

LED Elevated Runway Edge Light

EBL-RE-LED

Operation Manual



Please read this manual carefully before construction, installation and operation of the product.
Please keep this manual properly for further reference.

This manual is subject to change without prior notice.

Airsafe Airport Equipment Co., Ltd.

Revision Description

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Table of Content

1.0 Foreword.....	1
1.1 Illustrations and Meanings.....	1
1.2 Safety Rules and Notices	2
1.3 Quality Assurance and Responsibility	3
2.0 Introduction	4
2.1 Technical Specifications	5
2.2 Application Environment.....	5
2.3 Application Scope.....	5
2.4 Technical Parameters	5
2.5 Technical Features	6
2.6 Structure.....	6
2.7 Fault Detection or Lamp Bypass Functions.....	7
3.0 Installation	8
3.1 Installation Methods	8
3.2 Installation Tools.....	9
3.3 Screw and Torsion	9
3.4 Direction Installation of Flange	10
4.0 Operation and Control	12
4.1 Light Wiring Schematic Diagram.....	12
4.2 Light Intensity Adjustment and Control	12
5.0 Replacement of Components of Lighting Fixtures	13
5.1 How to Replace Frangible Pole	14
5.2 How to Replace Front Glass and its Gasket Sleeve.....	15
5.3 How to Replace Gasket	16
6.0 Maintenance of Lighting Fixtures	17
6.1 Daily Maintenance.....	17
6.2 Regular Spot Check and Troubleshooting	18
7.0 List of Components and Ordering of Spare Articles and Accessories	19
8.0 Packaging, Transportation and Storage	21
8.1 Packaging and Weight.....	21
8.2 Transportation Mode.....	21
8.3 Storage	21

1.0 Foreword

ICAO Airport Service Manual Part 9 “Airport Maintenance Practices” and FAA AC150/5345-26 Maintenance of Airport Visual Aid Facilities are the highest criteria for site installation and maintenance of such lighting fixtures. This manual was compiled with considerable reference to these two criteria.

The content stated in this manual is absolutely important, so construction personnel must read it carefully before construction. After properly understanding the entire content of this manual, construction personnel should carry out the construction in strict accordance with the methods specified herein, to ensure that the product is safely and properly installed in place.

Routine airport maintenance personnel should carry out the routine maintenance in strict accordance with the methods specified by relevant provisions, to ensure that the lighting fixtures are in the best operation condition.

Related personnel must strictly follow safety criteria. Any personnel without specialized training is strictly forbidden to touch the lighting fixtures and devices. Live line work should be avoided under any circumstances. Construction or maintenance personnel should get acquainted with first-aid knowledge, in case of any unexpected events.

1.1 Illustrations and Meanings

- Following illustrations will appear in this manual where necessary to remind or warn construction or maintenance personnel.
- Please continue reading the subsequent content of this manual after properly understanding the meanings of these illustrations.



- To remind that the behavior may cause serious injury or death.
- ※ Detailed description will be given in the box.



- To remind that the behavior may cause injury to people or damage to product.
- ※ Detailed description will be given in the box.



- To notify that the behavior is prohibited.
- ※ Detailed description will be given in the box.

1.2 Safety Rules and Notices



- Using the light fixtures outside of airport is strictly prohibited.
- ※ Inadequate maintenance or casual touch will cause light faults.



- Using power supply other than CCR is strictly prohibited.
- ※ Other power supply may cause damage to light source or other component of the lighting fixtures, or even malfunctions of power supply.



- Making sure that CCR is on power-off state before the installation or maintenance of the lighting fixtures.
- ※ Current surge produced during the installation of the lighting fixtures may cause damage to light source.



- Non-professional electricians are strictly forbidden to maintain any electrical fault of the lighting fixtures.
- ※ It may damage any electrical component of the lighting fixtures or cause bigger fault.



- Live line maintenance of the lighting fixtures is strictly prohibited; in case of lightning and/or thunderstorm, maintenance of the lighting fixtures is prohibited.
- ※ It may cause electric shock accident.



- Be careful when handling the lighting fixtures.
- ※ Falling to the ground may cause damage of the optical cover or other internal components of the lighting fixtures and injury of personnel.



- Replace the lead immediately in case the jacket of second cable is damaged.
- ※ It may cause short circuit, electric shock or other failure.



- Don't touch the damaged optical cover or other glass directly with hands.
- ※ Glass fragments may scratch hands.



- Touching the lighting fixtures with wet hand is strictly prohibited.
- ※ It may cause electric shock or other accident.

