

## **LED Sequence Flash Light System and LED Runway Threshold**

### **Identification Light**

### **SFLS-LED and RTIL-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

No.	Description	Version No.	Revised by	Approved by	Date
1	First release	V1.0	Z.H	C.SY	Sep.16, 2019
2	Modify the description of main control cabinet and update the communication cable	V1.1	W.M G.JH	C.SY	Apr. 1, 2020
3	Update the layout of main control cabinet	V1.2	G.JH	C.JQ	Nov.4, 2020
4	Replace the main control cabinet Replace the touch interface New power cable selection recommendation Add in-pavement LED flasher	V1.3	G.JH Z.H Y.YZ	C.JQ	Dec.9, 2021

## 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 System Introduction.....	4
2.1 Technical Specifications .....	6
2.2 Application Environment.....	6
2.3 Application Scope.....	7
2.4 Technical Parameters .....	7
2.5 Technical Features .....	8
2.6 Structure.....	9
2.6.1 Structure and Boundary Dimension of Main Control Cabinet.....	10
2.6.2 Structure and Boundary Dimension of Elevated Flash Light .....	11
2.6.3 Structure and Boundary Dimension of In-pavement Flash Light .....	12
2.6.4 Structure and Boundary Dimension of Unit Control Cabinet .....	13
2.7 Limiting Conditions of Flash Light System.....	13
2.8 Operating Instructions of Main Control Cabinet Panel .....	13
2.8.1 Electrification of Main Control Cabinet .....	13
2.8.2 Operation Interface of Main Control Panel .....	15
2.8.3 Function Introduction to Interfaces.....	17
3.0 Installation of System .....	25
3.1 Notices before Installation .....	25
3.2 Installation Tools.....	26
3.3 Confirmation of System Components.....	28
3.4 Installation of Main Control Cabinet and Unit Wiring Box.....	29
3.4.1 Placement of Main Control Cabinet .....	29
3.4.2 Placement of Unit Wiring Box and Light Head.....	29
3.5 Cement Installation Foundation of Flash Light .....	31
3.6 Specific Field Installation Methods of Lighting Fixtures .....	31
3.6.1 Installation Method 1): Backpack Type Installation .....	32
3.6.2 Installation Method 2): Separate Installation of Unit Wiring Box and Elevated Flash Lighting Fixtures .....	38
3.6.3 Installation Method 3): Installation of Elevated Mast .....	40
3.6.4 Installation of In-pavement Flash Lighting Fixture .....	42
3.6.5 Wiring between Unit Wiring Boxes.....	46
3.6.6 Seal of Unit Wiring Box .....	47
3.6.7 Installation Method of Light Head Cable from Light Head to Unit Wiring Box.....	47
3.7 Angle Adjustment of Elevated Flash Light Head .....	49
3.7.1 Angle Corrector and Installation.....	49
3.7.2 Adjustment of Horizontal Angle of Lighting Fixtures .....	50
3.7.3 Vertical Angle Adjustment of Lighting Fixtures .....	51
4.0 Electrical Installation of System.....	53
4.1 Flash Light System .....	53

---

4.1.1 Electric In-wiring Method .....	53
4.1.2 Communication Cable .....	54
4.1.3 Wiring Method of CAN Shielded Wire .....	55
4.2 Runway Threshold Identification Light.....	59
4.3 Overall System Wiring Diagram.....	60
4.3.1 Overall Wiring Diagram of Flash Light System.....	60
4.3.2 Overall Wiring Diagram of Runway Threshold Identification Light System .....	64
4.4 Internal Wiring Diagram of Main Control Cabinet.....	67
4.5 Physical Picture of Unit Wiring Box .....	71
4.6 Grounding .....	72
4.6.1 Method to Confirm Reliable Grounding.....	72
4.7 Self-Inspection Items before Startup of Flash System.....	73
5.0 System Safety Design Measures.....	75
5.1 Emergency Disposal after Failure of Main Control Cabinet .....	75
6.0 Replacement of System Components .....	76
6.1 Replacement of Rear Cover Gasket.....	76
6.2 Replacement of Light Body Gasket.....	77
6.3 Replacement of Light Body Gasket.....	78
7.0 Maintenance of Lighting Fixture System .....	80
7.1 Daily Inspection and Maintenance .....	80
7.1.1 Daily Inspection and Maintenance Items.....	80
7.2 Removal of Common Faults.....	81
8.0 List of Components and Ordering of Spare Articles and Accessories .....	82
8.1 Necessary Spare Parts List for Normal Operation .....	82
8.2 Spare Parts for Main Control Cabinet.....	82
8.3 Components and Spare Parts List of Elevated Lighting Fixtures .....	82
8.4 Components and Spare Parts List of In-pavement Lighting Fixtures .....	83
9.0 Packaging, Transportation and Storage.....	84
9.1 Packaging and Weight.....	84
9.2 Transportation Mode.....	84
9.3 Storage .....	84
Appendix I Selection of Power Cables and Communication Cables.....	85

## 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 is 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



- Installation or maintenance shall be performed in strict accordance with the instructions of this manual.
- ※ Fault may occur during daily operation.



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



- Stress on the upper part of the frangible pole is prohibited when it is installed.
- ※ It may cause break of the frangible pole.



- Installation or maintenance shall be performed when the power supply is in an off-position.
- ※ The current surge with unknown cause may damage the device.



- Non-professional electricians are strictly forbidden to maintain any electrical fault of the system.
- ※ It may cause electric shock or other personal injury.



- Prior to installation and use of lighting fixtures, their rated voltage must be confirmed.
- ※ It may cause electric shock or damage to the lighting fixtures.



- 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.
- ※ Drop of lighting fixtures or damage of glass may cause personal injury.



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

### **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.

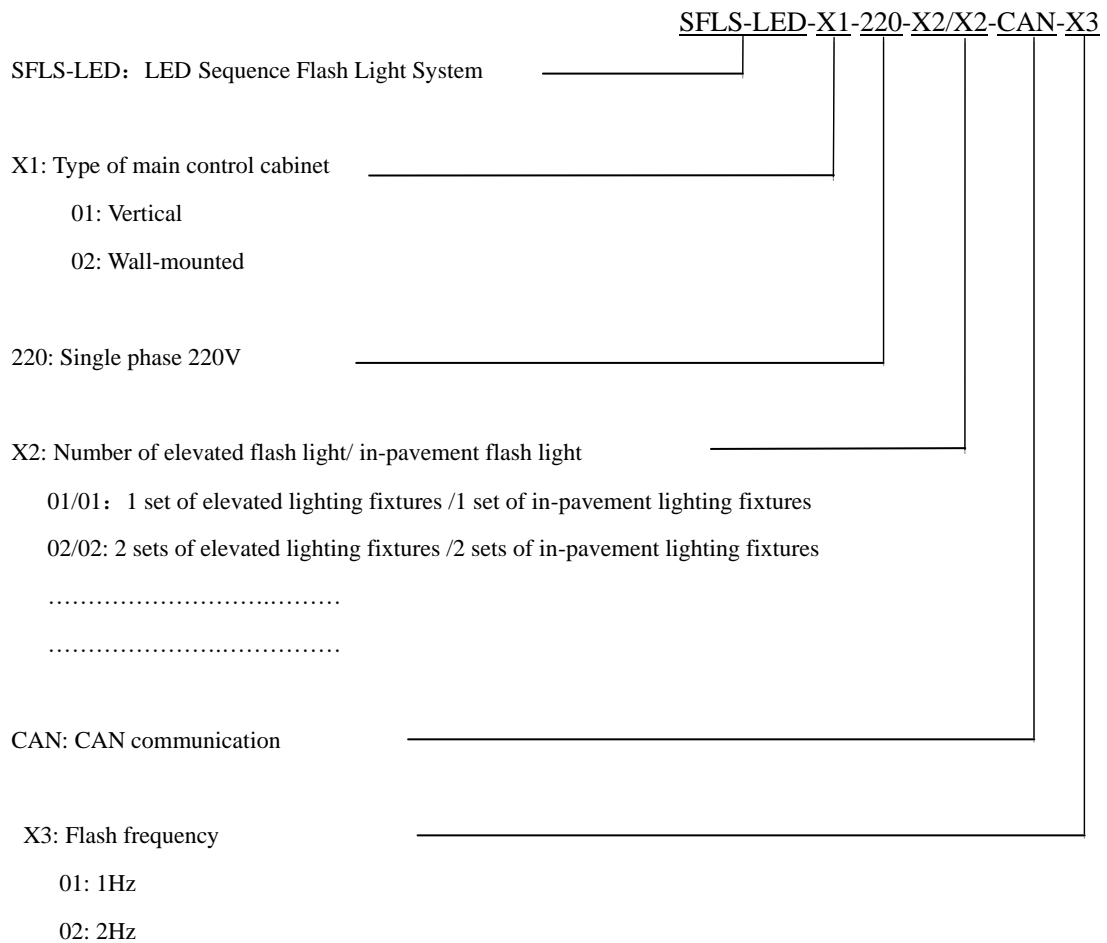
## 2.0 System Introduction

This manual involves the following series lighting fixtures:

SFLS-LED-----LED Sequence Flash Light System

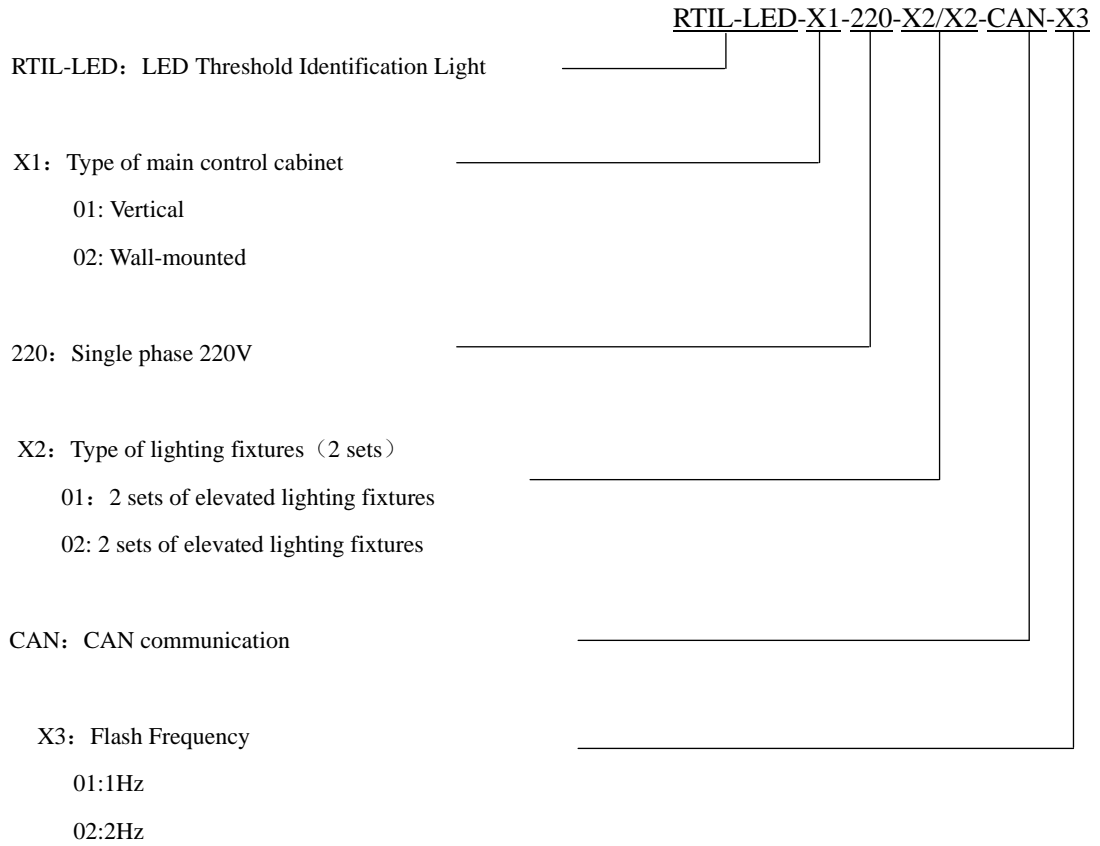
RTIL-LED-----LED Runway Threshold Identification Light

Type of LED Sequence Flash Light System (SFLS-LED):





Type of LED Runway Threshold Identification Light (RTIL-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 Electro-technical 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) FAA-E-2628 and FAA AC150/5345-51
- Federal Aviation Administration (FAA) FAA-EB67
- 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-2015-01-R1)
- Department of Airport of Civil Aviation Administration of China, Advisory Circular, *General Technical Requirements for Civil Airport LED Aid Lighting Fixtures* (AC-137-CA-2015-09)

## 2.2 Application Environment

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

## 2.3 Application Scope

Sequence flash light system and runway threshold identification 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

Name	LED Sequence Flash Light System		LED Runway Threshold Identification Light	
Type	SFLS-LED		RTIL-LED	
Form	Elevated	In-pavement	Elevated	In-pavement
Flash Frequency	2Hz / 1Hz			
Beam Distribution	Horizontal $\pm 15^\circ$ Vertical $0 \sim 10^\circ$	Horizontal $\pm 15^\circ$ Vertical $2 \sim 12^\circ$	Horizontal $\pm 15^\circ$ Vertical $0 \sim 10^\circ$	Horizontal $\pm 15^\circ$ Vertical $2 \sim 12^\circ$
Adjustable Range of Elevation	$0 \sim 13^\circ$	/	$0 \sim 13^\circ$	/
Power	44VA	64VA	44VA	64VA
Brightness Level 1	150cd—450cd	150cd—600cd	150cd—450cd	150cd—600cd
Brightness Level 2	800cd—2000cd	500cd—2000cd	800cd—2000cd	500cd—2000cd
Brightness Level 3	8000cd—20000cd	5000cd—20000cd	800cd—20000cd	500cd—20000cd
Flash duration	$< 5.5\text{ms}$			
Service Life of Light Source (times)	$\geq 10^7$			
Ground resistance	$\leq 4\Omega$			

## 2.5 Technical Features

- Light distribution and color comply with the requirements of FAA-E-2628E and consultation announcement of CAAC.
- LED lighting is featured by long working life, energy conversation, maintenance-free, which brings enormous economic benefits to customers.
- Unit control is integrated into light, which has compact structure and more reliable operation.
- Main body of the lighting fixtures is made of aluminum alloy material with anti-corrosion surface treatment, and all fasteners are made of stainless steel, thus being applicable to all kinds of harsh environment.
- The prisms of in-pavement lighting fixtures are made of tempered glass, the surface of which can resist to wind and sand erosion.
- The upper cover of in-pavement lighting fixtures uses equal-strength design and forging process, which has good mechanical properties, strong bearing capacity and impact resistance.
- The overall protection grade of elevated lighting fixtures reaches IP67, and that of in-pavement lighting fixtures reaches IP68 and can withstand the internal pressure of 138kpa or the water pressure formed by the aircraft impact window.
- The main control cabinets and lamp head have CPU, which works independently and collaborative cooperation is achieved through the bus communication.
- Compared with traditional xenon flash, LED flash has low power consumption and high power factor.
- High voltage integrated constant current driver circuit ensures stable current output.
- The cable layout inside the lighting fixtures is simple and compact.
- Unique system reliability design ensures that Fault of any components of the lighting fixtures will not result in system paralysis.
- The system has flash missing detection, times accounting and online detection, etc.
- The LCD panel of the main control cabinet displays, accounts and records the operation state of the system.
- The monitoring system can achieve remote monitoring, operation state upload, and local

control.

- The anti-thunder measures are provided for the circuit, power source and communication cable and the anti-thunder class complies with the standard of FAA.
- The elevated lighting fixtures can be connected with 1 inch or 2 inches frangible pipe, easy installation, firm and reliable.
- With precision machining, the forged frangible components comply with the requirements of FAA, which have steady and reliable performance.

## 2.6 Structure

This sequence flash light system consists of:

1. Main control cabinet, with its dimension of 550mm ×550mm ×1,400mm; see Figure 2.1;

a set of flash light system has one main control cabinet.

Wall mounted main control cabinet, with its dimension of 600mm ×400mm ×200mm; See Figure 2.1.1.

2. For the elevated flash light head, overall height of the light head is 301mm (excluding the height of the extension pole) and the center height is 195.5mm; the dimension of the head is 211mm \* 211 mm. See Figure 2.2; a set of flash light system consists of several flash light heads. (The number of the flash light heads can be adjusted according to the user's requirements and the standard number configurations are 21 and 30 units and the number of the lighting fixtures can be adjusted within the range of 1~30 according to the user's requirements.)

3. For the in-pavement flash light, the outer diameter of the lamp is  $\Phi$  304, the height is 99, the installation dimension is the same as that of the 12 inch in-pavement lighting fixtures, and the protruding pavement is no more than 12.5mm. The number of in-pavement flash lights can be adjusted according to the user's requirements.

4. The dimension of the unit control cabinet is 300mm×300mm×140mm; for more information, see Figure 2.3.1, one set of flash light system consists of several unit control cabinets, the number shall be the same as flash lights.

### 2.6.1 Structure and Boundary Dimension of Main Control Cabinet

A main control cabinet consists of its panel and box, as shown in Figure 2.1. It is mainly responsible for controlling the whole flash light system and collecting its status. The simple appearance and personalized interface make the user to control and maintain the flash light system conveniently.

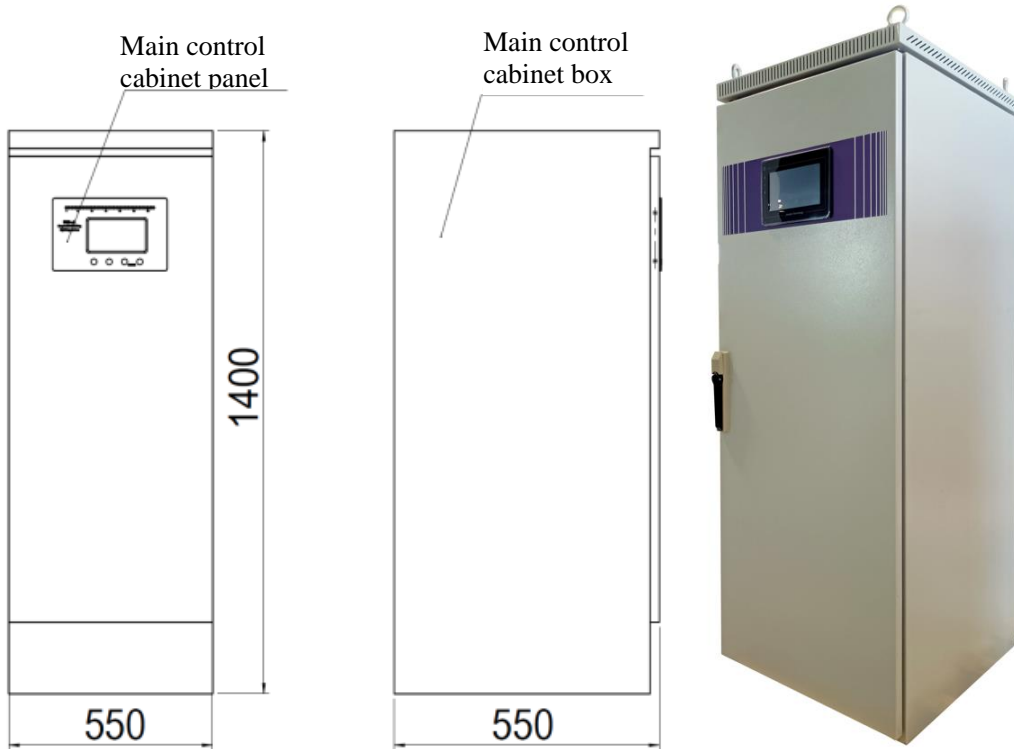


Figure 2.1 Dimension of Main Control Cabinet

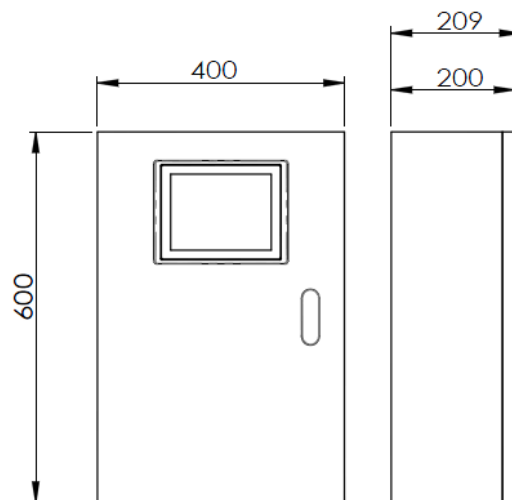


Figure 2.1.2 Dimension of wall mounted Main Control Cabinet

## 2.6.2 Structure and Boundary Dimension of Elevated Flash Light

The boundary dimension of the flash lamp head is shown in Figure 2.2. The lighting fixture housing is made of the aluminum alloy material and the lighting fixture is light and firm. All fasteners are made of the stainless steel material. User can adjust the angle elevation of the lamp head according to the field requirements, with the adjustable range of 0 °~13 °.

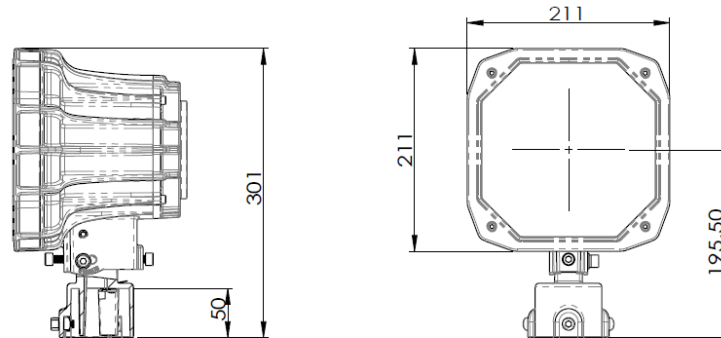


Figure 2.2 Dimension of Elevated Flash Light

### Main components of the elevated flash light:

- 1- Cover bracket
- 2- Optical cover gasket
- 3- Optical cover
- 4- LED lighting source components
- 5- Light body
- 6- Circuit board
- 7- O-ring gasket
- 8- Rear cover
- 9- Rear adjusting screw
- 10- Square nut
- 11- Nut Fixer
- 12- Front adjusting screw
- 13- Waterproof joint
- 14- Metal rotary plug
- 15- Hinge of light body

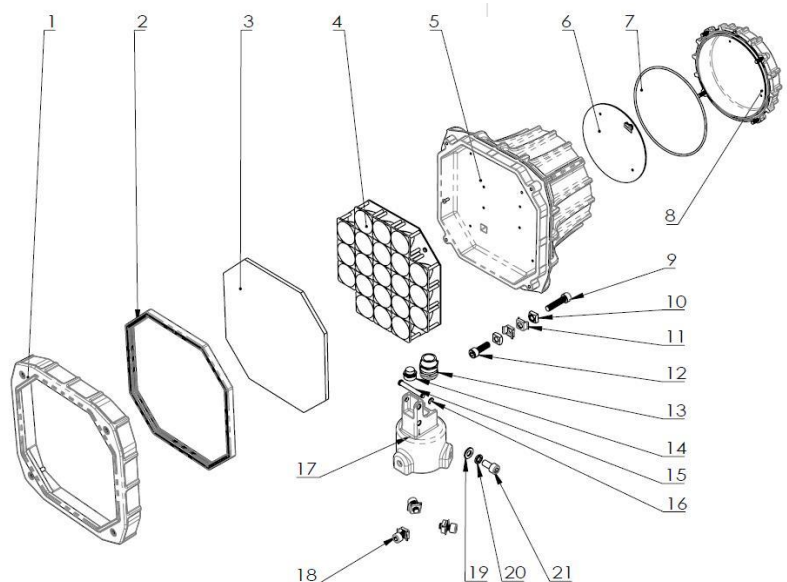


Figure 2.3 Main components of the elevated flash light

- 16- Retaining ring
- 17- Light body base
- 18- Locking screw vertical rod
- 19- Flat washer
- 20- Spring washer
- 21- Side locking screw

### 2.6.3 Structure and Boundary Dimension of In-pavement Flash Light

The appearance and installation dimension of the in-pavement flash light are consistent with the standard 12 inch in-pavement lighting fixtures. After installation, the protruding pavement shall not be more than 12.5mm. The lamp body is made of advanced aluminum alloy forging process. The surface of the lamp is subject to high wear-resistant and anti-corrosion chemical treatment, which is durable. All fasteners of the lamp are made of stainless steel, and the protection grade of the lamp body meets the air tightness requirements of the in-pavement lighting fixtures.

