

LED Plane Aircraft Stand Identification Sign LED Triangle Aircraft Stand Identification Sign

ASIS-H-P-L(BP)、ASIS-H-T-L

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.

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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.



- 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



- It is strictly prohibited to use this sign outside the airport.
- ※ Inadequate maintenance or use may cause failure.



- Be careful not to fall to the ground or collide when handling the signboard.
- ※ It may cause product damage and personal injury.



- During installation, ensure that the power supply is in the power-off state
- ※ The current shock caused by the installation of the signboard may cause damage to the light source.



- Before power on, confirm whether the connected power supply is M (220V) or S (6.6A).
- ※ It may cause internal electrical damage or even power supply failure.



- It is forbidden to maintain the signboard with electricity or maintain the signboard in case of lightning and rain.
- ※ May cause electric shock or other accidents.



- Non-professional electricians are strictly prohibited from maintaining equipment electrical faults.
- ※ It is possible to damage electrical components or cause greater faults.



- Do not touch the electrical equipment inside the sign with wet hands.
- ※ It may cause electric shock.



- If the skin of the outline is damaged, it shall be replaced immediately.
- ※ 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 replaced by manufacturer free of charge. The warranty doesn't cover the failures resulting from lamp burnt out, improper maintenance, installation or operation, or damages due to snow ploughs. Manufacturer shall not be liable to any further claims or particularly claims for damages not affecting the goods themselves.

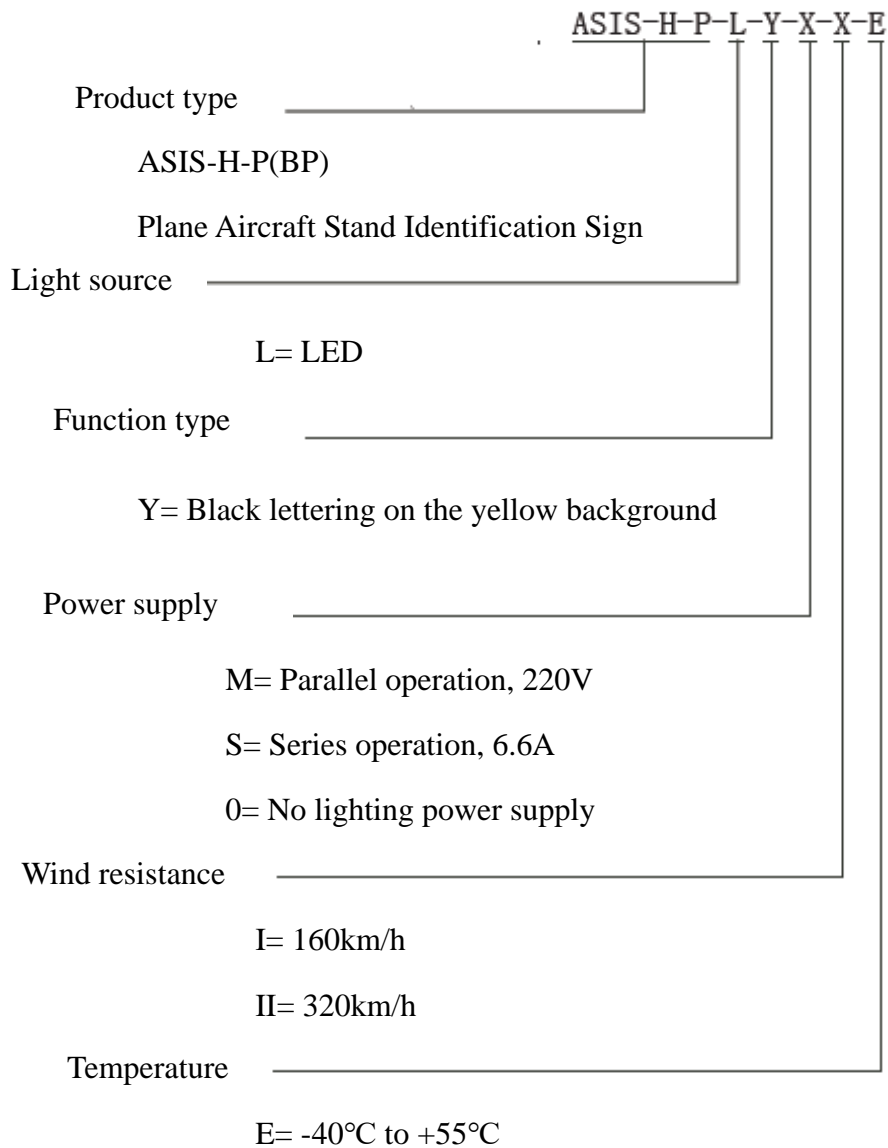
2.0 Introduction

This manual covers the following series of signboards:

ASIS-H-P-L(BP) ----- LED Plane Aircraft Stand Identification Sign

ASIS-H-T-L----- LED Triangle Aircraft Stand Identification Sign

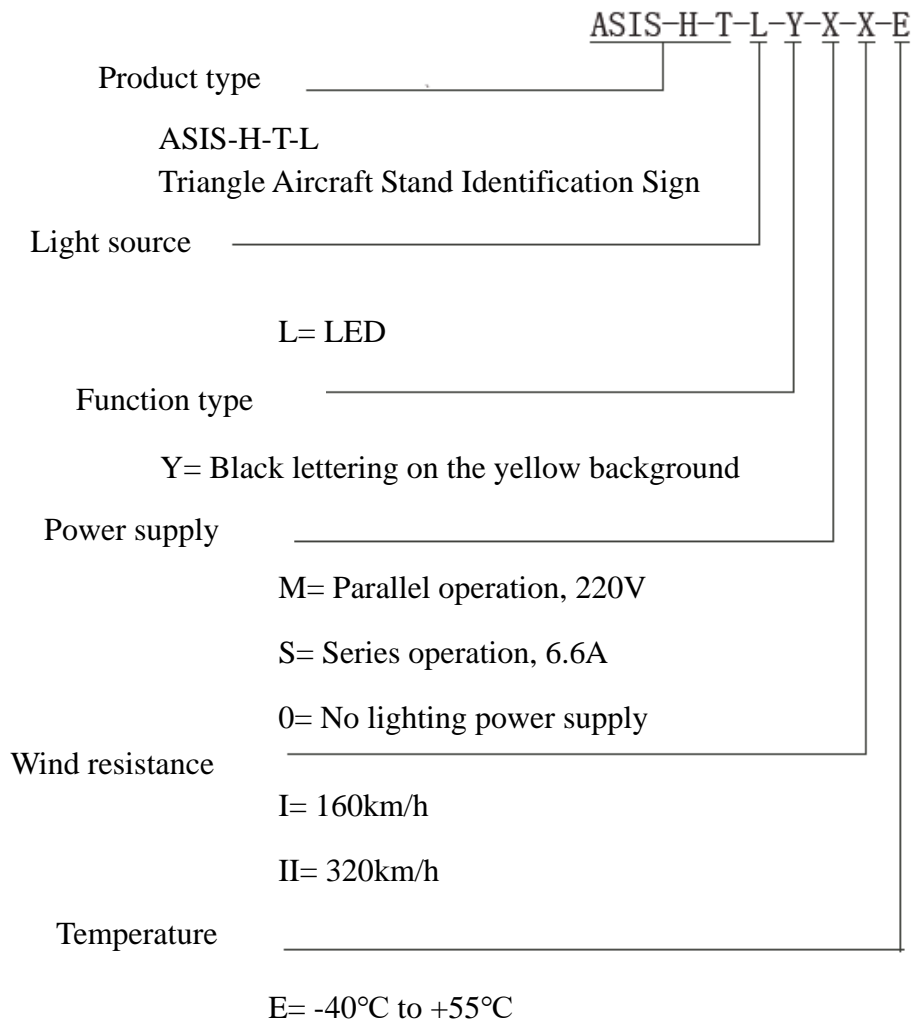
LED Plane Aircraft Stand Identification Sign



* When ordering, please describe the installation method of lamps in detail

* Spare parts and accessories shall be ordered and provided separately

LED Triangle Aircraft Stand Identification Sign



* When ordering, please describe the installation method of lamps in detail

* Spare parts and accessories shall be ordered and provided separately

2.1 Working principle of equipment

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 Annex 14- Aerodromes Volume 1
- International Civil Aviation Organization (ICAO)- Aerodrome Design Manual
- Federal Aviation Administration (FAA)AC 150/5345-44
- MH/T 6011 Sign of Civil Aviation Administration of China
- MH-T 5001 Aerodrome technical standards of Civil Aviation Administration of China

2.2 Application Environment

- Altitude: below 4,000m
- Relative air humidity: not more than 95%
- Ambient temperature: -40°C ~ +55°C
- In rain, snow, ice and water
- Expose to corrosive salt atmosphere
- Basic earthquake intensity VII.