1.3 Quality Assurance and Responsibility

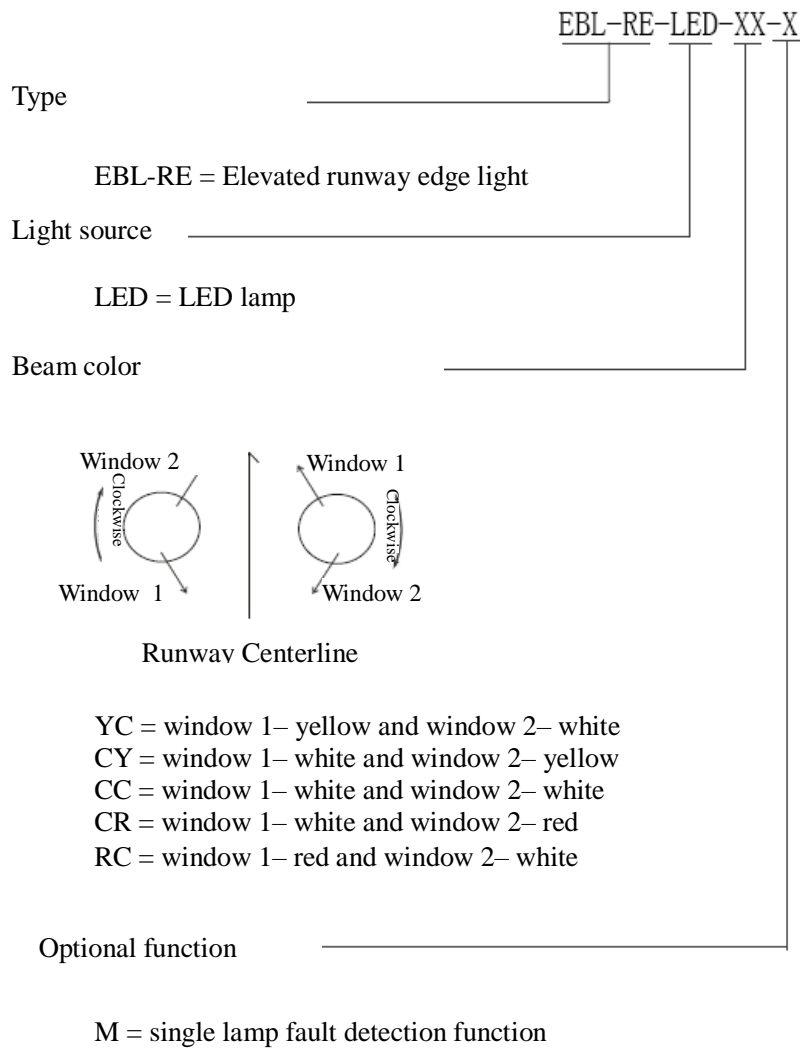
Any defect in design, material or workmanship, which may occur during proper and normal use over a period of one year from date of installation but less than 15 months from date of shipment, or within the warranty period of the tender, will be repaired or replaced by manufacturer free of charge. The warranty doesn't cover the failures resulting from lamp burnt out, improper maintenance, installation or operation, or damages due to snow ploughs. Manufacturer shall not be liable to any further claims or particularly claims for damages not affecting the goods themselves.

2.0 Introduction

This manual involves the following series lighting fixtures:

EBL-RE-LED ----- LED Elevated Runway Edge Light

Type of LED Elevated Runway Edge Light (EBL-RE-LED):



2.1 Technical Specifications

This product conforms to the provisions of the following standards or technical specifications. For dated standards or technical specifications, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- International Electrotechnical Commission (IEC) TS 61827;
- Convention on International Civil Aviation Annex 14- *Aerodromes* Volume 1;
- International Civil Aviation Organization (ICAO)- *Aerodrome Design Manual*- Part 4: Visual Aids;
- Federal Aviation Administration (FAA) AC150/5345-46;
- Federal Aviation Administration (FAA) EB 67;
- GB/T 7256 *General Requirements of Lighting Fixtures for Civil Airport*;
- Department of Airport of Civil Aviation Administration of China: Advisory Circular, *Technical Requirements for Runway and Taxiway Aid Lighting Fixtures* (AC-137-CA-2015-03) ;
- Department of Airport of Civil Aviation Administration of China, Advisory Circular, *General Technical Requirements for Civil Airport LED Aid Lighting Fixtures* (AC-137-CA-2015-01) ;

2.2 Application Environment

- Altitude: below 4,000m;
- Outdoor: -55°C ~ +55°C;
- Relative air humidity: not more than 95%;
- In rain, snow, ice and water;
- Expose to corrosive salt atmosphere.
- Basic earthquake intensity VII.

2.3 Application Scope

Runway edge light for Category I, II, III airports.



■ Using the lighting fixtures beyond the specified scope is strictly prohibited.

※ Application beyond the specified scope will cause damage or risk to any component.