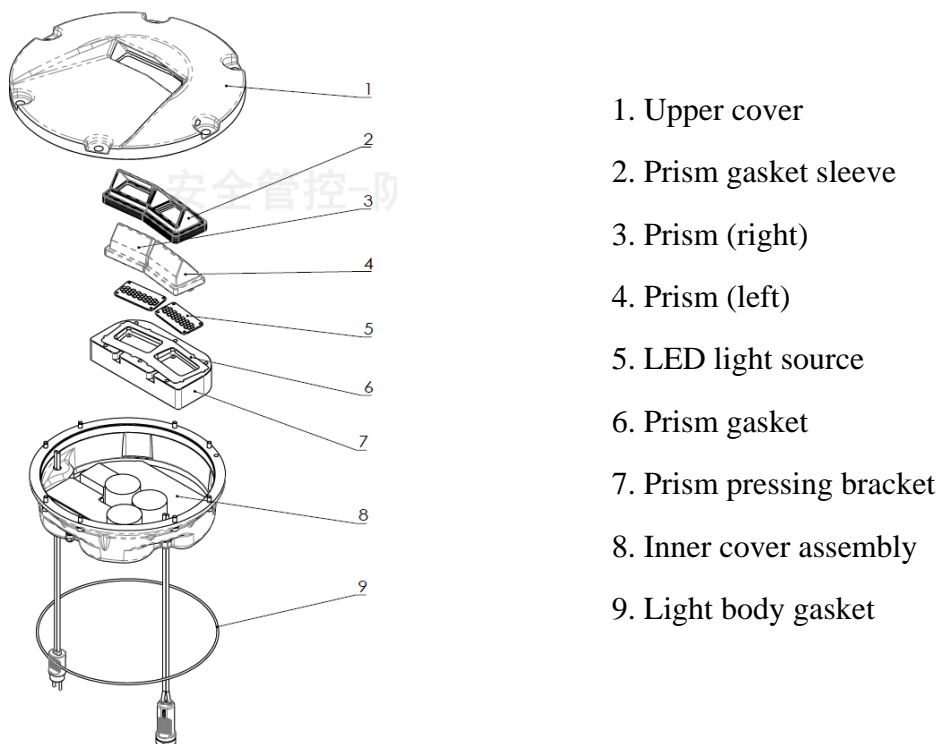


Figure 2.4 Main components of the in-pavement flash light



## 2.6.4 Structure and Boundary Dimension of Unit Control Cabinet

The dimension of the unit control cabinet is 300mm×300mm×140mm and the box is made of aluminium alloy with the protection grade of IP66, which has high airtightness performance, surface baking paint. Therefore, it may be used outdoors for a long time. See as Figure 2.4.1.

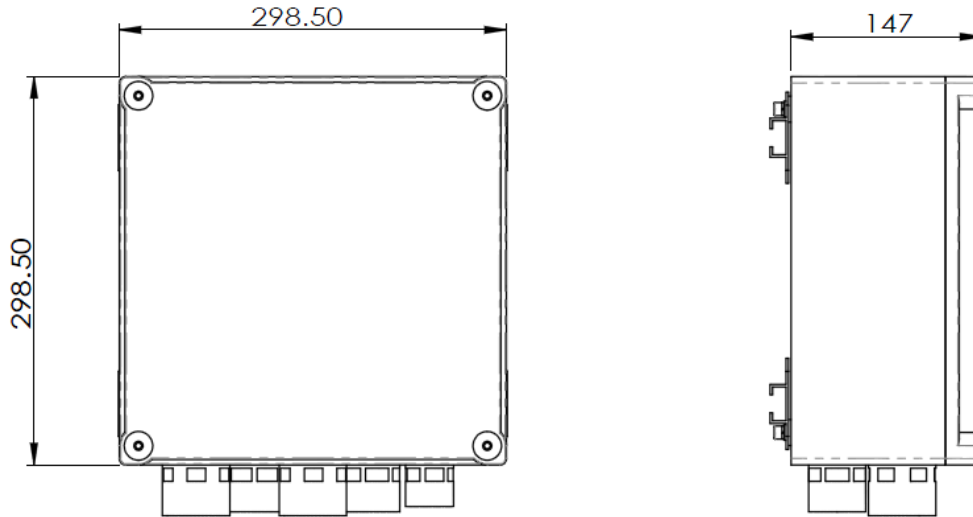


Figure 2.4.1 Dimension of the unit control cabinet

## 2.7 Limiting Conditions of Flash Light System

- 1).The standard factory configuration of the cable between the unit control cabinet of the flash light and its head is 6m.
- 2). If the length of the cable is longer than 6m, the user shall inform factory for customized length.
- 3).The number of the flash light units can be adjusted according to the user's requirements and the standard number configurations are 21 and 30 units; the user may also configure the number of the unit cabinets according to the actual requirements, with the unit number of 1~30.

## 2.8 Operating Instructions of Main Control Cabinet Panel

### 2.8.1 Electrification of Main Control Cabinet

When the main control cabinet is electrified, pay attention to turn on the main power switch, otherwise the system will not work normally. As shown in Figure 2.5:



Figure 2.5 Main power switch

After the main control cabinet is electrified, the interface display is as follows:

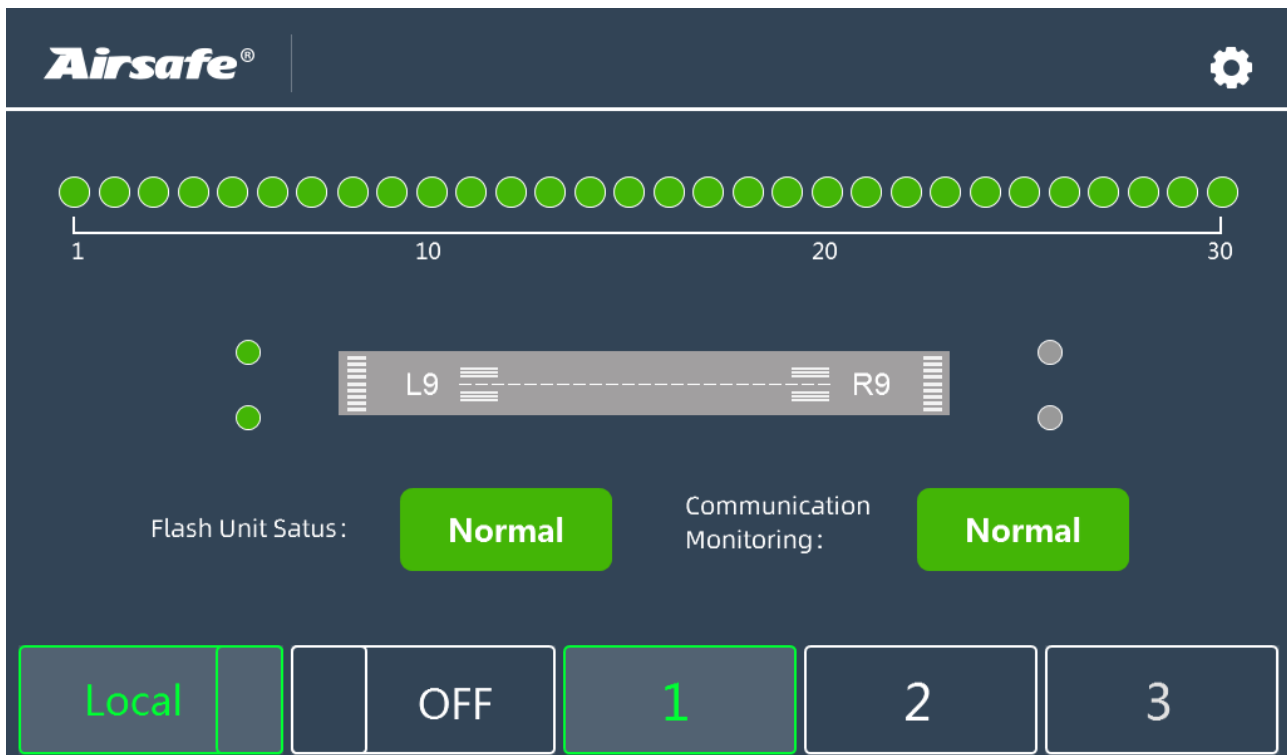



Figure 2.6 Main Interface of Main Control Panel



- Check whether the wire is connected correctly before the main control cabinet is electrified.
- ※ Incorrect input power source may cause system fault, or even system burnout.

## 2.8.2 Operation Interface of Main Control Panel

The operation of the flash main control cabinet is mainly carried out at the end of the main control panel. The selected screen is a resistive touch screen, which requires a certain pressure to trigger the key. Therefore, the operator is recommended to use fingernails or other flexible stylus for touch operation, rather than finger pulp operation.

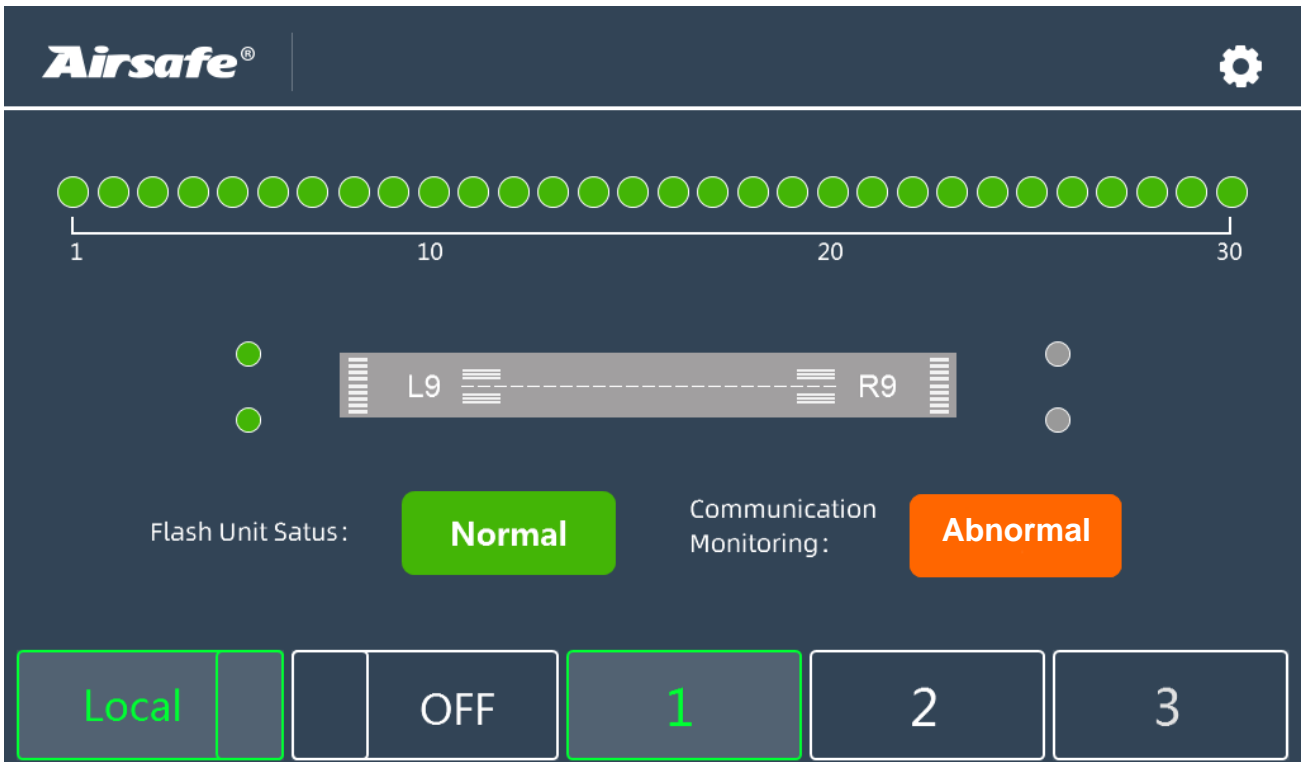





Figure 2.7 Button Indication of Main Control Panel

 is the menu button. Click on the menu, user can enter "fault view", "parameter view", "parameter setting", "address configuration", "timer" and other pages.

 Or  status view key: click "normal" or "abnormal" in the main page to enter the status view interface to view the current and recent faults, as shown in Figure 2.7.

Runway name setting key: click the runway to set the runway name, as shown in Figure 2.8.



Figure 2.8 Runway name setting page

LOCAL / REMOTE control button: the switch key of “Local control” and “Remote control” mode. In the "remote control" mode, the user can control and monitor the flash system through RS485 BUS by using the monitoring unit.

OFF/ON key: control the switch of the whole flash system, as shown in the figure above, the LCD is in the "OFF" state, and the system is now in the "OFF" state; Click the "OFF" key to open the system. At this time, the "OFF" state changes to the "ON" state.

1, 2, 3 number keys: used to adjust the brightness level. There are three brightness levels in the system, which can be adjusted by user according to the specific environment and weather conditions.

The system can switch between mode I and mode II / III to meet the special needs of some customers. Enter the "parameter setting" page, select the "CAT II / III" menu, and select "ON", then the home page will enter the switch mode, as shown in Figure 2.9.

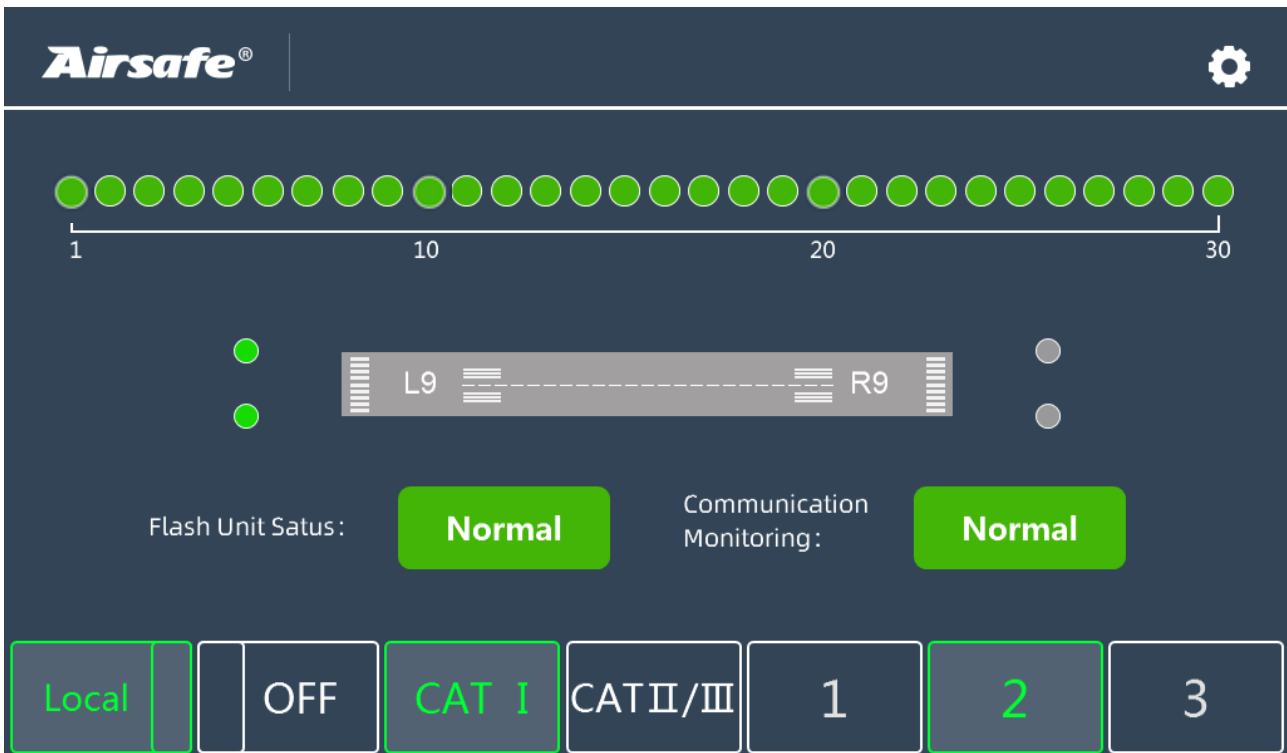


Figure 2.9 main page of main control panel (operation mode switching)

When operating in this parameter state, except that the operation mode can be switched, other function keys are the same as before.

CAT I: 30 flash light under mode I

CAT II / III: 21 flash light under mode II / III

### 2.8.3 Function Introduction to Interfaces

#### I. Main Interface

Flash indicator: the indicator with number displayed at the top of the page represents the lamp with corresponding number. (There are up to 30 flash lights + 4 threshold identification lights. The user can select the number of units under the factory mode according to the actual situation)

The working state of flash lights and the whole system is indicated by the color of indicator light on the screen;

Green: Flash light work normally

Yellow: Flash light missing (light source failure)

Red: Flash light offline (the light is not detected by the system)

Grey: Flash light is not activated

As shown in Figure 2.10, the yellow color of 10# light indicates that the state is flash missing, and the red color of 20# light indicates that the state is offline.

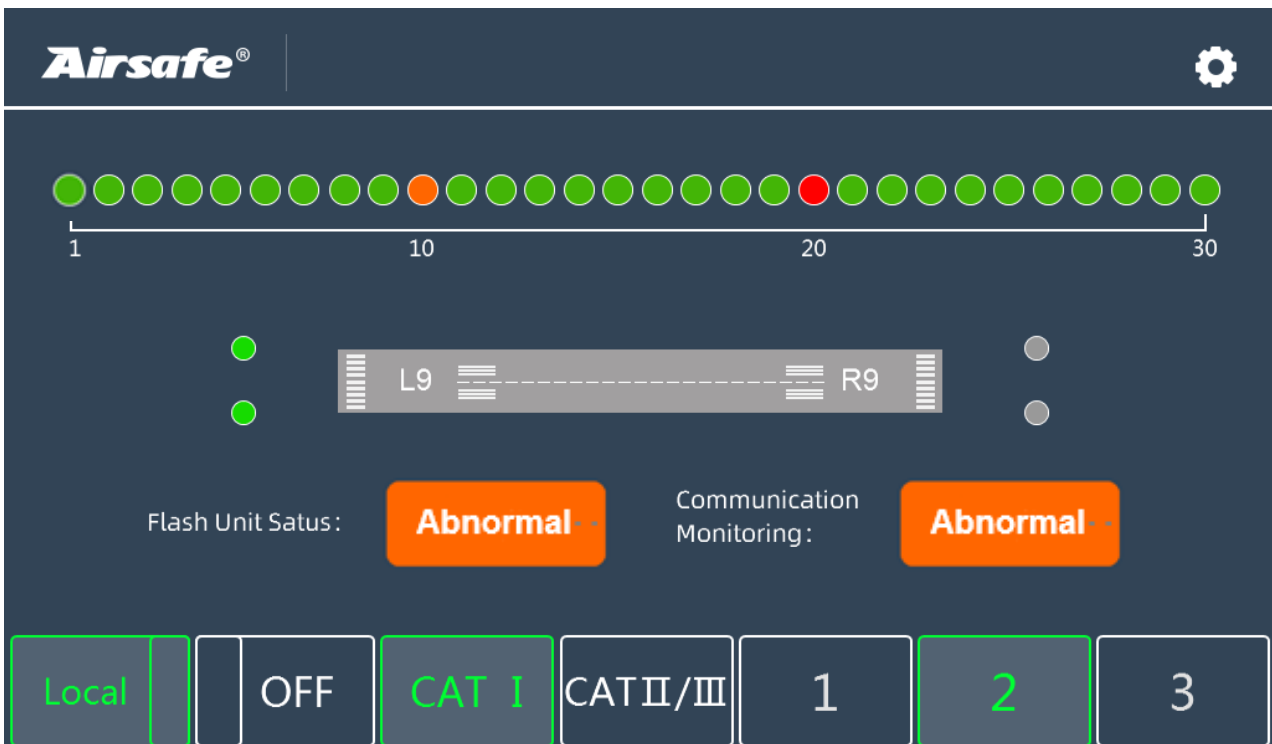
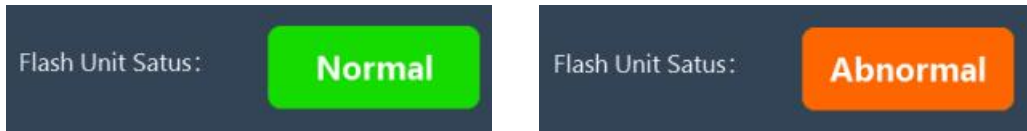


Figure 2.10 Main Interface of Main Control Panel (abnormal)

Fault display: when the flash unit is working normally, the status display key of the flash unit is green and the corresponding text is normal; if the display key changes to warning color (orange), the corresponding text becomes "abnormal", it indicates that some light(s) in the system fails. Click the orange "abnormal" display icon directly to enter the "fault" interface, where you can view the specific fault description.



When the communication of upper computer works normally, the monitoring communication display key is green and the corresponding text is "normal"; if the display key changes to warning color (orange) and the corresponding text becomes "abnormal", it indicates that the system is faulty. Directly click the orange "abnormal" icon to enter the "fault" interface, where you can view the specific fault description.



## II. Alarm interface

The faults of the main control cabinet during operation are displayed in the form of "time + specific events", which is convenient for users to view and carry out normal maintenance of the system. New faults are in the front, take the abnormal state shown in Figure 2.10 as an example, clicking the "abnormal" display icon to enter the fault view page. The fault view page is shown in Figure 2.11:

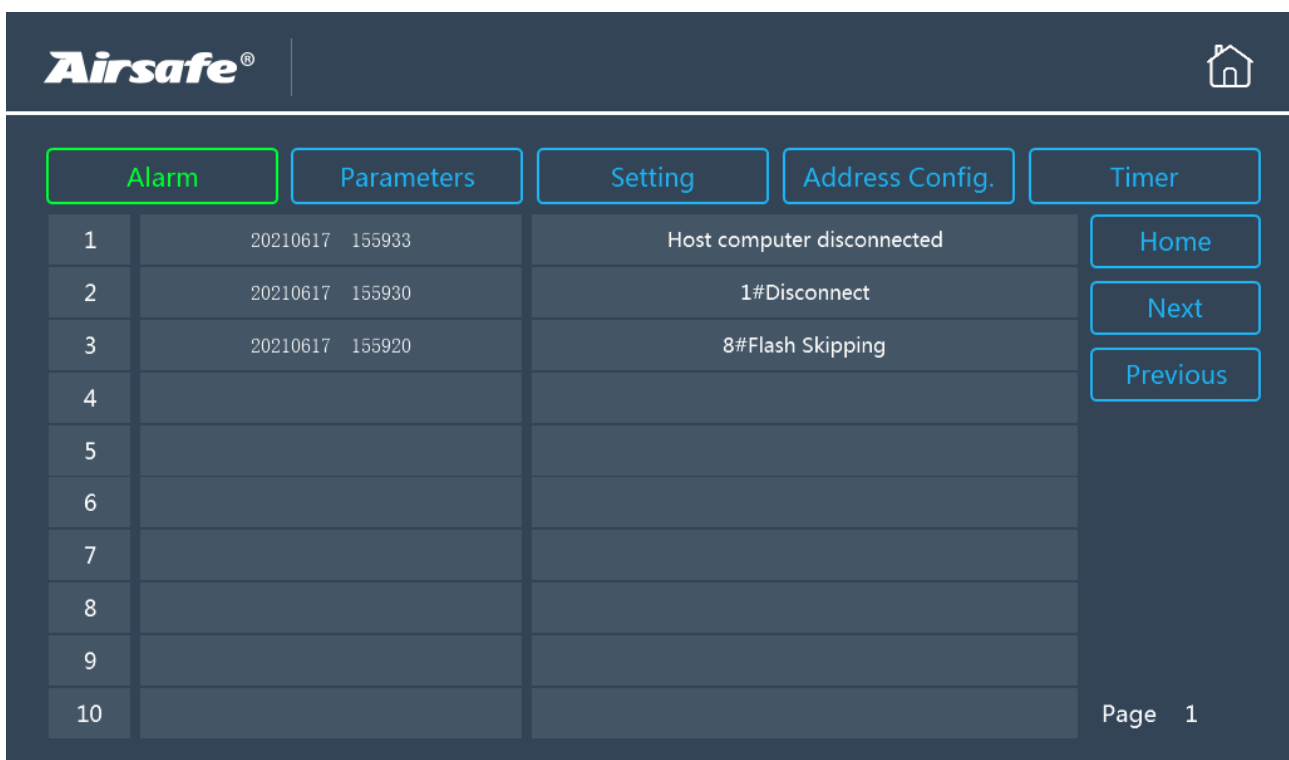


Figure 2.11 Alarm interface

Turn the page by pressing "Previous" and "Next" to view the historical fault record.

