
- AENA DIN-DSEYN-PPT
- TCCA TP312
- UK CAA CAP 168

2.3. Electrical Properties

Input Cable

- FAA L823 Class A, Type II, Style 6 ; Plug*1

Input Current

- 2.8A-6.6A_{eff} AC

Sinusoidal CCR

- $I_{\text{peak max}} = 9.88\text{A}$

Thyristor CCR

- $I_{\text{peak max}} = 12.60\text{A}$, $j_{\text{min}} = 45^\circ$

CAUTION: Inputting electrical parameters beyond the specified range above is highly likely to damage the fixture.

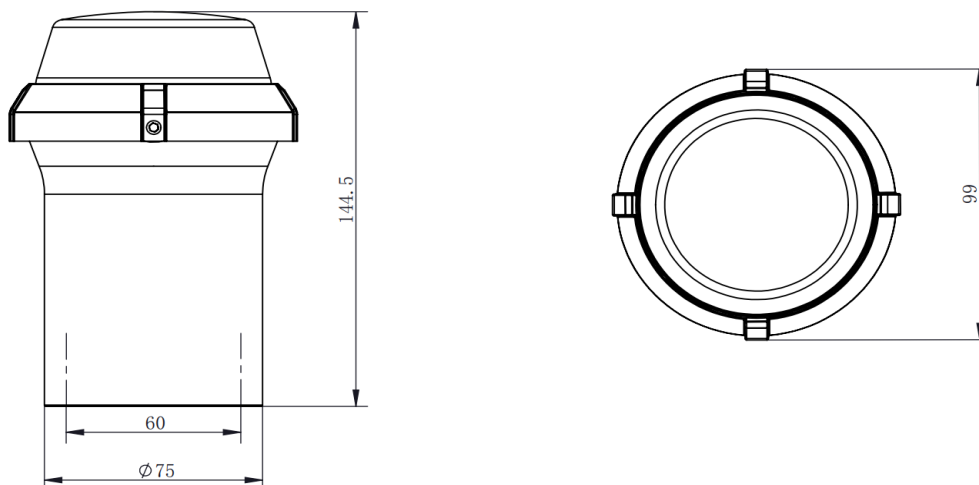


Table 2 - Requirements for Specification of Isolation Transformer

Application	Model	Suggested Transformer Specs
Taxiway Edge	ELC-TWE-B(L)	$\geq 25\text{W}$
Landing Direction Indicator	ELC-TSL-W(L)	$\geq 25\text{W}$
Runway Turn Pad Edge	ELC-RPT-B(L)	$\geq 25\text{W}$

2.4. Mechanical Properties

Figure 2 – Major Dimensions of the Light Fixture



Diameter of Light Fixture

- 99mm

Height of Light Fixture

- 144.5mm

Inner Diameter of Mounting Hole

- 60mm

Degree of Protection

- IP67 (IEC60598-1)

Operating Temperature

- -55°C ~ +55°C

Storage Temperature

- -55°C ~ +85°C

Weight

- Net Weight: 0.9 kg

Package Dimensions

- 360mmx225mmx350mm (9 Sets/ Package); Weight 8.5KG

2.5. Main Components

The HDK omnidirectional elevated LED light fixture contains following main components:

Light Fixture Top Cover (Hereinafter referred to “Top Cover ”)

