

LED Wind Direction Indicator (Internal Lighting)

WC-I Series

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	C.SY	W.GL	Sep.18, 2014
2	Design revised and internal lighting	V2.0	W.M	C.SY	Aug. 27, 2015
3	Editing revision	V2.1	Y.MZ	C.SY	Nov. 26, 2016

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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 criterions for site installation and maintenance of such lighting fixtures. This manual was compiled with considerable reference to these two criterions.


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 criterion. 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.

	<ul style="list-style-type: none">■ To remind that the behavior may cause serious injury or death.※ Detailed description will be given in the box.
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	<ul style="list-style-type: none">■ To remind that the behavior may cause injury to people or damage to product.※ Detailed description will be given in the box.
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	<ul style="list-style-type: none">■ To notify that the behavior is prohibited.※ Detailed description will be given in the box.
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1.2 Safety Rules and Notices



- This wind direction indicator is inapplicable to be used outside the airport.
- ※ It is only applicable to the place with the approximate wind direction and power indicated.



- During installation, the power source shall be disconnected.
- ※ Current impact caused during installation of the wind direction indicator may damage the lamp.



- Making sure valid earthing according to the requirements of the operation manual.
- ※ Otherwise electric leakage or shock may be caused.



- Live product maintenance is strictly prohibited and equipment maintenance is strictly prohibited if there is thunder or rain.
- ※ Otherwise it may cause electric shock or other accidents.



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



- The lead shall be immediately replaced when its surface is damaged.
- ※ Otherwise it may cause electric shock.

1.3 Quality Assurance and Responsibility

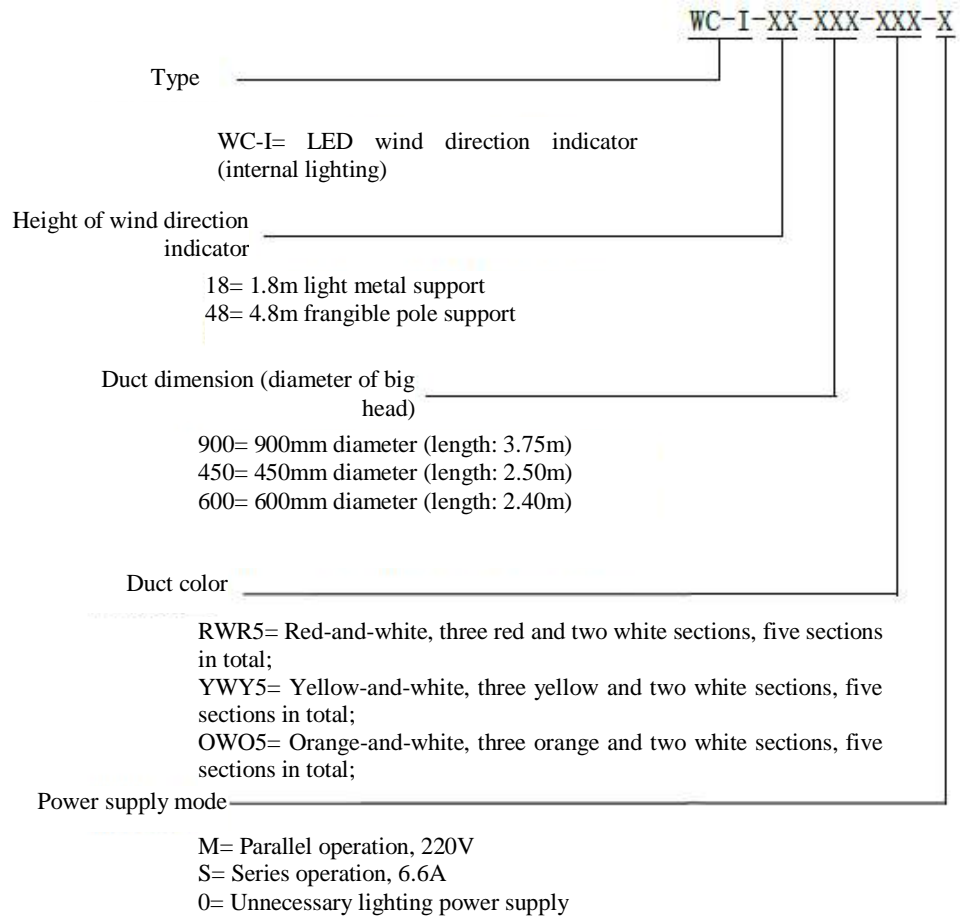
Any defect in design, material or workmanship, which may occur during proper and normal use over a period of one year from date of installation but less than 15 months from date of shipment, or within the warranty period of the tender, will be repaired or preplaced by manufacturer free of charge. The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

2.0 Introduction

This manual involves the following series wind direction indicators:

WC-I -----LED Wind Direction Indicator (Internal Lighting)

Type of LED Wind Direction Indicator (Internal Lighting):



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.

- Convention on International Civil Aviation Attachment 14- Airport Volume I
- Convention on International Civil Aviation Attachment 14- Airport Volume II
- ICAO Doc 9157- Airport Design Manual;
- ICAO Doc 9261- Heliport Manual;
- FAA AC150/5345-27;
- MH5001 Technical Standards for Airfield Area of Civil Airports;
- MH5013 Technical Standards of Civil Heliports;
- Civil Aviation Administration of China Airport Department Consulting Notice Technical Requirements for Wind Direction Indicator (AC-137-CA-2015-05)

2.2 Application Environment

- Altitude: below 4,000m;
- Outdoor: -40°C ~ +55°C;
- Relative air humidity: 95%; at (+24.5°C), the maximum humidity may be greater than 100%;
- Exposed to rain, snow, ice, ponding and solar radiation;
- Expose to corrosive salt atmosphere
- Basic earthquake intensity VII.
- Maximum wind speed is 38.9m/s.

2.3 Application Scope

A wind direction indicator may definitely indicate the surface wind direction and provide the wind speed reference for the pilot. The civil airport or heliport must be equipped with at least one wind direction indicator. It must be provided at the position which may be seen from the aircraft during flight or in the movement area, which is not interfered by the air flow caused by the object nearby.

The wind direction indicator consists of a conical duct and vertical extension pole. The duct is covered a striped textile fabric with obvious color contrast and different colors shall be selected according to the airport nature and ground background differences.

For the airport to be used at night, the wind direction indicator shall have lighting.



Using this wind direction indicator beyond the range is strictly prohibited.
※ Otherwise it may cause damage and risk to the assy.

2.4 Technical Features

- With a simple structure, the wind direction indicator works reliably and is easily maintained;
- Internal lighting has professional lighting system design and duct has uniform light and shade;
- LED is used for lighting, with long life, energy saving and free maintenance, bringing about huge economic benefits for the customer;
- A frangible pole is used for 4.8m extension pole of the wind direction indicator to protect the aircraft to the greatest extent;
- Special mental conductive structure makes all wires keep static when the duct rotates;
- Rigid extension pole may have an inclined structure, with simple structure and easy maintenance;
- The insert bearing with housing is used for the duct bearing to ensure that the duct rotates flexibly and truly displays the wind direction;
- The duct dimension, height of the wind direction indicator and alternating stripe color and number of stripes of the duct cloth bag may be selected;
- The duct framework is made of the aluminum alloy, with light structure and durability;
- The duct cloth bag is made of the light waterproof cloth with high strength;
- The duct and holder are dismountable for transportation and storage by the user;
- Integrated circuit power drive works reliably and is easily maintained;
- 220V AC or 6.6A constant current is used for power supply.

