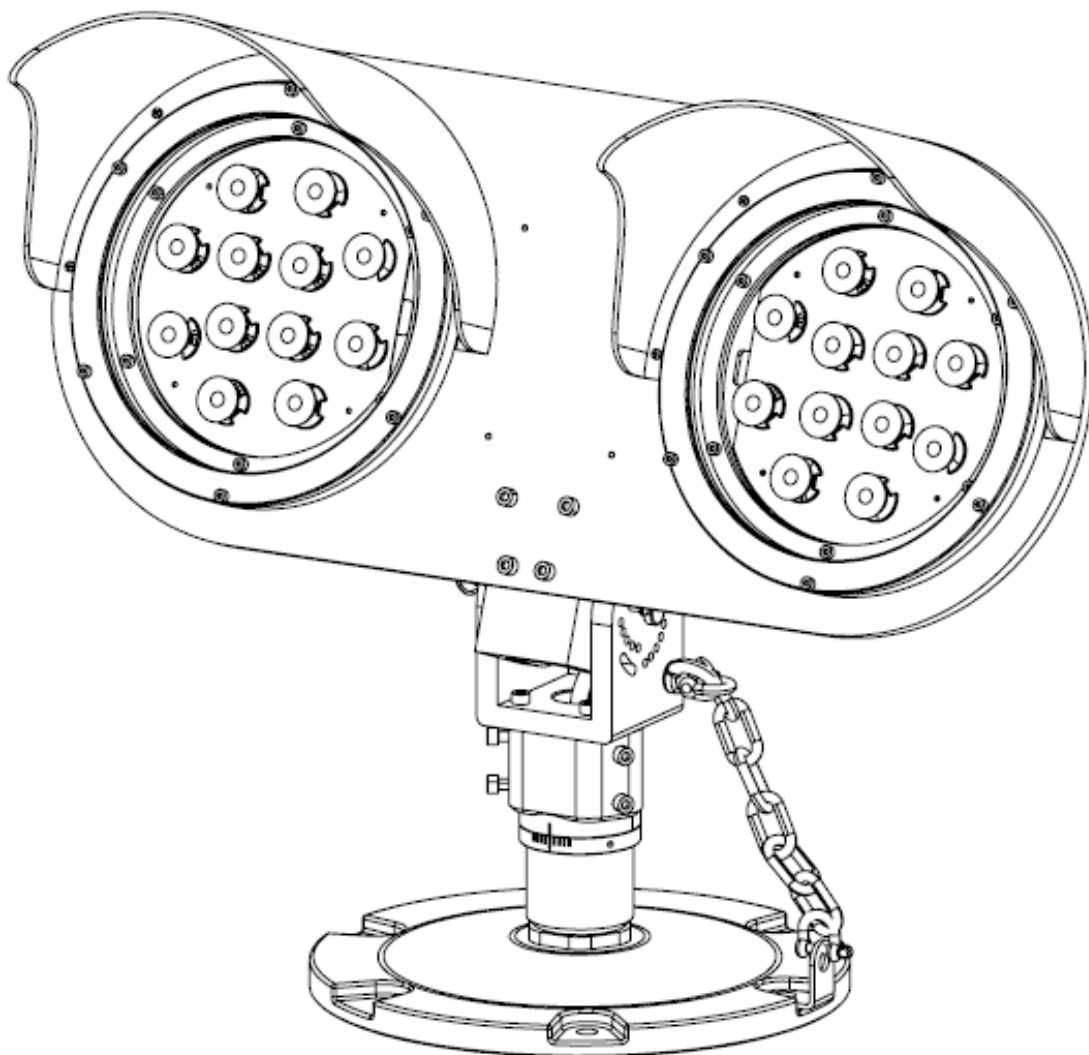


LED AIRFIELD LIGHTING



CONTENT

Disclaimer/Standard Warranty.....	6
1 . Safety.....	6
2 . Introduction.....	7
2.1 Product Features	8
2.2 Electrical Properties	9
2.3 Mechanical Properties.....	10
2.4 Main Components	11
2.5 Nameplate.....	12
3 . Installation	13
3.1 Tools preparation	13
3.2 Unpacking Unit	13
3.3 Installation on light fixture base	14
4 . Maintenance.....	18
4.1 General maintenance procedures.....	18
4.2 Tools preparation.....	19
4.3 Maintenance items	19
4.4 Operation steps	20
4.4.1 Disassembly and assembly of glass front cover.....	21
4.4.2 Disassembly and assembly of light panel assembly	22
4.4.3 Disassembly and assembly of rear cover assembly	23
4.4.4 Removal and installation driver module	24

4.4.5	Disassembly and assembly of power cable in rear cover	25
4.5	Trouble Shooting.....	26
5	. Support.....	28
5.1	Customer Service	28
5.2	Recycling.....	28
5.3	About HDK.....	28

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LIST OF TABLES

Table 1	Rated Power of Light Fixture	9
Table 2	General maintenance plan for vertical runway guard lights	18
Table 3	Maintenance Items for Light Fixture (Deployed)	19
Table 4	Trouble Shooting	26