2.3 Application Scope

Taxiing guidance sign and stand sign for Category I, II and III airports.



- It is forbidden to use the signboard beyond the scope.
- ※ Out of range application will cause damage and danger to components.

2.4 Technical Specifications

Main technical indexes of the product are as follows:

Lamp: LED light bar

Average life of lamp: 50,000h

Average brightness of panel:

Red ≥ 30 cd/m²

Yellow ≥ 150 cd/m²

White ≥ 300 cd/m²

The chroma complies with the provisions of 3.4 in Appendix 1 of IACO.

2.5 Technical features

- Character settings, luminance, uniformity and chroma on the sign comply with the requirements of Attachment 14 of ICAO.
- Long life, energy saving, maintenance free and other characteristics of LED will bring huge economic benefits to customers.
- International top brand LED and patented driving circuit greatly enhance the reliability and life of the sign.
- Strict LED color management ensures the consistency of light color.
- Internal reflected illumination method, more uniform lighting on the sign surface, without shadow.
- Panel is made of 4.5mm polycarbonate material containing the UV layer, which resists UV, impact and surface wear.
- Aluminum alloy section frame structure, strut passing through the case, firm and durable and high windproof capacity.
- Multiple waterproof structure design and high protection rating.
- The sign driving circuit has the modularized design for maintenance.
- Integrated surge protection function of the driving circuit and overheat protection module

increase the reliability.

- The power factor is ≥ 0.9 .
- EMI complies with the requirements of FAA and passes the inspection of the standard FCC Part15 Class A.
- The electrical connection line inside the signboard is fixed and reliable, the live part and the shell have sufficient electrical clearance, and the insulation resistance is greater than 50 megohms.
- Post air support of the front door frame makes the front door to be easily opened upward for daily cleaning and maintenance.
- Sign is made of the aluminum material, whose surface has preservative treatment. All fasteners are stainless steel products, which are applicable to various harsh environments.

2.6 Function Type

The sign may be divided into three types according to the function types:

Type Y- Black lettering on the yellow background, direction and destination sign with the arrow and information sign.

Type R- White lettering on the red background, instruction sign.

Type B- Yellow lettering on the black background, position sign with or without yellow frame.

This manual focuses on the Y-type signboard.

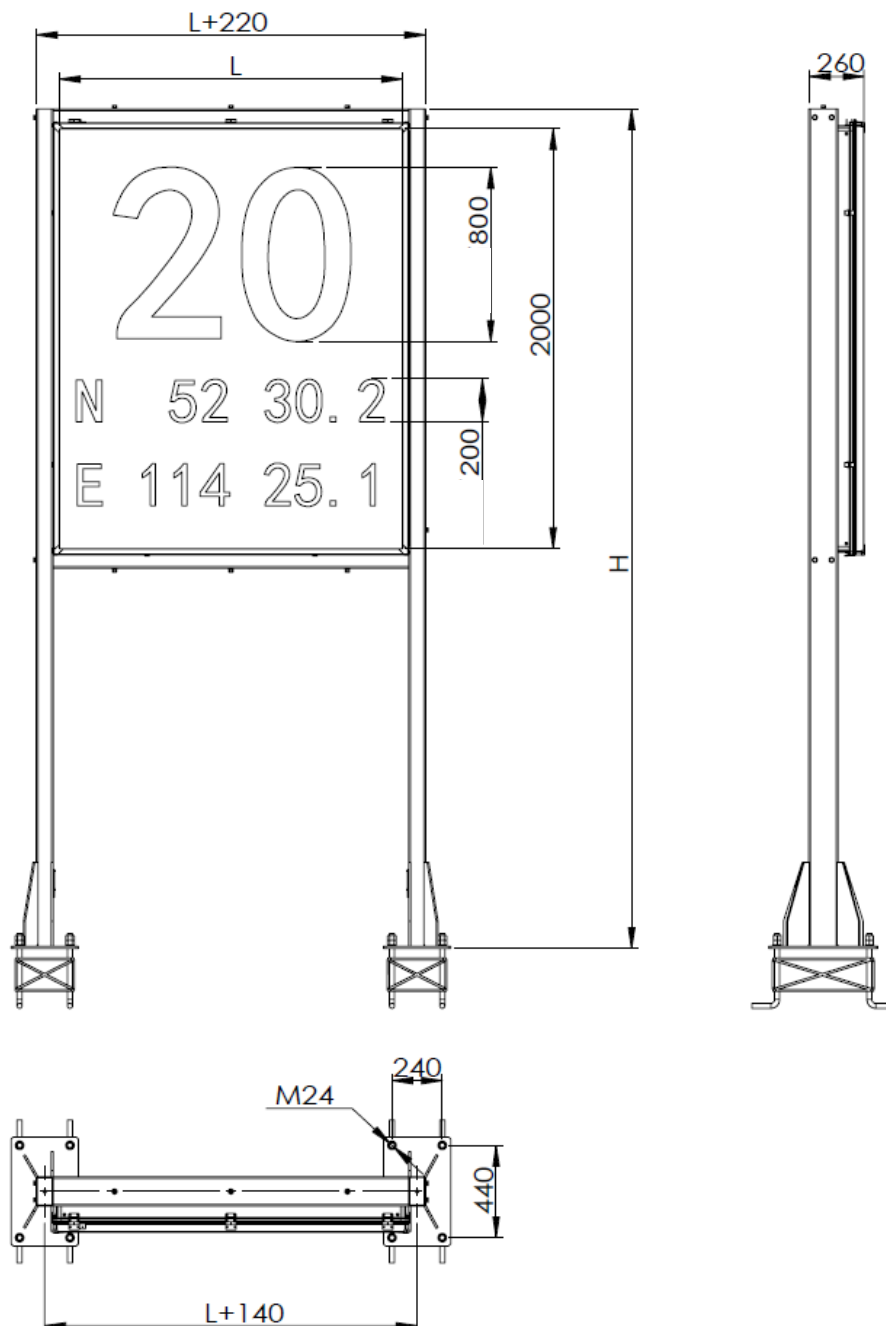
2.7 Structure

2.7.1 Sketch of boundary dimension of sign

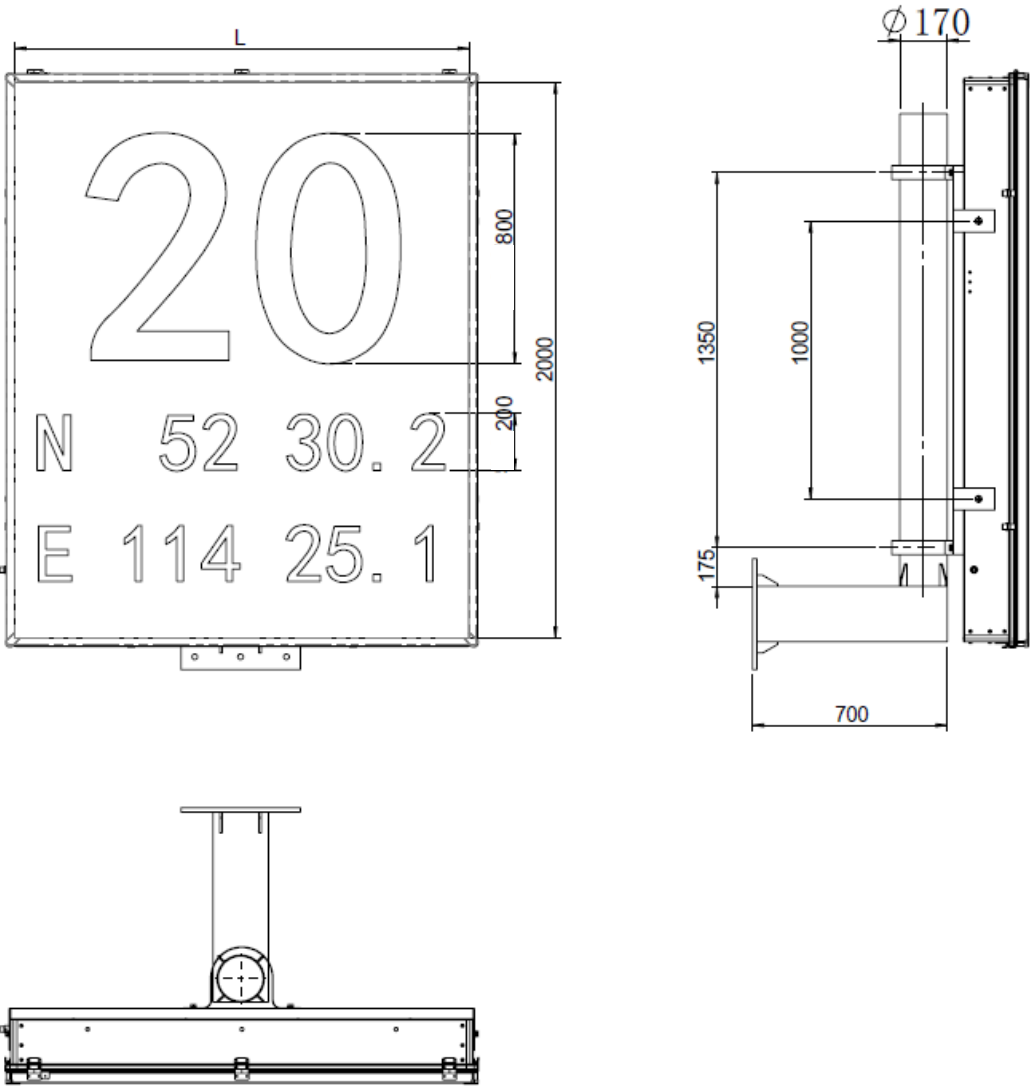
The width of the sign board is generally determined according to the content of the text symbols on the board, the number of words, the nature of the sign board and so on.