2.5 Technical Parameters

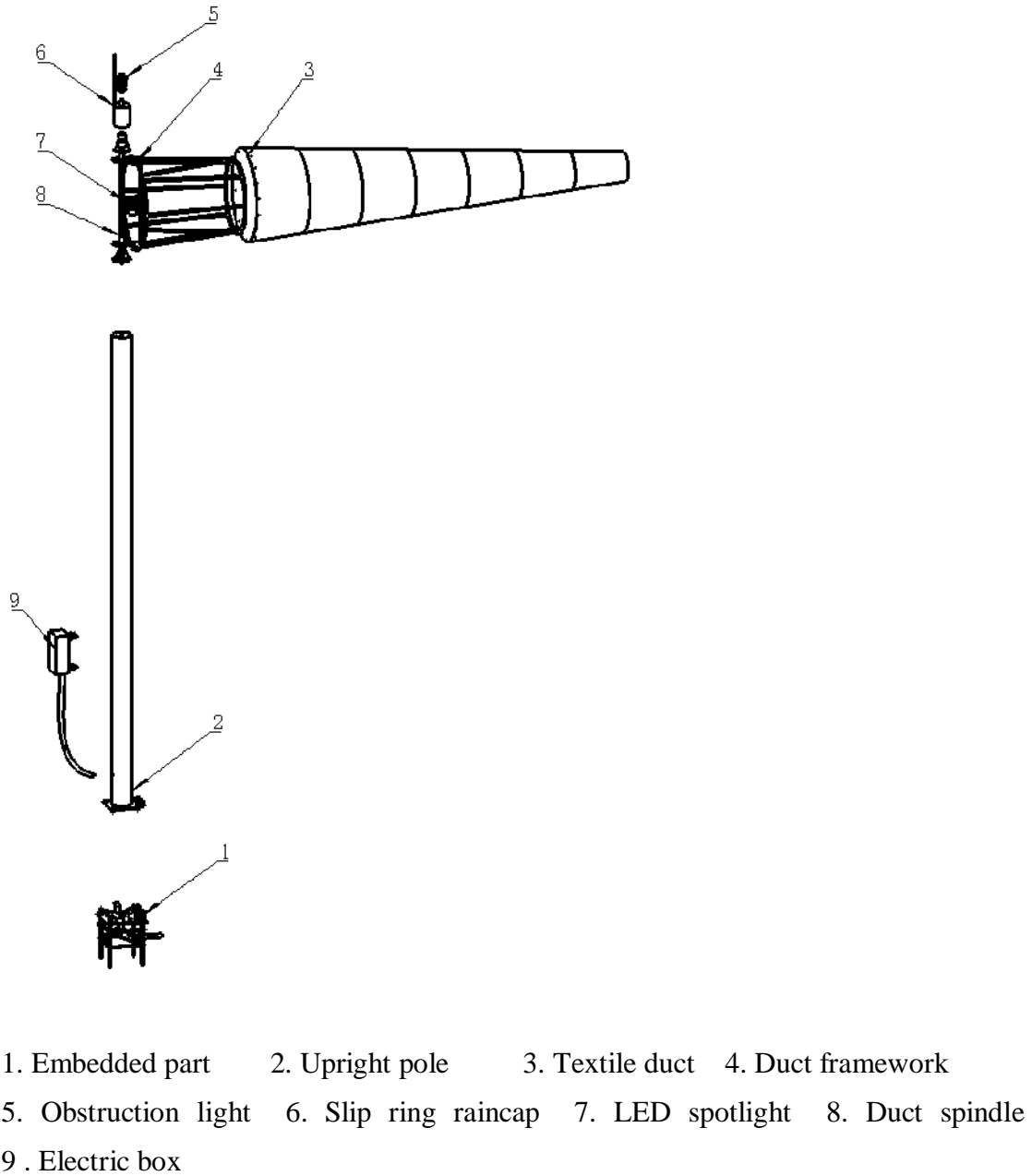
I. AC 220V power supply

- Supply voltage: 200V-240V 50Hz/60Hz
- Power: Internal lighting spotlight: 2×18W LED, total power consumption: 40W
- Lamp of obstruction light: 1×5W LED obstruction light, total power consumption: 7W

II. Constant current 6.6A power supply



- Supply current: 6.6A, 50W isolation transformer for power supply
- Power: Internal lighting spotlight: 2×18W LED, total power consumption: 40W
- Lamp of obstruction light: 1×5W LED obstruction light, total power consumption: 7W


3.0 Structure



4.0 Installation

The product installation tool is divided into the common and special tool. Common tools may be purchased from the store selling various tools, while special tools shall be ordered from the manufacturer.

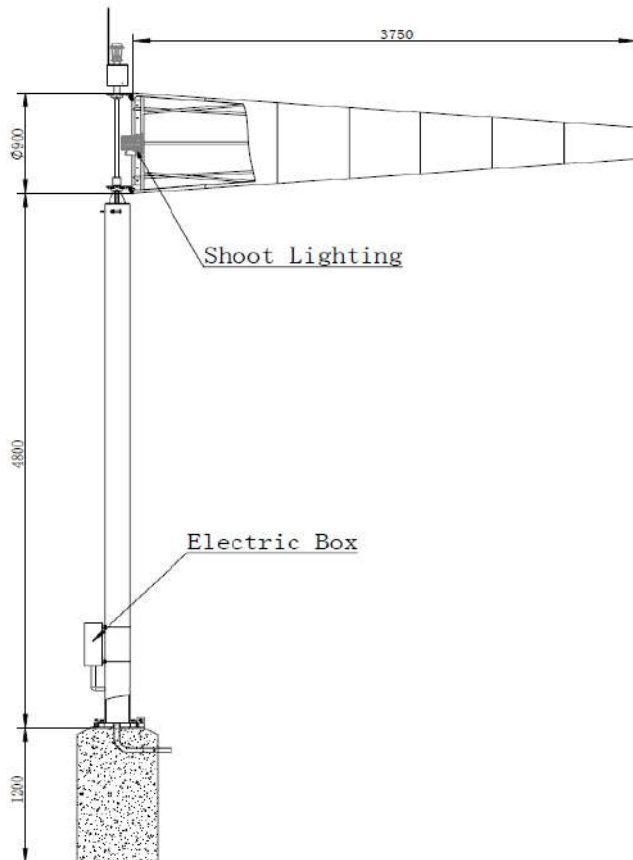
Picture	Name	Usage	Remark
	12 inches monkey wrench	Dismounting the hex head screw	Common tool
	Socket head wrench	Dismounting the socket head cap screw	Common tool



- Using non-standard tools to dismount the wind direction indicator is strictly prohibited.
- ※ Otherwise it may cause personal injury or damage to the wind direction indicator.