LIST OF FIGURES

Figure 1	LED Elevated Runway Guard Light	7
Figure 2	Main dimensions of LED Elevated Runway Guard Light(20° angle of elevation)	10
Figure 3	Exploded View of LED Elevated Runway Guard light Structure	12
Figure 4	Elevated Runway Guard Light Installed on base	14
Figure 5	Diagram of horizontal scale of elevated runway guard light	15
Figure 6	Installation of Elevated Runway Guard light scale ring 1	16
Figure 7	Installation of Elevated Runway Guard light scale ring 2	16
Figure 8	Elevated Runway guard light pitch Angle adjustment assembly diagram	17
Figure 9	Diagram of disassembly front cover of Elevated Runway Guard Light	21
Figure 10	Diagram of disassembly of elevated runway guard light panel	22
Figure 11	Diagram of disassembly rear cover assy of Elevated Runway Guard Light	23
Figure 12	Disassembly Diagram of Elevated Runway Guard Light drive module	24
Figure 13	Diagram of Elevated Runway Guard Light driver module interface	25
Figure 14	Diagram of removing rear cover power cord of elevated runway guard light	25

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 not operated properly. 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).

Various safety tips in the manual will be marked with different icons. The icons and their explanations are as follows: icons used in the manual (in accordance with GB and IEC standards)

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.

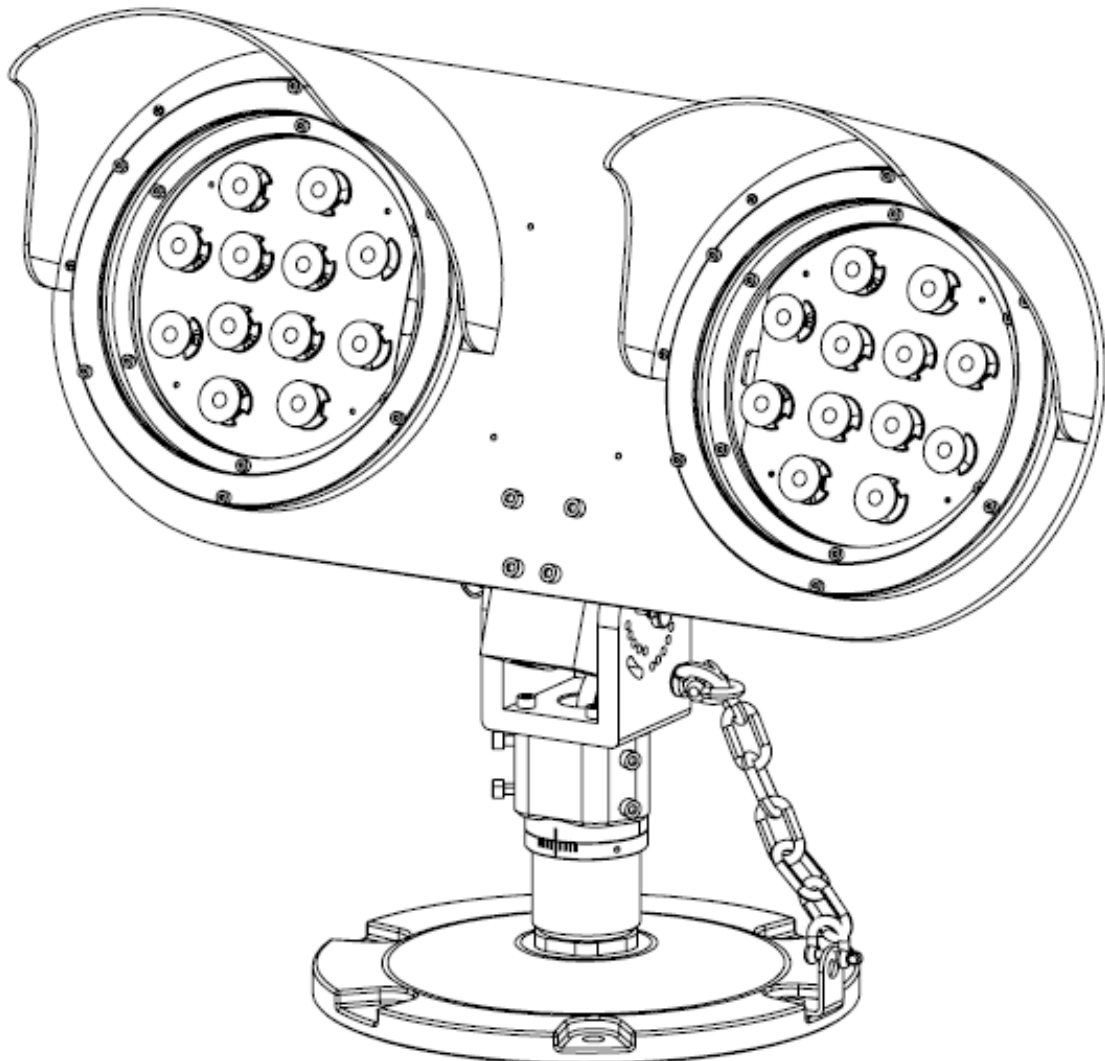
Note:

Explanations and supplements to parts of the description.

2. Introduction

The LED Elevated Runway Guard Light produced by HDK adopt imported LED light sources with energy saving and long service life. This series of light fixture has the characteristics of durable structure, exquisite appearance, long maintenance-free period, etc. The products are designed and produced in accordance with ICAO, CAAC, IEC, FAA standards, and applicable to airports in various environments.

Figure 1 - LED Elevated Runway Guard Light



2.1 Product Features

The lamp adopts LED light source, with longer service life and better stability.