2.4 Technical Parameters

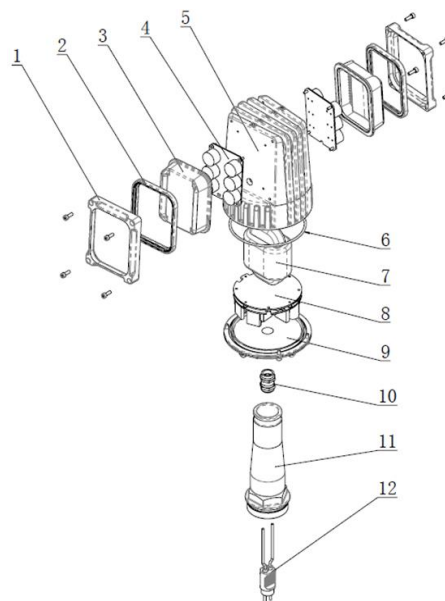
Description	Type	Rated Power	Power Factor	Life of Light Source
LED Elevated Runway Edge Light	EBL-RE-LED-XX-XX	36VA	>0.9	≥50,000h

2.5 Technical Features

- Long life, energy saving, maintenance free and other characteristics of LED will bring huge economic benefits to customers;
- Dimming curve of the lighting fixtures is consistent with the change of halogen lamp, and meets the requirements of FAA;
- Strict LED color management ensures the consistency of light color;
- Proprietary drive circuit and thermal management solution greatly improve the reliability and service life of the lighting fixtures;
- Optional single lamp fault detection function enables the light to be open as halogen lamp once LED fails;
- Compact structure, attractive appearance, small windward area and strong wind resistance capability;
- Main body of the lighting fixtures is made of aluminum alloy material with special anodizing surface treatment, and all fasteners are made of stainless steel, thus being applicable to all kinds of harsh environment;
- High precision components machining ensures dimensional quality and precision of the lighting fixtures;
- Forged frangible device with precise machining, complying with FAA standards and ensuring stable and reliable performance;
- The lighting fixtures can be connected to 1 inch or 2 inches frangible tube, which ensures convenient and secure installation;

2.6 Structure

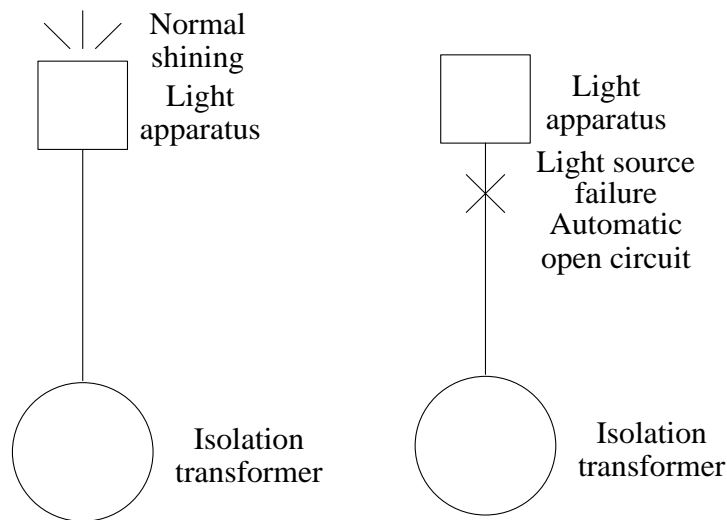
- 1 - Cover bracket
- 2 - Optical cover gasket
- 3 - Optical cover
- 4 - LED lamp assy
- 5 - Light body
- 6 - Body gasket
- 7 - Transformer
- 8 - Drive assy
- 9 - Bottom cover
- 10 - Waterproof gland
- 11 - Frangible pole
- 12 - Plug



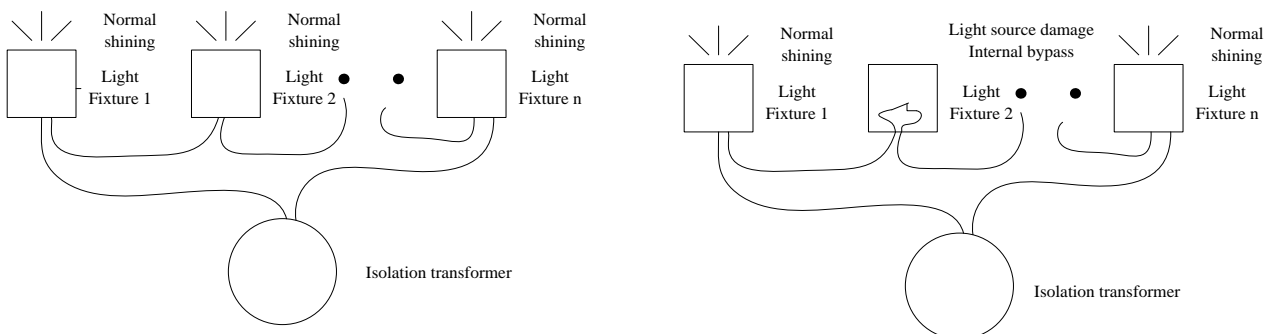
2.7 Fault Detection or Lamp Bypass Functions

This product complies with the requirements of FAA EB67 and GB/T 7256, and integrates single lamp fault detection function; Or, it can provide the option of lamp bypass function in accordance with the requirements of FAA AC150-5345/46.