4.1 Basic Installation Requirements and Dimension at Civil Airport

Make sure to erect the wind direction indicator in an open area without any sheltering. At the center of the area, it is suggested to build a concrete imitation lawn with the diameter of at least 15m. The wind direction indicator is erected at its center. The open concrete plane not only provides a spacious site for daily maintenance, but also makes the pointing of the wind direction indicator more easily identifiable.



- Making sure that the wind direction indicator has sufficient maintenance area.
- ※ Personnel may be injured due to no place for escape when the upright pole is put down for maintenance.

4.1.1 Foundation Pouring of Wind Direction Indicator

Pour the foundation of the wind direction indicator at the center of the imitation lawn with the radius of R7.5. The dimension of the embedded foundation of the wind direction indicator shown in Figure is only for reference. The manufacturer does not provide the specific guidance for the concrete pouring construction. The constructor shall determine the size of the embedded foundation according to the local soil texture and wind power and perform the construction according to the relevant provisions.

<p>1. The foundation of the wind direction indicator shall be poured with the concrete and make sure that it may bear 21Mpa intensity of pressure after solidification.</p>	
<p>2. The upper end face of the foundation shall have certain slope for calibrating the perpendicularity of the weather cock spindle during installation.</p>	
<p>3. When performing pouring, place the lead pipe with the diameter of 40mm at the foundation center and the iron wire reserved in the lead pipe is used for threading later. Make sure that the pipe opening will not be blocked when the foundation is poured.</p>	
<p>4. The constructor shall select the high quality concrete to fully meet the use requirements of the wind direction indicator foundation.</p>	

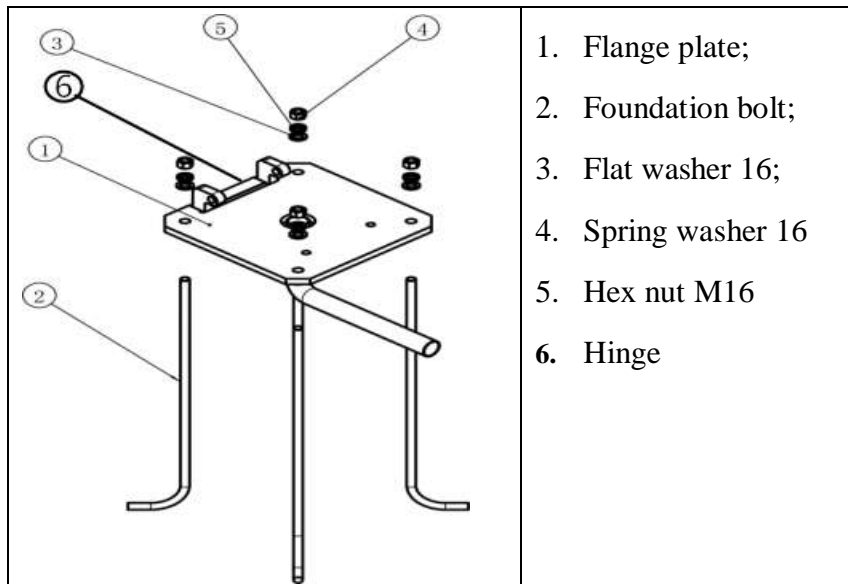
	<ul style="list-style-type: none"> ■ The high quality cement shall be used and making sure that the concrete foundation is firm. ※ Foundation with sufficient strength may ensure the use of the wind direction indicator in the harsh environment.
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4.1.2 Flange Installation

- ✧ Before installing the flange, first determine the falling direction of the wind direction indicator during maintenance.

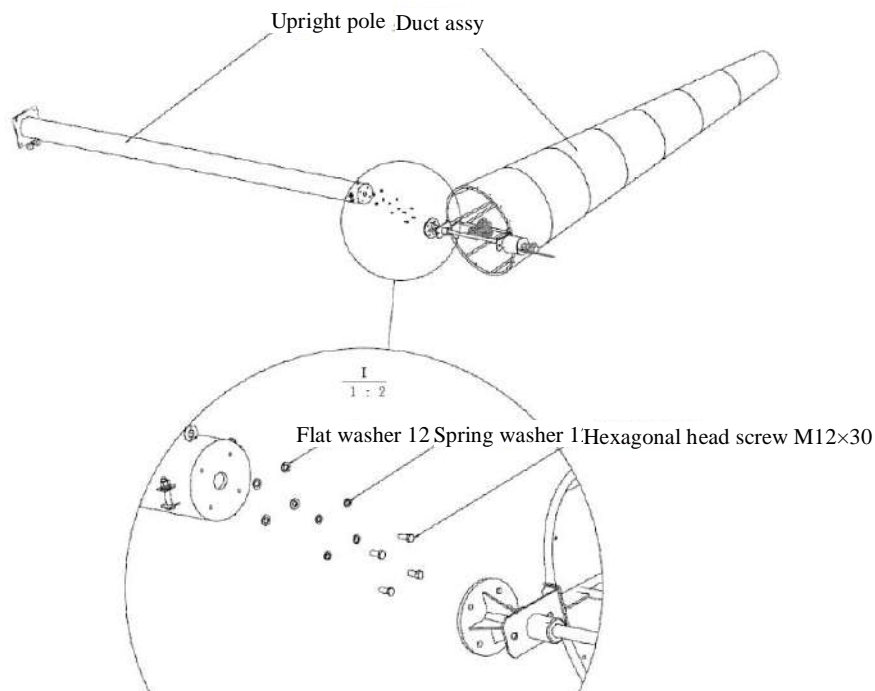
	<ul style="list-style-type: none">■ Making sure that the wind direction indicator has sufficient space for falling.※ Otherwise normal installation, use and maintenance are impossible.
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- ✧ Place an end of the flange plate with hinge installed in the direction where the wind direction indicator may be put down and fix it onto the concrete foundation.



4.1.3 Assembly of Upright Pole

- ✧ Install the base onto the foundation poured (consideration shall be given to the falling direction of the upright pole before installation).
- ✧ Horizontally put down the upright pole on the ground, thread the wire into it to ensure that it thoroughly passes the upright pole, align the upright pole with the base and lock the screw with nut and flat washer after it passes the base and upright pole.
- ✧ Align the duct assy to the corresponding threaded hole on the upright pole and lock them with flat washer 12, spring washer 12 and hexagonal head screw M12×30.
- ✧ Thread the halliard into the ring of the hoop on the upright pole and erect the upright pole.