The main structure of the light fixture is precision machining, the surface is treated with anti-corrosion treatment (plastic spraying, oxidation, etc.), and all fasteners are made of 316 stainless steel, so that the light fixture has good weather resistance.

The protection grade of the light fixture is IP54, and waterproof and dustproof performance is good.

The light-emitting can be dimmed with 5 levels of light intensity.

The installation angle of light fixture is easy to adjust, and additional calibration equipment is not required.

The performance index of the light fixture meets the following standards:

(current version)

- ICAO Annex 14, Volume 1, & Aerodrome Design Manual
- EASA CS-ADR-DSN
- FAA AC150/5345 & Engineering Brief No.67
- IEC TS 61827
- AENA DIN-DSEYN-PPT
- TCCA TP312
- UK CAA CAP 168

2.2 Electrical Properties

Input Cable

- FAA L823 connection 1

Input Current

- 2.8-6.6A_{eff AC}

Sinusoidal CCR

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

Thyristor CCR

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

Flashing Rate

- 45-50 per minute

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

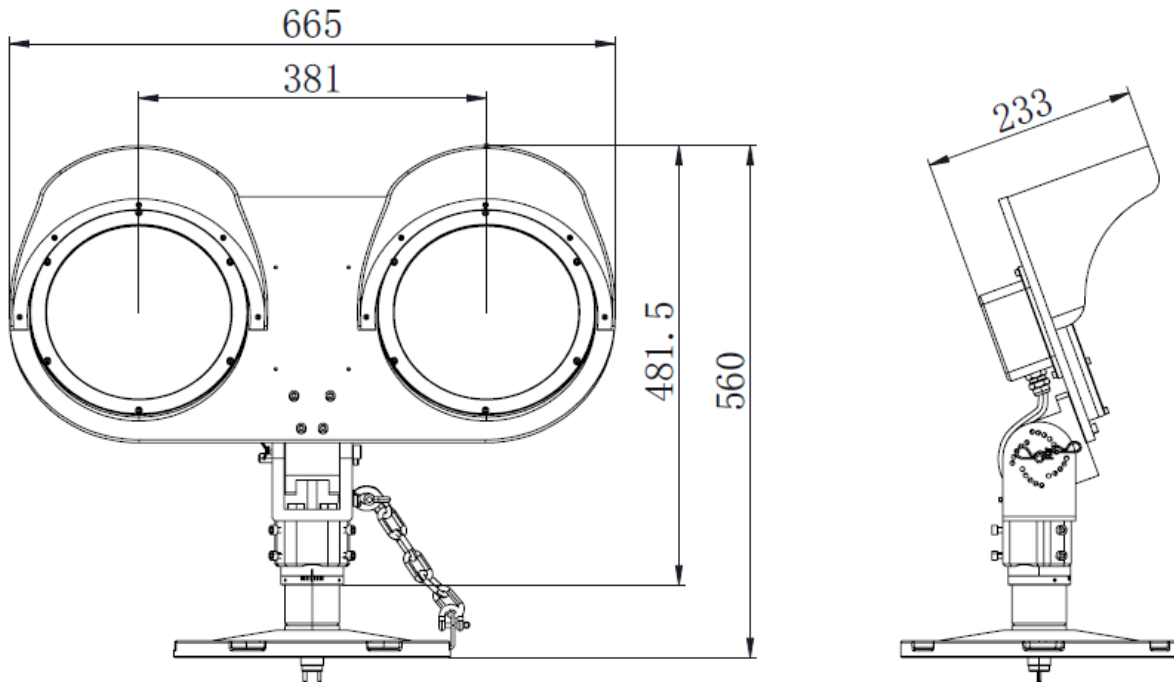


Table 1 Rated Power of Light Fixture

Product name	model	Rated Power (W)
LED Elevated Runway Guard Light	ELD-RGL-C(L)	23

2.3 Mechanical Properties

Figure 2 - Main dimensions of LED Elevated Runway Guard Light(20° pitch angle)



Horizontal adjustment

- $\pm 20^\circ$, Minimum adjustment interval 5°

Vertical Adjustment

- 0° to 20° , Minimum adjustment interval 1°

Degree of Protection

- IP67 (IEC60598-1)

Operating Temperature

- -55°C – $+55^\circ\text{C}$

Storage Temperature

- -55°C – $+85^\circ\text{C}$

Net Weight

- 10.7kg(Without the base)

Package Dimensions

- 700x350x400mm (2 sets in package); Weight 12Kg

2.4 Main Components

HDK LED Elevated Runway Guard Light contains the following components:

Optical components

- LED light source- yellow light source
- LED aluminum base circuit board
- Lens, front glass cover

Lamp body assembly

- Aluminum alloy main board - spray anti-corrosion treatment on the surface
- Sun visor - surface electrophoresis low gloss black finish anti-corrosion treatment
- High performance sealing silicone rubber ring