Single lamp fault detection function: The light will take automatic action to cut off the input when any malfunction occurs on the lamp and achieve an effect similar as the open circuit of ordinary halogen light once it is burnt. This function is generally used in conjunction with single lamp controller, to help single lamp control and monitoring system to identify any failed light. And it is integrated into the interior of the lighting fixtures, without need of any external device. Please specify this function during the ordering if needed.



Lamp bypass function: After any failure occurs to the lamp, relatively, the input terminal of light will be short to the isolation transformer. This function is generally applicable to occasions that one isolation transformer carries multiple lighting fixtures. If one or more of these lighting fixtures is or are damaged, the remaining lighting fixtures will not go out thereby. This function is integrated into the interior of the lighting fixtures, without need of any external device. Please specify this function during the ordering if needed.



3.0 Installation

Requirements for installation should be learned thoroughly before installation including installation tools and site requirement, etc., to avoid malfunction of the light due to incorrect installation.

3.1 Installation Methods

- Mounted on L- 867 deep base (Figure 3-1).
- Directly mounted with flange (Figure 3-2).
- Mounted on embedded pipe (Figure 3-3).

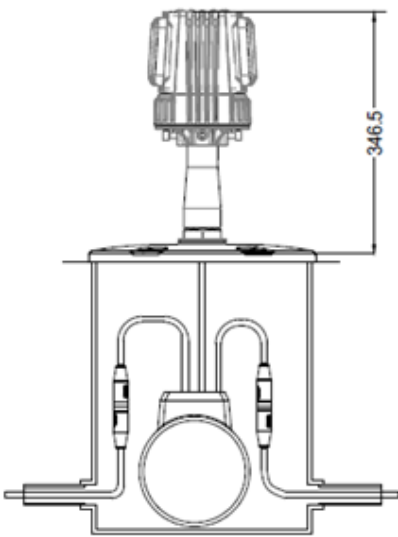


Figure 3-1

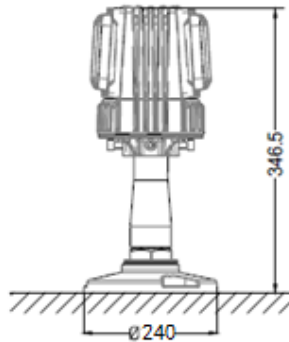


Figure 3-2

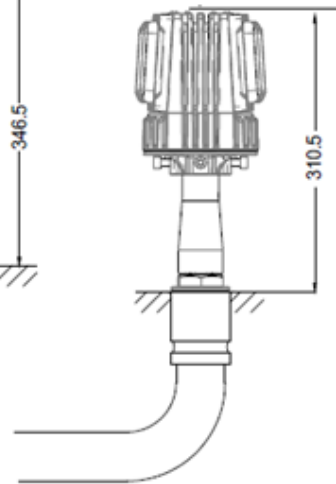


Figure 3-3

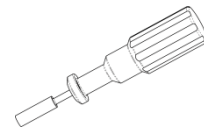


- Confirm window color and lighting direction before installation.
- ※ To avoid rework or any other problem.

3.2 Installation Tools

Choosing right tools not only can ensure the correct and reliable installation of the lighting fixtures, but also can reduce unnecessary safety accidents. *Special Tools* listed in the table may be purchased from the manufacturer or any distributor. Universal tools are available on local hardware market. Please pay attention to measurement range during procurement.

- Special tool- Elevated light nut wrench: be used to dismount the lighting fixtures, and available directly from the manufacturer or any distributor.
- Universal tool- Torque screwdriver: be used to dismount screw, equipped with PH2 cross screwdriver, and sellable in various hardware stores.



Recommended range is 1-6N.m.