The lower left corner shows the current number of pages, and the record can have up to 99 pages. You can return to the first page by pressing the "home" button. After 99 pages of records, the earliest records will overflow automatically and cannot be queried.

The common fault types and troubleshooting methods recorded on the main control panel are as follows:

Serial No.	Fault Phenomenon	Fault Cause	Removal Method
1	Abnormal status of flash unit X# Flash missing/ do not flash	Loose LED connection LED damage Driver malfunction	Re-plug the LED wire connection Replace LED Replace the driver board
2	Abnormal status of flash unit X# Offline	Loose CAN connection wire Driver malfunction	Re-plug the CAN connection wire Replace the driver board
3	Abnormal communication status	Loose RS485 connection wire Communication	Re-plug the RS485 communication wire, Directly connected to 485

		connection method: Serial port switched to USB then to 485 (the connection method can only be primary connection).	through the serial port (or USB)
--	--	---	----------------------------------

### III. Parameters interface

The parameter view page helps users understand some basic parameter configurations of the flash system, including current flash frequency, flash interval, field-bus form, hardware protocol used for monitoring communication, number of system lamp caps, current runway operation mode and other information. As shown in Figure 2.12 below:

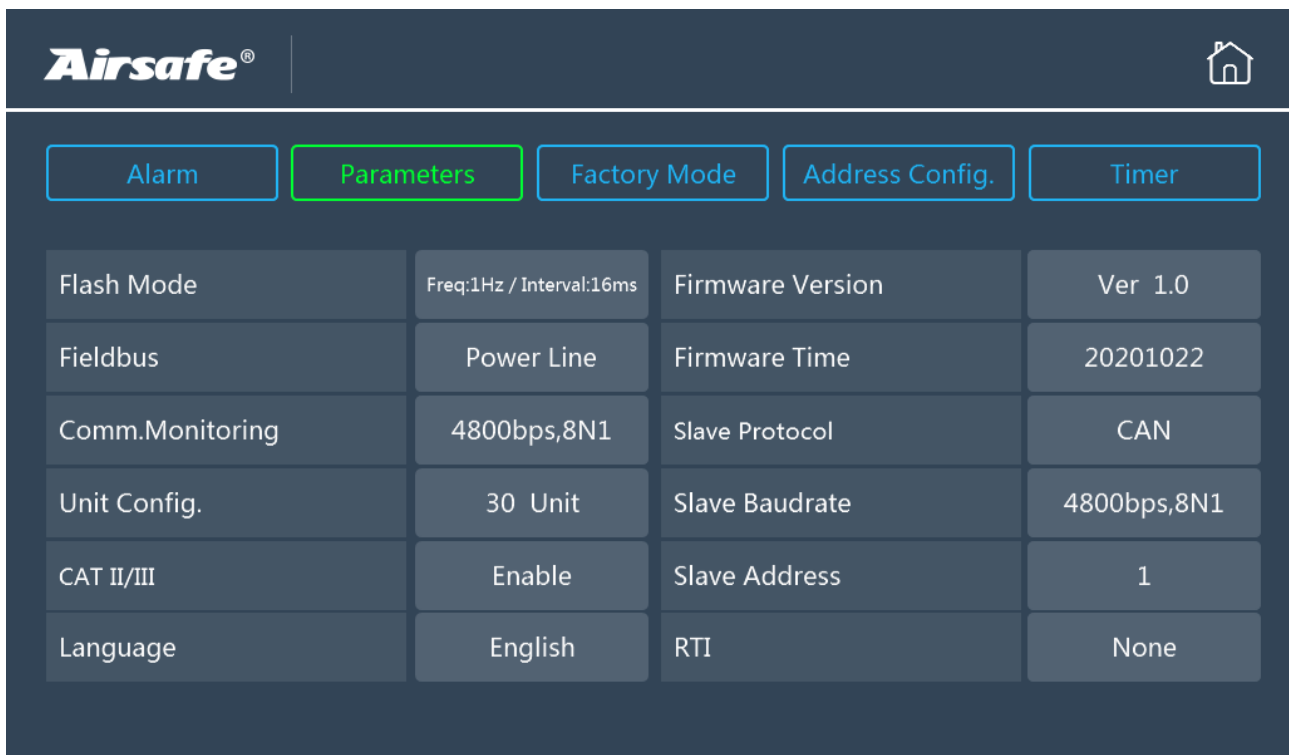



Figure 2.12 Parameters interface

### IV. Factory mode interface

"Factory mode" is the interface used by the manufacturer to set the system before leaving the factory. Users are not suggested to enter the interface in daily operation.

	<p>■ It is strictly forbidden to enter the factory mode without permission and change the parameters.</p>
	<p>※ It may cause system failure or provide misleading information.</p>



If the parameters need to be modified according to the actual situation, the following steps must be followed:

1. It should first be verified and confirmed that such modification is necessary and will not cause any problems.
2. The modification must be operated by the senior duty manager in person.
3. Enter the password to enter the factory mode interface for parameter modification

Initial password is 8888, the senior manager should set an exclusive password to prevent any change to the original data. The password reset key is in the lower right corner of the page.

The factory mode interface is shown in Figure 2.13:

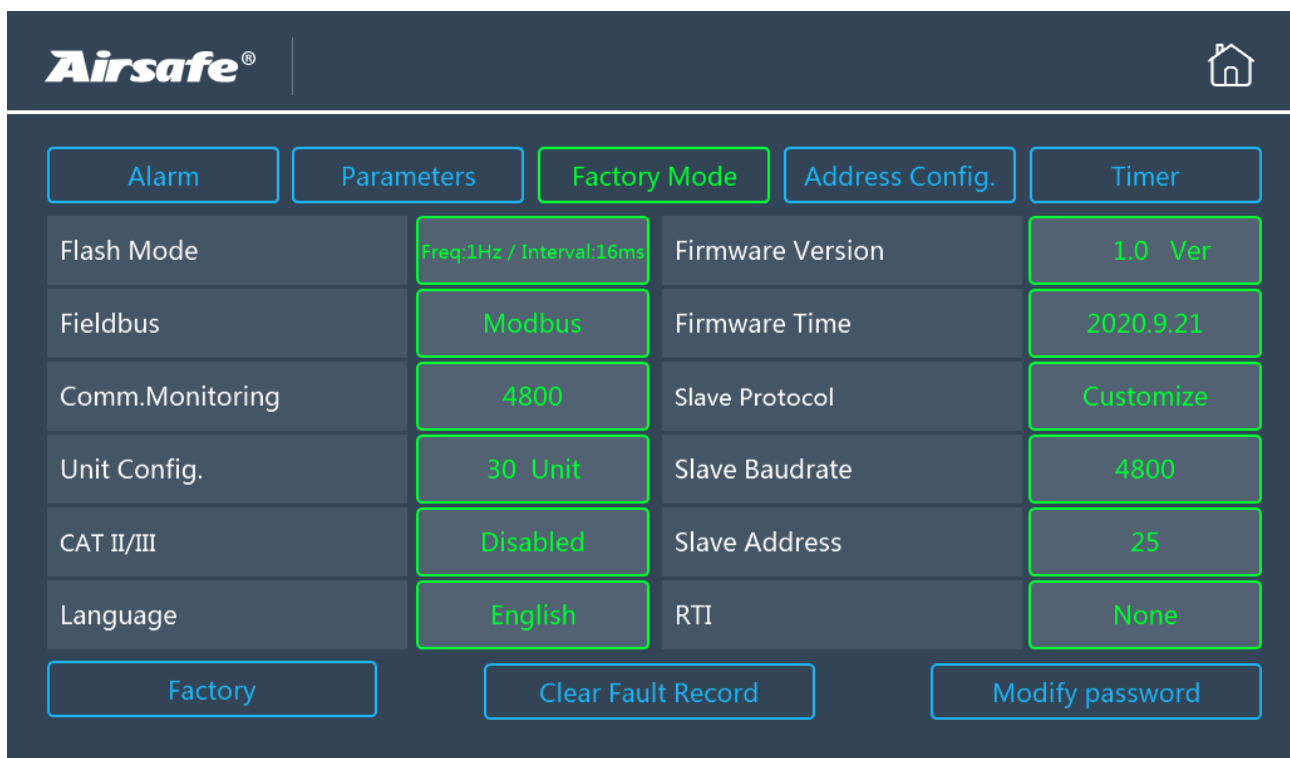


Figure 2.13 Factory mode interface

Details of parameter settings are as follows:

Item	Name	Parameter description	Option
1	Flash mode	Select the flash frequency / flash interval	Flash frequency: 1/2 Hz Flash interval: 16/20 ms
2	Field BUS	BUS interface selection of upper computer	CAN/RS485

3	Monitoring communication	BUS baud rate of upper computer communication	4800/9600/19600/5k/500k
4	Flash unit configuration	Number of flash lighting fixtures required on site	0~34
5	CAT II/III	Select according to the operation mode	ON/OFF
6	Language	Language	Chinese/English
7	Firmware version	Current firmware version	---
8	Firmware time	Modification time of the latest firmware version	---
9	Slave protocol	Flash protocol matched with Fieldbus	MODBUS protocol/Custom protocol
10	Slave baud rate	Baud rate matched with Fieldbus	4800/9600/19600/5k/500k
11	Slave address	Given by upper computer software protocol	0~255
12	Threshold identification light	Custom setting of threshold identification light	None/Single ended/Both ended

#### V. Address configuration interface

Each single flash light is equipped with a unique fixed ID address. When leaving the factory, the factory has numbered the lights according to the address inside the lights in advance. The lights must be installed in strict accordance with the number on the lights.

If the number of lights must be rearranged, enter the password to change the order of the individual light on the address configuration page (as shown in Figure 2.14).

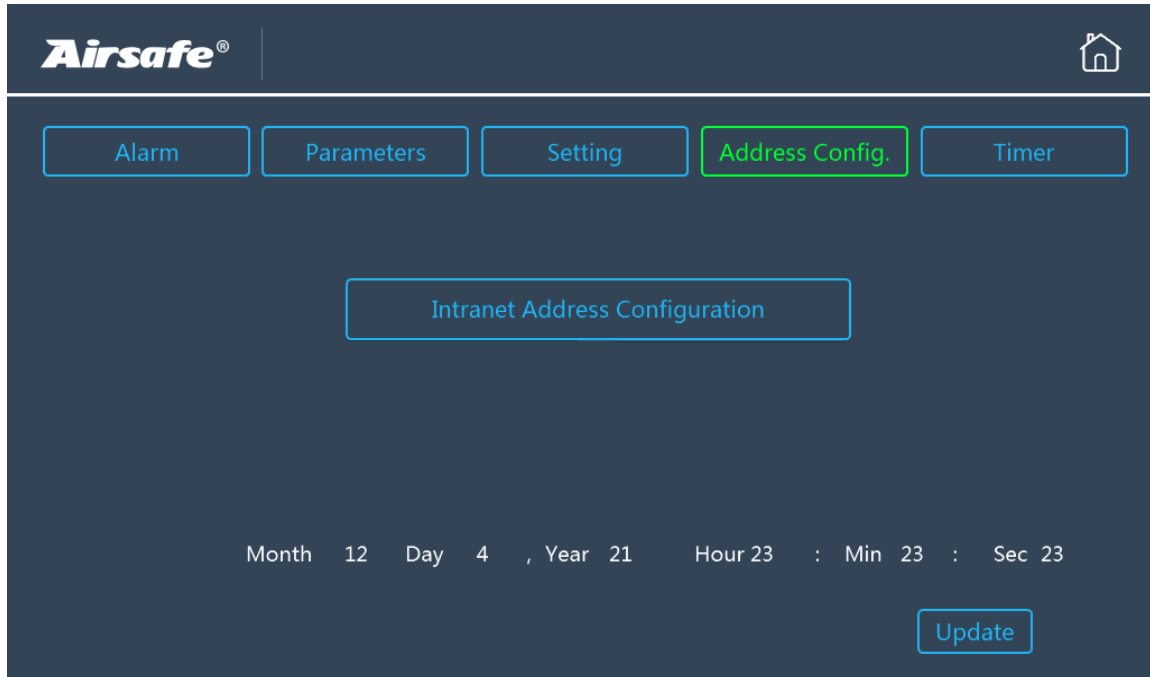


Figure 2.14 Address configuration interface

When the real-time displayed on the main control screen is inaccurate, the correct time can also be corrected on the page shown in Figure 2.14.

How to change the light address on site:

Click on the intranet configuration to enter the address change interface. As shown in Figure 2.15.

S/N	Exclusive ID	Address Mapping	S/N	Exclusive ID	Address Mapping
1	5463257	8462359 8752149	11	0	0
2	9654213	4521587 6541587	12	0	0
3	0	0 0	13	0	0
4	0	0 0	14	0	0
5	0	0 0	15	0	0
6	0	0 0	16	0	0
7	0	0 0	17	0	0
8	0	0 0	18	0	0
9	0	0 0	19	0	0
10	0	0 0	20	0	0

Sef-Adaptive Config. Adaptive Config. for Lamps Replacement ON OFF Next Page 1

Figure 2.15 Intranet Address Configuration Interface

Change the lamp number according to actual needs, find the unique ID of the lamp (which can be found on the lamp housing), correspond to the last 6 digits of the third column of data in the unique ID code in the above figure, and click the corresponding "lamp number" box, and enter the fixture number that the customer needs to reconfigure.

## VI. Timer interface

The working hours of the system at different brightness levels are recorded in this interface. The progress bar shows the proportion of total time in this brightness level, as shown in Figure 2.16.

If you want to retime, click the clear key, and the progress bar and time will be cleared.

If there are frequent false alarms of abnormal state of lamps, you can click the "Secondary Filter Time" button to enhance the software filtering and reduce the false alarm rate.

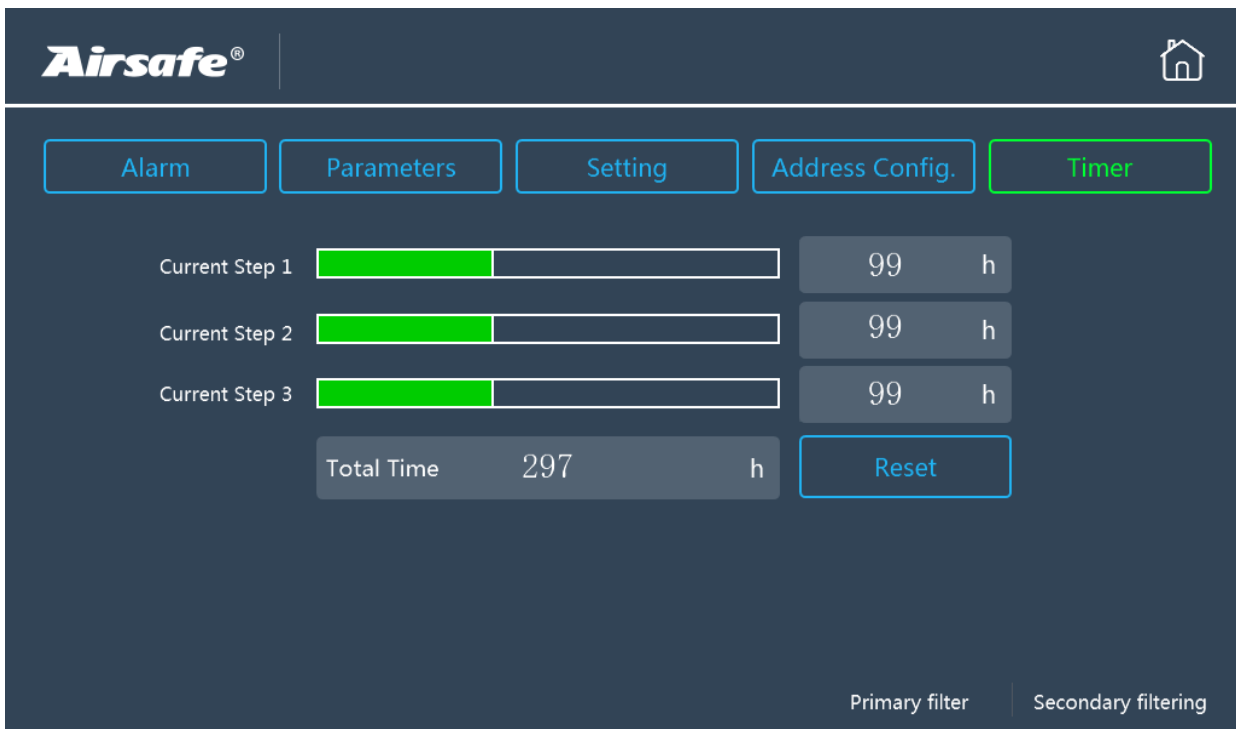


Figure 2.16 Timer Interface

## 3.0 Installation of System

### 3.1 Notices before Installation

Before installing the system, deeply understand the installation requirements for the SFLS-LED/RTIL-LED system. Prior to installation, you must read through this manual to understand the basic steps to install the lighting fixtures, accessories and cabinet and electrical wiring, including installation tools and site requirements, as well as be familiar with the electrical characteristics of this flash light system to avoid impacts on normal work of the system due to incorrect installation.

In order to facilitate on-site installation and to have a better understanding of the product, this manual supplement the "Rapid Installation Instruction of Sequential Flash" (Annex II). This instruction book is only for installation reference, the operation manual is the most complete one for operation and installation.

Before installing the system, installation personnel should read and fill in the Pre-installation Questionnaire (Annex III) carefully to further confirm whether the on-site installation conditions and cables meet the requirements of the system installation.

The manufacturer welcomes the installation personnel to communicate on any technical issues during installation.



- Prior to installation, the installation requirements for the flash light system must be understood.
- ※ Otherwise it may cause death or personal injury, or damage to the flash light system.



- Prior to installation, fill in the pre-installation questionnaire and pay attention to cable requirements.
- ※ Otherwise faults may occur when the flash system is running.



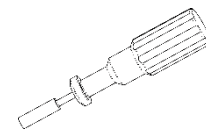
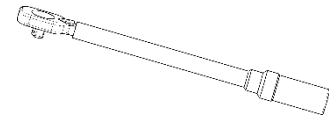
- Prior to installation, it is very important to understand the system in detail.
- ※ Any casual detail negligence may cause system fault.

### 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 can be purchased from the manufacturer or any distributor. Universal tools are available on local hardware market.

Please pay attention to measurement range during procurement.

- Universal tool: Torque wrench: be used to tighten the screw, which may be used with various sleeve wrenches and directly purchased from various hardware stores, manufacturer or agent. Recommended range is 10-40N m.
- Universal tools- Torque screwdriver: be used to dismount screw, equipped with PH1 cross screwdriver, torsion wrench includes hexagonal wrench and sellable in various hardware stores. Recommended range is 1-6N.m.



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	M5 hexagonal cylindrical head screw	Torsion wrench S4 with hexagonal wrench	3 N m
2	M3x6, M3x8 cup head cross screw	Force measuring screwdriver with cross screwdriver (PH1)	2.5 N m
3	M8 hexagonal cylindrical head screw	Torsion wrench S6 with hexagonal wrench	12.4 N m



- Please comply with the torque listed in the Table when screwing the screws.
- ※ Screw looseness may cause system fault.



- The testing instrument and equipment must comply with the requirements of degree of precision.
- ※ Erroneous judgment may be made during construction.

Other related test tools (provided by the customer)

- Test Tool: 500V Insulated Resistor Meter (Picture and Model for reference)



- Multimeter (Picture and Model for reference)



- Grounding resistor tester (pictures and models for reference)

### ZC29B-2



- Other tools: Nipper pliers, wire Strippers, electrical knives, art knives.
- Sealing tools: Styrofoam, foaming gun.
- Installation and calibration tools: Calibrator assembly (see Chapter 3.7 and spare parts for details)

## 3.3 Confirmation of System Components

After unpacking, first check the shipping list and count the quantity to avoid lacking of relevant assemblies when installing. Meanwhile, confirm that all components are not damaged during transportation.



- When unpacking the package, the carton shall be intact.
- ※ Carton damage may indicate damage to the lighting fixtures in the carton.

Components which shall be confirmed are as follows:

1. Main control cabinet
2. Elevated flash light, including flash light head, frangible pole and flange.

\* The manufacturer does not provide the extension pole required by installation of the flash light head because of its different lengths.



3. In-pavement flash light, including the in-pavement lighting fixtures and 12-inch shallow base.

4. Unit wiring box, poles, hoop, flange 240 and other components, in the state of complete assembly when shipment.

5. Flash light head cables. (The standard length is 6m, if you have other length requirements, please inform in advance)

\* Due to the different installation methods, the user may be required to drill on the extension pole prepared to connect the light head with the unit wiring box. For more information, see Section 3.6.

\* The manufacturer provides light head cable between the unit wiring box and the elevated flash light, the other various cables (including power cable and communication cable between the main control cabinet and unit wiring box) are prepared by the user. Prior to installation, the user shall calculate the length and specification of the relevant cables according to the wiring diagram and actual installation position.

Details of the cable specifications recommended by the manufacturer are shown in Appendix I.

## **3.4 Installation of Main Control Cabinet and Unit Wiring Box**

### **3.4.1 Placement of Main Control Cabinet**

The main control cabinet of the system is placed inside the light station.

It can be placed in the same room as the CCR.

### **3.4.2 Placement of Unit Wiring Box and Light Head**

When the light head is delivered, the label is attached on the housing and packing container. No. on the housing is consistent with that of the packing container.



Figure3.1 Label of lighting fixtures



Figure3.2 Label of packing container

Figure 3.1 is a label attached to the lighting fixtures, the expression in the red box means: Light head No.1, and this flash system consists of 21 units.

Figure 3.2 is a label attached to the packing container, the expression in the red box means: Light head No.2, and this flash system consists of 21 units.

Prior to system wiring, the user shall place the light head according to the No. and the placement shall be in strict accordance with the following provisions.

1: The light head with small No. shall be installed at a position far away from the runway threshold

2: The light head with No.1 is installed at a position which is farthest away from the runway threshold

3: No number shall be skipped or missed for placing the light head, or disordered installation not accordance with the number.

The unit wiring box of the flash light head has no number and thus it may be freely matched

with the light head.

In case of missing, repetition or mixing of the label on the packing container or lighting fixtures, please immediately contact the manufacturer, so as to find out the correct address.



- The label No. of the lighting fixtures shall be consistent with the address in the system and installed according to the No.
- ※ Disordered address code will cause abnormal work of the flash light system.

### 3.5 Cement Installation Foundation of Flash Light

The flash light unit shall be installed on the cement foundation made of the excellent cement. The base surface must be flat and horizontal. The dimension of the cement foundation is determined according to the design and site conditions.

Pipelines of various cables shall be embedded in advance in the cement foundation according to the wiring requirements of the flash light system. Meanwhile, reliable grounding must be ensured. For wiring method of all unit wiring boxes, please refer to Chapter 4.0 “Electrical Installation of Flash Light”.

M10 or above expansion screws can be used for the installation of elevated flash lighting fixtures and unit wiring boxes, and the flanges of the light head and the unit wiring box are fixed on the cement base.



- Make sure that the flange is fastened firmly.
- ※ Equipment wagging in the wind for a while may cause equipment fault.

### 3.6 Specific Field Installation Methods of Lighting Fixtures

There are three installation methods for the elevated lighting fixtures. When installing them, freely select the following installation methods according to the design requirement and specific site conditions.

Three installation methods are as follows:

1) Backpack type installation: The unit wiring box is directly hung on the extension pole of

the lighting fixtures;

- 2) The unit wiring box and light head are installed on different upright poles respectively;
- 3) The light head is installed on the elevated mast.