Sketch of the boundary dimension of sign with the height of 800 letters:

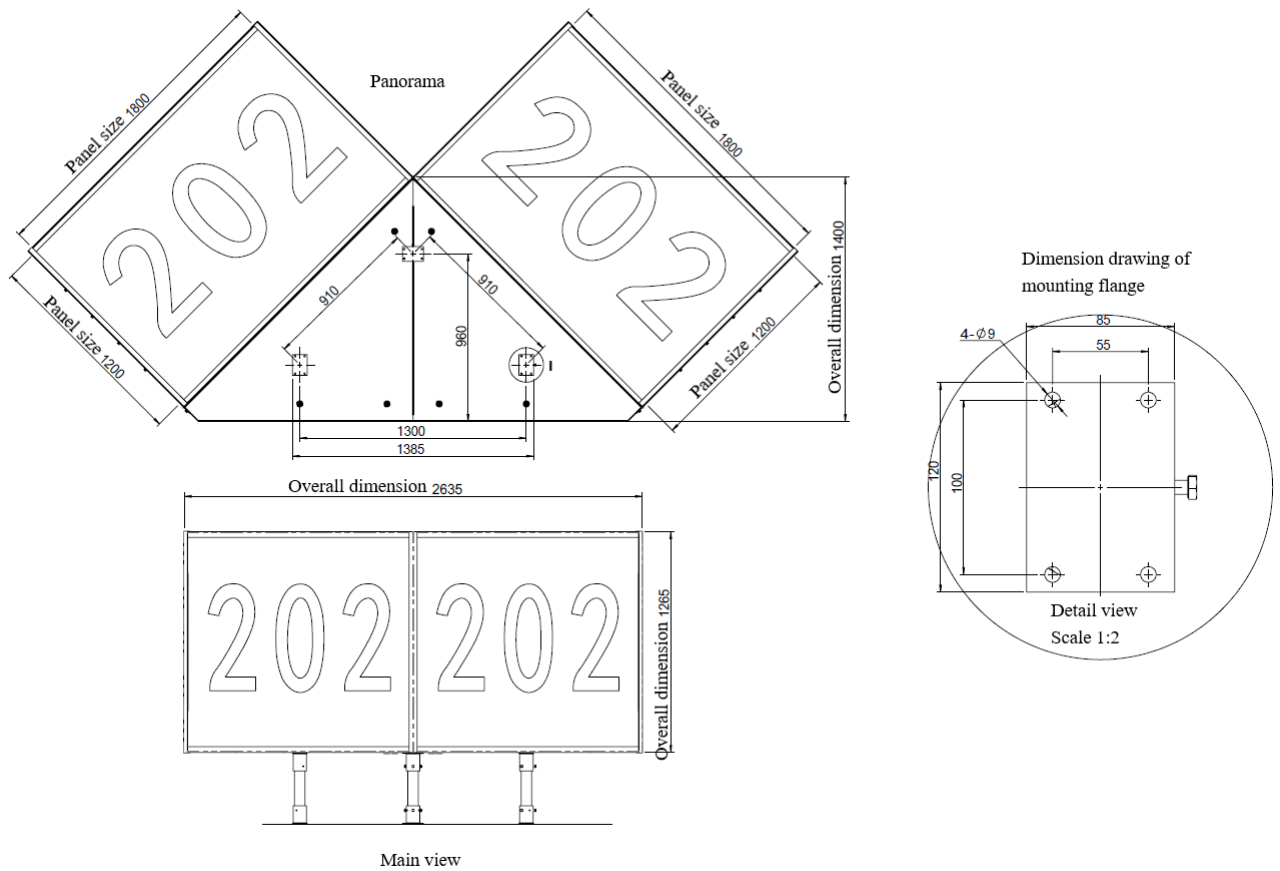
Stand identification sign for column installation



Stand identification sign for wall mounted



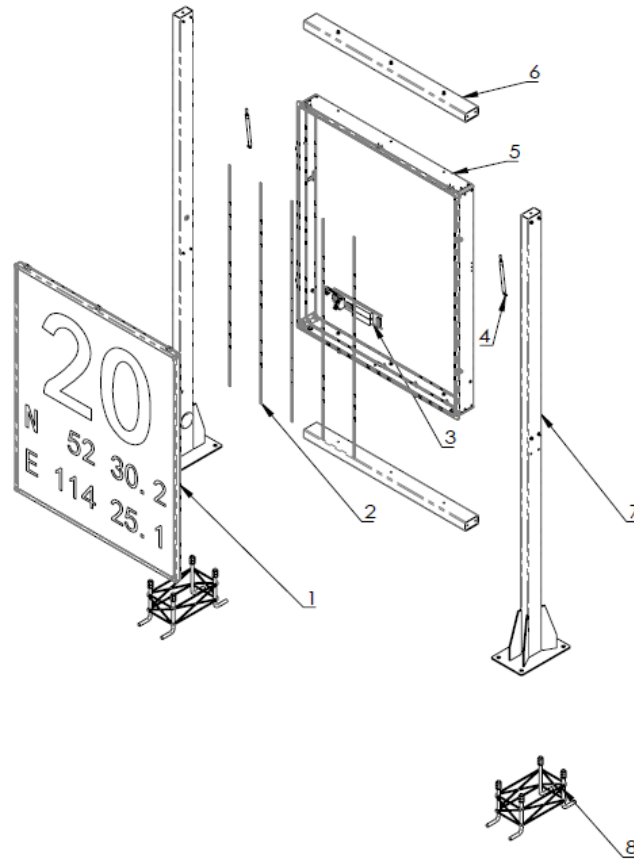
Sketch of boundary dimension of triangle aircraft stand identification sign



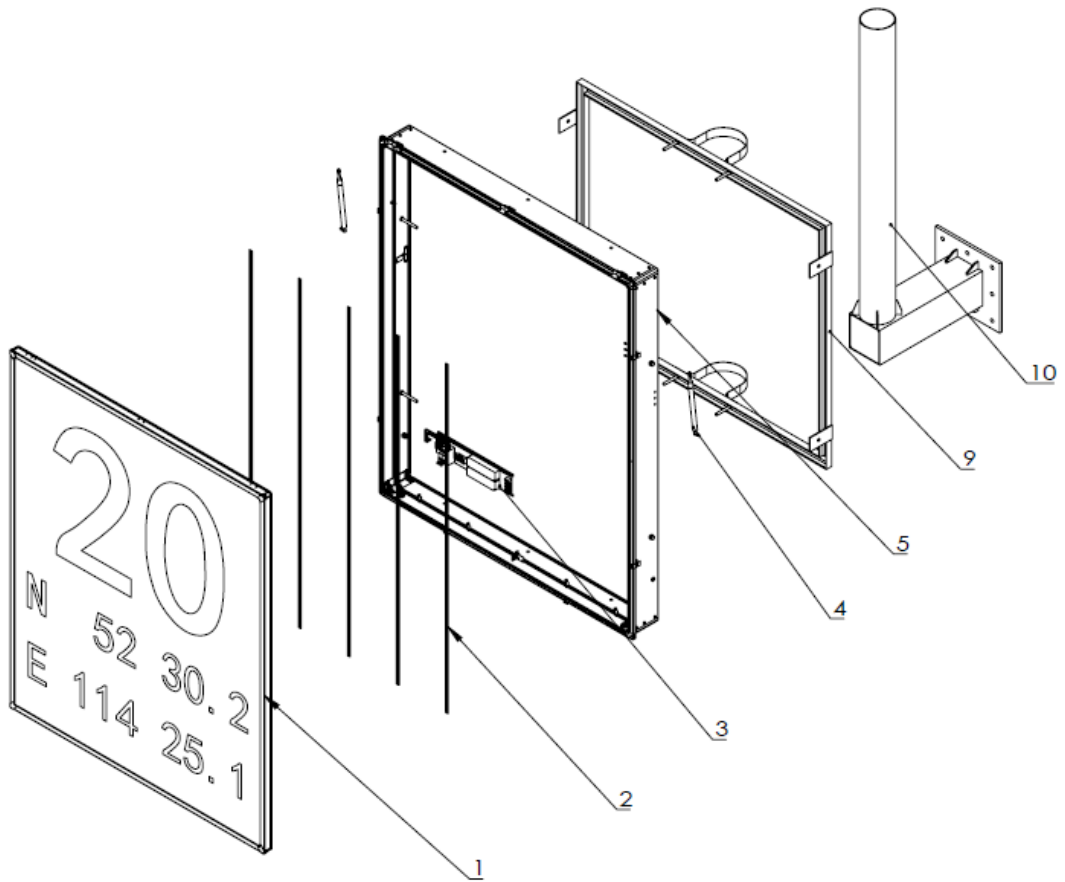
- The width of single sign shall not be greater than 3,000mm.
- ※ Too great width impacts the sign rigidity, which does not comply with the requirements of ICAO.