3.3 Screw and Torsion

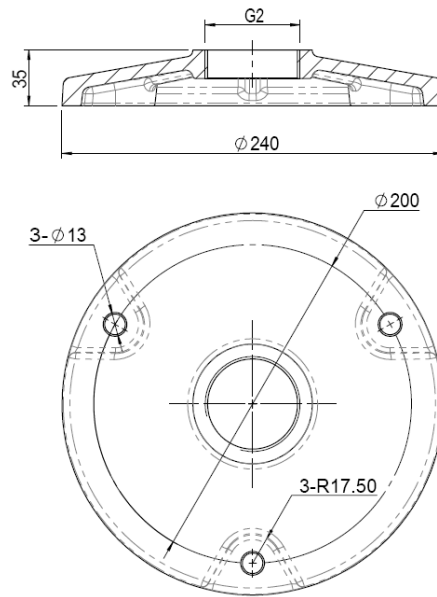
The torque listed in this section is only for reference by maintenance personnel. Correct fastening force of screw can ensure normal operation of the lighting fixtures. If screw is too tight, it will easily damage the lighting fixtures; on the contrary, if screw is easy to fly out, it may cause an accident.

Serial No.	Screw Type	Tool	Torque
1	M6 screw	Internal hexagonal wrench	5 N·m
2	M4 screw	Force measuring screwdriver with cross screwdriver (PH2)	1.5 N·m



- Please use torque wench or other special tool for installation.
- ※ Informal tools may cause damage to fasteners or personal injury.

3.4 Direction Installation of Flange



- This manual does not give any guidance to installation of chassis. Please seek for technical support from construction side. Dimension of chassis to be installed is as follows:
- After installation of chassis (embedded pile) (See Figure 3-4), in accordance with construction requirements, connect secondary cable, and screw frangible pole of the lighting fixtures in the threaded hole on flanges. (See Figure 3-5).
- After pre-tightening the lighting fixtures, screw down the lighting fixtures with special wrench. (See Figure 3-6 and Figure 3-7).
- Then tighten screw. (See Figure 3-8).

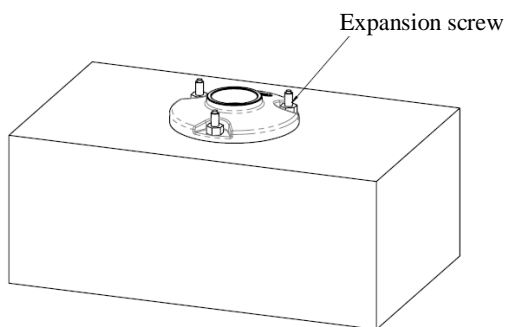


Figure 3-4

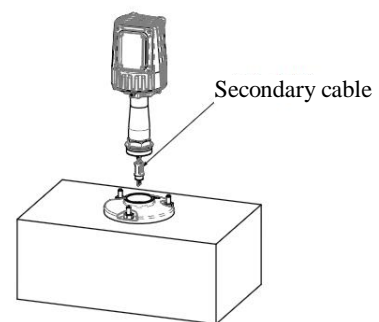


Figure 3-5

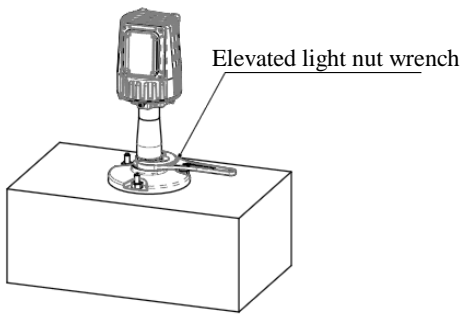


Figure 3- 6

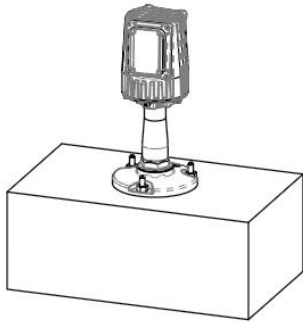


Figure 3-7

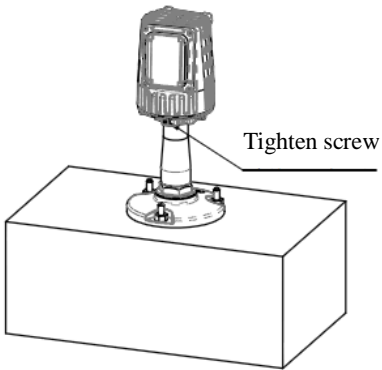
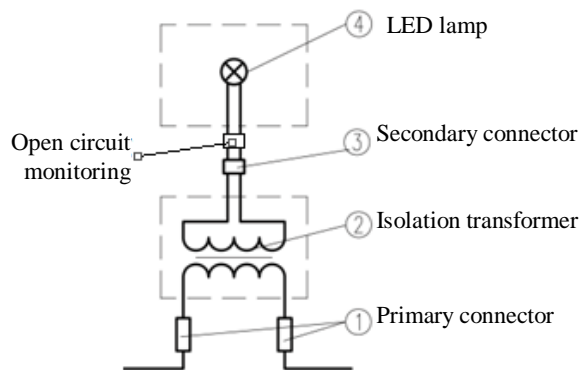