### 3.6.1 Installation Method 1): Backpack Type Installation

For this installation method, the light head and unit wiring box are installed on the same upright pole, with compact structure. The connecting wire between them is short and thus it is easy to install and the overall installation effect is beautiful. If there is no height limitation to the light head according to the airport design, such installation method is suggested by manufacture, see as figure 3.3.

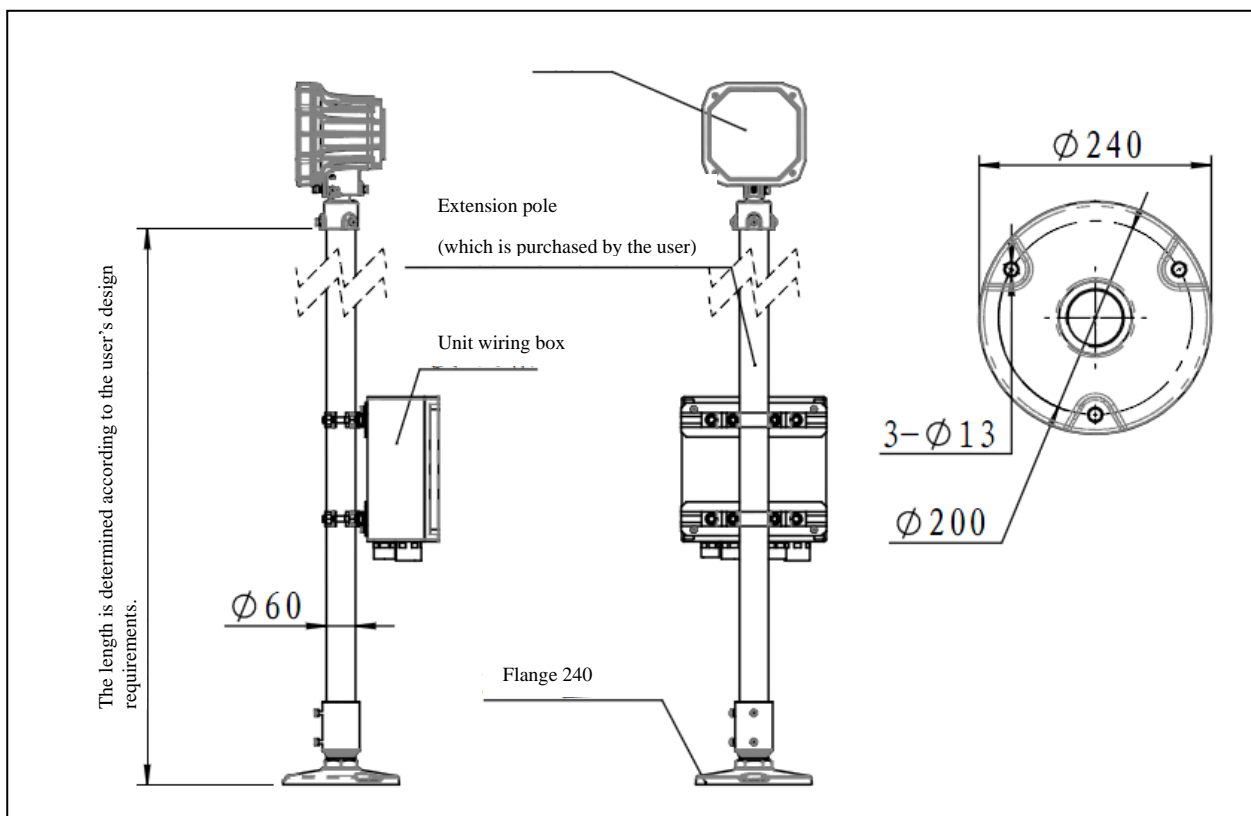


Figure 3.3 Backpack Type Installation Diagram

### **3.6.1.1 Field Installation of Elevated Flash Light Head and Unit Wiring Box**

- Prepare 2 inches extension pole with appropriate length for supporting the light head according to the design requirements;

(The extension pole provided by the manufacturer is only used for the unit wiring box, not for supporting the light head.)

- Check whether the light head on site is placed according to the No. sequence and it must be strictly placed according to the method stated in 3.3.2;
- Clean the site, especially the contact point with the flange;
- Connect and fasten the prepared extension pole, frangible pole, flange and light head at the designated position;
- Special tools must be used for screwing and fastening the frangible pole and flange and the force exerting position of the wrench must be on the hexagonal plane under the frangible part;
- Install the unit wiring box on the extension pole of the light head (the installation hoop is equipped on the back of the unit wiring box, which may be used to fasten the unit wiring box on the extension pole firmly. The flexible pipe coupling is downward as shown in Figure 3.4). The installation height of the unit wiring box should first consider the convenience of maintenance and the manufacturer does not specify the height.

The laying of embedded pipes in the system is in accordance with the general installation rules of electrical equipment. The laying pipes including power cables, communication cables, etc. is done in advance, and the various electrical test of cables is completed in accordance with relevant regulations.

All the incoming wires of this system have been completed in the unit wiring box.

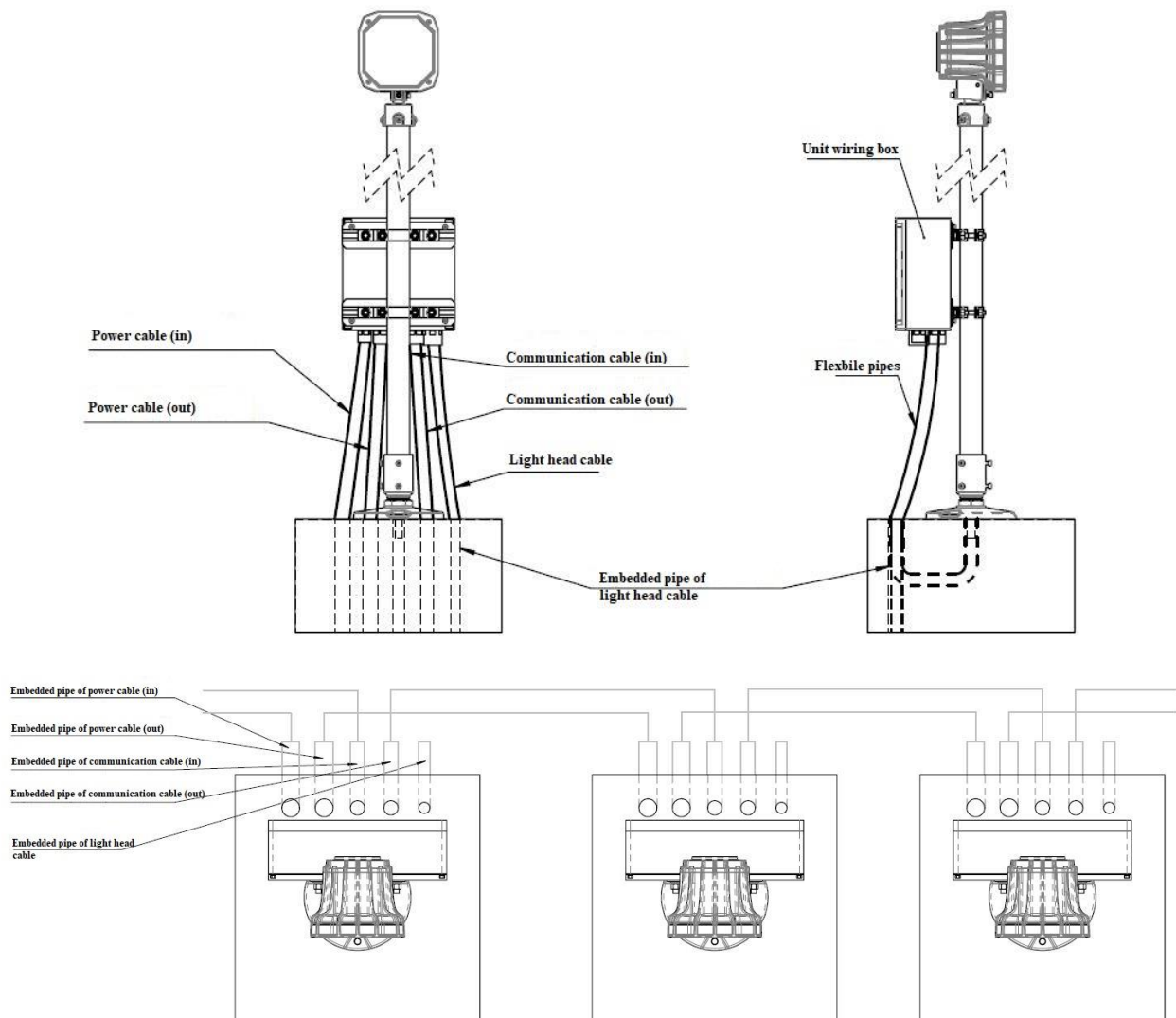


Figure 3.4 Cable Entry Diagram



- During installation, protect various cables led from the ground.
- ※ Damaged cable may cause system fault.



- The hoop nut of the unit wiring box must be screwed.
- ※ The unit wiring box in the natural environment for a while may loosen or fall off.



- During installation, the unit wiring box must be handled carefully.
- ※ Violent vibration may cause damage to the internal important components.

### 3.6.1.2 Connection of Cable of Elevated Flash Light Head and its Relevant Terminal Block

- The manufacturer provides the light head cable with the standard length of 6m. When it is installed, the cable with appropriate length may be produced according to the actual requirements.
- The light head cable is consisted of six-color wires. Connect the wires to the corresponding terminal blocks of the unit wiring box according to the sequence of gray (CANCOM), black (CANL), red (CANH), brown (VH), blue (VL), green (PE), and tighten the screws to ensure good contact, as shown in Figure 3.5.

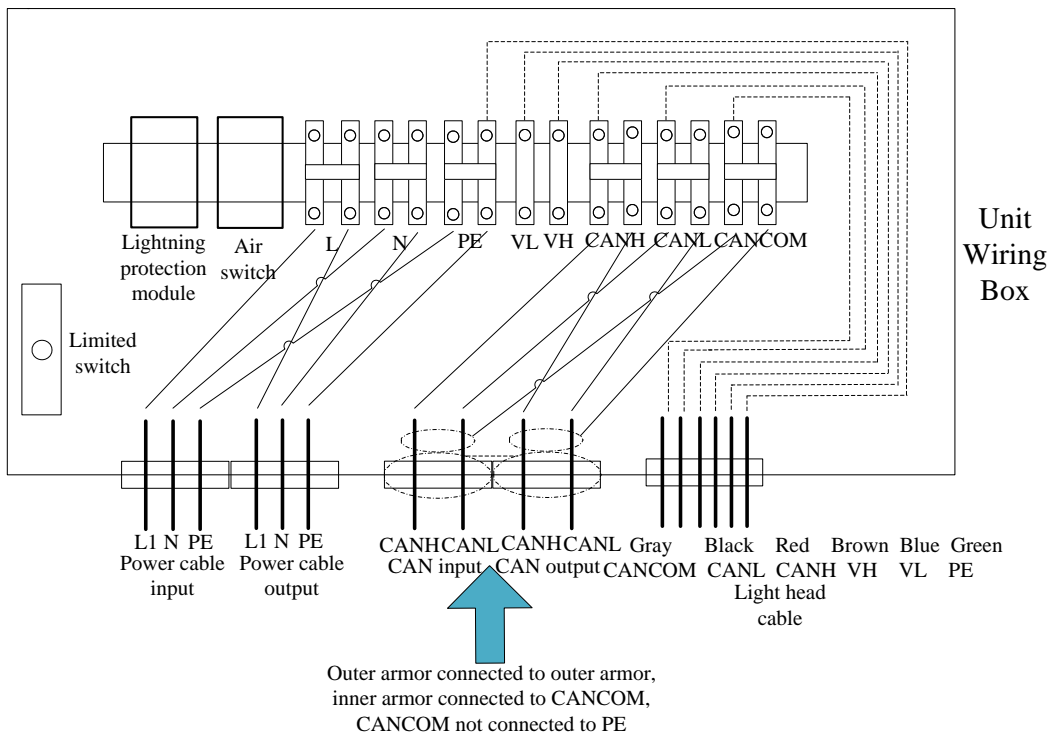



Figure 3.5 Wiring Method of Single Phase Power Supply of the Unit Wiring Box and CAN Bus Communication



- Make sure the cables and the terminal blocks are connected reliably.
- ※ Poor contact caused by screw fixation may cause system fault.



- The light head cables with different colors must be connected in strict accordance with the instructions.
- ※ Otherwise it may cause fault of the flash light.

### 3.6.1.3 Elevated Flash Light Head on Extension Pole in Place

- Thread the light head cable (which has been connected with the light head) across its extension pole and thread it out from the below side hole; (M25x1.5mm screw hole shall be drilled on the side of the extension pole of the light head for connecting the flexible pipe.)
- Cover the lower end of the head onto the upper end of the extension pole and tighten the side fastening screw of the light body;
- Cover a flexible pipe on the head cable which is threaded out of the bottom of the extension pole, which is connected with the unit wiring box.



- Do not damage the light head cable when it passes the extension pole or connected with the light head.
- ※ Otherwise it may cause system fault or even death or personal injury due to electric shock.

Note 1: After the flash light head is fixed on the extension pole, its horizontal and vertical angles must be adjusted accurately. The specific adjustment method will be described in detail in Section 3.7.

Note 2: Before installing the light head, thread the light head cable across its extension pole first. The specific installation method will be described in detail in Section 3.6.6.

### 3.6.1.4 Cables Wiring in Unit Wiring Box

After the light head is installed and fixed, start to wire the cables inside the unit wiring box.

- Open the cover plate of the unit wiring box.
- Connect the light head cable that has been connected to the light head into the unit wiring box.



Pass the light head cable through the opening under the housing of the unit wiring box and connect it with the corresponding terminal blocks according to the colors and method in Figure 3.6. Tighten the screws to ensure good contact.

- The power input cable is consisted of brown (VH), blue (VL) and green (PE), which is respectively connected to the corresponding terminals, and tighten the screws to ensure good contact.

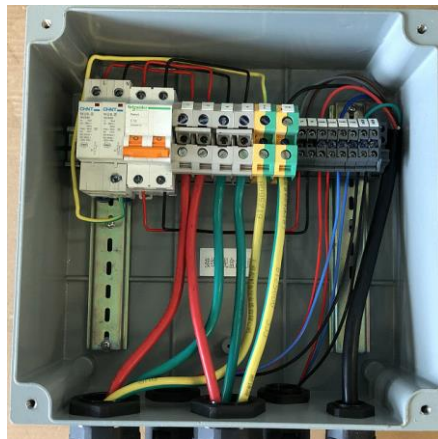


Figure 3.6 Cable Wiring Method inside the Unit Wiring Box

Wiring colors inside the unit wiring box are as follows respectively from left to right:

Green (PE) Blue (VL) Brown (VH) Red (CANH) Black (CANL) Gray (CANCOM)



- When wiring, make sure that all terminal blocks are connected reliably.
- ※ Poor contact may cause system fault.

- Close the cover plate of the unit wiring box. When doing so, make sure the seal strip is placed correctly in the groove and the electrical cabinet has valid airtightness. Tighten the screws.



- Make sure there are flexible pipe between the unit wiring box and the cable of light head.
- ※ Poor contact may cause system fault.



- During assembly, violent collision or knocking on the lighting fixtures is strictly prohibited.
- ※ Otherwise the frangible pole may be broken or it may cause other faults of the lighting fixtures.

### 3.6.2 Installation Method 2): Separate Installation of Unit Wiring Box and Elevated Flash Lighting Fixtures

Due to the limitation of the height requirements of the light head in the airport design, the unit wiring box and light head can be installed on the ground respectively. Herein this installation method, the unit wiring box and the lighting fixtures are respectively installed on the ground close to each other..

The installation diagram is as shown in Figure 3.7.

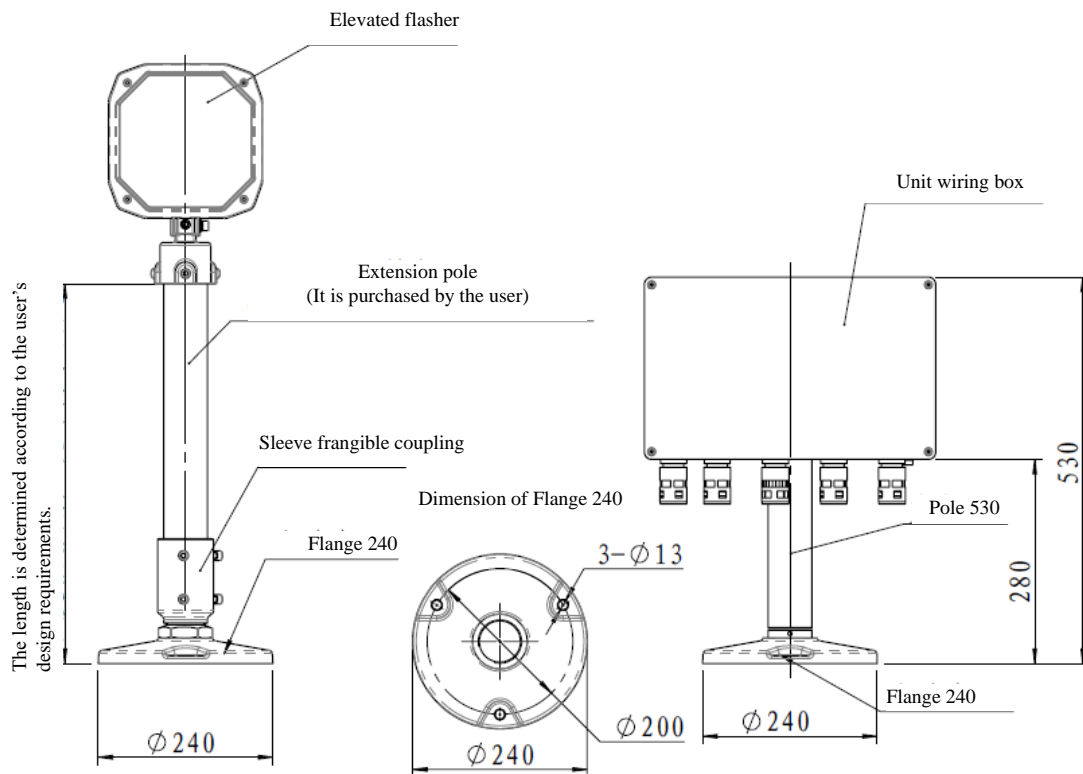


Figure 3.7 Separate Installation Diagram of Unit Wiring Box and Lighting Fixtures

### 3.6.2.1 Installation of Elevated Flash Lighting Fixtures

(For the installation of flash light, please refer to “3.6.1 Installation method 1”, but the unit wiring box shall not be installed on the extension pole.)



- The lamp heads must be organized and installed according to the No. sequence.
- ※ Otherwise it may cause disorder of the flash sequence.

### 3.6.2.2 Installation of Unit Wiring Box

- When leaving the factory, the unit wiring box has been fixed on the pole and flange; only need to install it to the designed position on site, and fastened with M10 expansion bolts.



- The unit wiring box must be handled carefully during installation.
- ※ Violent vibration may cause damage of the internal components.



- The bolts on the extension pole must be tightened to ensure that the extension pole is connected reliably.
- ※ Inclination or fall of the extension pole may damage the lighting fixtures.

### 3.6.2.3 Cable Wiring between Elevated Flash Light Head and Unit Wiring Box

Different from the first installation method, if the unit wiring box is separately installed from the flash light head, it is suggested to embed the cable pipelines underneath the light head cable of the unit wiring box and the extension pole of the light head. The light head cables shall be laid as shown in Figure 3.8.

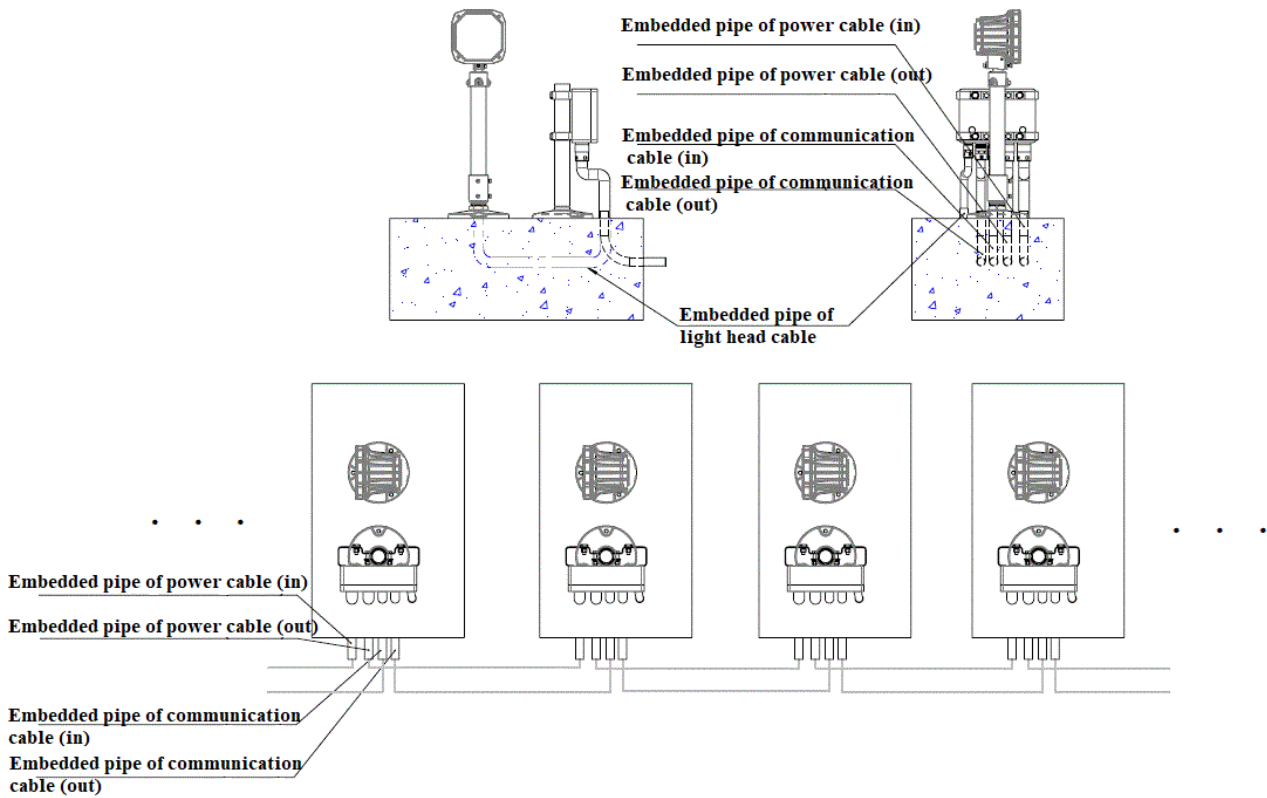


Figure 3.8 Light Head Cable and Cable Entry Diagram

For the connection of light head cable with the flash light head and unit wiring box, please refer to Wiring Method of Light Head Cable in Installation Method I.

### 3.6.3 Installation Method 3): Installation of Elevated Mast



Figure 3.9 Installation Field Figure of Elevated Mast

Limited by geological conditions and installation field conditions, the flash light head is

designed to be installed on the elevated mast or tower bracket. The light head cable between the flash light head and unit wiring box is limited. For more information, please see Limitation to Flash Light in Section 2.6. The manufacturer suggests to install the unit wiring box to the bracket close to the lighting fixtures.

### 3.6.3.1 Installation of Elevated Flash Lighting Fixtures

The user may first firmly fasten 2 inches pole to the mast, directly load the lower end of the lighting fixtures of the flash light into 2 inches pole and tighten the side screws at the lower end of the lighting fixtures.



- Attention shall be paid to working at height and personnel and articles shall be tied with a rope.
- ※ Fall of personnel or articles may cause death or personal injury.

### 3.6.3.2 Installation of Unit Wiring Box

The unit wiring box shall be installed according to the specific field situation, which may be directly installed on the mast or ground. Because the length of the cable between the light head and unit wiring box is only 6m, please note that the distance between them shall not be too far when determining the installation method of the unit wiring box.

### 3.6.3.3 Cable Wiring between Elevated Flash Light Head and Unit Wiring Box

The wiring methods of the light head and unit wiring are the same with that stated above, please refer to them directly.