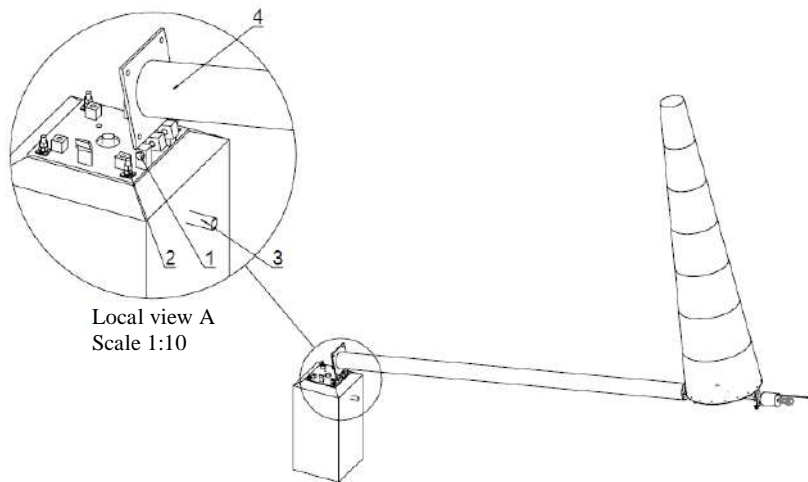
- Check whether the ring on the upright pole is firmly installed.
- ※ Ring drop will cause personal injury or damage to the equipment.



- Making sure that the hoisting equipment is safe and reliable.
- ※ Failure of the hoisting equipment may cause personal injury.

4.1.4 Erect Wind Direction Indicator

- ✧ Align the flange hinge pin hole at the bottom of the upright pole with the hinge pin hole of the bottom plate, thread the hinge pin 16 into the hole and screw the flat washer and nut on the other end (during falling of the upright pole, standing under it is strictly prohibited).



1. Hinge pin Ø16 2. Embedded part 3. Conduit 4. Upright pole

	<p>1. Upright pole; 2. Hex bolt M16×50, flat washer 16 and spring washer 16; 3. Flange; 4. Wedge</p>
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- ✧ Confirm that the wire and power supply circuit are correctly connected and waterproof treatment shall be performed.
- ✧ Thread the rope onto the ring of the upright pole, pull the wind direction indicator to make it vertical and fix the upright pole onto the flange with hex screw M16×50, flat washer 16 and spring washer 16.
- ✧ The perpendicularity of the upright pole shall be calibrated, which may be measured with a theodolite. Insert the wedge into the flange bottom and calibrate the perpendicularity of the whole upright pole by adjusting the insertion of the wedge under the flange.

- ✧ Confirm the perpendicularity of the whole upright pole in at least three different directions.



- Making sure that the principal spindle of the upright pole is perpendicular.
- ※ The duct may be inclined due to gravity, resulting in correct display of the wind direction.



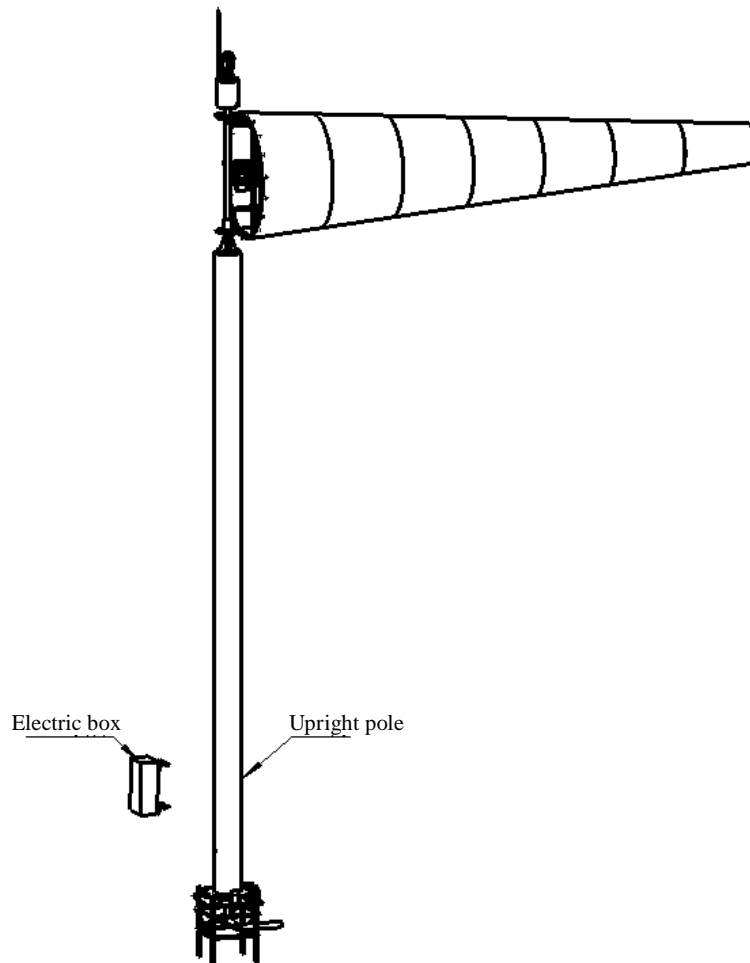
- All screws of the wind direction indicators must be tightened.
- ※ Otherwise it may cause personal injury or damaged to the equipment.



- In no case, the constructor shall stand at the position where the upright pole is put down.
- ※ Otherwise it may cause casualty.

4.1.5 Installation of Electric Box

1. The electric box is locked onto the upright pole through the hoop on the back of the box (the box is vertically installed on the same side with the thread hole on the upright pole).
 2. The electric box (side with the lead hole) is installed at a position over 350mm from the bottom of the upright pole (such datum is only for reference). Connect the lead in the duct framework and power line in the embedded foundation with the terminal block in the electric box after they are inserted into the corresponding nylon hoses respectively (for this operation, please refer to the schematic circuit diagram in the upper cover of the electric box).
 3. Screw the nylon hose and waterproof gland onto the upright pole and box respectively (ensure to lock them and comply with the waterproof requirements).
- ✧ Confirm that the wire and power supply circuit are correctly connected and waterproof treatment shall be performed.



- Wiring must be performed in strict accordance with the circuit diagram.
- ※ Incorrect wiring may cause burnout of the lighting fixture in the wind direction indicator.