Figure 3-8

4.0 Operation and Control

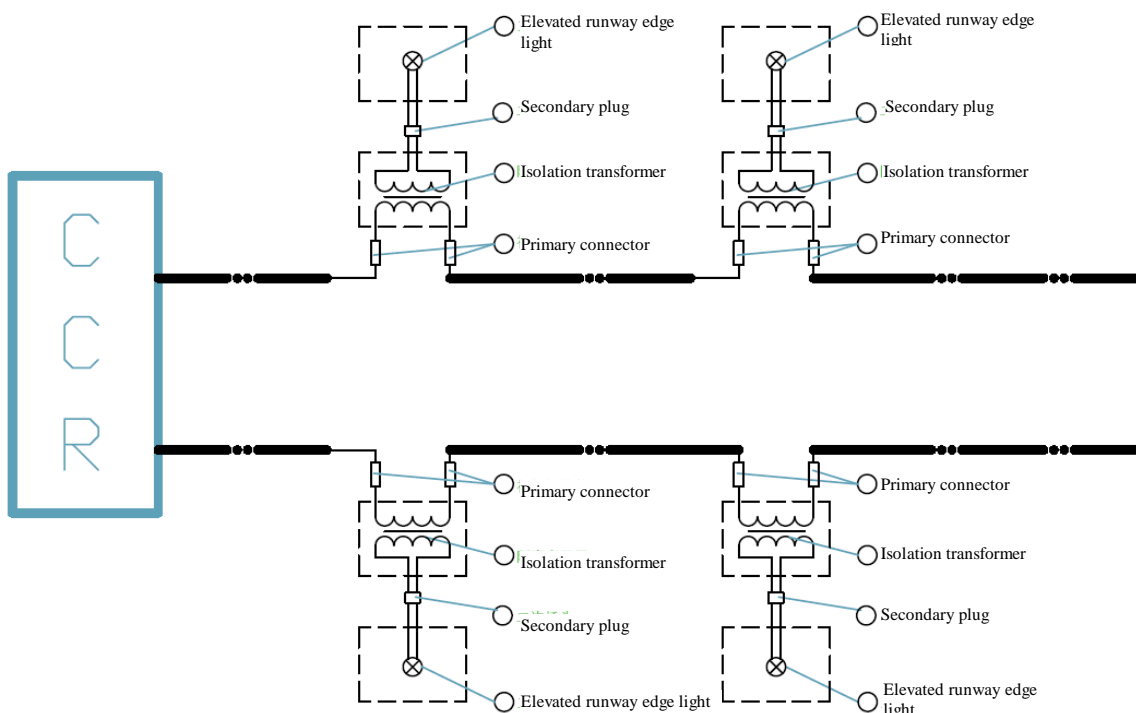
The lighting fixtures are applicable to CCR power supply 6.6A circuit special for airports, which forms a secondary circuit with the lighting fixtures through secondary outgoing line of isolation transformer connected on primary circuit. Due to the use of isolation transformer, the damage of lamp of single lighting fixture will not affect whole series circuit.

4.1 Light Wiring Schematic Diagram



4.2 Light Intensity Adjustment and Control

In actual use, according to weather visibility, light intensity of the lighting fixtures may be adjusted through different current output by CCR, and varies significantly. If it is used on occasion of lower than rated current (6.6A), it may greatly improve the service life of lamp.



5.0 Replacement of Components of Lighting Fixtures

When any damage or failure occurs to any consumable or other component of the lighting fixtures, it is required to timely dismantle the lighting fixtures for replacement of the component. Replacement of components needs to dismount the lighting fixtures, so any minor error will cause adverse consequences. The manufacturer requires users to attach importance to the following warnings. It is required to be careful during disassembly, to conduct comprehensive inspection of lighting fixtures, to replace some vulnerable parts as required, and to ensure the performance of the lighting fixtures after disassembly.



- Replacement of components must be conducted by personnel who have received professional training.
- ※ To avoid various failures of the lighting fixtures.



- It is suggested that maintenance of the lighting fixtures be carried out in lighting station or workshop.
- ※ Any impurities mixed in the lighting fixtures may cause any failure of the lighting fixtures.



- **The manufacturer suggests that various gaskets should be replaced during each maintenance of the lighting fixtures.**
- ※ **Aging and damage of gaskets are the main reasons for the leakage of lighting fixtures.**

5.1 How to Replace Frangible Pole

- Loosen fastening screw on the body, hold the head, and disconnect the lighting fixtures from flanges with elevated light nut wrench. (See Figure 5-1)
- Separate secondary plug; take new frangible pole, insert it in working position, and screw it down with internal hexagonal wrench. (See Figure 5-2)
- Connect to secondary plug, screw frangible pole in flanges, and fix the lighting fixtures on chassis with elevated light nut wrench. (See Figure 5-3)



- Before screwing frangible pole in or out of flanges, fastening screw must be loosened.
- ※ It may damage secondary line.