### 3.6.4 Installation of In-pavement Flash Lighting Fixture

According to the design requirements of the airport, sometimes in-pavement lighting fixtures are required. Please refer to the base dimension of in-pavement lighting fixtures for pavement construction.

The installation diagram is shown as below.

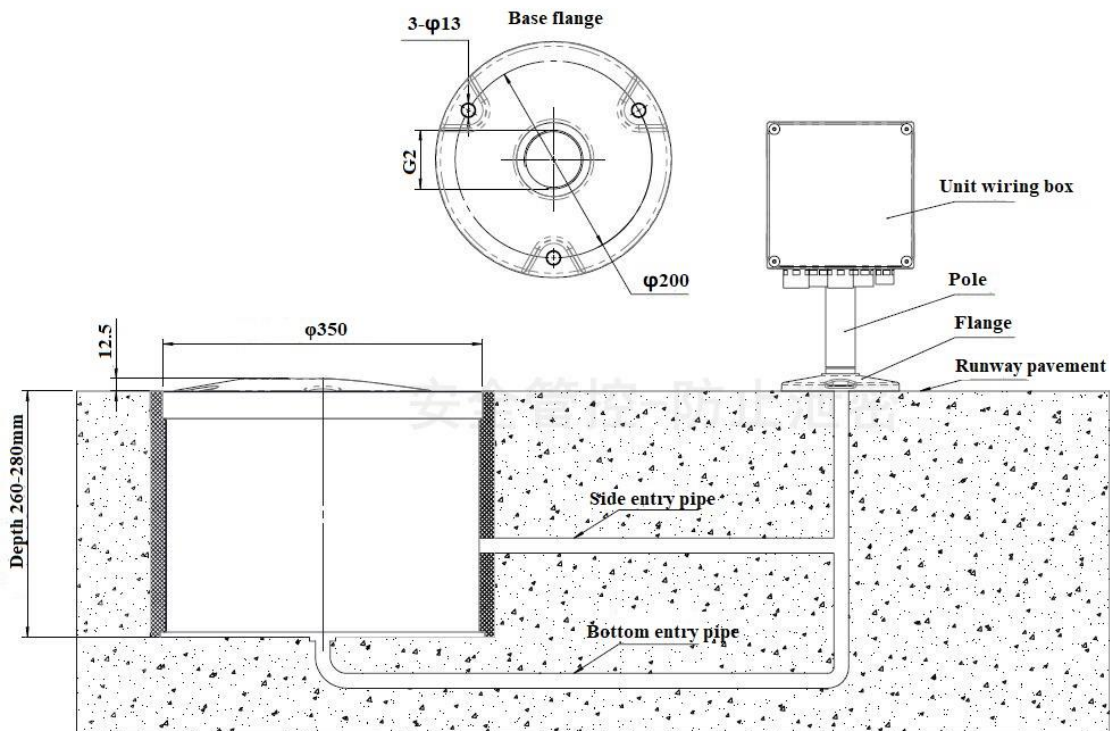
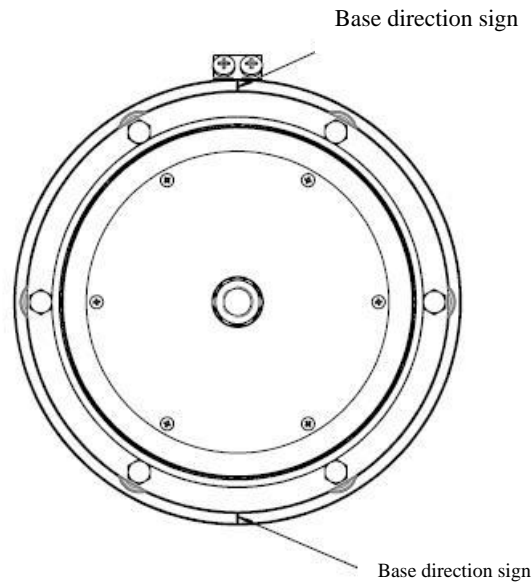


Figure 3.10 Installation Diagram of In-pavement Lighting Fixture

#### 3.6.4.1 Base installation of In-pavement Flash Lighting Fixture

The base of in-pavement flasher should be embedded into the runway pavement, and installation dimension is shown in figure 3.10. There is scribed line on the base edge (see as figure 3.11) and the luminous direction of the lighting fixtures is often parallel to the runway centerline. The cable inlet is at the bottom of the base. During installation, pay attention to reserving the wiring slot between the base and the unit wiring box. At the same time, the grounding pile outside the base shall be considered when opening.



### 3.6.4.2 Installation of Unit Wiring Box

For the installation of unit wiring box, please refer to Section 3.6.2, the separate installation method of elevated flash lamp and unit wiring box.

### 3.6.4.3 Wiring between In-pavement Flash Lighting Fixture and Unit Wiring Box

The cable lead of the in-pavement flash light is a style 6 plug and a style 7 socket. The cable is shown in the figure below to connect the style 6 plug and style 7 socket, and the yellow and green wire is grounded. See Figure 3.11 for details.

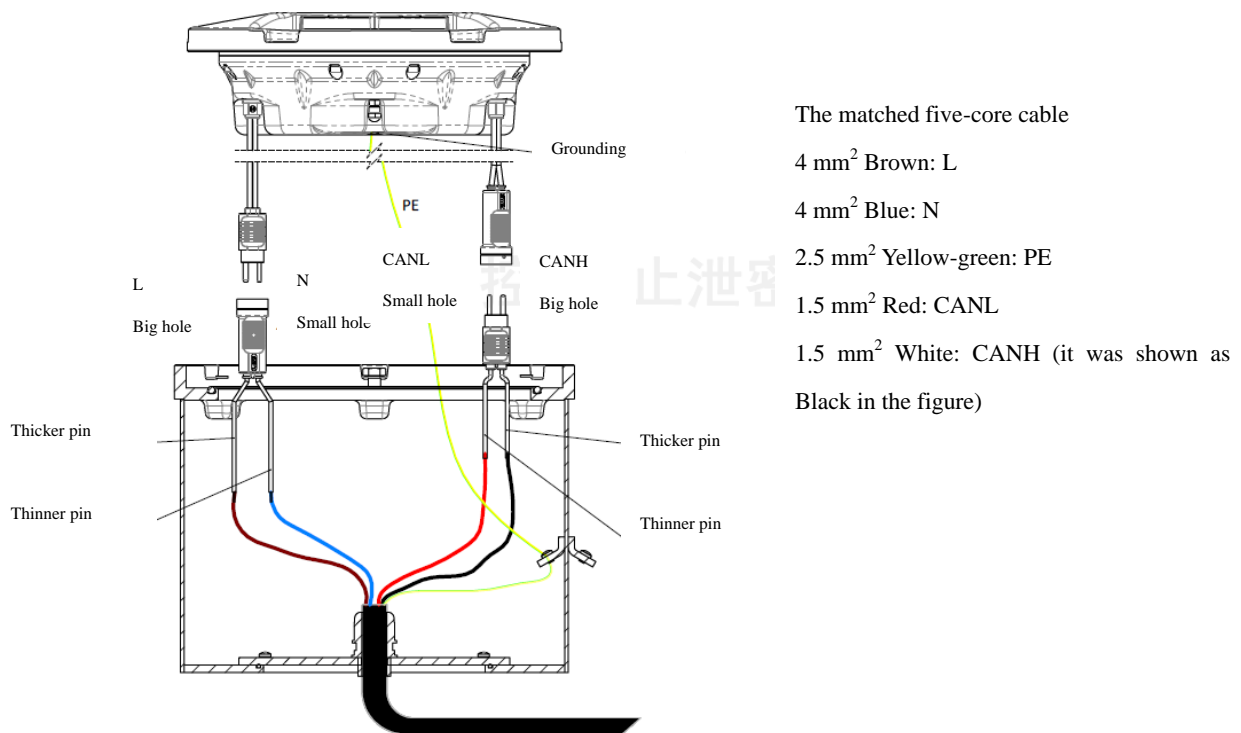



Figure 3.11 Installation Diagram of In-pavement Lighting Fixture

The wiring of the unit wiring box is the same as the above method. Refer to chapter 3.6.1.4, Wiring in Unit Wiring Box, 4mm<sup>2</sup> cable is used for L and N.



- The connection between the five core cable and the matched style6 / 7 needs waterproof and insulation protection
- ※ Water ingress or falling off of cable connector may cause equipment damage and casualties.

### 3.6.4.4 Installation of In-pavement Flash Lighting Fixture

Before installing the lighting fixtures, clean the waste in the seal groove to keep good seal. Put the O-ring gasket into the working position in the seal groove. Load the lighting fixtures into the base, identify the direction, and tighten the screws.



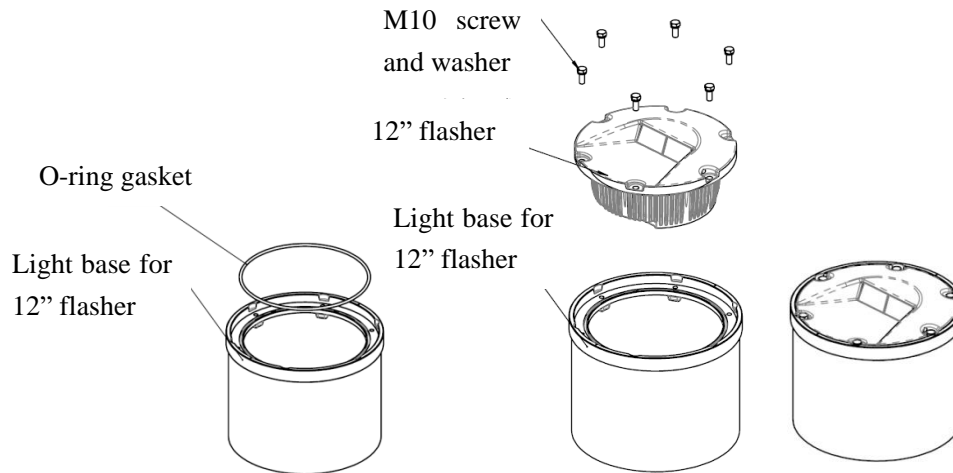





Figure 3.12 Installation Diagram of In-pavement Lighting Fixture




- The fastening screws of in-pavement lighting fixtures shall be tightened with a torque wrench.
- ※ Dislodged screws may cause equipment damage and endanger the safety of the aircraft.



- The O-ring sealing groove needs to be cleaned.
- ※ It may cause water leakage in the lamp base, which may lead to greater failure.



- The grounding of light fixtures must be reliable in accordance with regulations.
- ※ It may cause communication failure.



- During installation, ensure that the cable lead is not crushed by the lighting fixtures.
- ※ It may lead to flash missing, electric leakage or short circuit of lighting fixtures.

### 3.6.5 Wiring between Unit Wiring Boxes

After the installation of the unit wiring box, wiring between unit wiring boxes of the flash light can be performed. The cables between each unit wiring box must pass the flexible pipe. Permitted by the conditions, the flexible pipe shall be embedded in the cement foundation.

Prior to wiring, the following preparatory work must be completed:

1. Insulation resistor test:

The power cable to ground insulation and inter-cable insulation resistor is  $\geq 2M\Omega$ .

The communication cable to ground insulation and inter-cable insulation resistor is  $\geq 1M\Omega$ .

2. Ground resistor test: The ground resistor of the protective earth line is  $\leq 4\Omega$ .



- Strictly make sure the insulation of the communication cable and grounding of the earth line.
- ※ Otherwise it may cause communication disorder to impact the communication reliability.

3. Tests of 1 and 2 shall be conducted for each power cable and communication cable and unified mark shall be made after confirmation.

4. Cable nose (pin terminal) must be made for the connection between each cable and terminal strip to ensure reliable connection with the terminal strip and easier installation.

Note:

- Laying method of the cable in the cement foundation shall comply with the relevant provisions. There are no special requirements for this flash light system.
- For wiring method and principles of all unit wiring boxes, please refer to Chapter 4.0 “Electrical Installation of Flash Light”.



- Strictly make sure the insulation of the power supply cable.
- ※ Otherwise electric leakage may cause death or personal injury; or fire may be caused to destroy the public properties.



- Strictly make sure the connectivity of the cable between unit control cabinets.
- ※ Any poor contact may cause system fault.

### 3.6.6 Seal of Unit Wiring Box

The housing of unit wiring box is made of the polyester material with protection grade IP65. The connecting cable between the housing and outdoors must pass the waterproof gland and the matched flexible pipe to prevent the moisture from entering the unit wiring box.

After the wiring, make sure the cover is closed. Also strictly make sure the seal of the electrical box of the unit wiring box, as shown in Figure 3.13.

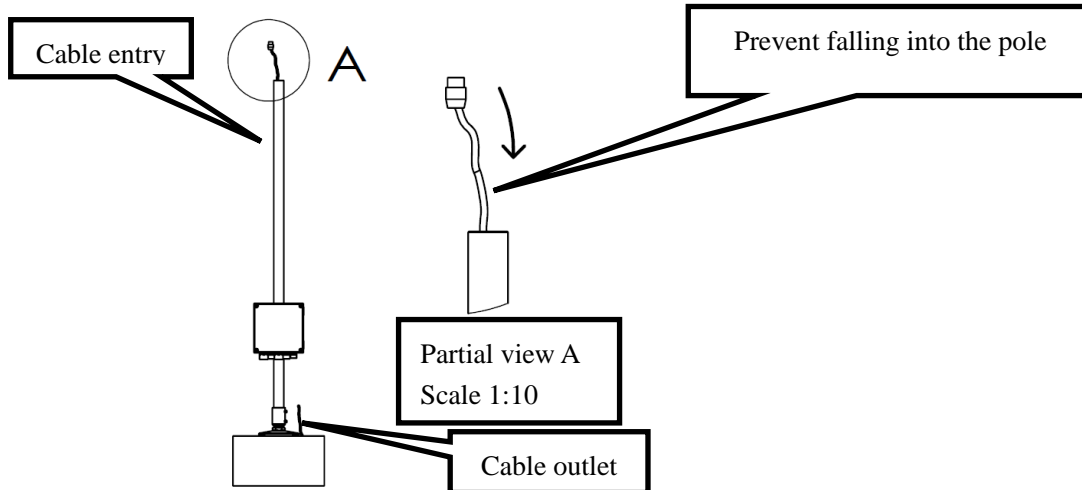


Figure 3.30 Seal Diagram


### 3.6.7 Installation Method of Light Head Cable from Light Head to Unit Wiring Box

The 6 meters light head cable will be offered by the manufacture, during installation, light head cable will be cut according to the actual installation length with a certain allowance.


Penetrate one end of the cable without waterproof joint in from the upper end of the light head pole, and take it out from the embedded pipe orifice of the light head line to the unit wiring box for wiring.




After the light cap cable passes through the pole, enough allowance shall be reserved at the end of the pole to prevent the cable from being too short to be stretched out from the pole.



- The waterproof joint of the light shall be tightened to ensure effective sealing
- ※ Internal pins affected by moisture may cause system failure



- The wiring construction must be carried out according to the specified threading method
- ※ Otherwise it may cause construction difficulties



- Sufficient allowance shall be reserved at the penetration end of cable
- ※ Otherwise the cable may fall into the pole

## 3.7 Angle Adjustment of Elevated Flash Light Head

### 3.7.1 Angle Corrector and Installation

The horizontal and vertical light beam angles of the flash light head must be adjusted prior to use. Installation must be performed in strict accordance with the design angle. For the angle adjustment of this system, the special tool, i.e. angle corrector (digital inclinometer) may be used.

The corrector structure is shown in Figure 3.14.

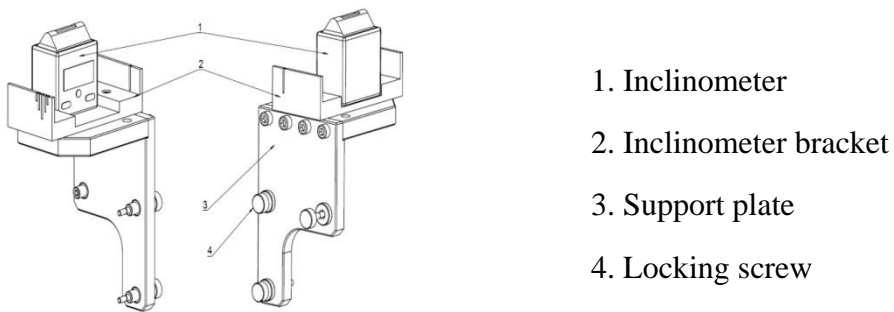


Figure 3.14 Corrector

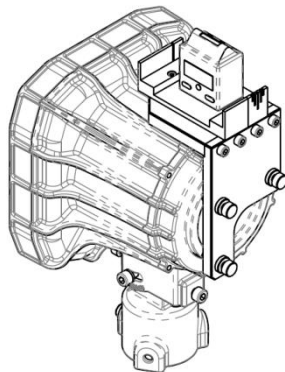


Figure 3.15 Installation of Corrector

It is very easy to install the corrector, as shown in Figure 3.15. There are three reserved screw holes at the rear of the light. Screw the three fixing screws on the corrector into the reserved screw holes tightly to complete the connection between the corrector and the light.

### 3.7.2 Adjustment of Horizontal Angle of Lighting Fixtures

The corresponding angle of the standard groove and inclination angle groove is shown in Figure 3.16.

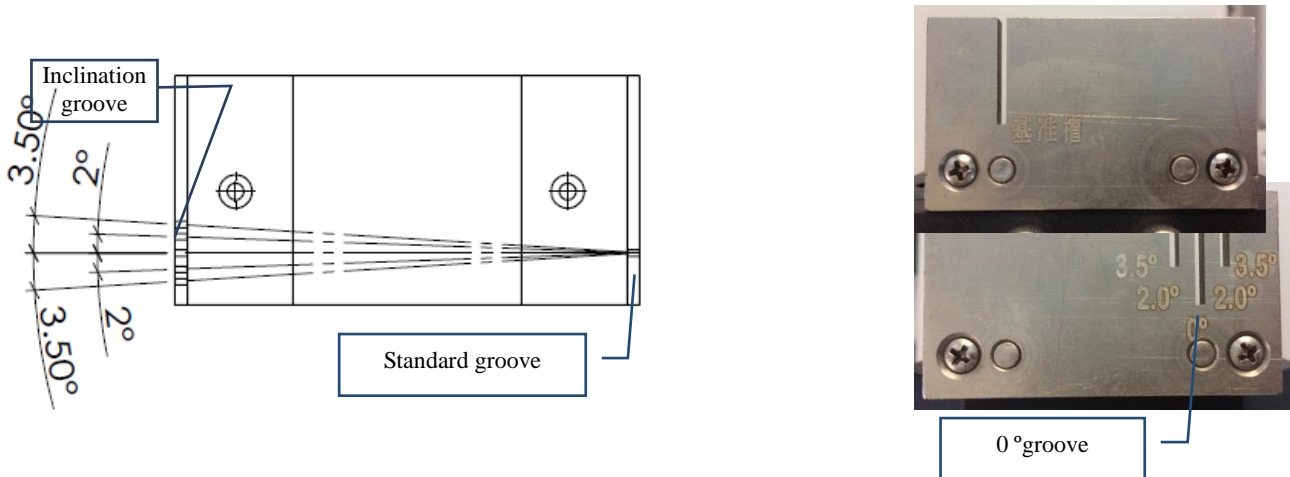



Figure 3.63 Standard Groove and Inclination Groove

In order to ensure that the lighting fixtures of the whole flash light system are parallel to the runway centerline, the installation upright pole must be in a straight line for adjusting the light head angle.



- The installation upright pole of the flash light shall be in a straight line.
- ※ Otherwise it may cause failure of debugging.

**Horizontal adjustment method 1:** A pole may be provided ahead of the first lighting fixture nearest the runway threshold as a foundation to adjust the horizontal angle of the lighting fixtures. The pole shall be in a straight line with the upright installation pole.

Gently loosen three locking screws on the lighting fixture base, and through rotating the lighting fixtures to left and right and based on the standard pole to be seen through the standard groove and 0° groove as a straightening standard, tighten the locking screws (Figure 3.17). The first lighting fixture is straightened; align the standard groove and 0° groove of the second lighting

fixture with the standard groove of the first lighting fixture and tighten the locking screws under the lighting fixture; complete the adjustment of the rest lighting fixtures in proper order.

### **Horizontal adjustment method 2:**

Gently loosen the locking screws of the first and second lighting fixtures, and through rotating the lighting fixtures to left and right, adjust the standard groove and 0° groove of these two lighting fixtures to the same straight line, tighten the locking screws. Straightening of two lighting fixtures is completed; align the standard groove and 0° groove of the third lighting fixture with the standard groove of the second lighting fixture and tighten the locking screws under the lighting fixture; complete the adjustment of the rest lighting fixtures in proper order.

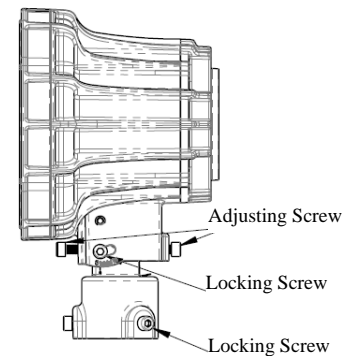


Figure 3.17 Adjusting Screws of Lighting Fixtures

### **3.7.3 Vertical Angle Adjustment of Lighting Fixtures**

Put the digital inclinometer in the correct groove (Figure below), gently loosen the locking screw on the lighting fixture, adjust the front and rear adjusting screws on the light body, observe the position of the bubble on the inclinometer until it comes to the middle and press the button “ABS/ZERO”. The value displayed now is “0.0”.

Readjust the front and rear adjusting screws on the light body, observe the value displayed on the inclinometer until it reaches the design angle, tighten the locking screw to complete the adjustment of the vertical light beam angle, see as figure 3.18.

The system does not contain all kinds of debugging equipment, and needs to be purchased during installation.

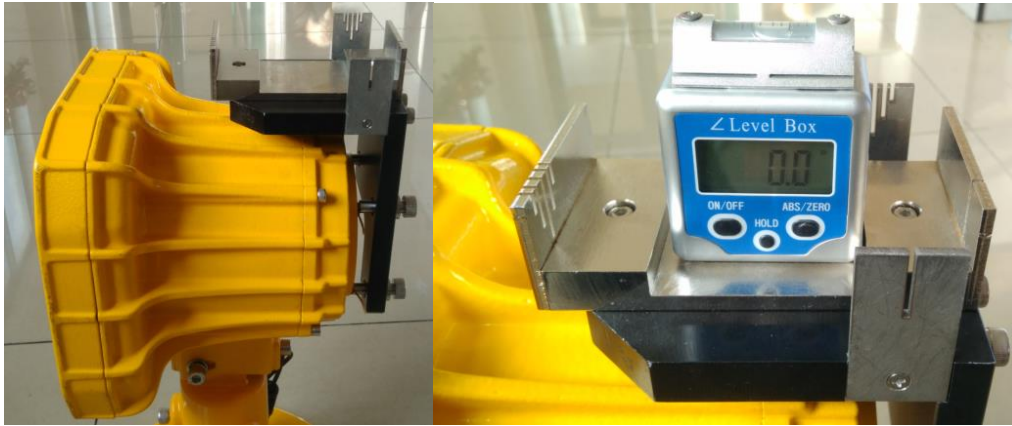


Figure 3.18 Inclinometer



- Horizontal adjustment of the lighting fixtures is an important part of installation, which shall not be skipped.
- ※ Lighting fixtures without horizontal adjustment may impact the overall grading effects of the taxiway.



- Please use the horizontal corrector designated by the manufacturer.
- ※ Otherwise it may impact the horizontal adjustment effects of the lighting fixtures.



## 4.0 Electrical Installation of System

There is only one power supply method of this system, which is single phase power supply. System wiring is mainly introduced in this Chapter.

System wiring is very important, especially in the electrical construction. Good wiring is very important for steady operation of the electrical equipment and safe equipment use! In fact, many system faults are caused by faulty wiring.

The manufacturer specifically highlights that wiring must be completed by the professional personnel.



- Non-professional electricians are strictly forbidden to perform the electrical installation.
- ※ It may cause system operation fault.