Driver module

- LED drive circuit board
- Potting adhesive
- Cooling box

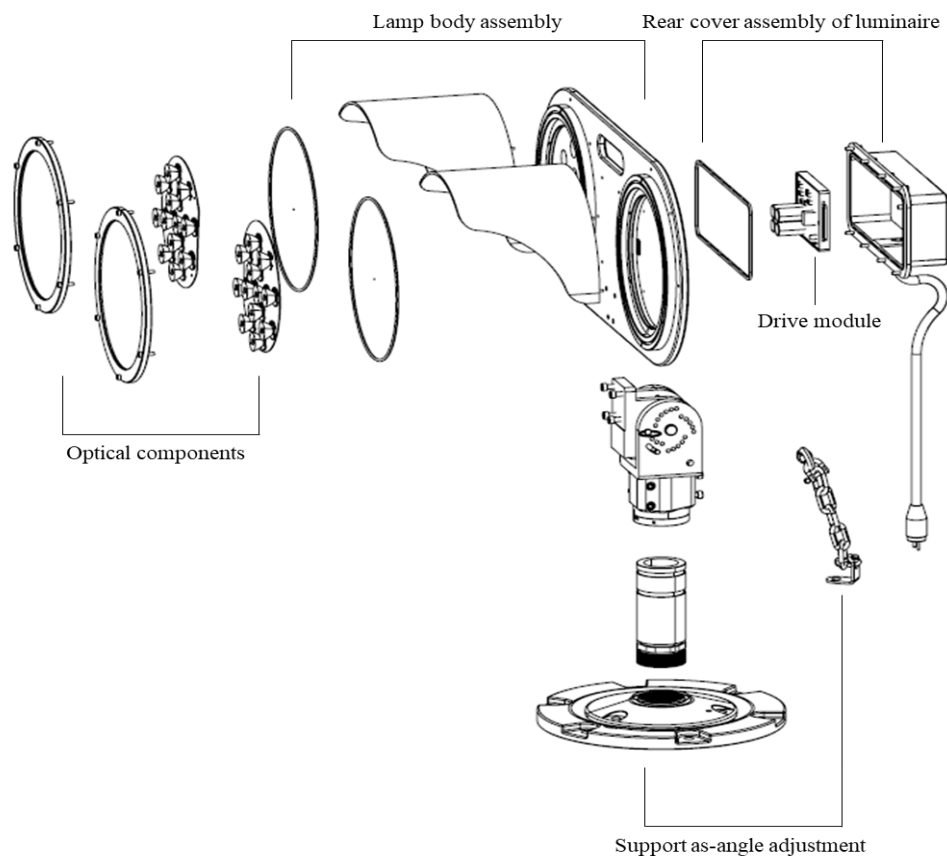
Angle adjustment support assembly

- Angle adjuster A,B
- Fixing pin, R-buckle
- Support parts, breakable coupling parts
- Flange

Rear cover assembly of light fixture

- Aluminum alloy rear cover - plastic spraying anti-corrosion treatment
- Power cord - plug: FAA L-823 type 1, secondary cable: FAA 150/5345-70 standard
- Power cord sealing head
- High performance sealing silicone rubber ring

Figure 3 - Exploded View of LED Elevated Runway Guard light Structure



2.5 Nameplate

Runway Guard Light

Model: ELD-RGL-C(L)

Type: 5.3.23 A2-25(ICAO)
L-804(FAA)

Input: AC 2.8A-6.6A

Color: Yellow/Yellow

Power: 23W

S/N: 2JH1803

www.hdk-aero.com



3. Installation

WARNING: Before installation, confirm that the primary circuit of the light is in the power-off state, that is, turn off the power supply of the constant current regulator of the circuit.



Note: 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 preparation

Installation tools and materials are as follows:

- Hexagonal wrench (11mm and 17mm specifications)
- Allen wrench (metric 2-5)
- Open end wrench
- Cable joint sealing material and insulating tape
- Impact drill and accessories
- Clean cloth

3.2 Unpacking Unit

Please carefully check whether the outer packaging is in good condition. If the products and accessories are damaged after opening the packaging, please claim for compensation from the carrier in time. When receiving light fixture, please confirm whether the product information on the goods list is consistent with the construction design. At the same time, check whether the quantity, type, specification, color and other characteristics of light on the goods list are consistent with the real object. If any problem is found, please contact the supplier in time.

CAUTION: This product package can be used for maintenance, disassembly and subsequent transportation of light fixture. Please keep this product package properly after receiving the goods.

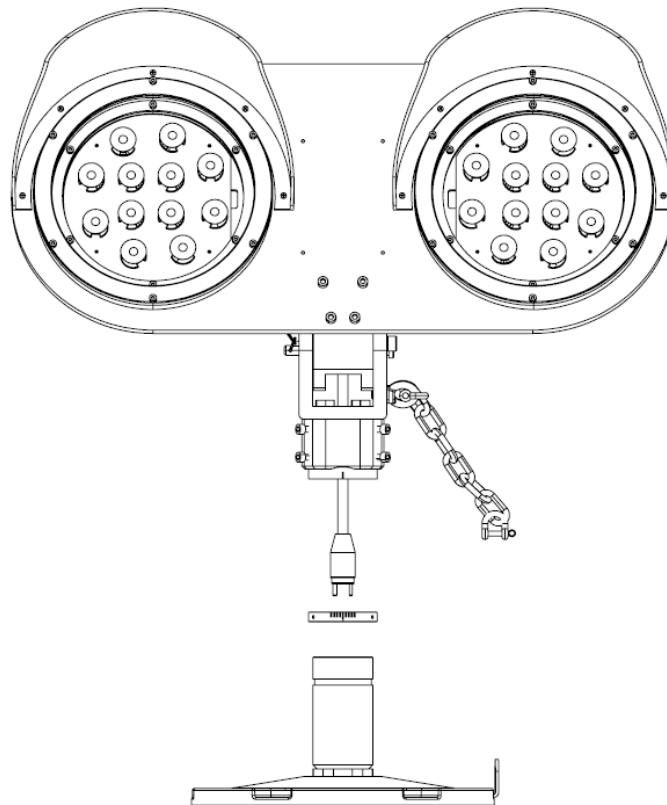


3.3 Installation on light fixture base

Please check the following items before proceeding:

- Blow the threading pipe clean and dry with compressed air
- Confirm the installation position of the flange, pre-embed M10 bolts or M10 expansion bolts, then fix the flange on the pavement, and then tighten the breakable coupling sleeve of light fixture.
- It is recommended that the reserved length of the secondary cable be 30 to 50cm for easy installation and maintenance

Figure 4 - Elevated Runway Guard Light Installed on base



- Put the scale ring on the outside the breakable coupling part
- Assemble the secondary power supply cable of the light fixture through the breakable coupling 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 lamp into the flexible part sleeve
- Insert the light fixture into the breakable coupling sleeve

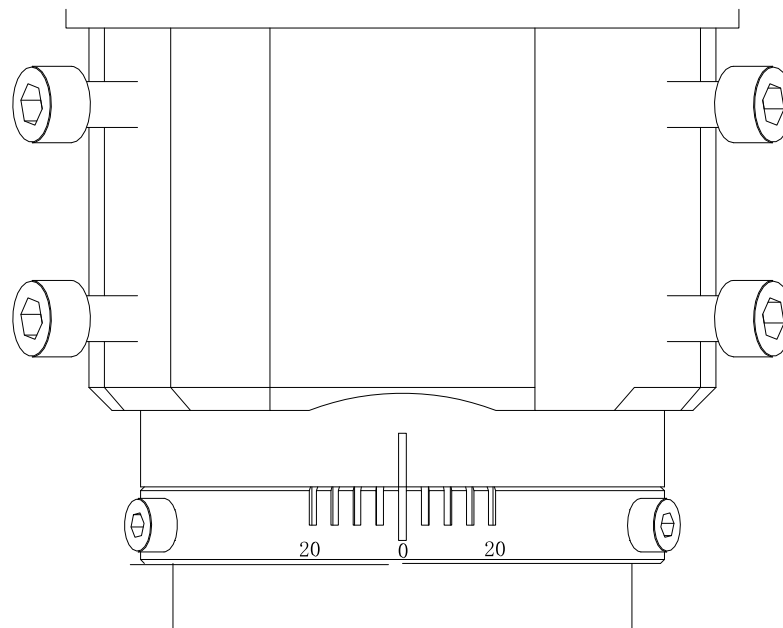
- Adjust the horizontal angle of light fixture according to the design requirements
- Tighten the fixing bolts to fix the light fixture on the breakable coupling
- Adjust the pitch angle of light fixture according to the design requirements
- Secure the tether to the flange bolts

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.



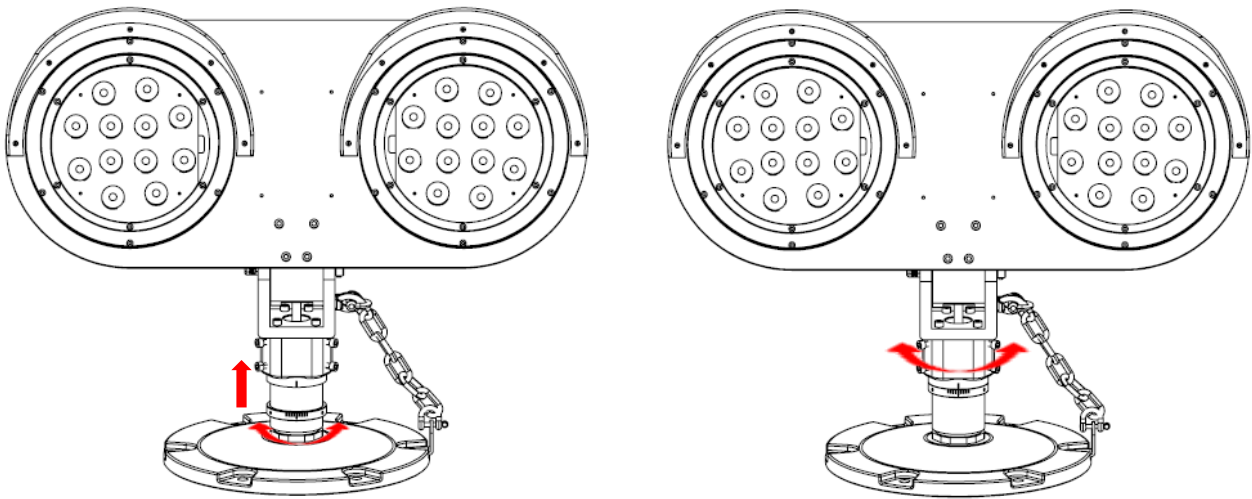
Horizontal adjustment: horizontal direction $\pm 20^\circ$ adjustable, minimum adjustment amount 5° , as shown in the following figure:

Figure 5 - Diagram of horizontal scale of Elevated Runway Guard Light



- Pull up the scale ring on the breakable coupling part, stick to the lower edge of the light fixture, then rotate the scale ring to an appropriate position (the scale center line is towards the aircraft approach direction), and tighten the scale ring fixing bolt
- Rotate the light fixture, adjust it to the design angle, and lock the fixing bolts.