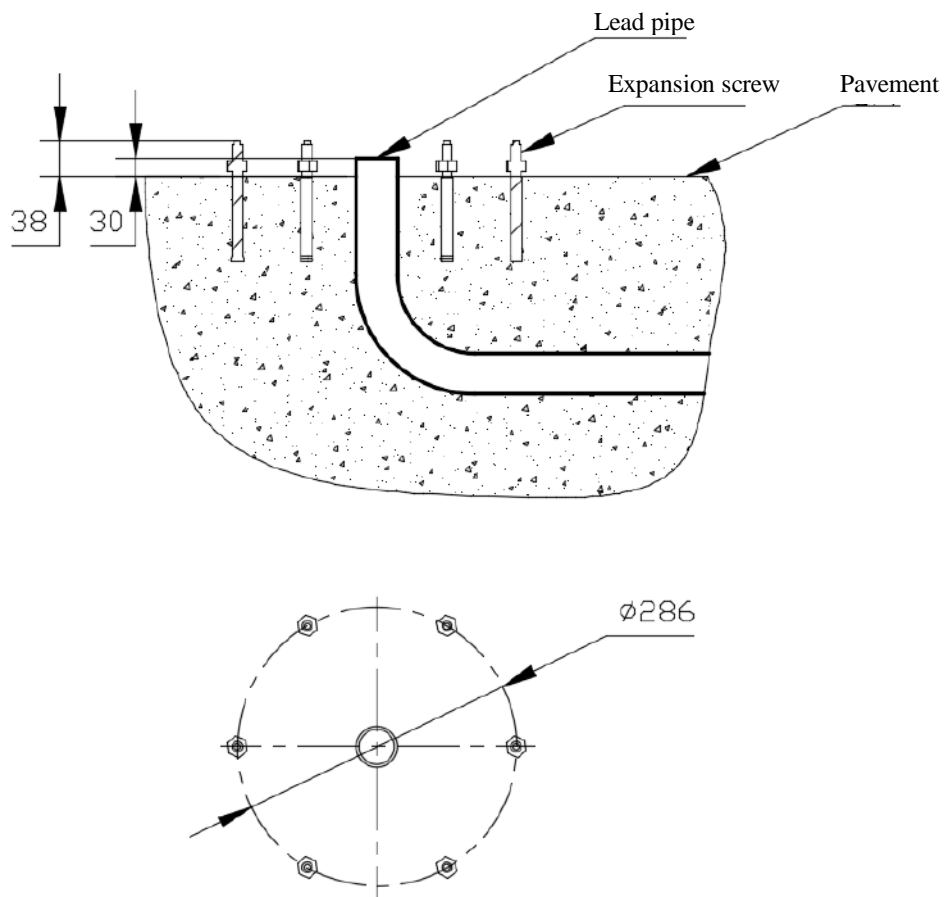


- All screws of the wind direction indicator must be tightened.
- ※ Otherwise it may cause personal injury or damaged to the equipment.

4.2 Basic Installation Dimension Required of Heliport

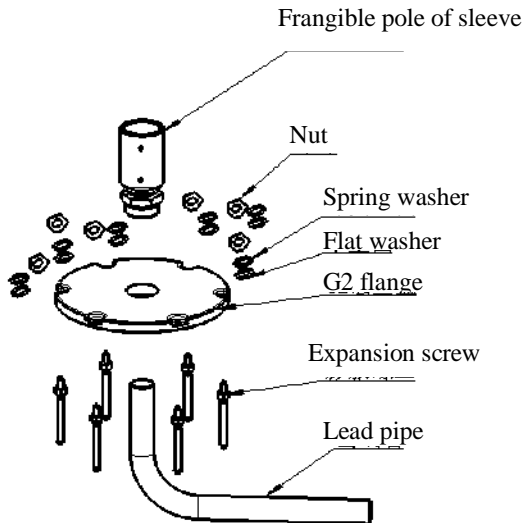
4.2.1 Pavement Arrangement Expansion Screw

Arrange 6 M10X150 expansion screws on the airport pavement in the manner shown in Figure below, with the diameter of $\phi 286$ for uniform distribution and arrange a lead pipe with the diameter of $\phi 40$ at the center of a circle.



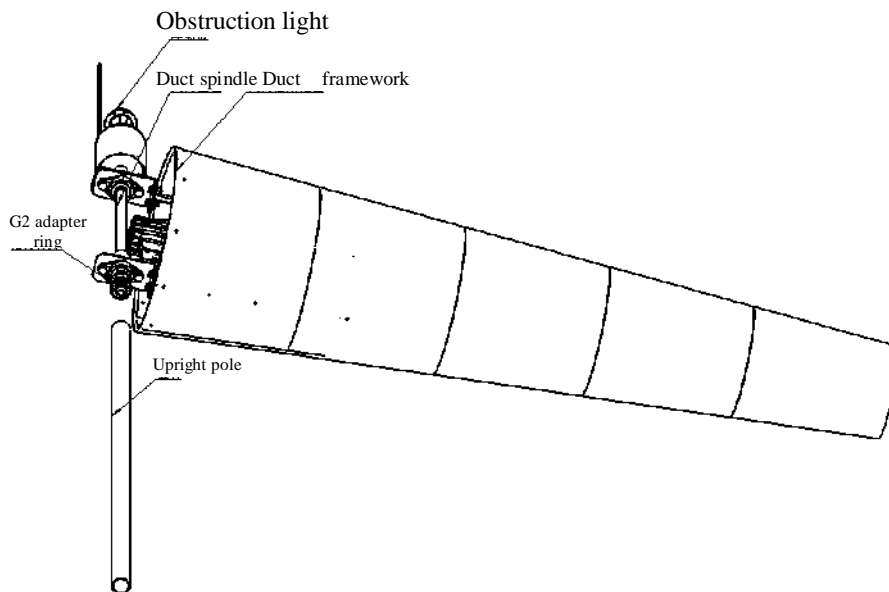
4.2.2 Assembly of Pavement Flange

Load 6 fixed holes of G2 flange into the expansion screw, fix them with the flat washer, spring washer and nut and screw the frangible pole of the sleeve into the G2 flange.



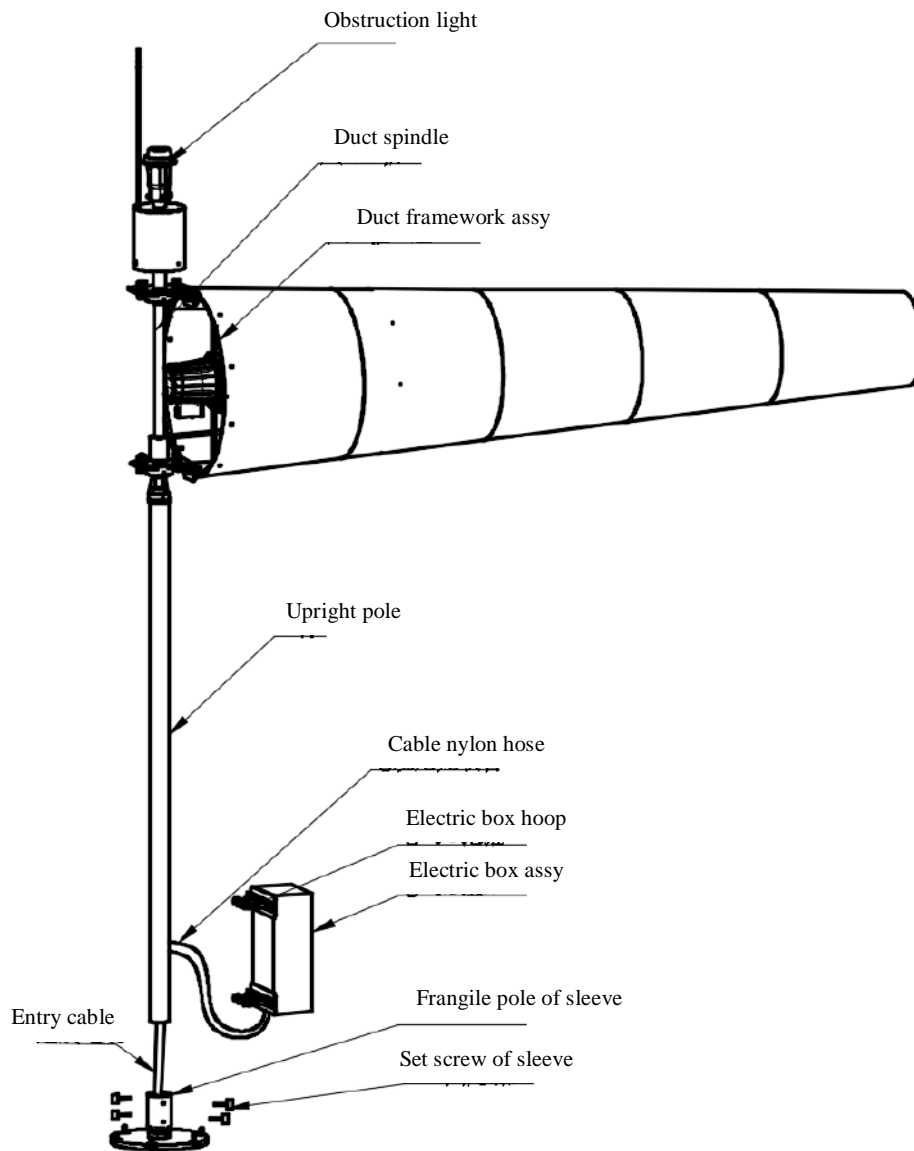
4.2.3 Assembly of Upright Pole and Wind Direction Indicator