## 4.1 Flash Light System

### 4.1.1 Electric In-wiring Method

Single phase: The single phase power source is used as power supply. The power cable enters the unit wiring box and there are one entry and one lead

Mode		Number of Openings of Unit Wiring Box	Wiring Figures of Unit Wiring Box
Power cable	Communication cable		
Single phase	CAN bus	5	Figure 4.5

The recommended model by the manufacturer is: DZYJY 0.6/1KV 2\*16mm<sup>2</sup>+1\*6mm<sup>2</sup>

Conductor: 16mm<sup>2</sup> is a 7-Strand stranded conductor, 6mm<sup>2</sup> is a single conductor

16mm<sup>2</sup> diameter power cable is applicable to the SFL system, of which distance from light station to the outfield is 4km.

In actual use, customers can choose different cable diameters according to their actual needs, as shown in Table below.

Cable Diameter mm <sup>2</sup>	Maximum Resistor at 20°C Ω/km	Distance from Light Station to External Field (Km)	Note
6	3.39	1.47	Same cable for 21 Light Heads and 30 Light Heads
10	1.95	2.56	
16	1.24	4.03	
25	0.795	6.30	

This cable has waterproof and moisture-proof performance, stable power transmission, safe and reliable, and has the performance of shielding electromagnetic interference signals.



- Accuracy and reliability are needed before electrifying.
- ※ It may cause burnout of the circuit board, so as to cause system failure.

#### 4.1.2 Communication Cable

The communication mode is the CAN bus communication and there are one entry and one lead.

The manufacturer recommends double shielded cable, the specified model is: ASTP-120Ω 2×2mm<sup>2</sup> or 2×4 mm<sup>2</sup>; If the customer has spare demand, optional model is ASTP-120Ω 2×2×2mm<sup>2</sup> or 2×2×4 mm<sup>2</sup>. Double shielded soft-core copper wire has less attenuation to the communication signals.

Notes: if customer selects ASTP-120Ω 2×2mm<sup>2</sup>, it's suggested that the maximum communication distance shall not exceed 3km.



- Use the factory-specified double shielded communication cable.
- ※ Communication cable with bad quality may cause communication fault or affect communication reliability.

### 4.1.3 Wiring Method of CAN Shielded Wire

In order to avoid impacts of the external interference, the transmitting cable must be the twisted pair with shielded layer and the shielded layer shall be connected to the reference ground.

Examples of analysis and connection of CAN cable with single/ double shielded layer(s) are shown in Figures 4.1 and 4.2.

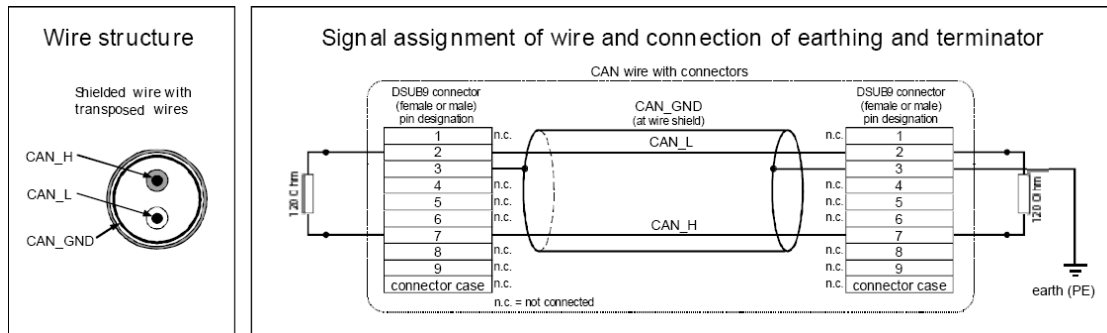


Figure 4.1 Analysis and Connection of CAN Cable with Single Shielded Layer

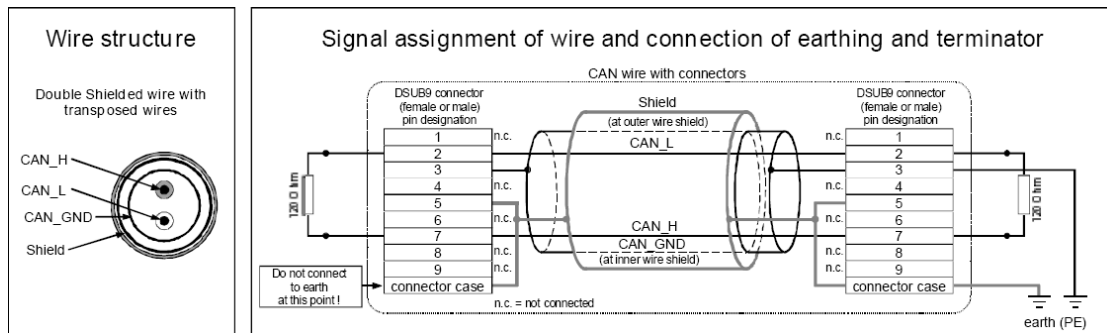


Figure 4.2 Analysis and Connection of CAN Cable with Double Shielded Layers

Serial No.	Description Rules
1	There must be two terminal resistors of $118\Omega < RT < 130\Omega$ at both network ends (between signals CAN_L and CAN_H)!
2	The reference potential “CAN_GND” is connected to the ground (PE) at a certain point. There must be one-point grounding!
3	When the cable with double shielded layers, the external shielded layer is connected to the ground at a certain point. There must be one-point grounding!
4	The unused branch must be short as much as possible (its length is shorter than 0.3m)!
5	Use the appropriate cable type! The cable voltage attenuation must be confirmed!
6	Do not lay the CAN bus near the interference source. If it has to be done so, the cable with double shielded layers is suggested.

Figure 4.3 Connection Rules for CAN-bus Network

As the reference power supply (CANCOM) of CAN signal, the inner armor should be connected to the CANCOM wiring rows of each unit wiring box effectively, and only one point of

the main control cabinet is connected to the PE ground.

The outer armor is generally not used as CANCOM and ensures that the whole cable only connects the PE ground through one point of the main control cabinet.

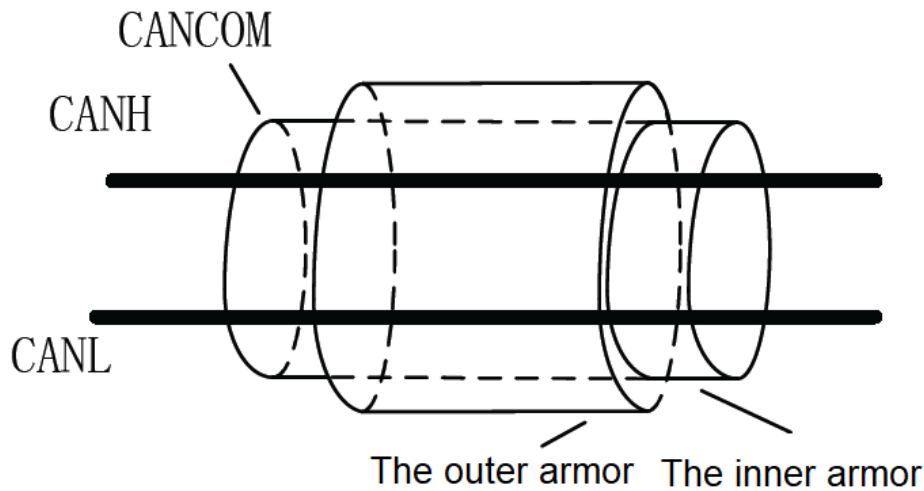


Figure 4.4 Diagram of CAN Cable



- The shielded wire must be used for the communication cable.
- ※ The non-shielded wire may cause poor communication due to presence of faradism.

Note:

Theoretically single shield can support long-distance CAN communication.

However, in very few cases, if the cable is damaged during construction, and there is a very small resistor between the damaged part and the ground, or there is a great gap between the ground zero potential of the damaged part and the ground zero potential of the internal field, the external field will be uncontrolled, so the manufacturer recommends using double shielded cable.

The use of double shielded cable still have a certain transmission capacity when the situation above occurs, but if it occurs in multiple places at the same time, it will also affect the communication or even be out of control.

In case of multi-point grounding of shield wire, it can work normally in most of the cases, but

it may cause problems due to other external factors after a period of time, so it is necessary to strengthen training and inspection before construction or during acceptance.

Attached:

If the single shielded cable has been used in the airport, the connection method is similar to that of the double shielded cable, except that the double shielded external armor is not connected.

CANCOM of all the unit wiring boxes is not connected to PE

Risk: if the skin of cables is damaged, uncontrolled problems may occur in some cases

Solution: if the communication cable cannot be replaced, first ensure that the hardware and wiring are in good performance. Separate the rest of the lights in the outfield, only connect the light closest to the lighting station, and check whether the communication is normal. If not, it means that there is a fault point in the cable from the lighting station to the outfield. If yes, add the lights to find the fault point through the method of segmented search and replace the cable.

If unshielded cable is used in the airport, it can only ensure that CANCOM in the outfield is in suspension state, also not connected to PE.

Existing risks: communication distance may be short and uncontrolled

Solution: replace PE terminal block; do not connect CANCOM line; check signal of unit board

As there is no shield, the induced voltage of the power cable will be higher. If multiple points are grounded and the potentials are different, the communication module may be damaged.

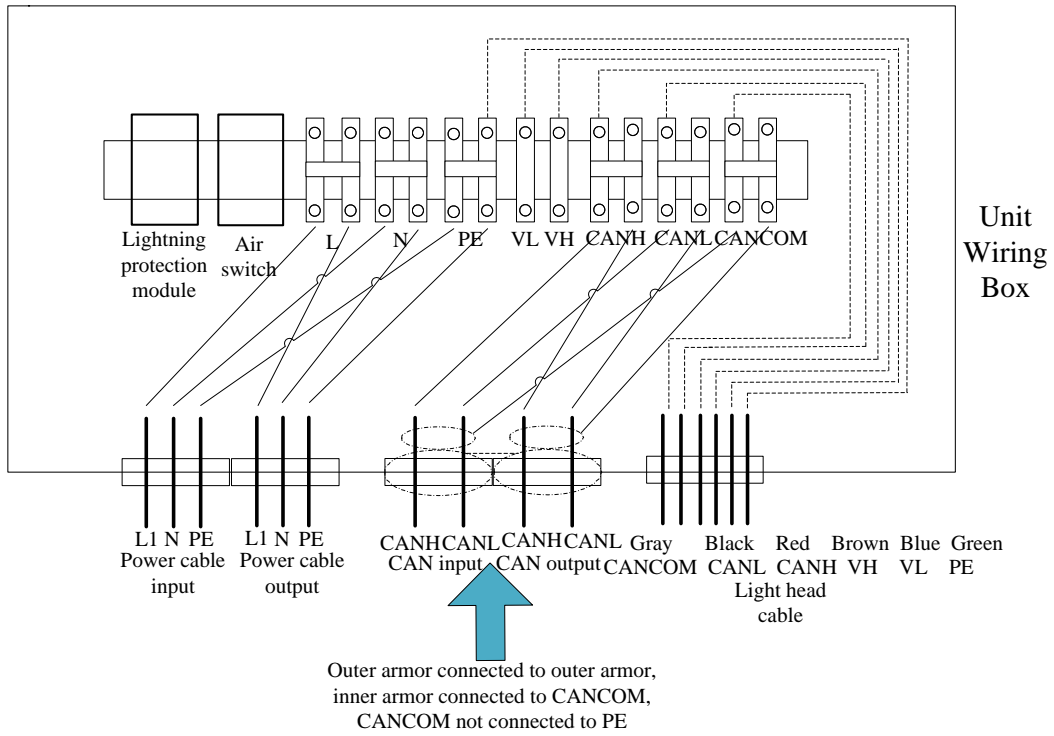


Figure 4.5 CAN Bus Communication Wiring Diagram of Unit Wiring Box of Elevated Flasher

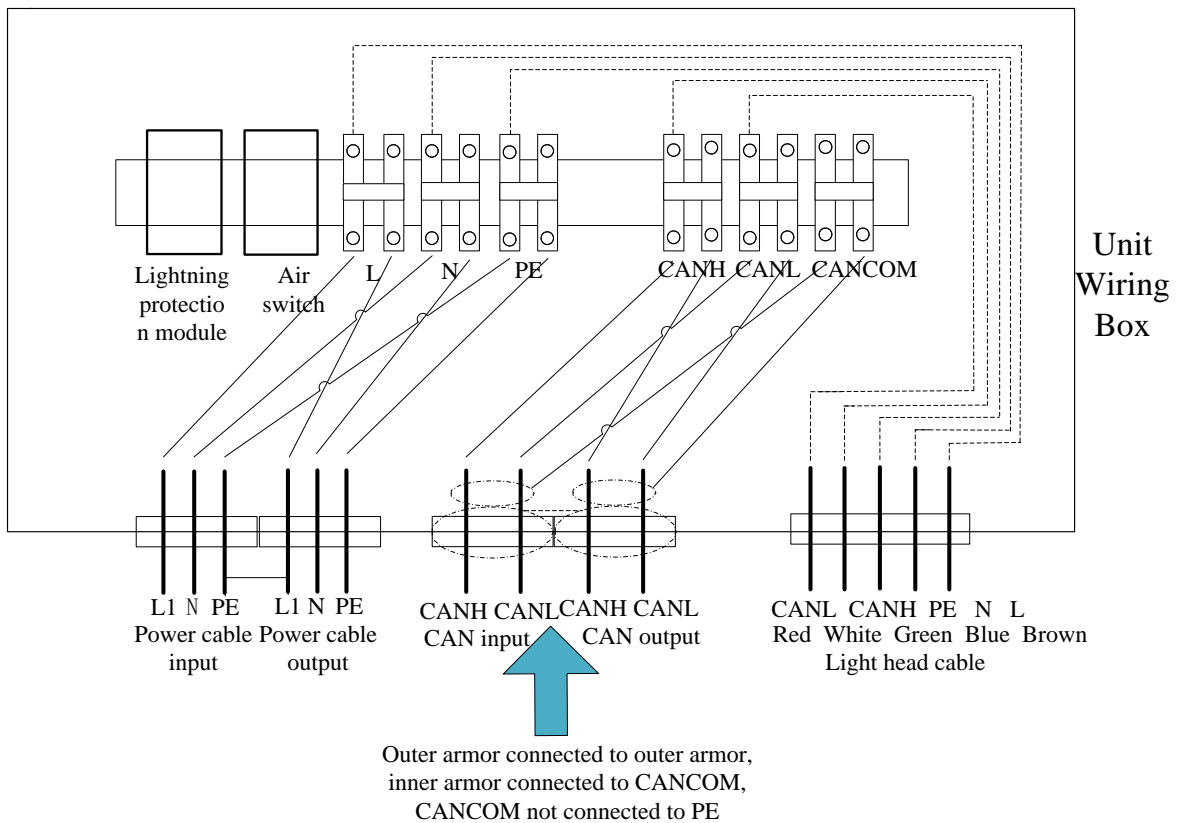


Figure 4.6 CAN Bus Communication Wiring Diagram of Unit Wiring Box of IN-pavement Flasher

Note:

CANCOM in outfiled is not connected with the ground (PE) to guarantee one-point grounding of the whole communication system.

The outer armor is connected with outer armor, instead of ground (PE) to guarantee one-point grounding of the whole outer armor.

## 4.2 Runway Threshold Identification Light

The runway threshold identification light consists of two sets of flash light. Just as its name implies, it plays a prompt role at the position of the runway threshold.

It has two existence ways:

One depends on the connection of the flash light system (as shown below 31 # & 32 #), see as figure 4.6.

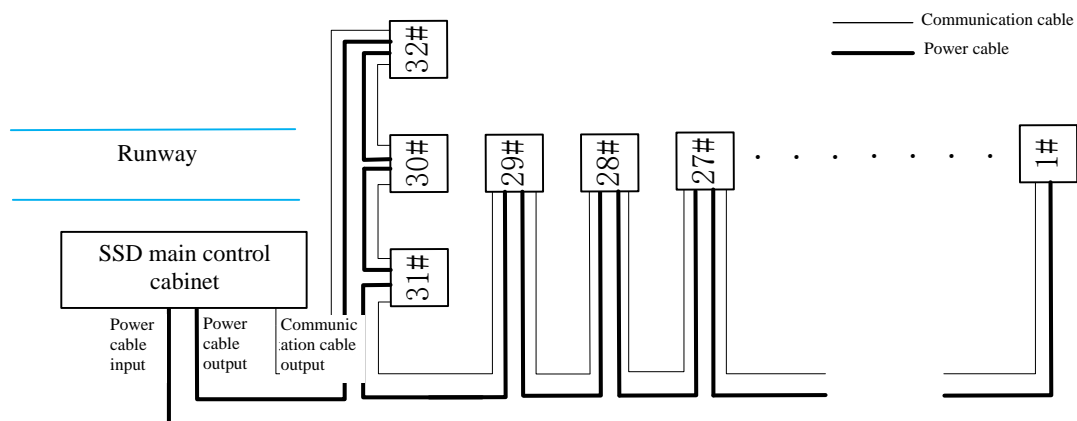


Figure 4.6 Connection depending on flash light system

The other is separate from the connection of the flash light system, see as figure 4.7.

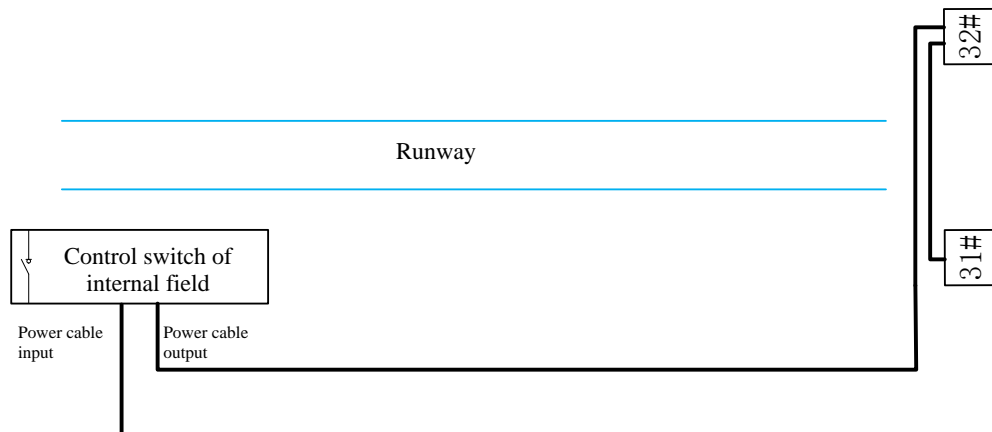


Figure 4.7 Independent communication of runway threshold identification light system

## 4.3 Overall System Wiring Diagram

### 4.3.1 Overall Wiring Diagram of Flash Light System

The whole flash light system consists of the main control cabinet, unit wiring box and unit flash light head. The user may determine the quantity of the unit wiring boxes to be used according to the actual requirements. The default mode is the mode with 21 light heads and 30 light heads. Please see Figure 4.8 Overall System Wiring Diagram (CAN communication).

Under the CAN communication mode, as shown in Figure 4.8, the main control cabinet has two sets of outputs, including output power cable and output communication cable. Power output cable has three sets, including one null line, one firing line and one earth line. Communication cable is consisted of CAN bus (CANH, CANL and CANCOM). CANCOM line is connected with the ground, namely, it is connected with the earth line of the power source to ensure communication stability.

The power cable and communication cable shall be distinguished and enter the unit cabinet from different waterproof pipes to avoid signal interference.



- Make sure that CANCOM is well grounded.
- ※ Otherwise it may cause abnormal system.



\*Note: The diameter of the entrance hole of the power cable embedded by manufacture is 1 inch (25.4mm), which may meet the direct connection of less than 1 inch (25.4mm) power cable with the unit wiring box.

Because the space in the unit wiring box is limited and the number of the lines is 21 at most. If the cable diameter is too large, it is impossible for construction. For safety, beauty and easy installation, only one VV22 power cable with  $5 \times 10 \text{mm}^2$  sectional area is held in each thread hole. If the sectional area of the power cable is more than  $5 \times 10 \text{mm}^2$ , the light hole must be used for the switchover cable of the T-shaped head. If the light hole is used for switchover, the sectional area of the power cable shall be more than  $4 \text{mm}^2$ .

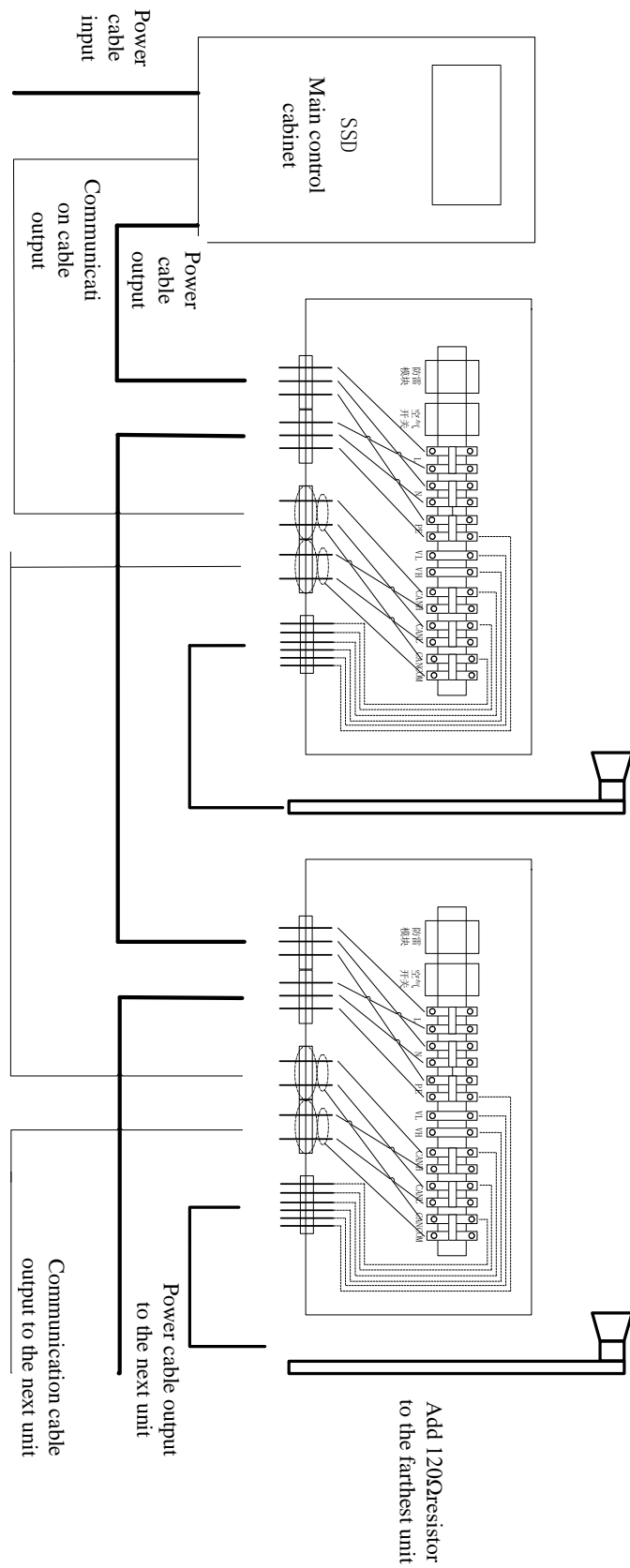


Figure 4.8 Overall Wiring Diagram of Elevated Flash Light System (CAN Communication)