- Transparent top cover - Ultra-Durable UV-resistant PC

LED Light Source

- LED light source with the color of blue or white

Driver Module

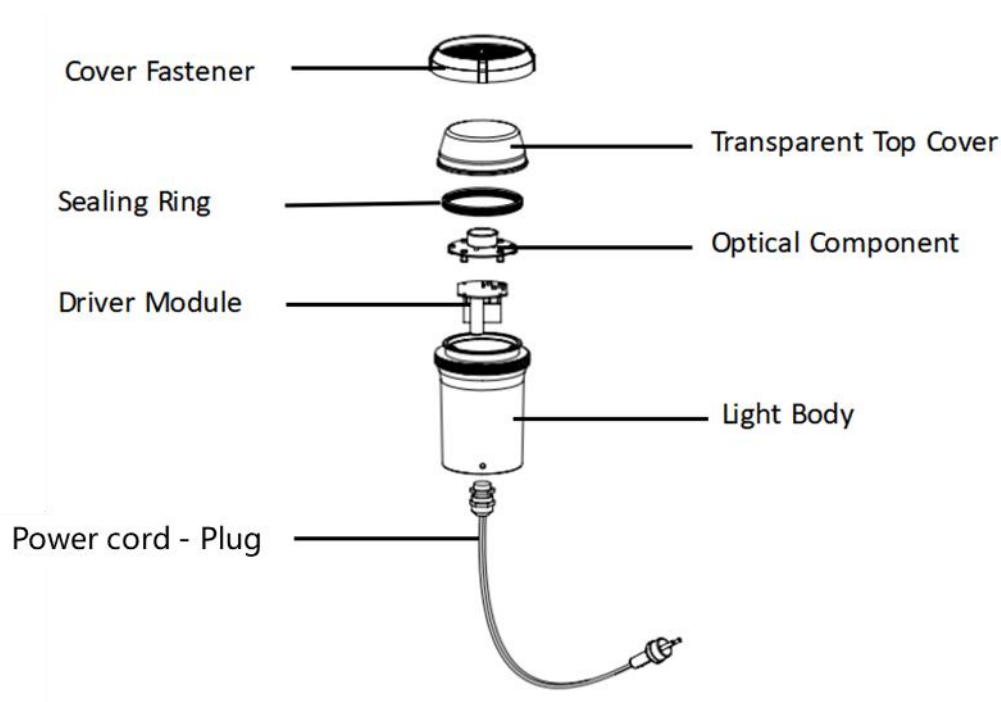
- Driver circuit board

Light Fixture Body (Hereinafter referred to as “Light Body”)

- Aluminum alloy body - spray plastic anti-corrosion treatment
- Power cord - Plug: FAA L-823 Type II, Style 6; Secondary cable: FAA 150/5345-7F

Standard

Figure 3 – Exploded View of the Light Structure



2.6. Nameplate

Taxiway Edge Light

Model: ELC-TWE-B(L)

Type: 5.3.18(ICA0) L-861T(FAA)

Input: AC 2.8A-6.6A

Color: Blue

Power: 5.5W

Function: FOA

S/N: 3MQ1001

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3. Installation

WARNING: Before any operations, make sure that circuit is disconnected from the voltage supply, switch off the Constant Current Regulator to power off the circuit and never connect or disconnect live circuits.



For the installation position requirements of the light fixture, refer to the MH5001 Technical Standards for airfield area of civil airports and the ICAO Annex 14, Volume 1.

3.1. Tools Required

The tools and materials required for installation are listed below:

- Hexagon wrench (Specification: 11mm, 17mm)
- Allen wrench (Specification: Metric No. 3)
- Cable seam sealing material and insulating tape
- Impact drill and accessories
- Clean cloth

3.2. Unpacking Unit

Please check carefully whether the package is in good condition. After opening the package, please promptly claim compensation from the carrier if the product and accessories in the package are damaged.

When receiving the light fixture cargo, please confirm whether the product information on the cargo list is consistent with the actual construction design. At the same time, please check whether the quantity, type, specification, color and other characteristics of the light fixtures on the cargo list are consistent with those of the actual cargo. If you find any problem, please contact the supplier as soon as possible.

CAUTION: The packaging of this product can be used for various purposes such as future maintenance, uninstallation and transportation of the light fixture. Please keep the product packaging properly after receiving the cargo.