2.7.2 Sign Structure and Parts

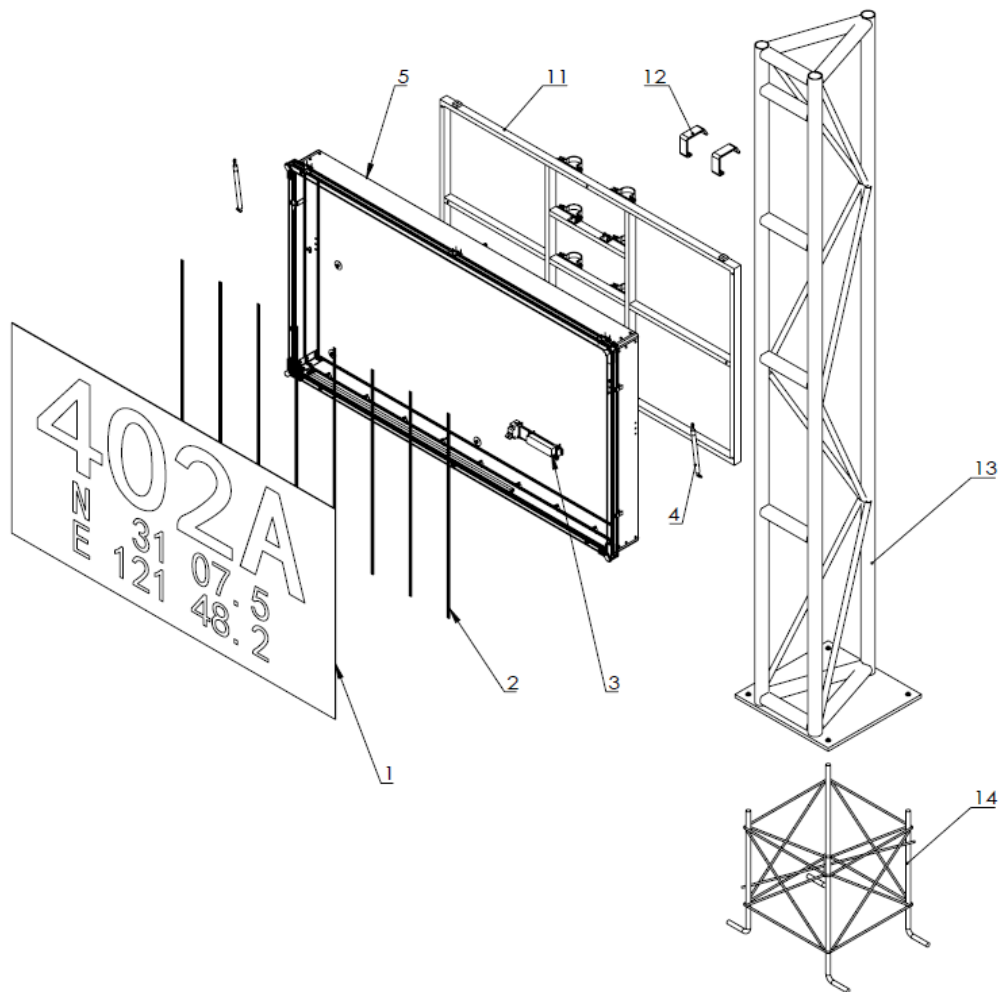
1. Stand identification sign structure with column installation



2. Stand identification sign structure with wall mounted

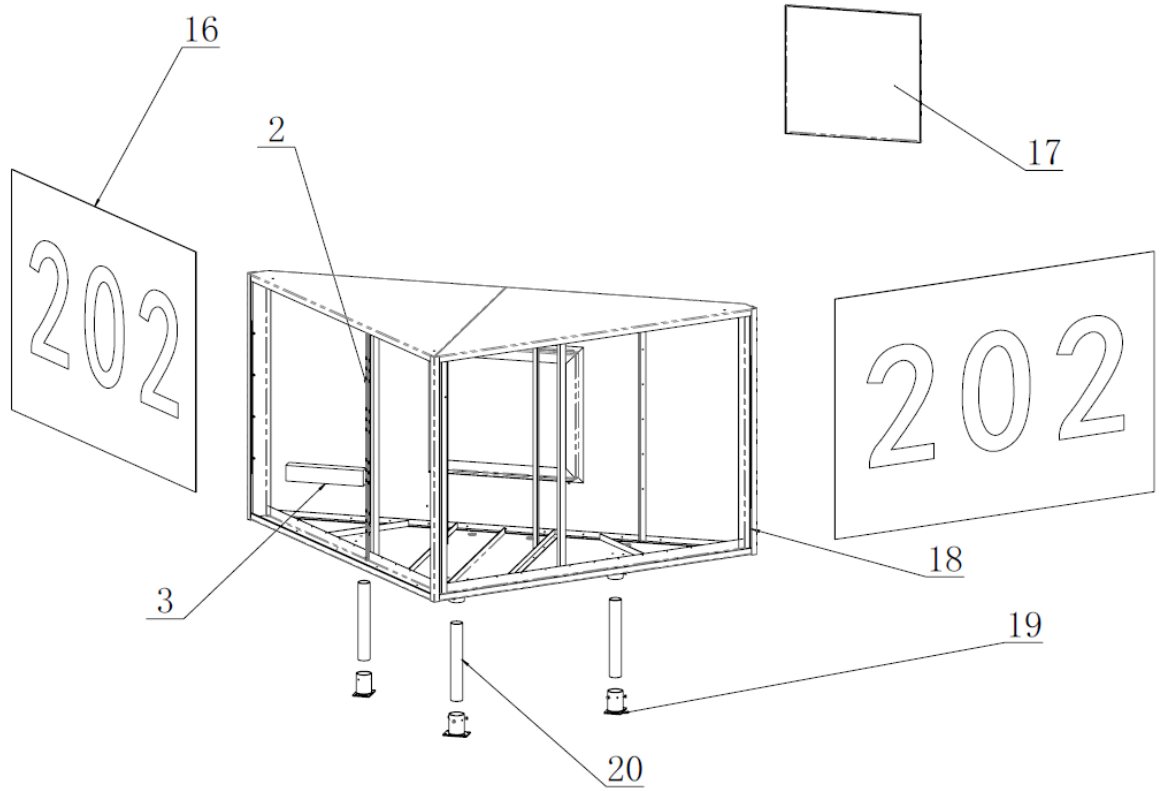


3. Stand identification sign structure with triangular steel frame installation



For wiring and daily maintenance, unfasten the left and right and bottom buckles and open the front frame assembly upwards to open the case for general operation.

4. Triangle sign structure



3.0 Installation Overview

Correct installation is crucial for ensuring the normal operation of the sign and giving its full play. Make sure that the professional installs the sign.