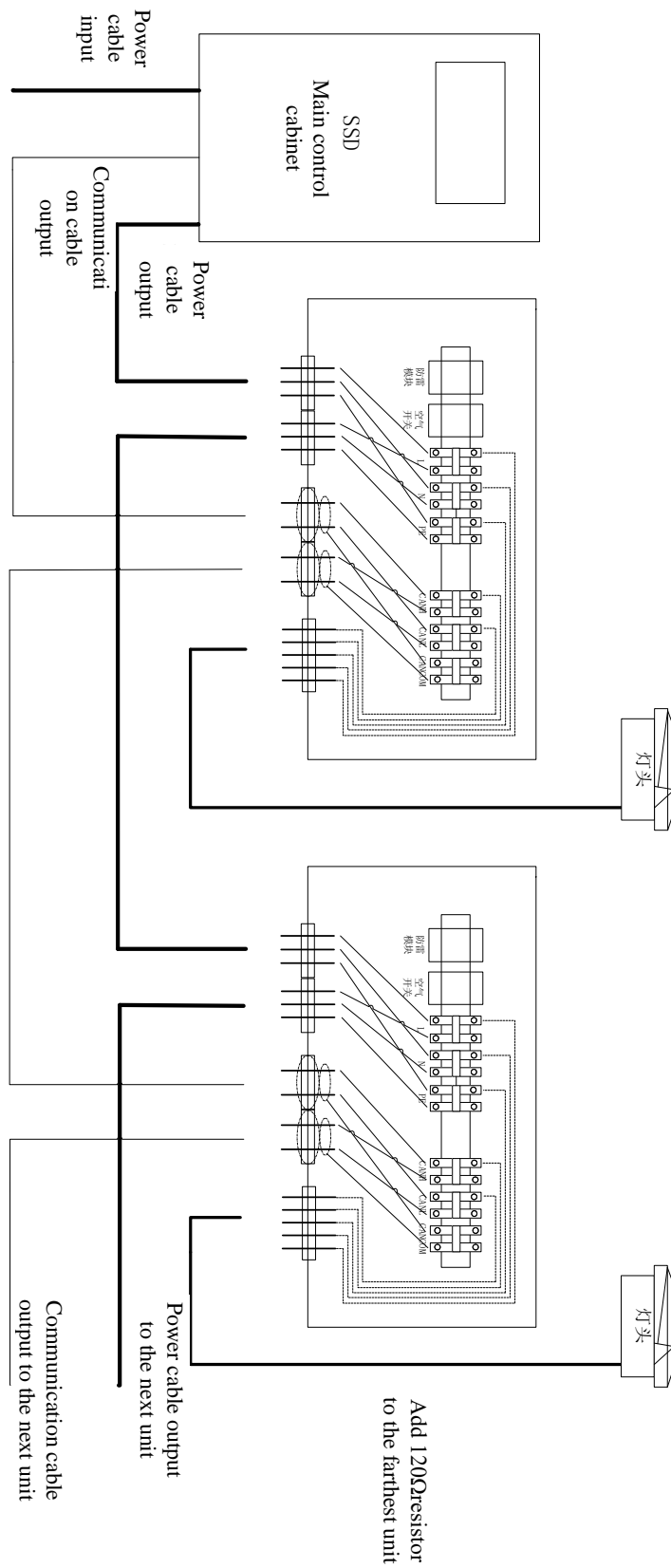


Figure 4.9 Overall Wiring Diagram of In-pavement Flash Light System (CAN Communication)

### 4.3.2 Overall Wiring Diagram of Runway Threshold Identification Light System

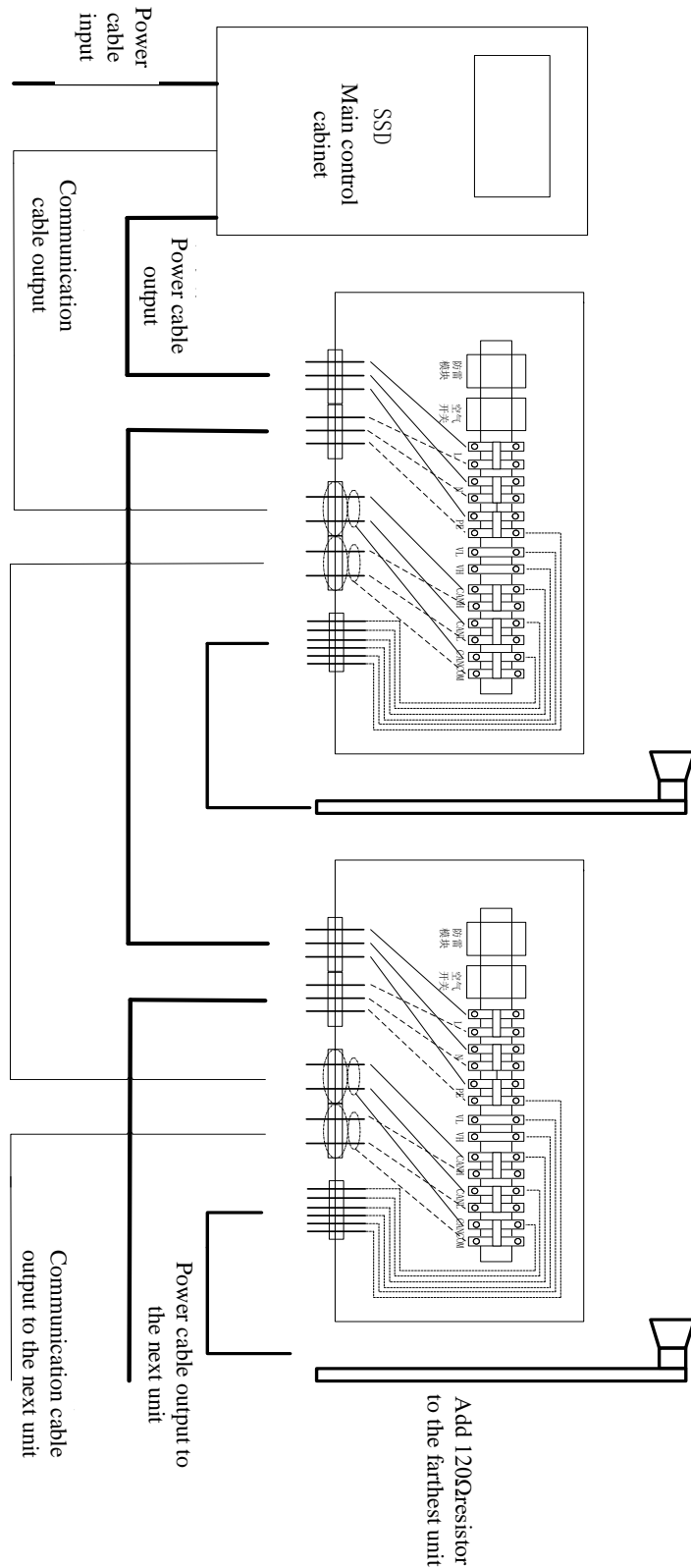


Figure 4.10 Overall Wiring Diagram of Elevated Runway Threshold Identification Light (attached) System (CAN communication)

The overall wiring diagram of the runway threshold identification light system attached to the flash light system is the same with that of the flash light system, as figure 4.10.

The communication cable is not needed for the wiring diagram of the runway threshold identification light system independent of the flash system, only power cable needed for power supply (same phase), and power grid used to control it synchronously, as shown in Figure 4.11.

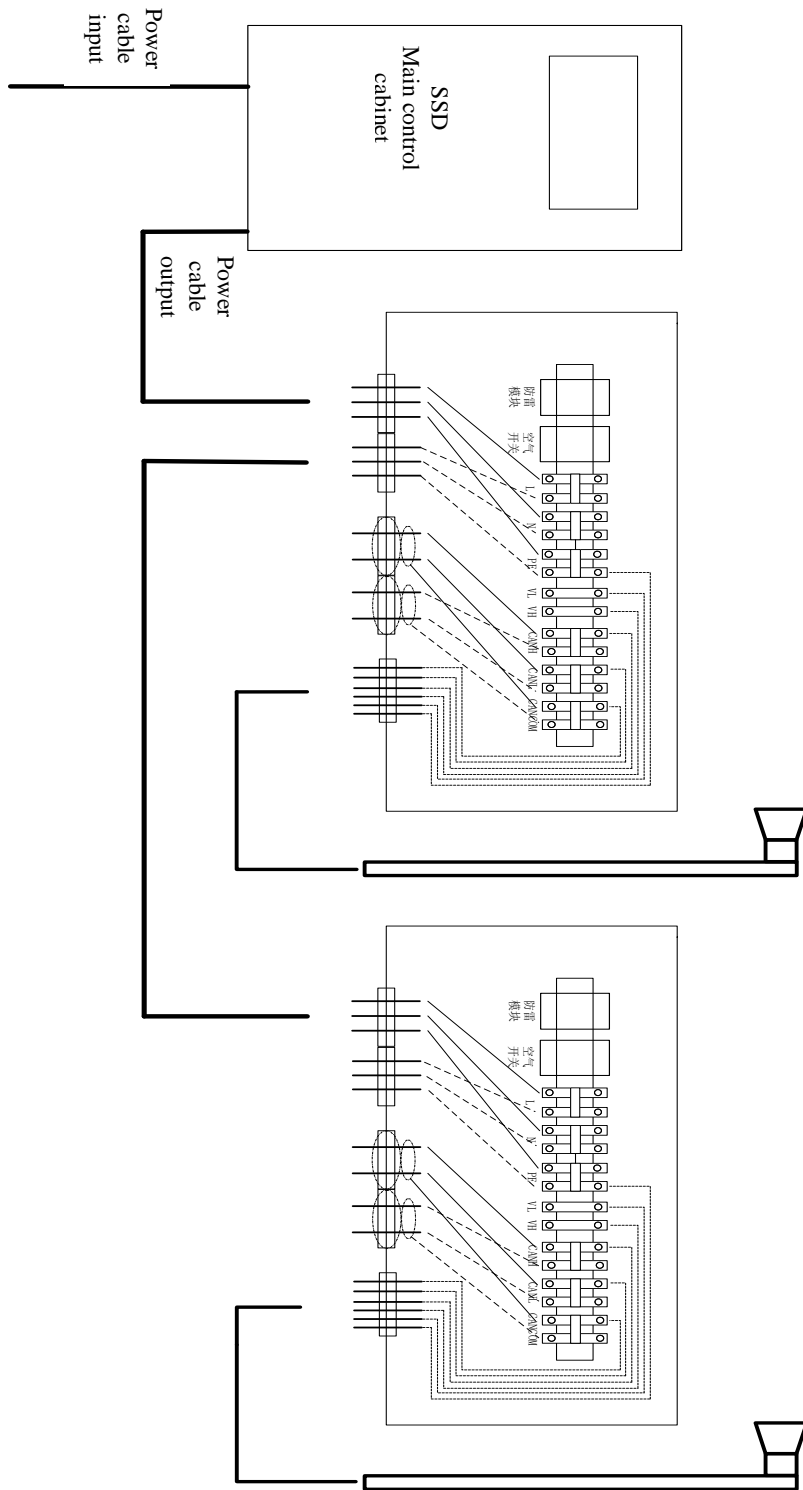


Figure 4.11 Overall Wiring Diagram of Independent Elevated Runway Threshold Identification Light System  
(grid synchronization)

## 4.4 Internal Wiring Diagram of Main Control Cabinet

The main control cabinet has two sets of output lines, including power source line and signal line.

**Power source line:** The yellow, green and red lines are firing lines and the blue line is null line (null line bar) and the yellowish green line is the power connection line (grounding bar). Three in the left are power source inputs (L1 in, L2 in and L3 in) and three in the right are lines for power source outputting to the unit wiring box (L1 out, L2 out and L3 out).

**Signal line:** The output signal line is CAN bus. There are three lines in total, including CANH line (red), CANL line (black) and CANCOM line (grey). CANCOM line is connected with PE (yellowish green earth terminal). The user shall only connect them to the corresponding CANH, CANL and CANCOM interfaces of the unit wiring box in order.

As shown in Figure 4.12, the main control cabinet has three switches. The first is the main power switch, the second is the power switch of the main control board and the third is the lightning protection switch.



- Confirm whether the main power source is disconnected when the external field maintenance is performed.
- ※ Live operation is very dangerous, which may cause accidents.

Note: "L1 IN", "L2 IN" and "L3 IN" are firing line input terminals of the power source. After passing an air switch, output to "L1 OUT", "L2 OUT" and "L3 OUT" respectively.

"CANH", "CANL", "CANCOM" is the signal line for communication. A 120Ω resistor is integrated between "CANH" and "CANL" in the main control board. Another 120Ω resistor shall be connected externally in parallel between "CANH" and "CANL" in the unit wiring box at the farthest end of the power connection.

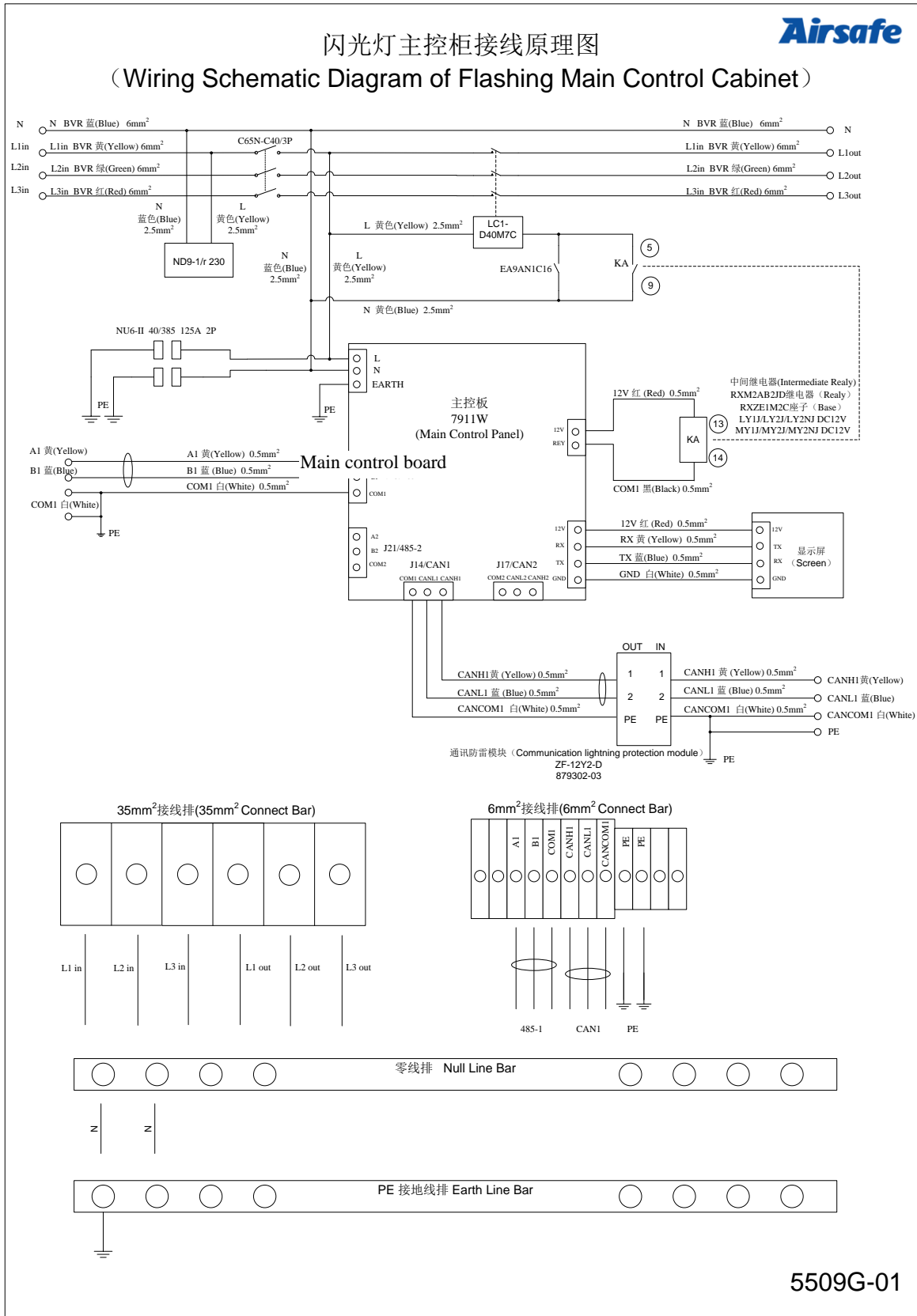


Figure 4.12 Internal Wiring Schematic Diagram of Main Control Cabinet



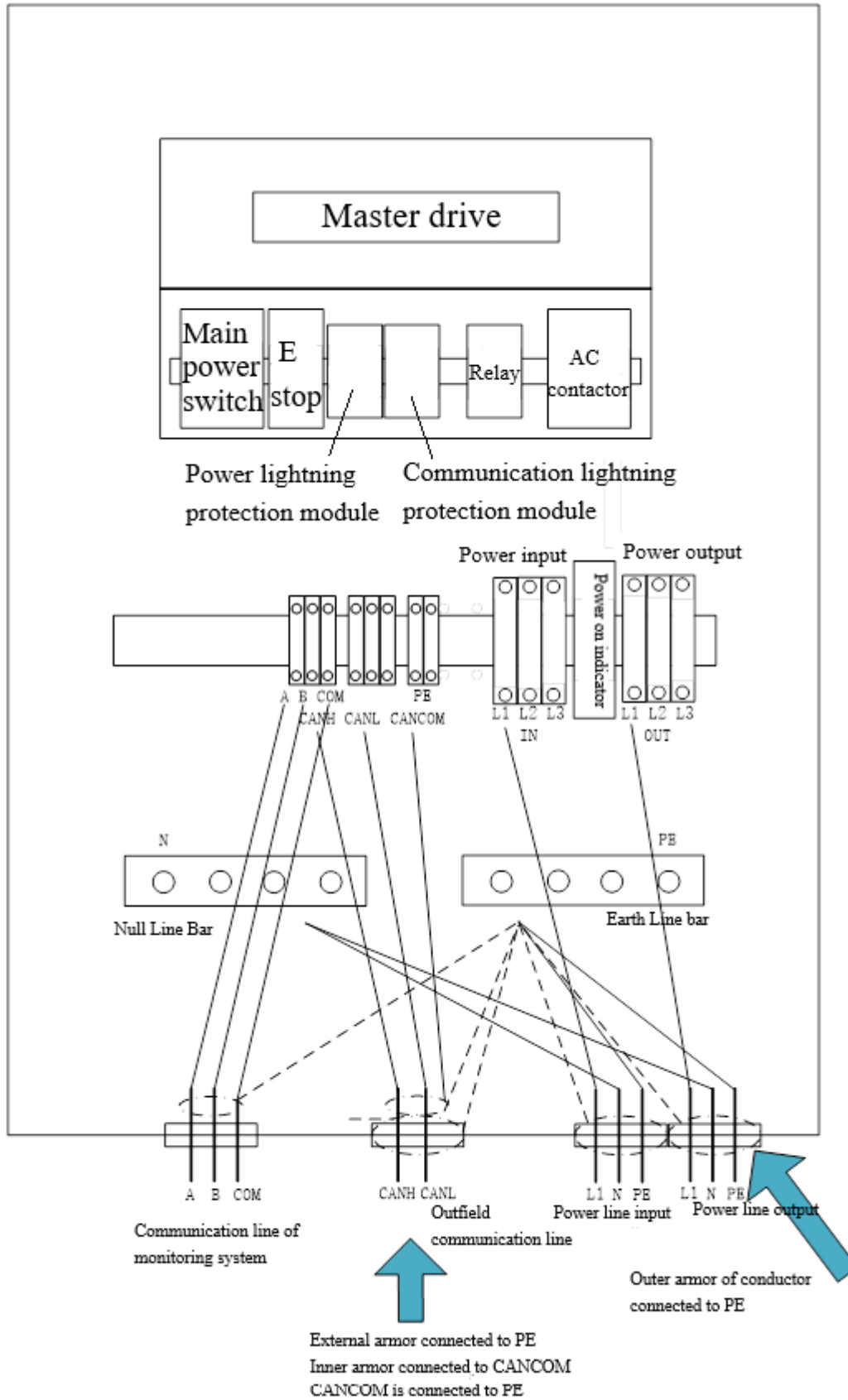


Figure 4.13 Internal Wiring Diagram of Main Control Cabinet

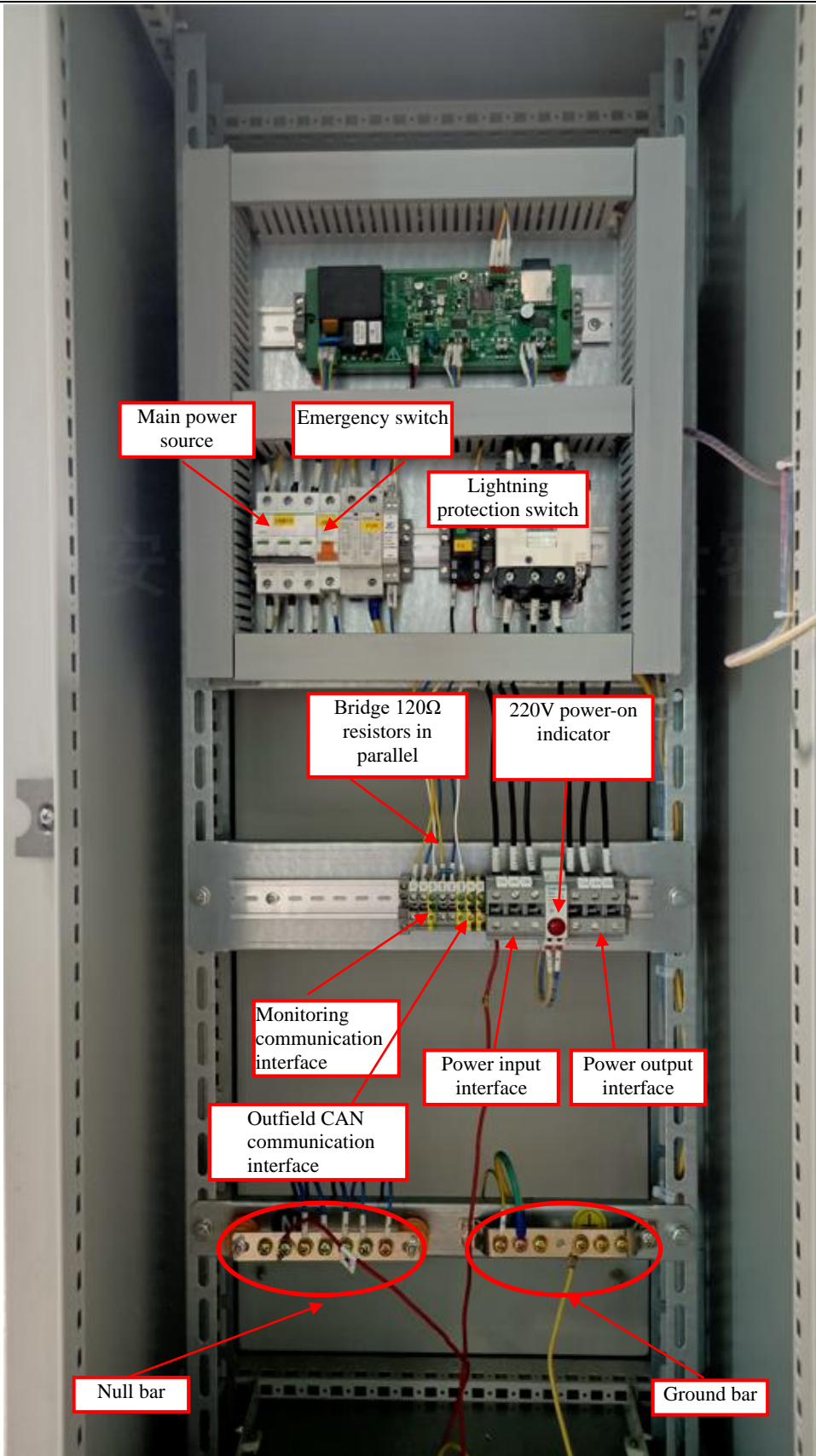


Figure 4.14 Internal Physical Picture of Main Control Cabinet 1

## 4.5 Physical Picture of Unit Wiring Box

As shown in Figure 4.15, the inside of the wiring box is mainly consisted of terminal blocks.

Note: A  $120\Omega$  resistor shall be connected in parallel between CANH and CANL of the unit wiring box at the farthest end of the power connection (see Figure 4.16).



- Laypeople are prohibited to operate the unit wiring box.
- ※ The operating voltage higher than the safety voltage may cause personal injury.