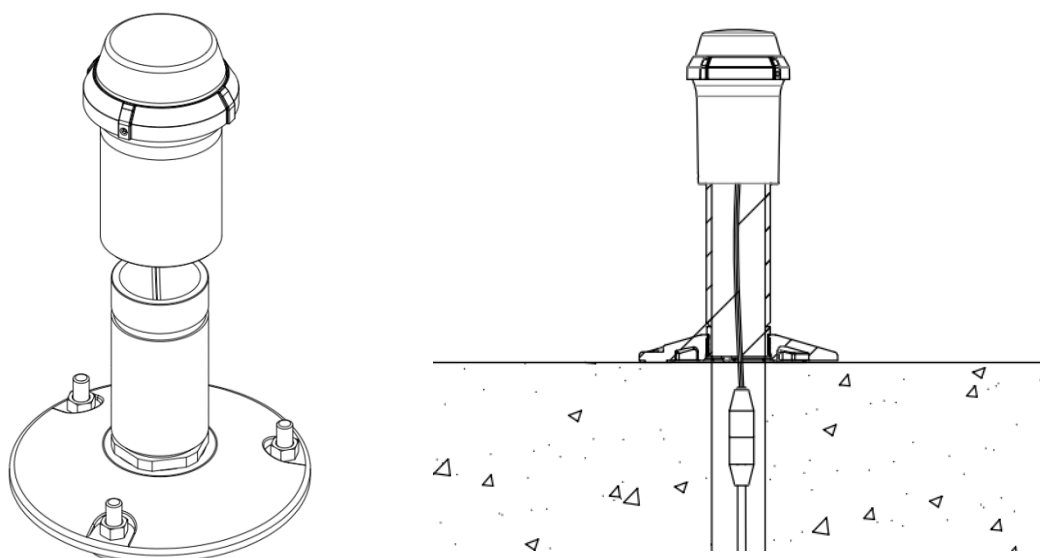


3.3. Installation on the Light Fixture Base

Please check the following items before proceeding:

- Please confirm that the angle of the light fixture base is consistent with the design requirements and construction regulations.
- Please make sure that the length of the reserved secondary cable is 30-50cm for installation and maintenance.
- Before installation, please make sure that the breakable coupling parts meet the light fixture installation requirements.

Figure 4 – Installation on the Light Fixture Base



- Use an air compressor to blow and dry the threading tube;
- Confirm the installation position of the flange, pre-embed M10 bolts or M10 expansion bolts, fix the flange of the light fixture on the pavement surface, then tighten the frangible mast sleeve of the light fixture after fixing the flange;
- Assemble the secondary power supply cable of the light fixture through the frangible mast sleeve according to the L-823 plug and socket connection method (Plug: FAA L-823, Type II; Socket: FAA L-823, Type II). Use sealing tape if necessary;

- Insert the light fixture into the frangible mast sleeve
- Tighten the M6 fixing bolt so that the light fixture can be fixed to the frangible mast.

CAUTION: Be careful not to cut the cable during the operation.



Do not use high-speed power tools to tighten the bolts, as this may cause slippage.

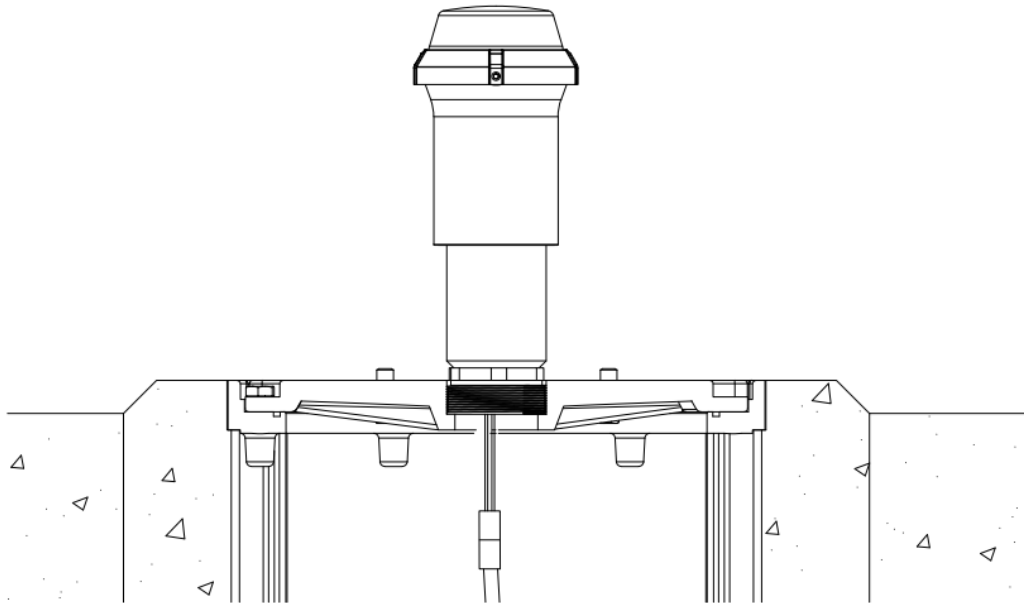
3.4. Installation on the Top Cover of the Isolation Transformer