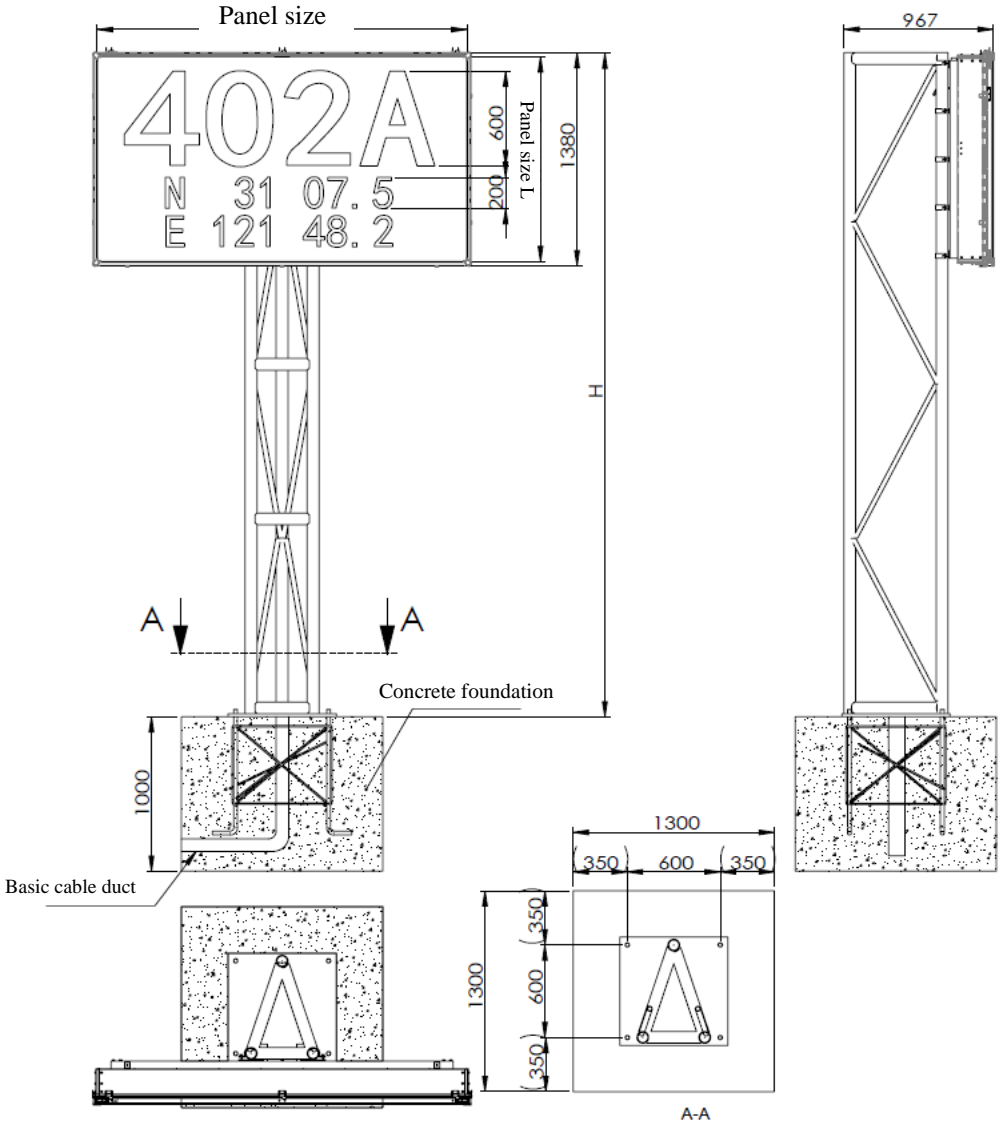
- Installing the sign by the laypeople is strictly prohibited.
- ※ Otherwise it may impact the normal use of the sign or cause major fault.

3.1 Installation Dimension and Installation Base Specification

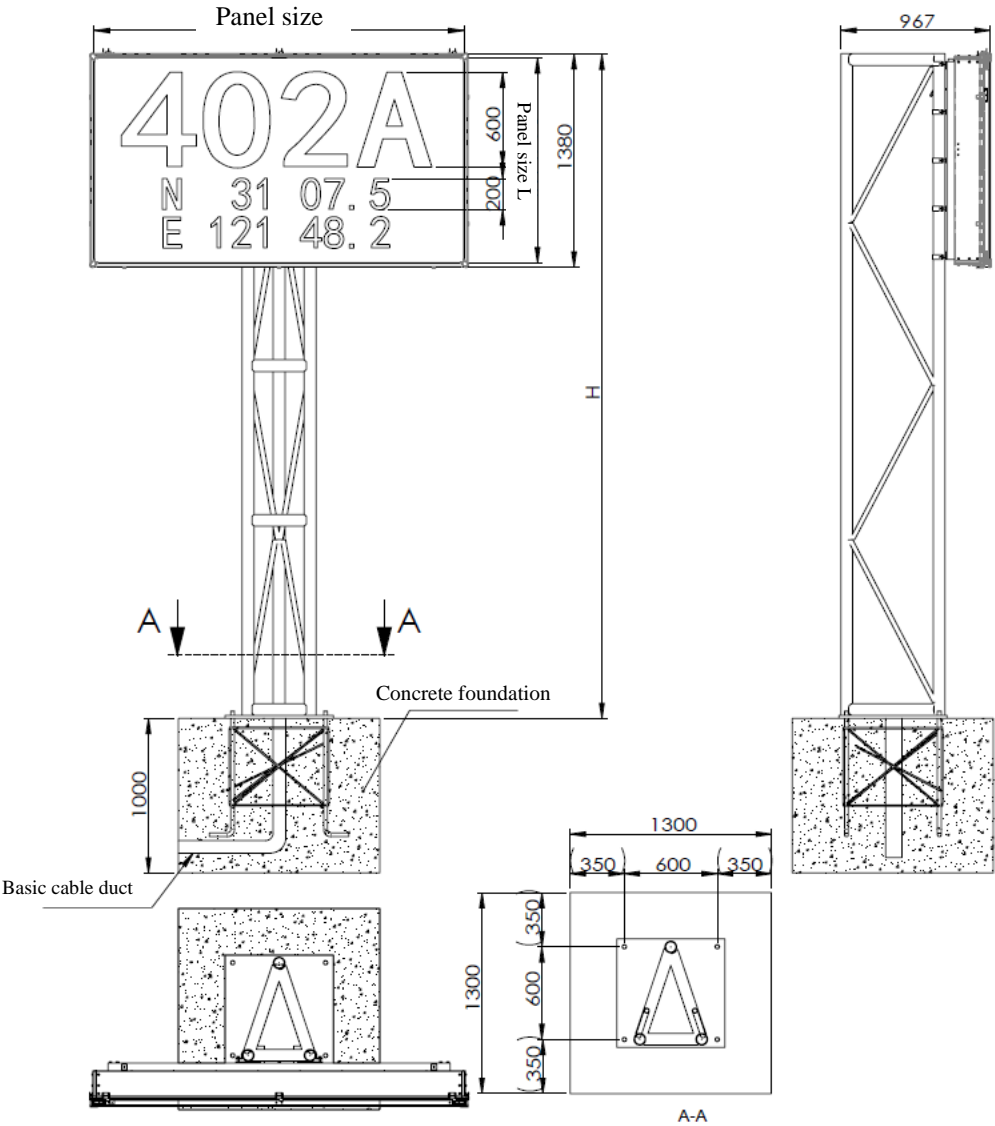
Sign boards are usually installed on prefabricated cement bases through columns or steel frames, or on walls through steel frames.

The installation dimensions of stand identification sign are as follows:

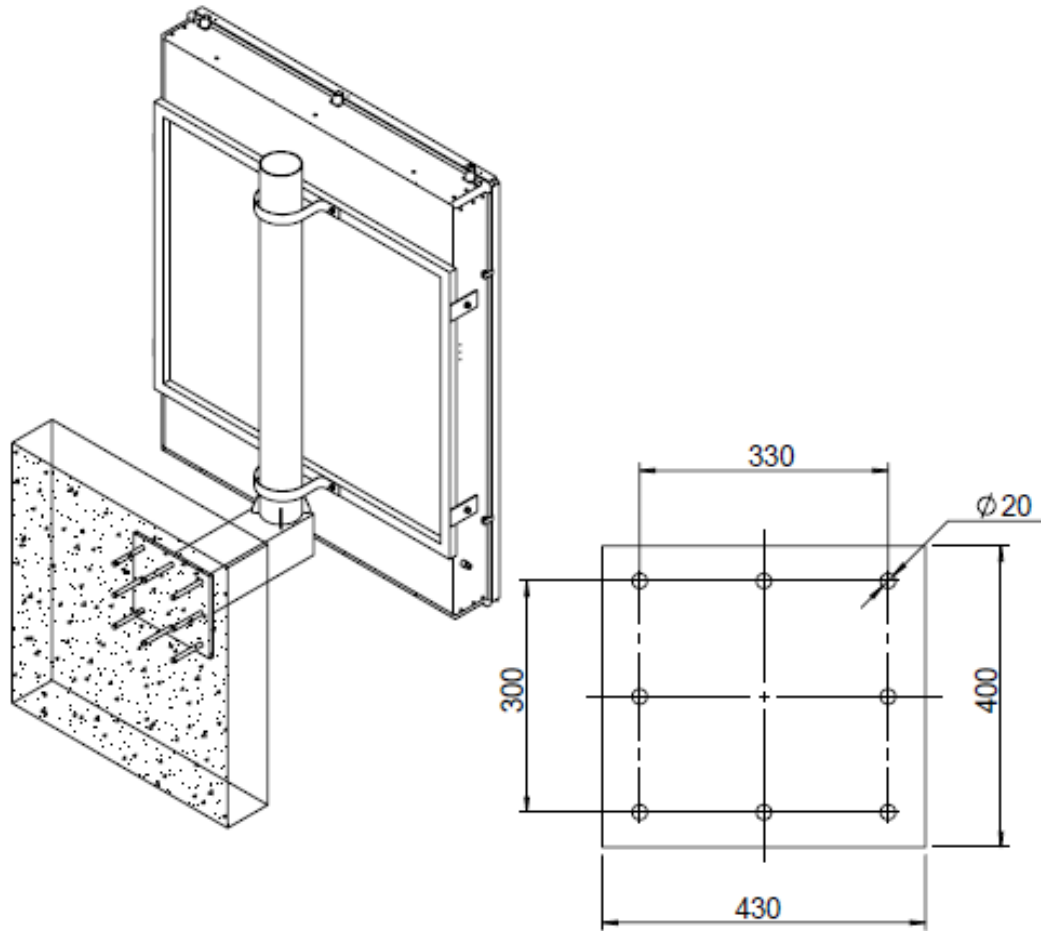
1. Installation diagram of column pavement



2. Installation diagram of triangular steel frame

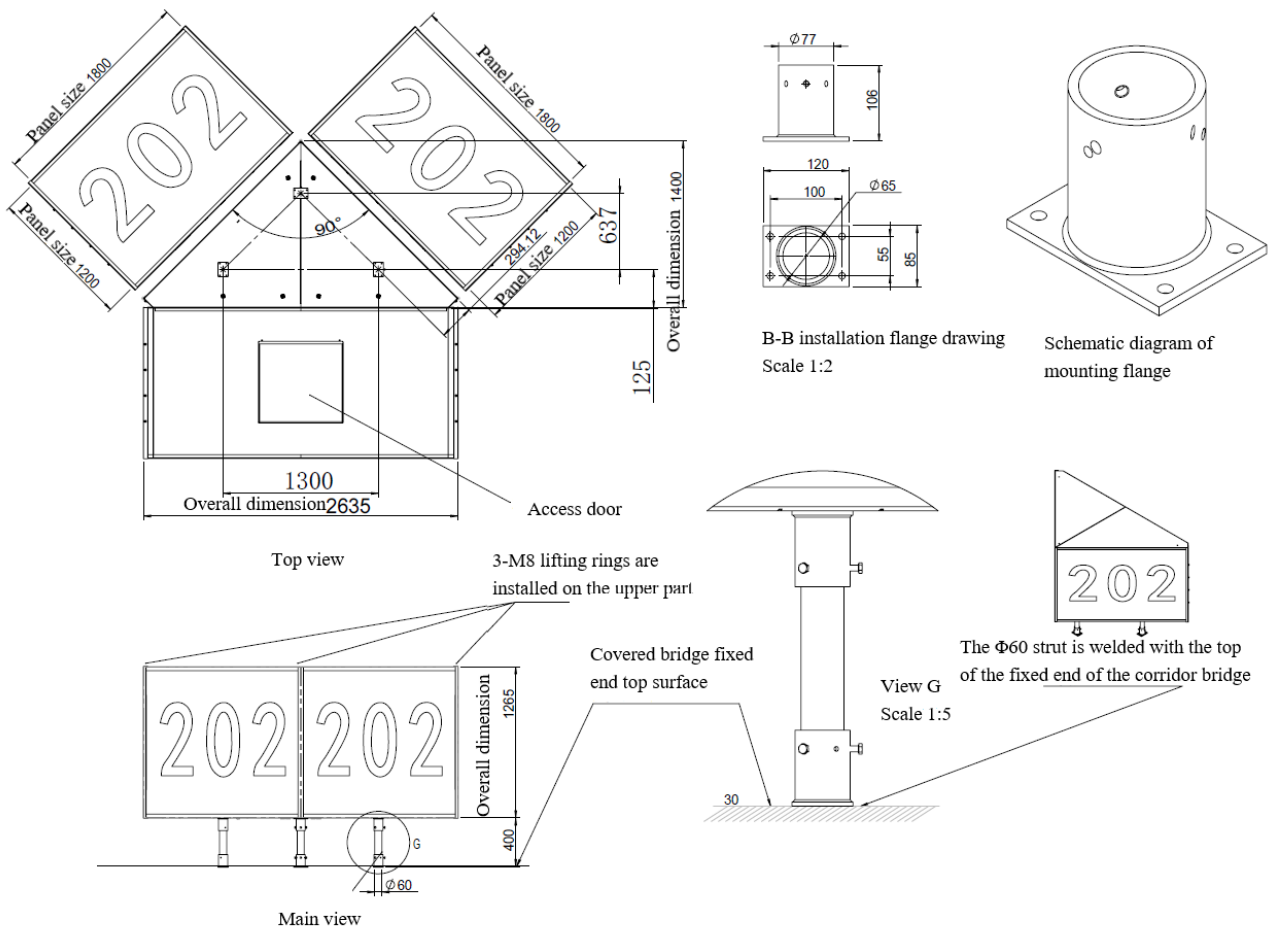


3. Installation diagram of wall mounted or steel structure



Flange installation dimension

4. Installation diagram of triangle signboard



- The sign flange must be reliable and firmly locked.
- ※ If the lock fails, the sign may fall or fall, causing an accident.



- The cement foundation dimension is only for reference. Please perform the construction by referring to the design.
- ※ Factors such as climate and soil texture of all airports impact the foundation dimension.

3.2 Installation Steps

1. Stand identification sign with column installation

- Embed the embedded parts into the cement pavement in advance.
- Clean the site, especially the pavement of embedded parts and accessories shall be kept clean and flat.
- Open the package of the sign board, check the appearance of the sign board and confirm that there is no damage.
- Connect the left and right columns with the box components through M12 screws (as shown in Figure 3.2.1). Before connection, thread the power supply cable into the box through the column in advance.

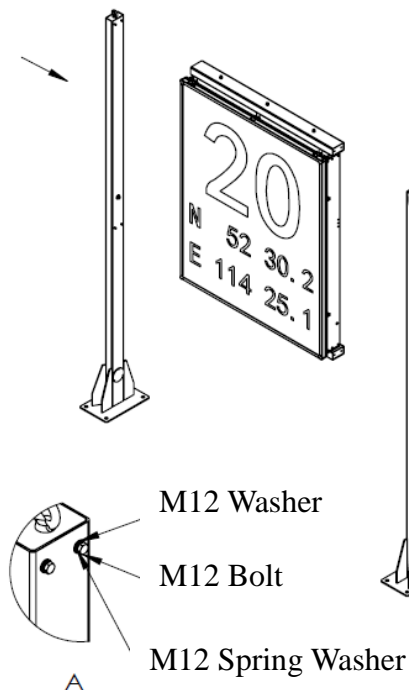


Figure 3.2.1

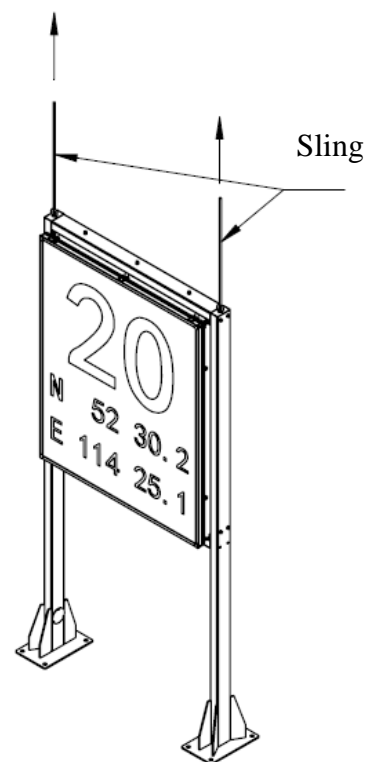


Figure 3.2.2

- Lift the stand plate through the sling screw.
- Align the mounting hole of stand identification sign column with the embedded parts, and then lock it with M24 nut, flat washer and spring washer. (Figure 3.2.3)