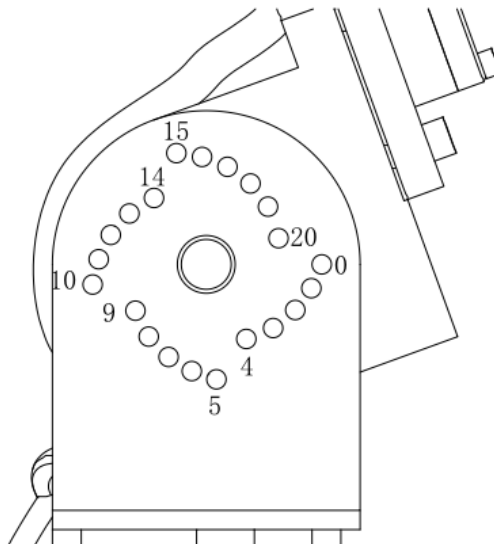
Figure 6 - Installation of Elevated Runway Guard Light scale ring 1



Note: Pitch angle adjustment: adjustable from 0 ° to 20 °, with a minimum adjustment of 1 °, as shown in the following figure:

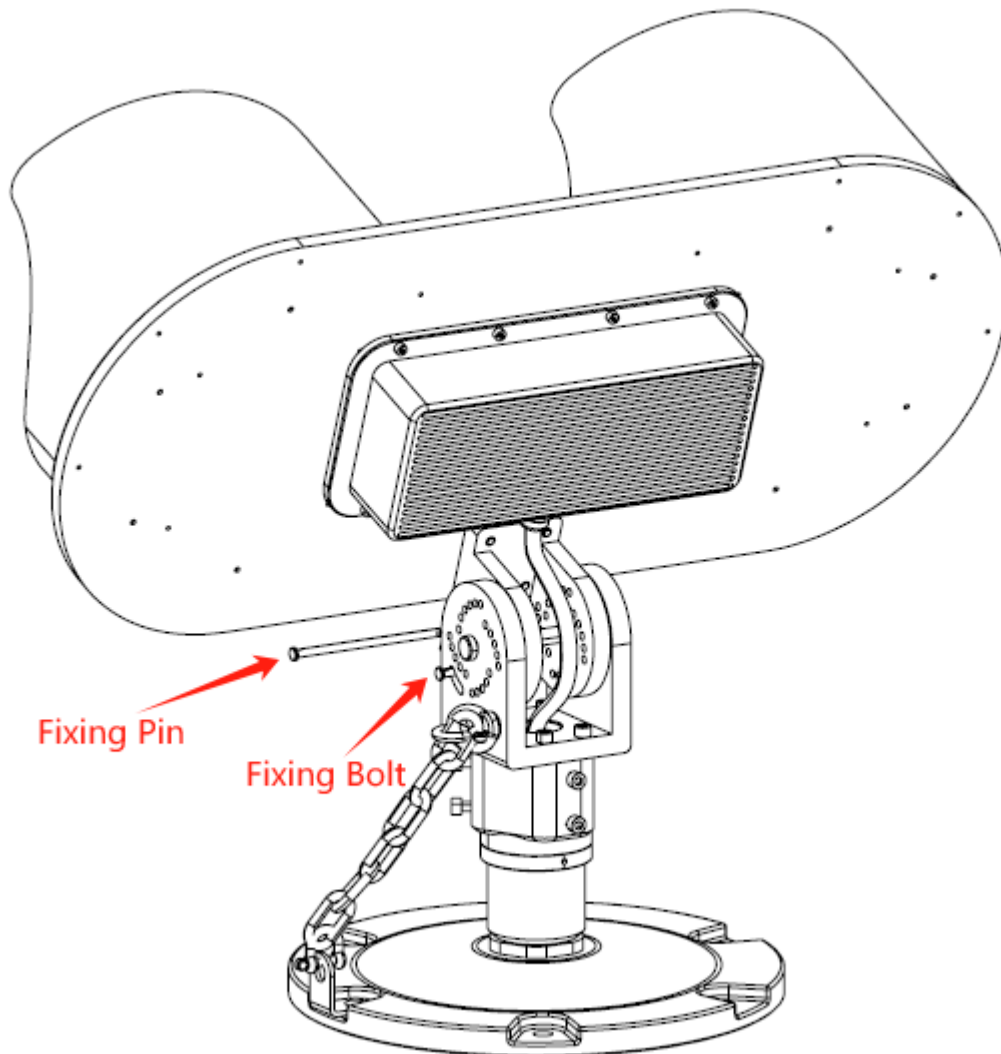


Figure 7 - Installation of Elevated Runway Guard light scale ring 2



- Loosen the pitch angle fixing bolt, pull out the R buckle at the front end of the fixing pin, and pull out the fixing pin
- Turn the light fixture vertically to the design angle, insert the fixing pin and R buckle, then tighten the fixing bolt.

Figure 8 - Elevated runway guard light pitch Angle adjustment assembly diagram



4. Maintenance

Note: For trouble shooting, please refer to 4.5 in this manual.