- Screw the breakable coupling part on the 1-inch or 2-inch screw holes on the top cover of the isolation transformer;
- Assemble the secondary power supply cable of the light fixture through the breakable coupling according to the L-823 plug and socket connection method (Plug: FAA L-823, Type II; Socket: FAA L-823, Type II). Use sealing tape if necessary;
- Insert the light fixture into the breakable coupling sleeve
- Tighten the M6 screw so that the light fixture can be fixed to the breakable coupling sleeve.

CAUTION: Do not use high-speed power tools to tighten the bolts, as this may cause slippage.



Figure 5 – Installation on the Top Cover of the Isolation Transformer



3.5. Removal of the Light Fixture

- Loosen 1 Pcs M6 screw at the bottom of the light fixture;
- Separate the light fixture from the breakable coupling sleeve;
- Separate the secondary cable connector connecting the light fixture to the isolation transformer;
- Pack the light fixture and load it into Vehicle.

WARNING: After disassembling the light fixture, all tools and parts on the site should be carefully checked and taken away to avoid "FOD". During the on-site operation, dust on the surface of the light fixture should be cleaned as much as possible.



4. Maintenance

Note: For trouble shooting, please refer to section 4.5.



4.1. Basic Maintenance Program

According to the requirements of ICAO, Airport Services Manual Part 9, Airport Maintenance Practice and FAA AC 150/5340-26, Maintenance of airport visual aids facilities, the suggested maintenance program plan is listed in Table 3.

Table 3 - Basic Maintenance Program of Omnidirectional Elevated Light

Maintenance Frequency	Maintenance Task
Daily	Check if light is emitted/illuminated.
	Check if there is any damage to the light fixture body.
Semiannual	Clean the dust and dirt on the light fixture surface.
	Check the fixing condition and the bolt torque of the light fixture.
Annual/Biennial	Check the sealing performance of the light fixture

Note: The table above is the recommended plan. The actual implementation of the plan should be subject to the maintenance regulations of the customers.



4.2. Tools Preparation

The maintenance tools and materials are as follows

- Phillips screwdriver, specifications: PH1
- Allen wrench, specification: Metric 3
- Clean cloth
- Special non-woven cloth for cleaning optical lenses
- Optical lens cleaner
- Tweezers

Table 4 Specifications of Screws and Washers

Screw Name	Screw Specs	Installation Torque	Quantity
Light Body Screw	M6*8 Jack Screw	1Nm	2
Driver Module Screw	M3*10 Phillips Head	1.2Nm	2
Optical Module Screw	M3*5 Phillips Head	1.2Nm	8

4.3. Maintenance Items

For the light fixtures deployed on the runway / taxiway, the following maintenance items can be applied:

Table 5 - Maintenance Items for Light Fixture (Deployed)

Maintenance Items	Method/Steps
Check if the light is emitted/illuminated.	Visual inspection
Check if there is any damage to the top cover	Visual inspection
Clean the dust and dirt on the light fixture surface	Use a clean cloth or brush
Check the fixing condition	Visual inspection
Check the bolt torque	Using torque wrench to confirm the torque is 24.5Nm
Check the sealing performance of the light fixture	Check if there is any moisture/ water mark(inside the light fixture) through the transparent top cover
Malfunctioning light fixture removal	See section 3.5



CAUTION: When cleaning the dirt on the surface of the light fixture, do not use a cloth covered with dirt and sand, or a hard brush to rub the surface to avoid scratching the transparent top cover (as it may reduce the luminous performance of the light fixture). A clean soft cloth should be used to gently wipe the glass surface. Optical lens cleaner can be used if necessary.

When elevated light fixtures are not in use, please avoid outdoor storage. They should be stored in a dry and clean indoor environment. Also, keep the storage temperature in accordance with the requirements.