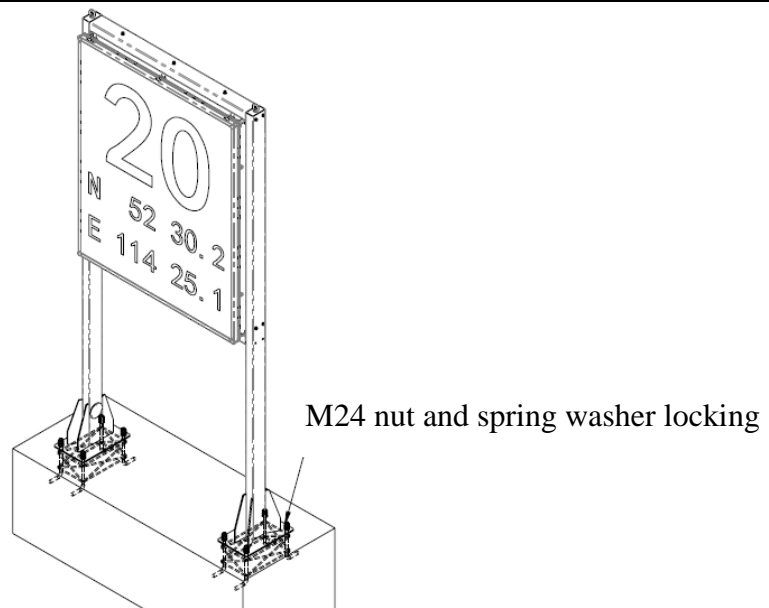
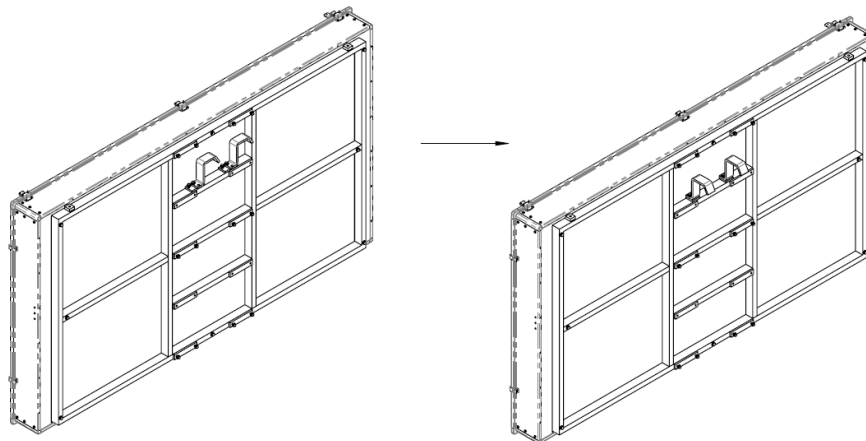


Figure 3.2.3

2. Stand identification sign installation steps of triangular steel frame

- Embed the embedded parts into the cement pavement in advance.
- Clean the site, especially the pavement of embedded parts and accessories shall be kept clean and flat.
- Open the package of the sign board, check the appearance of the sign board and confirm that there is no damage.
- Adjust the direction of the Z-shaped hook on the back frame of the box (Figure 3.2.4).



- Align the mounting hole of triangular steel frame with the embedded parts, and lock it with M24 nut, flat washer and spring washer.
- Use Z-shaped hook to hang the box on the triangular steel frame and lock it with hoop.
(Figure 3.2.5, Figure 3.2.6)

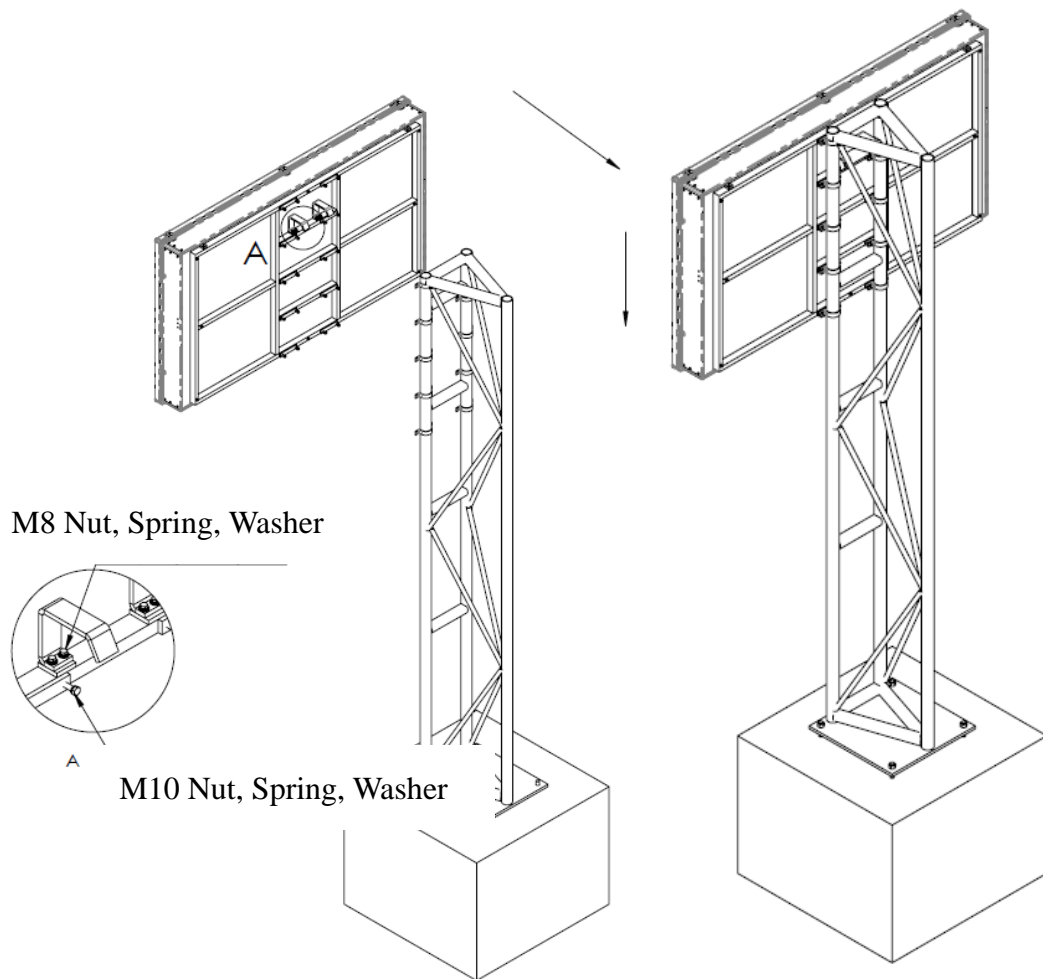
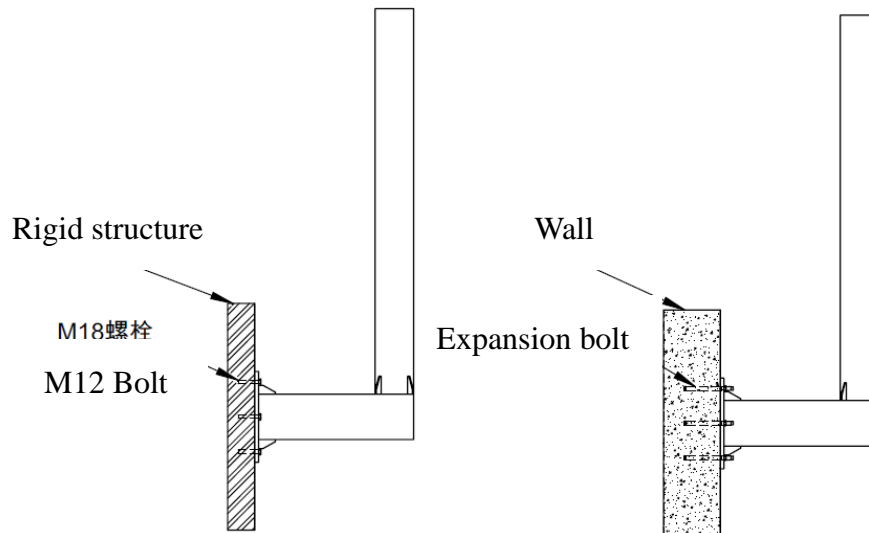


Figure 3.2.5

Figure 3.2.6

3. Stand identification sign installation steps of wall mounted

- Open the package of the sign board, check the appearance of the sign board and confirm that there is no damage.
- Install the wall mounting bracket on the wall through the embedded M18 expansion screw or fix it on the rigid structure through the M18 bolt (Figure 3.2.7).