4.1 General maintenance procedures

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 2.

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



Table 2 - general maintenance plan for elevated runway guard lights

Maintenance frequency	Method
Everyday	Check the light-emitting
	Check whether the light fixture glass cover is damaged
Semiannual	Check whether the light fixture is damaged
	Clean the dust and dirt on the surface
Annual/Biennial	Check the fixing condition and bolt torque
	Check the sealing performance
	Clean optical components (if necessary)

4.2 Tools preparation

Maintenance tools and materials are as follows:

- torque wrench: nut 16mm/17mm
- Socket wrench : 16mm/17mm
- Allen wrench : metric 3-5
- 13/16 open end wrench
- Clean rag
- Special dust-free cloth for optical lens cleaning
- Optical lens cleaner
- Thermal grease
- Tweezers

4.3 Maintenance items

For the light fixture deployed on the pavement, the following maintenance items are available:

Table 3 - 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 4.4

Fail open function

See section 4.5

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.

4.4 Operation steps

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 Disassembly and assembly of glass front cover

Disassembling the front cover:

- Turn the lamp upside backwards
- Remove the screw with an Allen wrench (metric No. 3)
- Open the glass front cover
- Remove O-ring from light fixture

Figure 9 - Diagram of disassembly front cover of Elevated Runway Guard Light



Assemble the front cover:

- Clean the dirt and dust in the O-ring groove and keep it clean and dry
- Put in a new light fixture body sealing ring
- Insert the flat cable at the light source end into the main board
- If possible, the light fixture can be checked by power-on before installation.
- Close the glass front cover, align the screw holes, and screw the bolts with an Allen wrench (specification: metric 3), with a torque of 2Nm

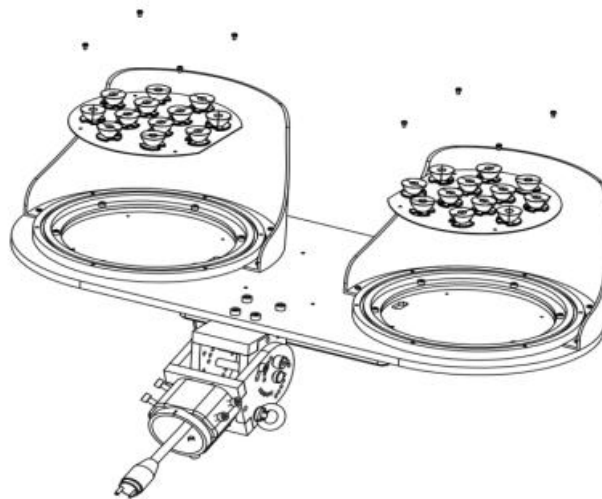
4.4.2 Disassembly and assembly of light panel

assembly

Disassembling the light panel:

- Unplug the cables from the light source assembly
- Remove the screws of the light source assembly with a phillips screwdriver (specification: Ph1)
- Remove the LED aluminum based circuit board from the light source assembly
- After removing the light source assembly, place it properly

Figure 10 - Diagram of disassembly of elevated runway guard light panel



Assemble the light panel:

- Attach the LED aluminum based circuit board on the main board, and align the holes
- Use a phillips screwdriver (specification: Ph1) to tighten the screws with a torque of 1.2Nm
- Connect the flat cable
- Use a phillips screwdriver (specification: Ph1) to tighten the screws with a torque of 1.2Nm

Note: Make sure that the cable is plugged tightly and gently pulled without falling off.

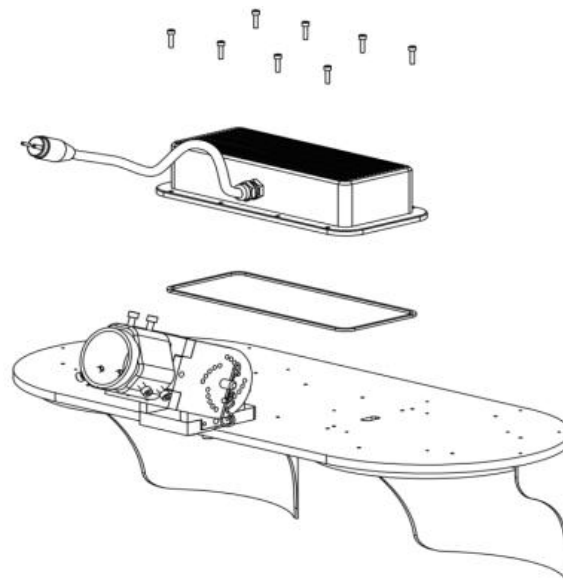


4.4.3 Disassembly and assembly of rear cover assembly

Disassemble the bottom cover:

- Turn the light fixture upside down
- Remove 10 screws with an Allen wrench (metric No. 3)
- Open the rear cover
- Remove the connection terminal of the power cable
- Take out the light body O-shaped sealing ring

Figure 11 - Diagram of disassembly rear cover assy of Elevated Runway Guard Light



Assembling rear cover:

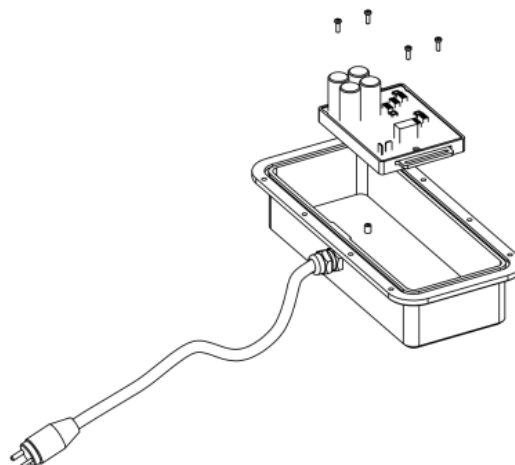
- Clean the dirt and dust in the O-shaped sealing ring groove of the rear cover and keep it clean and dry
- Put in a new sealing ring
- If possible, the light fixture can be checked by power-on before the bottom cover is installed.
- Close the top and bottom covers, and use an Allen wrench (specification: metric 3) to screw the bolts with a torque of 2Nm

4.4.4 Removal and installation driver module

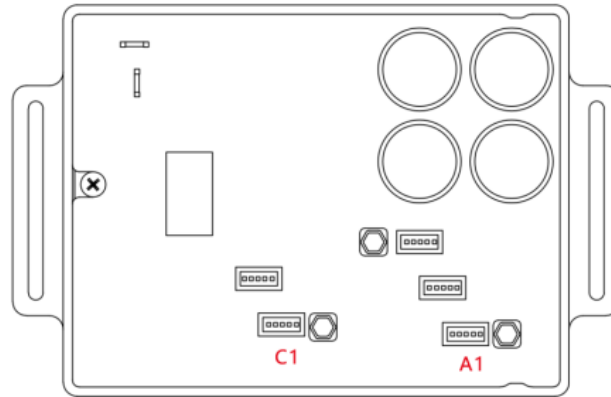
Disassembling the driver module:

- Unplug all cables
- Use a Phillips screwdriver (Ph1) to remove 4 screws of the driver module.
- Pick up the drive module

Figure 12 - Disassembly Diagram of Elevated Runway Guard Light drive module

**Assembly driver module:**

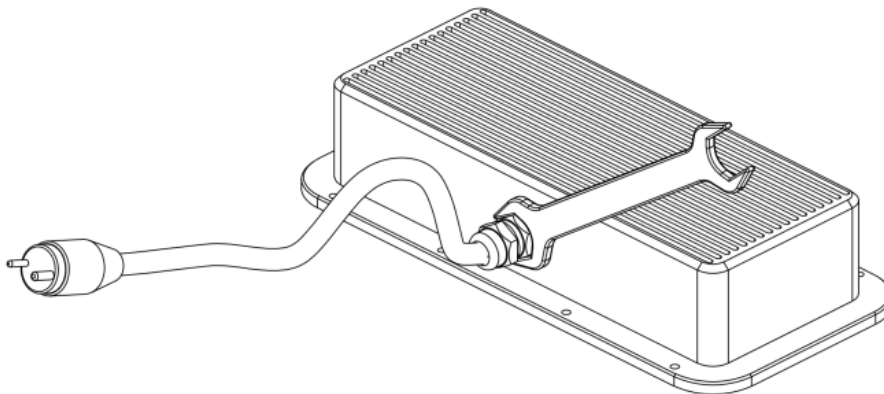
- Put the driver module into the top cover and align the screw holes
- Use a phillips screwdriver (Ph1) to install the screws with a torque of 1.2Nm
- Connect the cables

Driver module interface description:**Figure 13 - Diagram of Elevated Runway Guard Light driver module interface**

4.4.5 Disassembly and assembly of power cable in rear cover

Disassembly:

- Remove the power cord sealing head and place the opening of the rear cover down and parallel on a working surface
- Use a 13/16 open-end wrench to hold the root of the power cord sealing head and turn it counterclockwise until the sealing head is completely separated from the mounting hole of the bottom cover
- Pull out the cable and clean the mounting hole

Figure 14 - Diagram of removing rear cover power cord of elevated runway guard light

Assembly:

- Take the new parts to be replaced, pass the cables through the mounting holes of the bottom cover and reserve 10 cm cable inside
- Screw the sealing head of the power cord clockwise into the mounting hole, tighten the hexagon nut at the root of the head and the cable locking hexagon nuts with a 13/16 open-end wrench. If the power cord is loose, tighten the locking nut

4.5 Trouble Shooting

Table - 4 Trouble Shooting

Malfunction	Trouble shooting steps
Can not work normally	1. Turn on the light again after turning it off for one minute;
	2. If the fault is not eliminated, check the plug of power cord
	3. If the fault is not eliminated, check the cable connection between the power cable and the driver board;
	4. If the fault is not eliminated, check the driver board;
Water leakage	1. Check the sealing condition of the front cover;
	2. If the fault is not eliminated, check the seal ring and the seal groove on the light body;
	3. If the fault is not eliminated, check the sealing head of the power cord;

Can not adjust the light intensity normally	1. Confirm that the CCR and isolation transformer are fault-free and operation without problems; 2. If the fault is not eliminated, replace the driver board;
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Light-emitting unstable and flickering	1. Confirm that the specifications of the CCR and isolation transformer match the operation requirements of the light fixture, and fault-free and operation without problems; 2. If the fault is not eliminated, replace the driver board; 3.if the fault is not eliminated, contact the manufacturer for further instructions;
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5. Support

5.1 Customer Service

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

After-sales service hotline

China: +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 an already professional 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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