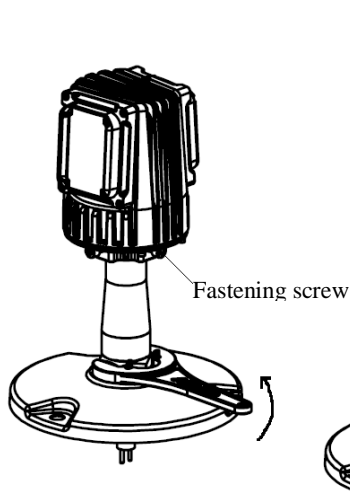


Figure 5-1

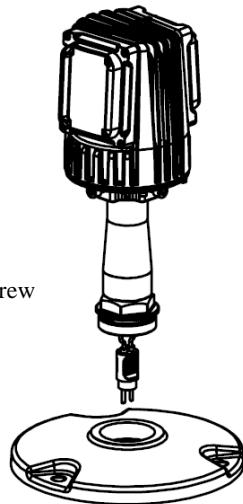


Figure 5-2

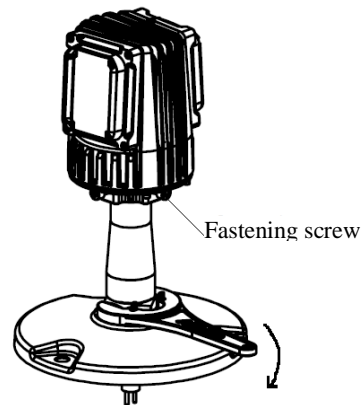


Figure 5-3

5.2 How to Replace Front Glass and its Gasket Sleeve

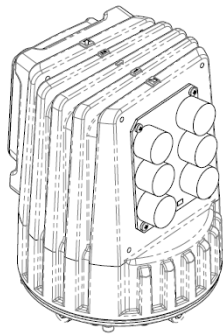


Figure 5-4

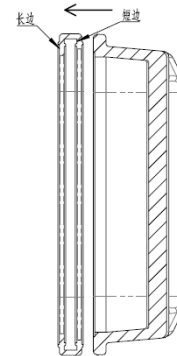
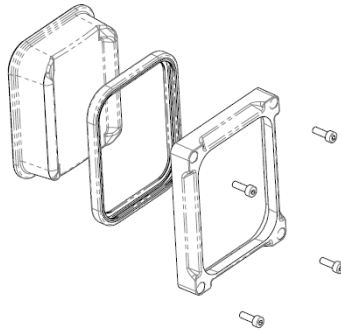


Figure 5-5

- Twist off four screws which fix front glass junk ring, and remove front glass junk ring. (See Figure 5-4)
- Take out old front glass and gasket sleeve, replace them with new front glass and gasket sleeve, pay attention to gasket sleeve direction and front glass direction, and make “TOP” inscription ↑ upward. (See Figure 5-5)
- Install junk ring, and tighten four screws in mode of opposite angle.



- It is strictly forbidden to directly touch outer and inner covers with hand. During operation, it is required to wear clean white gloves.
- ※ To prevent glass edge from scratching any fingers.
- ※ Fingerprint will be left on glass and affect optical performance.

5.3 How to Replace Gasket

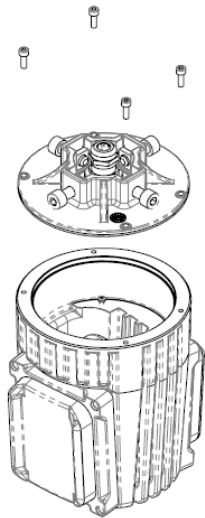


Figure 5-6



Figure 5-7

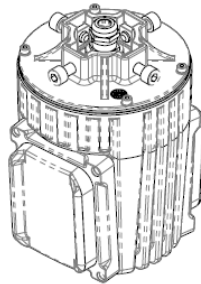


Figure 5-8

- Twist off four screws which fix the body and tray (See Figure 5-6).
- Remove old gasket of body, and install new gasket of body (See Figure 5-7).
- Close the body and tray (See Figure 5-8).



- Sealing tape or washer should not be taken out from bag before assembly.
- ※ If sealing tape or washer is stained with any impurities, it may cause water seepage of the lighting fixtures.



- It is required to carefully check sealing and sealing slot to ensure that they are not stained with any impurities.
- ※ Impurities being clipped in the middle is the main reason for the leakage of the lighting fixtures.