Figure 4.15 Physical Picture of Waterproof Gland of Unit Wiring Box

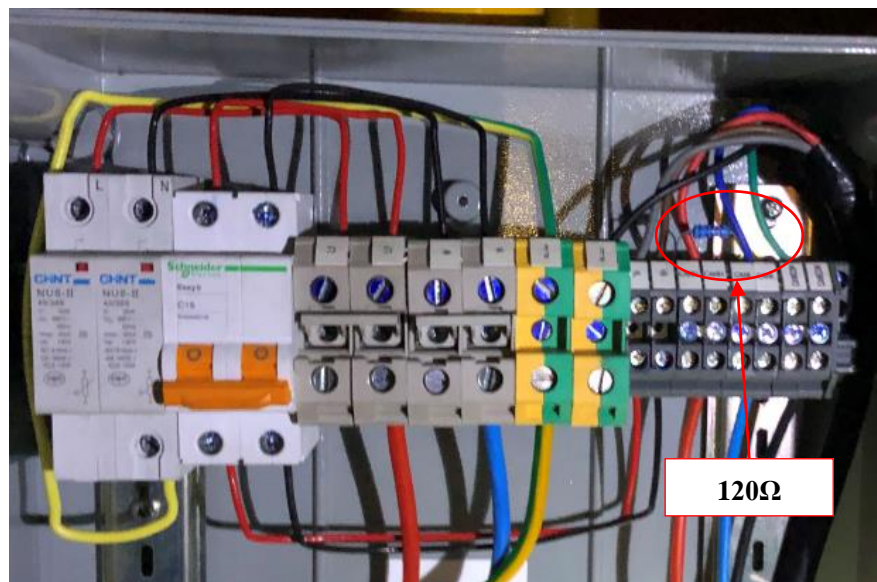


Figure 4.16  $120\Omega$  resistor connection

## 4.6 Grounding

Good grounding may make the system work more steady and safer. The suggested grounding method is as follows:

Each flash light unit uses 2.5m box iron as a grounding electrode, which is infiltrated into the ground. A 2.5 mm<sup>2</sup> yellowish green earth line is led out of the yellowish green earth line bar of the unit wiring box, which is connected to the box iron, as shown in Figure 4.17 (the box iron and earth line are prepared by the user).

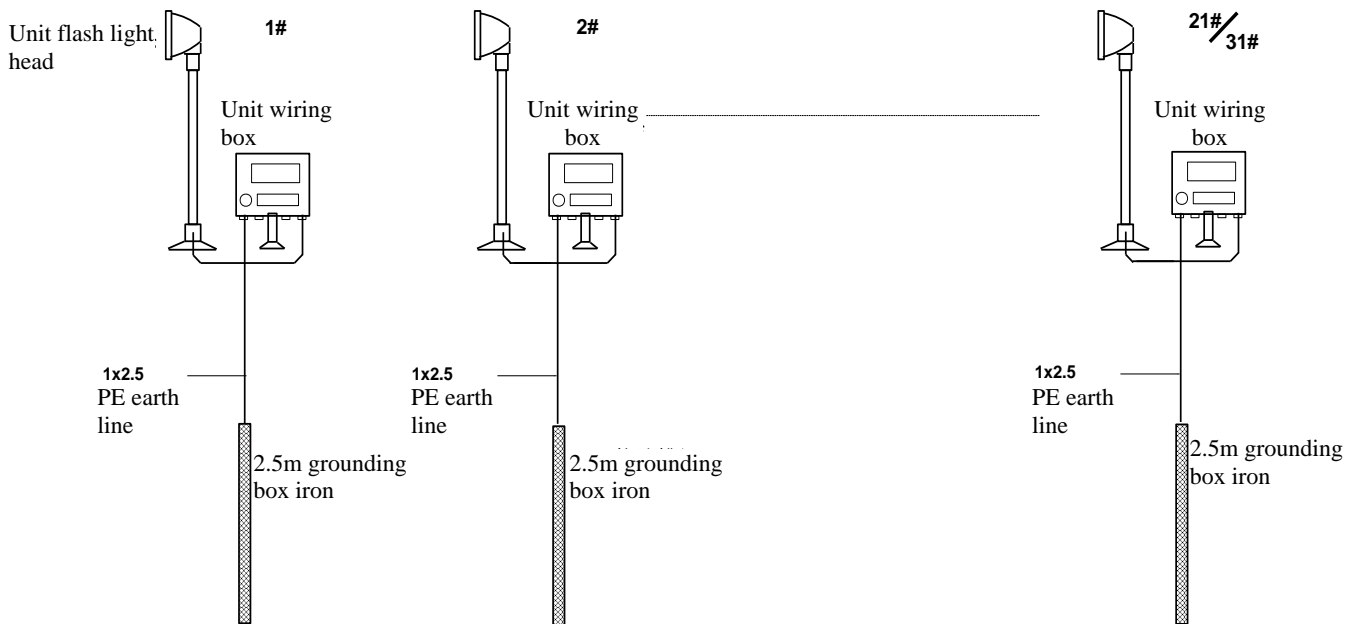


Figure 4.17 Suggested Grounding Method



- Make sure that the whole system is grounded reliably.
- ※ Otherwise normal communication is not achieved and lightning may cause damage to the system.

### 4.6.1 Method to Confirm Reliable Grounding

#### Preparatory Work:

Because the unit board and main control board have lightning protection, the tested voltage is clamped. If an accurate value shall be tested, except that the PE of power cable and communication CANCOM shall be disconnected, all outfield CANCOMs shall be suspended and

CANH, CANL and CANCOM connected with the main control cabinet shall be removed.

**Test Method:**

I. Measure the voltage difference of the internal and external fields when there is an outage (the multimeter AC gear directly measures the voltage of the PE bar of the main control cabinet and PE line of the external field). The voltage shall be 0V if no current is delivered. If it is not 0, please troubleshoot other line interference.

II. Measure the voltage of the internal and external fields at step 1. Because CAN does not communicate, after startup, the lighting fixtures will start to flash after 4s. Observe whether the voltage difference is changed and the normal value is 0; if the voltage is lower than 3VAC (average), it is the reserved margin, the communication is possible; if the voltage is higher than 18VAC (peak value: 24V), please shut it down because CAN communication chip may be damaged.

III. Measure the voltage difference between outfield CANH and internal field PE, outfield CANL and internal field PE. Compare them with the above-mentioned value.

IV. Measure other steps according to the above-mentioned method.

**Solutions:**

If the above-mentioned test shows that the outage itself has the induced voltage or the electrifying induced voltage is higher than 3VAC, it means that grounding is not reliable.

The following solutions are for reference:

1. Select the shielded cables and make the distance between the communication cable and power cable greater than 30cm, not in the same trench.

2. Lay the grounding box iron and reconstruct the earth.

## **4.7 Self-Inspection Items before Startup of Flash System**

1. The power cable is insulated to the ground and the insulation resistor between the lines is  $\geq 2M\Omega$

2. The communication cable is insulated to the ground and the insulation resistor between the

lines is  $\geq 1M\Omega$

3. The ground resistor of the protective earth line is  $\leq 4\Omega$

\*Note: The above-mentioned three items shall be tested before all unit wiring box of the flash light are wired, the insulation and grounding reliability may directly impact the stability of the flash light system.

4. The potential difference of the internal and external fields at all steps is  $\leq 3VAC$

Test method of potential difference of the internal and external fields:

Disconnect the earth line PE of power cable and communication earth line CANCOM in the main control cabinet which are connected with the grounding bolt and measure the voltage differences between PE, CANCOM and grounding bolt, i.e. potential difference of the internal and external fields.

5. The power cable/communication cable has been correctly connected and tightened according to the manual.

The power cable/communication cable must be connected accurately and firmly to avoid board burnout, or failure of the whole flash light system.

6. The waterproof gland of the unit wiring box is sealed in place.

If the unit wiring box is not sealed in place, the moisture will enter it to cause electrical fault.



- All the above items must be strictly inspected.
- ※ Otherwise the system may not work normally.

7. The communication cable for transmitting data must be double shielded cable



- The communication cable must be double shielded cable.
- ※ The non-shielded cable may cause poor communication due to faradism.

## 5.0 System Safety Design Measures

### 5.1 Emergency Disposal after Failure of Main Control Cabinet

When the main control cabinet has failure, the system stops working.

At this time, you only need to turn on the urgency switch and directly power on the outfield unit wiring boxes. The flash units continue to be used and the system resumes to work. However, because the main control cabinet fails, the real-time status of each unit of the system cannot be read, and the brightness level cannot be adjusted, as shown in Figure 5.1.

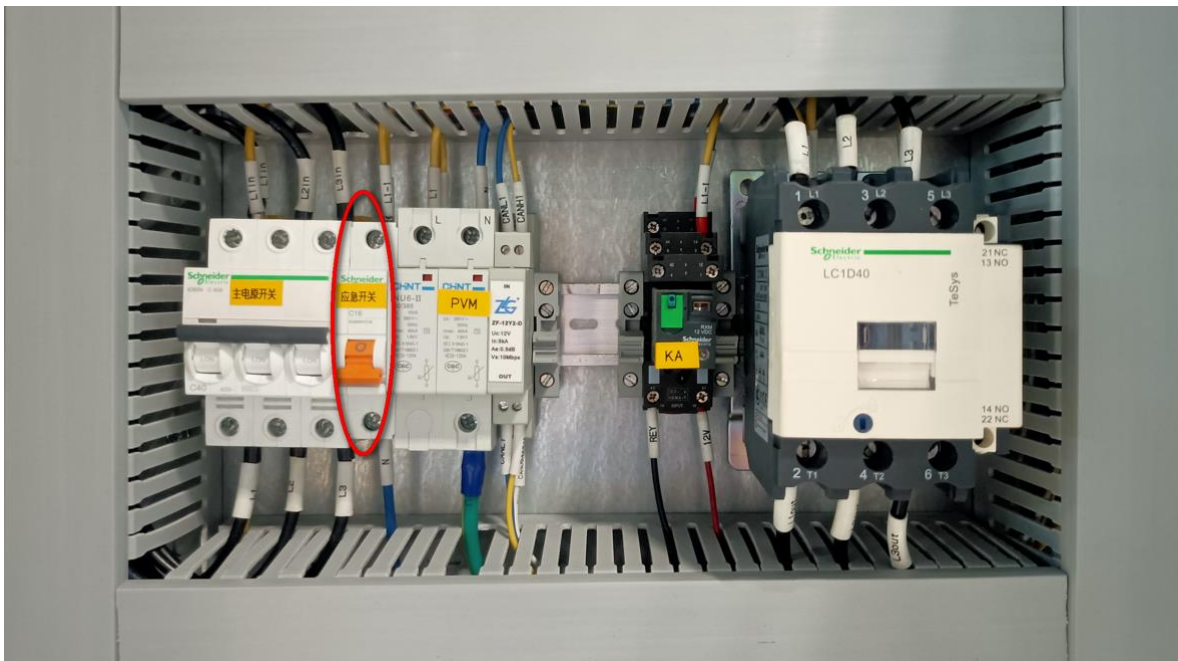


Figure 5.1 Main Control Cabinet Switch

The work driven by the unit wiring box is an abnormal operation of the system, and it is recommended that the user only use it as an emergency. At the same time, the fault of the main control cabinet should be eliminated in the shortest time to make the system back to normal operation.



- System driven by the unit wiring box outside the field is prohibited, except special cases.
- ※ Various working states of the system cannot be monitored and read under this working state.



- The power supply must be disconnected when the main control cabinet is checked .
- ※ Otherwise it may cause electric shock

## 6.0 Replacement of System Components

When the consumables or other parts of the system are damaged or fail, the system components should be disassembled in time and the parts should be replaced. Because when replacing parts, any slight error may cause undesirable consequences. The factory requires users to pay attention to the following warnings. Be careful when disassembling and assembling, inspect the light thoroughly, replace some vulnerable parts as required, and ensure the performance of the light after disassembly.



- The equipment has high voltage, the power must be cut off when checking the flash system, and maintenance operations can be carried out after 30 seconds.
- ※ Otherwise it may cause electric shock.



- The system components must be replaced by the trained professionals.
- ※ To avoid various system faults.



- It is suggested to maintain the lighting fixtures at the light station or in the workshop.
- ※ Entry of any impurities may cause leakage.



- The manufacturer suggests to replace various gaskets when maintaining the lighting fixtures each time.
- ※ Gasket aging and damage are main causes of leakage of the lighting fixtures.

### 6.1 Replacement of Rear Cover Gasket

First, confirm that the main power source in the main control cabinet is on OFF state and live operation is strictly prohibited!

Loosen the four locking screws of the rear cover of the lighting fixture, take out the gasket from the rear cover groove, replace with the new one, ensure it fits well, align the rear cover hole with the positioning pin of the light body, and tighten the four screws.



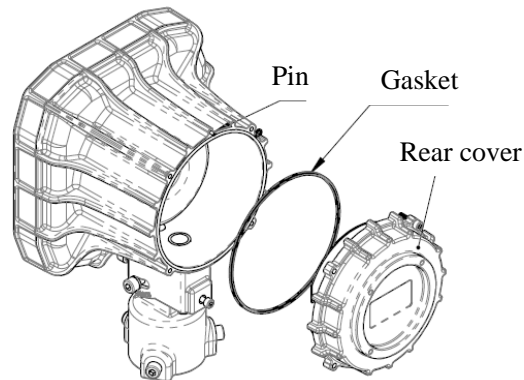


Figure 6.1 Schematic diagram of gasket replacement



- Prior to gasket replacement, the power source must be disconnected.
- ※ Otherwise it may cause electric shock.



- Ensure that the seal groove is clean when replacing the gasket.
- ※ Impurities may cause leakage.

## 6.2 Replacement of Light Body Gasket

Loosen the four screws at the front cover and remove the front cover; take out the front glass and gasket from the front cover, take out the old gasket from the front glass, replace the new gasket into the glass, and ensure that the four corners of the gasket fit well. Put the assembled front glass of the gasket into the front cover, and fix the front cover with the light body with four screws. In the process of replacement, you must wear cotton gloves to ensure that the front glass is clean.

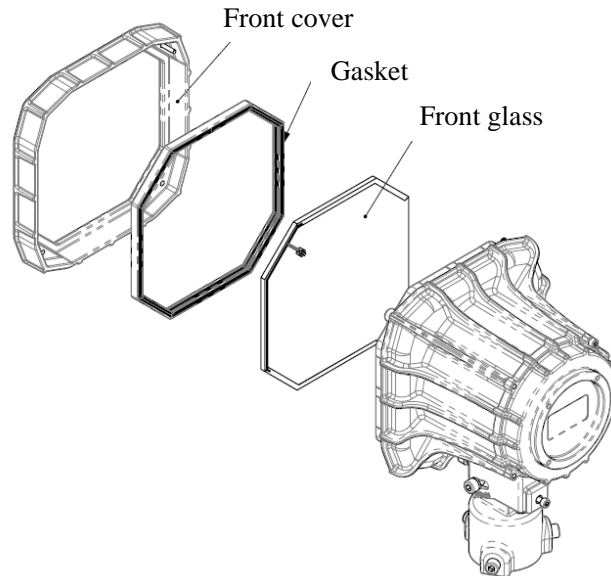


Figure 6.2 Schematic diagram of light body gasket replacement

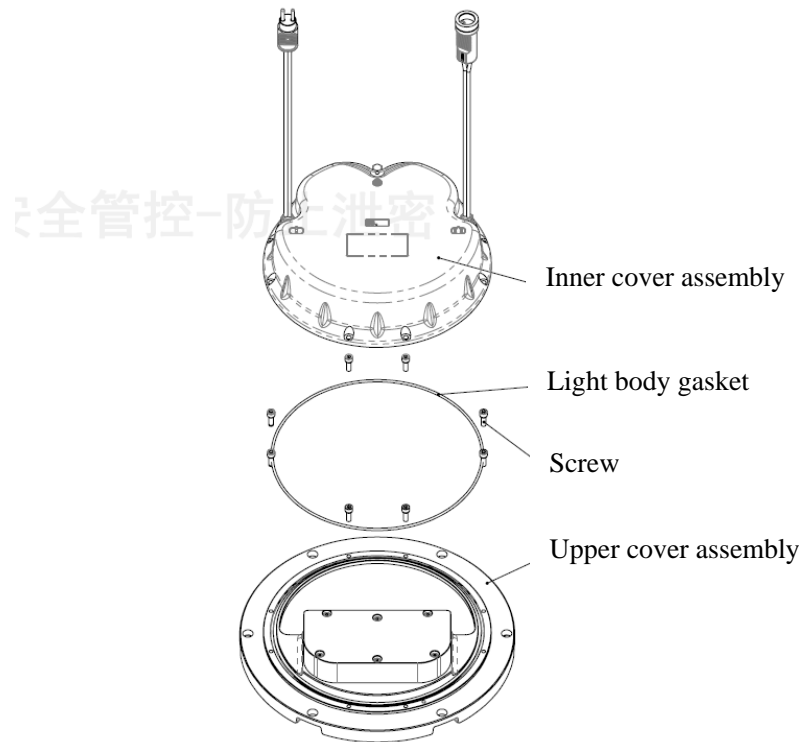


- Wear clean cotton gloves when replacing the gasket.
- ※ Otherwise it may affect the light intensity.

### 6.3 Replacement of Light Body Gasket

Loosen the screw between the upper cover and the inner cover, pull out the light source connector from the circuit board and remove the inner cover.

Replace the O-ring between the upper cover and the inner cover. Clean the O-ring groove during replacement.



- When replacing the O-ring, clean the O-ring groove.
- ※ Otherwise it may lead to loose sealing, water leakage of lighting fixtures and equipment damage.

## 7.0 Maintenance of Lighting Fixture System

### 7.1 Daily Inspection and Maintenance

The daily maintenance suggestions provided in this section are only for reference. The airport may establish its daily maintenance rules according to other provisions or maintenance experience of its staff. The manufacturer does not make the hard-and-fast rules.

The airport lighting fixtures shall be maintained by the professional personnel according to the contents in 1.0 Foreword.

#### 7.1.1 Daily Inspection and Maintenance Items

1. Pay attention to the flash missing information of the lighting fixtures on the main control cabinet panel. If there is flash missing (the indicator light on the panel is in red).

If the unit wiring box is offline (the red indicator light on the panel light up), the fault shall be removed. The user may determine whether the flash light system has fault through the fault prompt on the main control cabinet panel and enter the “Menu” to check the reason.

2. Check the locking screws of the lighting fixtures and tether connecting screws.

3. Wipe the external surface of the front glass with a clean and soft towel to keep the optical lens (front glass) clean and transparent.

4. Observe whether there is moisture and water on the front glass of the lighting fixtures.



- The front glass or reflection cup of the lighting fixtures shall not be randomly taken down on site.
- ※ Otherwise it may cause fault of the lighting fixtures.



- Laypeople are prohibited to disassemble and assemble the system assy.
- ※ Otherwise it may cause system malfunction.

## 7.2 Removal of Common Faults

Serial No.	Fault Phenomenon	Fault Cause	Removal Method
1	Low luminance	Whether the optical path is stained Check whether LED is burnt out.	Clean the optical components Replace the light
2	Existence of moisture and water (check the internal surface of the prism through visual inspection)	Aging of sealing component Desiccant failure	Replace the gasket of the light body Replace the gasket of the rear cover Replace the desiccant
3	Moisture in the unit wiring box	The sealing adhesive tape is failed. The foaming agent at the flexible pipe joint is not filled completely.	Replace the adhesive tape. Fill the foaming agent.
4	Flash missing	Loose LED connection LED damage Driver malfunction	Replace LED Replace the driver board
5	The lighting fixtures do not flash.	Loose LED connection LED damage Driver malfunction	Replace LED Replace the driver board
6	Error or no display of the touch screen	No power source Main control board malfunction Touch screen malfunction	Check the wiring and power input. Replace the main control board. Replace the touch screen.
7	Poor communication of main control cabinet	Communication connection method: Serial port switched to USB then to 485 (the connection method can only be primary connection).	Directly connected to 485 through the serial port (or USB)

## 8.0 List of Components and Ordering of Spare Articles and Accessories

The table in this chapter lists the standard ordering number of the system components or articles. 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 system.



- The manufacturer suggests that the user should place an order after reading through the manual.
- ※ Otherwise it may cause incorrect ordering or inaccurate quantity of system components.

### 8.1 Necessary Spare Parts List for Normal Operation

Structure No.	Component Name	Order No.	Description
1	Main control cabinet	979302	Main control cabinet assembly
2	LED Elevated flash light head	66280	Optical cover gasket 196×196
3	LED In-pavement flash light	66440	
4	Unit wiring box	79308-D	With pole and flange
5	Frangible coupling	924252	2-inch sleeve frangible coupling
6	Flange	FL-10	Flange 240 (G2-H35)
7	Shallow base	927402	12-inch shallow base-ISFL

### 8.2 Spare Parts for Main Control Cabinet

Structure No.	Component Name	Order No.	Description
1	Touch screen of Main control cabinet	791A7	
2	Main control driver	7911W	

### 8.3 Components and Spare Parts List of Elevated Lighting Fixtures

Structure	Component	Order	Description
-----------	-----------	-------	-------------

No.	Name	No.	
2	Front cover gasket	41186	Front glass gasket 196*196
3	Front cover	31159	Front glass 192*192*C43
4	LED light source	79248/31181	LED light source 175*175/Lens 10° *30°
7	Light body gasket	41188	O-ring gasket
	Rear cover assembly	924D11	Rear cover LED 140 (with electrical board)

#### 8.4 Components and Spare Parts List of In-pavement Lighting Fixtures

Structure No.	Component Name	Order No.	Description
1	Upper cover	21391	Upper cover (12) S
2	Prism gasket sleeve	43112	Prism gasket sleeve H42 (14° )
3	Prism	31162	ISFL glass - right
4	Prism	31161	ISFL glass - left
5	LED light source	7927D	Heat dissipation paste 62.5*33
6	Prism gasket	43315	Prism gasket (14° )
7	Prism pressing bracket	4642K-01	Prism pressing bracket (14° )
8	Inner cover assembly	921441	
9	Light body gasket	41135	O-ring gasket 228.27*2.62

#### List of Accessories

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

Serial No.	Order No.	Description
1	FC-02	Frangible coupling (2-inch)
2	954211	Calibrator assembly
3	REC7	Secondary cable connector-A7 two-pin socket
4	PLG6	Secondary cable connector-A6 two-pin plug

## **9.0 Packaging, Transportation and Storage**

### **9.1 Packaging and Weight**

Elevated lighting fixtures:

Packaging: 1pcs / box

Gross weight: 6.5 kg

Volume: 262\*302\*380mm<sup>3</sup>

Unit wiring box:

Packaging: 1pcs / box

Gross weight: 9.5 kg

Volume: 440\*350\*550mm<sup>3</sup>

Main control cabinet:

Packaging: 1pcs / box

Gross weight: 55 kg

Volume: 550\*550\*1400mm<sup>3</sup>

### **9.2 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.

### **9.3 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.



## Appendix I Selection of Power Cables and Communication Cables

### Power cable:

The recommended model by the manufacturer is: DZYJY 0.6/1KV 2\*16mm<sup>2</sup>+1\*6mm<sup>2</sup>

Conductor: 16mm<sup>2</sup> is a 7-Strand stranded conductor, 6mm<sup>2</sup> is a single conductor

16mm<sup>2</sup> diameter power cable is applicable to the SFL system, of which distance from light station to the outfield is 4km.

In actual use, customers can choose different cable diameters according to their actual needs.

In case of 220V, single phase power supply and 2Hz flash, the suggested supporting cables and usable lengths are shown in Table below.

Cable Diameter mm <sup>2</sup>	Maximum Resistor at 20°C Ω/km	Distance from Light Station to External Field (Km)	Note
6	3.39	1.47	Same cable for 21 Light Heads and 30 Light Heads
10	1.95	2.56	
16	1.24	4.03	
25	0.795	6.30	

### Communication Cable

The communication mode is the CAN bus communication and there are one entry and one lead.

The manufacturer recommends double shielded cable, the specified model is: ASTP-120Ω 2×2mm<sup>2</sup> or 2×4 mm<sup>2</sup>; If the customer has spare demand, optional model is ASTP-120Ω 2×2×2mm<sup>2</sup> or 2×2×4 mm<sup>2</sup>. Double shielded soft-core copper wire has less attenuation to the communication signals.

Notes: if customer selects ASTP-120Ω 2×2mm<sup>2</sup>, it's suggested that the maximum communication distance shall not exceed 3km.

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

Thanks for your purchasing and using AIRSAFE product!

Address: No.205, Changchuan Road, Baoshan District,  
Shanghai, China

Postal Code: 200949

Tel.: 021- 39533596

Fax: 021-63643114

E-mail: [sales@airsafe.com.cn](mailto:sales@airsafe.com.cn)