Screw the G2 thread at the upright pole end and G2 adapter ring, which may be appropriately reinforced with the thread glue.



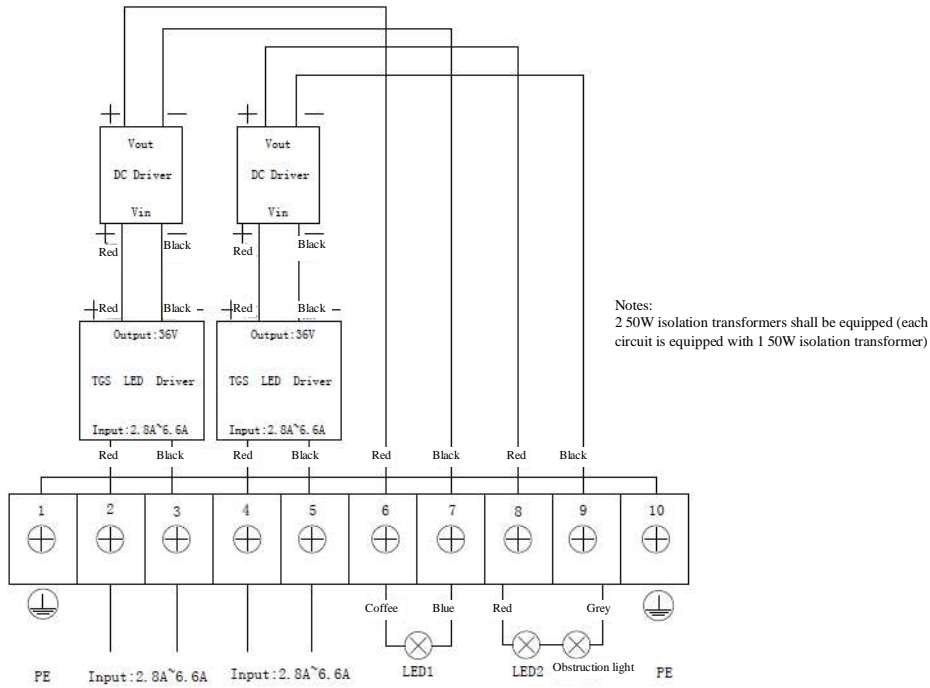
4.2.4 Erect Wind Direction Indicator

Raise the wind direction indicator and insert the upright pole into the frangible pole of the sleeve and fix it with 4 set screws of the sleeve; connect the main cable passing the hole at the bottom of the upright pole to the electric box after it passing the nylon hose (please perform wiring according to the circuit diagram and distinguish the entry and incoming cable). Finally, fix the electric box onto the upright pole bottom with its hoop.