After removing the light fixtures from the runway/taxiway, the maintenance items in Table 5 can be applied:

Table 6 - Maintenance Items for Light Fixture (Non-deployed)

Maintenance Items	Method/Steps
Test whether the light fixture works properly	Connect the light fixture with power and visually inspect it
Trouble shooting	See section 4.5
Check the sealing performance of the light fixture	Check if there is any moisture/ water mark (inside the light fixture) through the transparent front cover or after disassembling the light fixture

4.4. Operation Procedure

WARNING: Before operation, please make sure that the Safety Instructions are read carefully.



CAUTION: During maintenance, please use the screws and washers which can meet the required specifications, otherwise, the potential safety hazard may arise. Please keep the onsite environment clean during the maintenance. Please do not touch the optical components directly by bare hands, otherwise, the service life of light source and optical performance will be reduced. If there are dirties and dust on the optical components, a soft, clean and dry non-woven cloth can be used to clean it. The optical components include prism, LED light source.



4.4.1. Installation and Removal of Transparent Top Cover

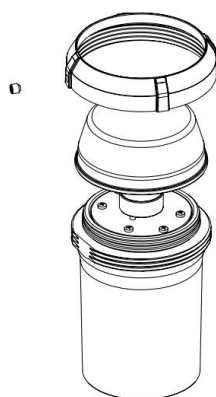
Removal of transparent top cover:

- Using Allen Wrench (Specification: Metric 3) to screw out the M6 Jack Screw from the top cover fastener.
- Taking down the top cover fastener.
- Open the transparent top cover

Note: If the transparent top cover is hard to open, the flat-end screwdriver can be used to pry lightly at the seams.



Figure 6 Installation and Removal of transparent top cover



Installation of transparent top cover:

- Clean the dirties and dust of sealing ring.
- Put on the transparent top cover onto the light body and make sure the opening edge of top cover touch to the light body.
- Screw the top cover fastener onto the light body and tighten it, then align the screws holes and tighten M6 jack screw with a torque 1Nm.

4.4.2. Installation and Removal of Driver module and Optical components

Removal driver module and optical components from light body:

- Using Phillips Screwdriver(Specification: PH1) screw out two pcs M3*10 screws from LED board.
- Pour out the driver module and optical components.
- Remove the wiring terminal of the power cable

Figure 7 Installation and Removal of Drive module and Optical components to/from light body



Installation of Driver module and Optical components to light body:

- Insert the plug-in of power cable into the driver board tightly.
- Insert the driver module and optical components into light body, and align the screw holes between the optical components and light body.
- Tighten two pcs M3*10 screws on LED board by Phillips screwdriver (Specification: PH1)

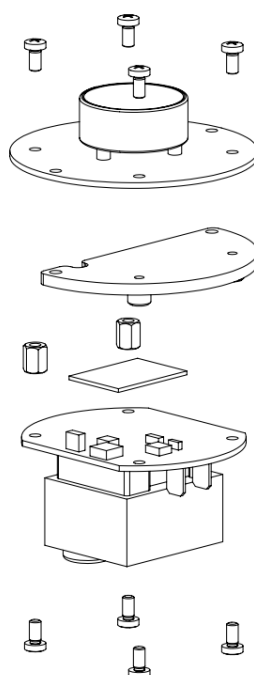
Removal driver module from optical components:

- Using Phillips screwdriver(Spec: PH1) to screw out 4pcs M3*5 screws from LED board, then the optical components can be removed from driver module.
- Using Phillips screwdriver(Spec:PH1) to screw out 4pcs M3*5 screws from driver board, then the driver module, heat sink, and 2pcs Brass Studs can be separated.

CAUTION: Please wear rubber gloves to operate, and during operation, please avoid to direct touch the light-emitting surface of optical components which include prism and LED light source.