6.0 Maintenance of Lighting Fixtures

Suggestions for daily maintenance provided in this section are only for reference. Airports may formulate their own daily maintenance guidelines with reference to other provisions or maintenance experience of airport staff; the manufacturer does not provide any hard-and-fast rules.

Maintenance of the lighting fixtures for airports shall be conducted by professionals as stated in 1.0 Foreword.

6.1 Daily Maintenance

Interval	Check	Activity
Every day	No light output or flashing	Replace LED lamp assy.
	Light output is lower	<ol style="list-style-type: none"> 1. If optical cover surface is dirty, wipe it up. 2. Check deviation or moisture of the lighting fixtures. 3. Check aging or displacement of LED.
Every week	Obstacles to light output channel	Clean surface of route and optical cover.
Every month	Existence of moisture and water (Visual check of internal surface of prism)	<ol style="list-style-type: none"> 1. Open the body. 2. Clean, dry and check. 3. Replace gasket and any other damaged components.
Every two months	Tighten the screws	Check whether screw for tightening light body is locked.
After snow removal	Damage to lighting fixtures	<ol style="list-style-type: none"> 1. Replace seriously damaged light.
After snow removal	Light output is lower	<ol style="list-style-type: none"> 1. Sweep snow on the optical cover away. 2. If optical cover surface is dirty, wipe it up. 3. Check deviation or moisture of the lighting fixtures. 4. Check aging or displacement of LED.



- The manufacturer suggests that times of daily maintenance should be increased in rainy season.
- ※ To ensure normal operation of lighting fixtures.



- The manufacturer suggests that LED lamp assy should be systematically replaced when service life of LED lamp is up to 80%.
- ※ To ensure the consistency of light intensity of whole circuit.



- It is necessary to use torque wrench. Power wrench is strictly prohibited.
- ※ Otherwise, it may damage screw and thread, and thus cause an accident.

6.2 Regular Spot Check and Troubleshooting

Serial No.	Failure Phenomenon	Possible Reasons	Countermeasures
1	LED lamp assy failure	LED aging or other unknown failure	Replace LED lamp assy or send lighting fixtures back to factory for repair.
2	The lighting fixtures is darker	There are some stains on optical cover surface	Clean up stains on optical cover surface.
3	Existence of moisture and water	Damage to front glass or gasket	Replace front glass or gasket.

7.0 List of Components and Ordering of Spare Articles and Accessories

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 distributor 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:

Structure No.	Component Name	Order No.	Description
1	Cover bracket	24135	Optical cover junk ring
2	Optical cover gasket	41149	Front glass gasket sleeve LED
3	Optical cover	3110A	LED runway side - front glass
4	LED lamp assy	79243-C/ 79243-R/ 79243-Y	LED lamp 95×63.5 white/ LED lamp 95×63.5 red/ LED lamp 95×63.5 yellow
5	Body	241K1	LED two-way light body
6	Light gasket	41161	O-type gasket 106×3
7	Transformer	BR45-11346	R type transformer 45W
8	LED drive assy	979143	Circuit board- approach light -12X (component)
9	Body tray	241J1	Body tray
10	Waterproof gland	48404	Metal waterproof gland MG18×1.5
11	Frangible pole	24211	Frangible pole
12	A6 dual-core plug	HT70603	Secondary cable connector- A6 dual-core plug (Flat)- high temperature

List of supporting accessories of this product is as follows (needing additional order):

Serial No.	Order No.	Description
1	276A1	Flange 240
2	70703	A7 dual-core socket
3	54101	Elevated light nut wrench
4	27683	Flange 304mm (FAA standard)
5	TJB-12-L867	L867 deep bucket
6	ITF-45-066	45W isolation transformer
7	954211	Corrector assy



- When optical cover cannot work normally, please order it from our company.
- ※ Other brand glass may affect lighting angle and light intensity of the lighting fixtures.



- If secondary plug is damaged, please order it from our company.
- ※ Other brand plug may cause light leakage and other failures.



- When LED lamp cannot work normally, please send body to our company.
- ※ Users should not open the body for repair without authorization.



- When any frangible article is damaged, please order it from our company.
- ※ Frangible articles are components special for the lighting fixtures, and cannot be replaced.

8.0 Packaging, Transportation and Storage

8.1 Packaging and Weight

Packaging: 4 pcs / box (excluding flange)

Gross weight: 17.5 KG / box

Volume: 385*335*385

8.2 Transportation Mode

Well packed products may be transported in three modes- railway, highway and air according to factors such as transportation distance, quantity of lights and delivery cycle.

8.3 Storage

This product shall be stored in a place which is dry, well ventilated and far away from heat source and has no caustic gas. Custody should be checked on a regular basis.

The final right to interpret this manual is reserved by Airsafe Airport Equipment Co., Ltd.

Thanks for your purchasing and using AIRSAFE product!

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