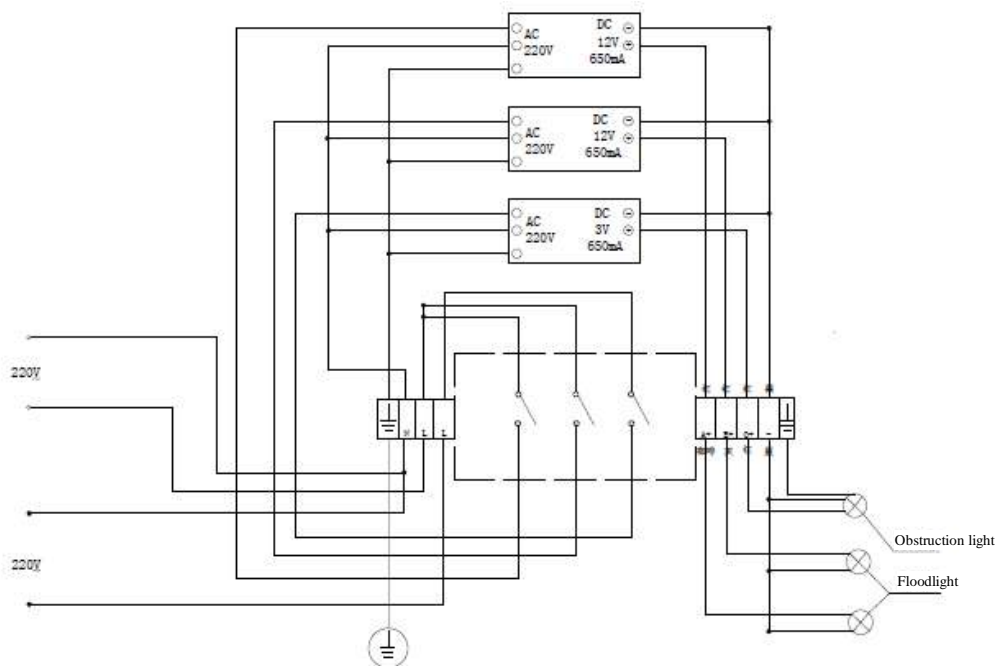


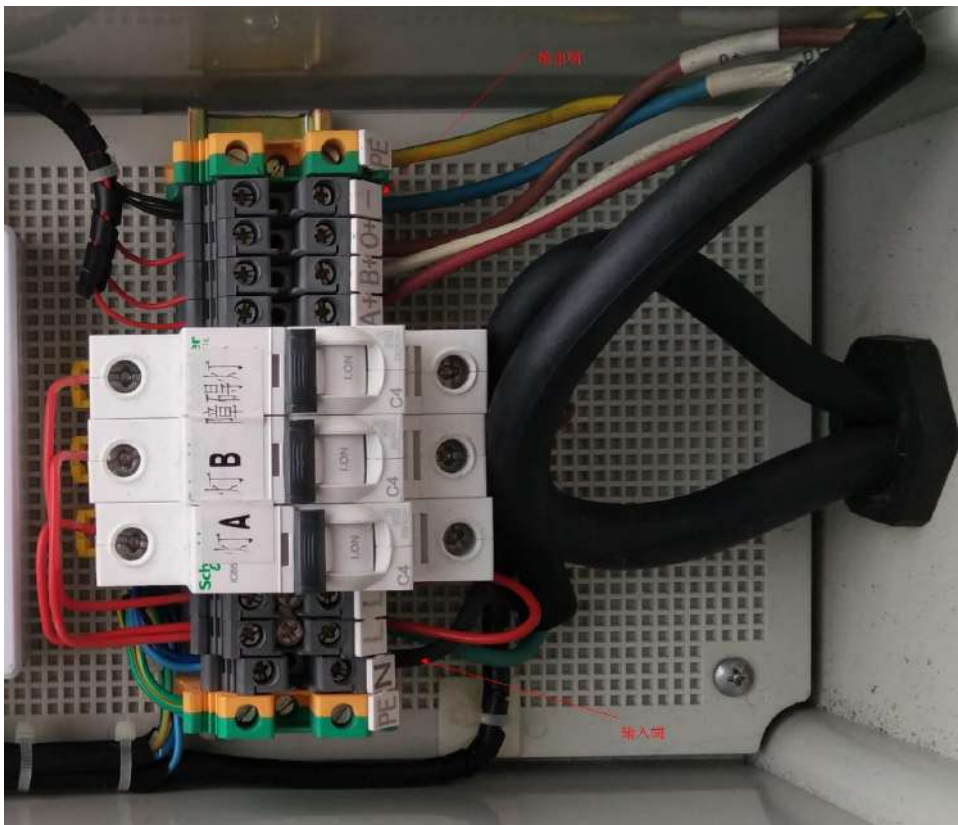
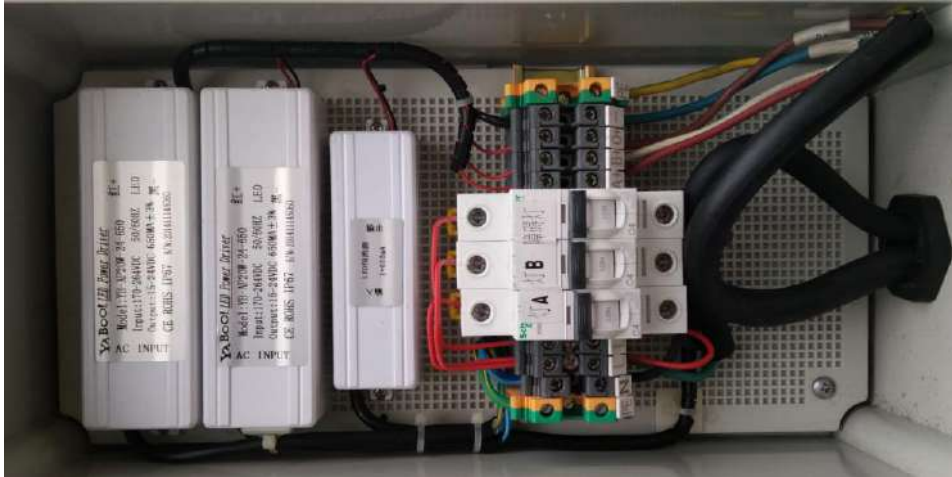
5.0 Wiring Diagram of Wind Direction Indicator


I. CCR Power Supply:



II. 220V AC Power Supply:

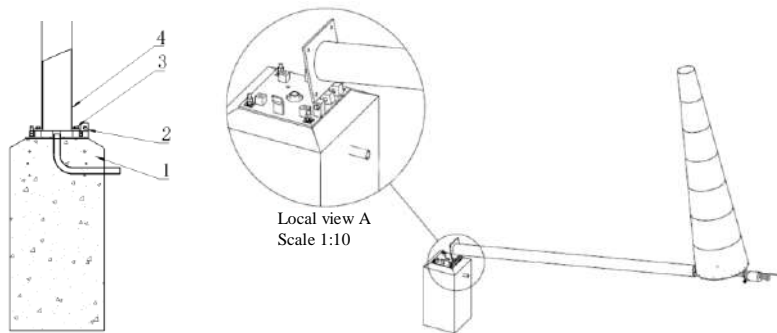




 ■ Correct power source must be used.
※ Otherwise it may damage the lighting lamp and obstruction light.

6.0 Replace Components

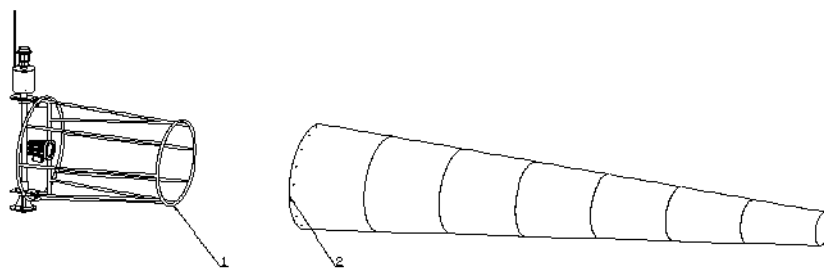
6.1 Put Down Wind Direction Indicator



1. Embedded piece 2. Hinge axle $\varnothing 16$ 3. Hexagon bolt M16 \times 50 assy 4. Upright pole

- ✧ Hold the upright pole firmly and people shall not stand in the direction where the wind direction indicator is put down.
- ✧ Unscrew the hexagon bolt M16 \times 50 assy bolts fixing the upright pole onto the flange one by one and remove them one after another.
- ✧ Unscrew the nut of the hinge axle $\varnothing 16$ fixing the upright pole onto the flange and it is unnecessary to remove the hinge axle $\varnothing 16$.
- ✧ Gently put down the wind direction indicator in the direction that it is put down.

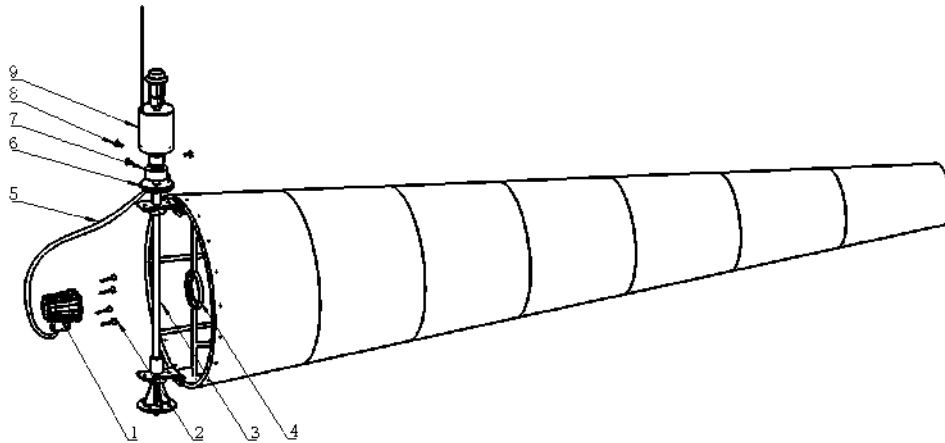
6.2 Replace Duct Cloth Sock



1. Duct framework 2. Duct cloth bag

- ✧ Put down the wind direction indicator according to 6.1, remove the old wind sock, cover a new one, whose end face of the big end is aligned with that of the duct framework and firmly bind the framework with the rope on the wind sock.
- ✧ Finally, erect the wind direction indicator according to 4.7 and please take care!