Figure 8 Installation and Removal driver module to/from optical components



Installation driver module to optical components:

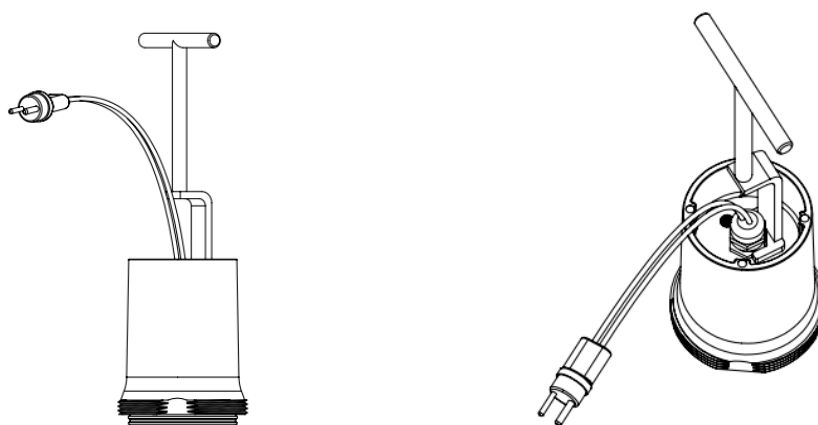
- Align 2pcs brass studs with the screw holes of heat sink (There is a thermal conductive paste between driver board and heat sink), then using Phillips screwdriver(Spec: PH1) tighten 4pcs M3*5 screws to the bottom of driver board.
- First, align the mounting holes of optical components with the 2pcs brass studs and the screw holes of heat sink, and then, tighten 4pcs M3*5 screws to the LED board by Phillips screwdriver (Spec.:PH1)

4.4.3. Installation and Removal of Power Cord

Removal of power cord:

- Place the power cord outlet of light body downward
- Use a special tool for removing and assembling power cords to lock the root of the sealing head of the power cord and twist it counterclockwise until the sealing head is completely detached from the mounting hole on the bottom cover.
- Pull out cable and clean the mounting hole of bottom cover

Figure 9 Installation of power cord

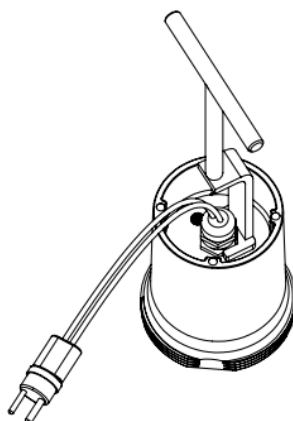


Installation of power cord:

- Take the new fittings to be replaced, pass the cables separately through the bottom cover mounting holes and reserve 10 cm of cable inside.

- Turn the sealing head of the power cable clockwise into the installation hole on the bottom cover, and use the special tool for power cable disassembly to tighten the root of the sealing head and the cable locking hexagonal nut. Check whether the cable is secured. If the cable is loose, tighten the locking nut.

Figure 10 Removal of power cord



4.5. Trouble Shooting

Table 7 - Trouble Shooting

Malfunction	Trouble Shooting Step
The light stops working (glowing)	1. Turn off the light and restart after 1 min 2. If the fault is not eliminated, check the power cord plug 3. If the fault is not eliminated, contact the manufacturer for customers service and update the program
Water leak inside the light fixture	1. Check the sealing of the transparent front cover 2. If the fault is not eliminated, contact the manufacturer for customer service
Unable to dim normally	1. Confirm that the dimmer and isolation transformer are fault-free and operate without problems 2. If the fault is not eliminated, contact the manufacturer for customer service
Unstable glowing and flickering	1. Make sure that the specifications of the dimmer and isolation transformer match the operation requirements of the light fixture, no operational problem 2. If the fault is not eliminated, contact the manufacturer for customers service and update the program

5. Support

5.1. Customer Service

If you need after-sales service, you can contact us through the after-sales service hotline or sales consultant.

After-sales service hotline

+86-27-63498449

Please prepare the following information in advance in order to get the service quickly:

- Product name and serial number
- Airport code or company name
- Your phone and email address

5.2. Recycling

Improper disposal of scrapped electronic equipment may have a negative impact on the environment and human health. Regarding the recycling of electronic products, please follow the local laws and regulations.

5.3. About HDK

Handakang Electrical & Mechanical Technology Corp. Ltd., established in 2003 in Wuhan/China is a professional locally known provider of Airfield Lighting, Navigation Aids, Frangible Mast Systems and Heavy Duty Support Equipment. In 2017 HDK started to create a new LED Airfield Lighting Portfolio supported by known capacities from Europe, to become the supplier for Airfield Customers in China, Asia, Europe and all over the World for reliable, efficient and innovative Airfield Lighting Products at highest quality.

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