6.3 Replace LED Spotlight

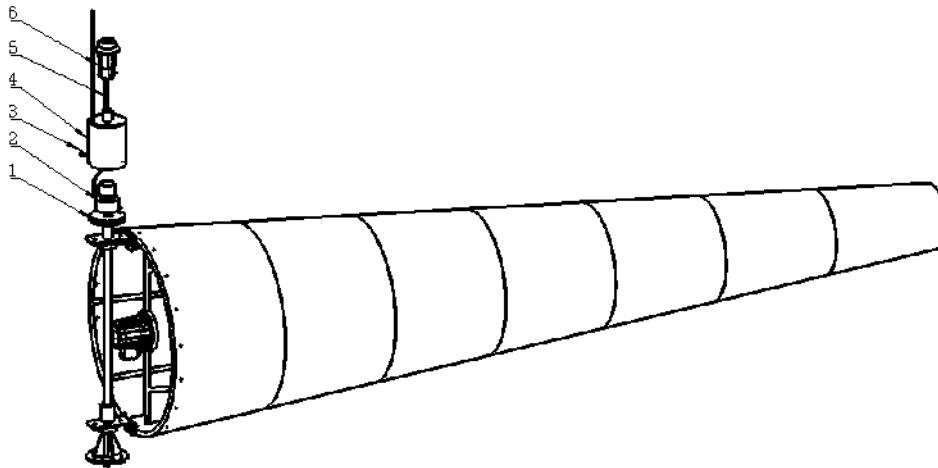


1. LED spotlight body 2. Set screw of spotlight 3. Duct spindle 4. Set ring of light body
5. Spotlight cable 6. Connecting piece of bearing 7. Slip ring 8. Set screw of raincap
9. Slip ring raincap

Put down the wind direction indicator according to 6.1, untie the spotlight cable. On the spindle, unscrew the set screw of LED spotlight on the set ring of the light body, take down the LED spotlight and set screw of the raincap on the slip ring raincap, gently pull out the slip ring raincap, untie the spotlight cable connectors on the spotlight and slip ring, unscrew the screw clamping the spotlight cable of the waterproof gland fixed on the connecting piece of the bearing, pull out the spotlight cable and completely take down the LED spotlight body; Take out the LED spotlight body to be replaced, plug the spotlight cable into the waterproof gland and screw it, connect the connectors on the spotlight and slip ring, cover the slip ring raincap and fix the set screw of the raincap, connect the LED spotlight body onto its set ring with the set screw of the spotlight, bind the spotlight cable onto the spindle;

Finally, erect the wind direction indicator according to 4.7 and please take care!

6.4 Replace Obstruction Light



1. Connecting piece of bearing
2. Slip ring
3. Set screw of raincap
4. Slip ring raincap
5. Obstruction light cable
6. Obstruction light

Put down the wind direction indicator according to 6.1, take down the set screw of the raincap on the slip ring raincap, gently pull out the slip ring raincap, unbind the obstruction light cable connectors on the obstruction light and slip ring, take down the set screw of the obstruction light on the slip ring raincap and take down the obstruction light;


Take out the obstruction light to be replaced, connect the connector of the obstruction light cable and that of the slip ring, plug the obstruction light to the top of the raincap, tighten the set screw of the obstruction light, cover the slip ring raincap and fix the set screw of the raincap.

Finally, erect the wind direction indicator according to 4.7 and please take care!

7.0 Maintenance of Lighting Fixtures

Maintenance of the lighting fixtures shall comply with ICAO Airport Service Manual Part 9 “Airport Maintenance Practices” and FAA AC150/5345-26C Maintenance of Airport Visual Aid Facilities.

The maintenance personnel shall be employed with certificates after receiving the specific training.




■ Maintenance of the lighting fixtures by the laypeople is strictly prohibited.

※ Otherwise it may cause failure of the lighting fixture or other personal injuries.

7.1 Daily Maintenance

Interval	Check	Activity
Every day	No light output or flashing	Replace LED lamp assy.
	Light output is lower	<ol style="list-style-type: none"> 1. Clean the prism surface if it is dirty. 2. Check deviation or moisture of the lighting fixtures. 3. Check aging or displacement of LED.
Every week	Obstacles to light output channel	Clean the path and prism surface.
Every month	Existence of moisture and water (Visual check of internal surface of prism)	<ol style="list-style-type: none"> 1. Open the body. 2. Clean, dry and check. 3. Replace the gasket of the light body and other parts damaged.
Every two months	Tighten the screws	<p>Check whether screw for tightening light body is locked.</p> <p>Use the tools such as wrench and sealant by referring to the Table in Section 3.4.</p>
Every half a year	Damage or color fading of the textile duct	Replace the textile duct.
	The duct does not rotate flexibly.	The bearing shall be regularly oiled.
After operation at 6.6A for 48,000h	Failure of LED lamp assy	Replace the LED lamp assy



■ Careful daily maintenance is a guarantee for normal operation of the equipment.

※ Failure of daily maintenance may impact the functions.

8.0 List of Components and Ordering of Spare Articles and Accessories

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

The manufacturer suggests to purchase some important parts from the original manufacturer, so as to ensure various indexes of the lighting fixtures.

List of components and spare articles:

Structure No.	Component Name	Order No.	Description
1	Embedded part	061283	
2	Upright pole	061276	Length: 4,800
3	Textile duct	027234	Diameter: 900
4	Duct framework	061191	Diameter: 900
5	Obstruction light	ETEL-A-R	Low intensity obstruction light LED
6	Slip ring raincap	074627	
7	LED spotlight	063997	LED spotlight (12C)
8	Duct spindle	065847	Length: 900
9	Electric box	075006	Including light control

List of necessary spare parts for daily operation:

Structure No.	Component Name	Order No.	Quantity
1	Textile duct	027234	1
2	Obstruction light	ETEL-A-R	1
3	LED spotlight	063997	1



- Making sure the necessary components for daily operation to the minimal extent.
- ※ Damage to the vulnerable parts may cause failure of normal operation of the equipment.

9.0 Packaging, Transportation and Storage

9.1 Packaging and Weight

1× lighting fixture (including electric box, but excluding upright pole)

Net weight: 30 kg

1× upright pole

Net weight: 120 kg

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.

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

Thanks for your purchasing and using AIRSAFE product!

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