- Fix the box on the bracket with hoop (Figure 3.2.8).

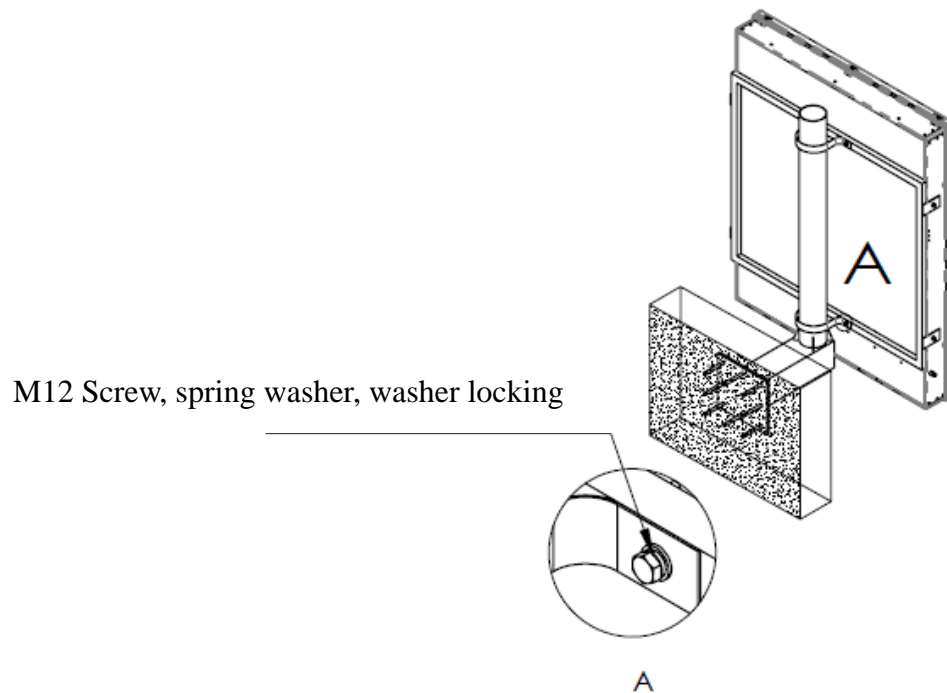


Figure 3.2.8



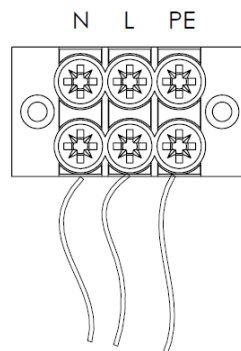
- When installing the signboard, ensure that all nuts are locked firmly.
- ※ Sign board is occasionally attacked by typhoons.

3.3 Wiring

The default introduction method of the power cable of the signboard is wiring in the pole (Figure 3.3.1).

Or the external flexible pipe wiring method of the sign may be employed according to the customer's requirements (3.3.2).

The internal electrical components of the signboard are composed of terminal blocks, drive power, lamp pins and LED strips.



Use 220V AC power supply for driving.



- Connect the power supply in strict accordance with the label instructions.
- ※ Otherwise, the LED may not work normally.

3.3.1 Wiring in Pole

The power cable, return circuits, output cable and communication cable of the switching cabinet enter from the bottom.

When the wiring mode in the pole is adopted, the wiring steel pipe must be preset inside the cement base in advance. The user shall determine the length of cable (4mm²) according to the actual needs. The cable is connected to the terminal block inside the sign board and connected to the power input terminal and grounding terminal respectively.

Special attention: the grounding terminal on the internal wiring terminal of the tag must be reliably grounded.

Wiring mode I: diagram of diagram in pole wiring

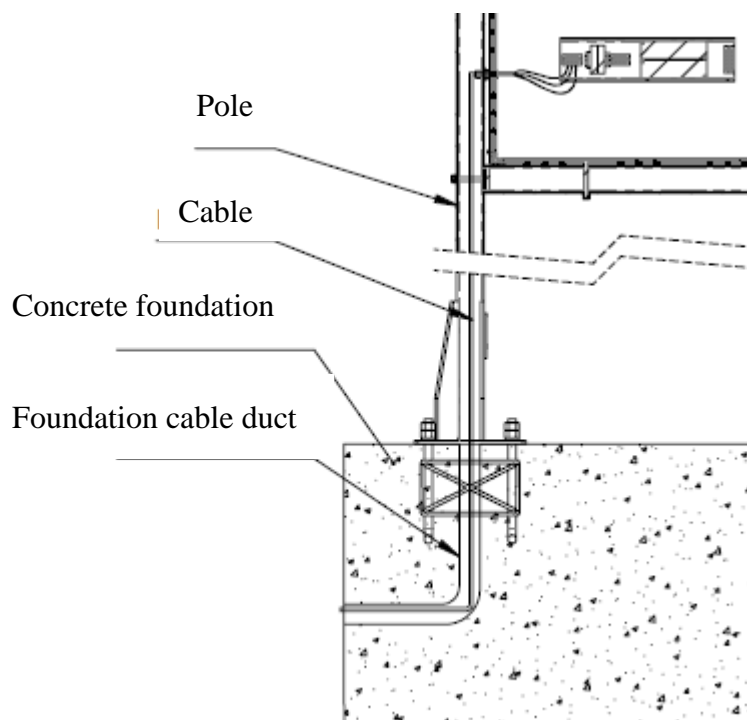


Figure 3.3.1



- Making sure good grounding of the ground lead.
- ※ Otherwise it may cause damage to the internal electrical parts, or even fault of power supply.

When it is powered on for the first time, please confirm the specification of the power source. Make sure that the specification of the power source used complies with the requirements and the

matching parameters of the relevant parts comply with the requirements of this specification.



- When it is powered on for the first time, please confirm the specification of the power source.
- ※ Otherwise it may cause damage to the internal electrical parts, or even fault of power supply.

3.3.2 External nylon hose routing

The external nylon hose wiring method makes the construction more flexible and it is conveniently to connect the power lead to the power source pipeline nearby the sign and the nylon hose tubing effectively protects the power line.

One end of the cable is connected to the wire holder in the sign, which is connected with the power input terminal and ground terminal respectively and the other end is connected power and the ground lead is grounded.

Special attention: the grounding terminal on the internal wiring terminal of the tag must be reliably grounded.

Wiring mode II: diagram of external flexible metal tubing wiring

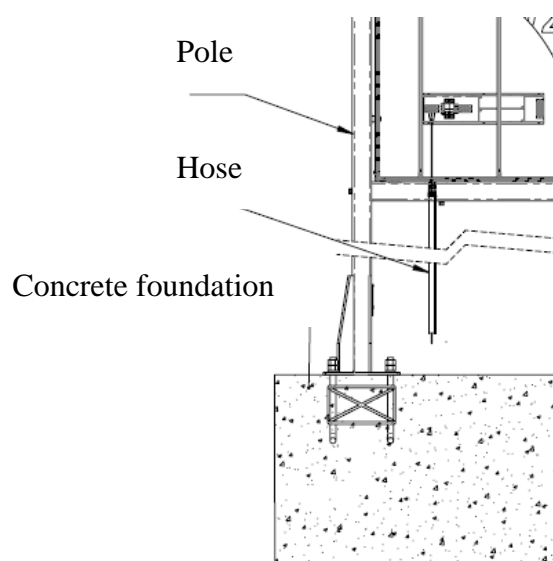


Figure 3.3.2

The incoming cable is threaded into the PVC protective tube after protected by the flexible tube. The foaming agent is used to block the PVC tube port to prevent external rain from entering the protective pipeline.

When it is powered on for the first time, please confirm the specification of the power source. Make sure that the specification of the power source used complies with the requirements and the matching parameters of the relevant parts comply with the requirements of this specification.



- Must check whether the contact is good and has good waterproof performance.
- ※ Otherwise it may cause circuit fault.



- When it is powered on for the first time, please confirm the specification of the power source.
- ※ Otherwise it may cause damage to the internal electrical parts, or even fault of power supply.

3.4 Internal Electrical Configuration

Based on different numbers of LED light bars and corresponding drivers of the sign, the isolation transformer configuration is changed accordingly. The power and number of isolation transformer to be configured for this sign are indicated on the nameplate label of each sign.

The requirements of the isolation transformer of the sign may be calculated based on Table below.

Number of LED light bars	Isolation transformer
n	$\geq n*6.5+m*25$



- Overload use of the isolation transformer or driver is strictly prohibited.
- ※ Otherwise it may cause circuit fault or isolation transformer fault.



- Drivers must be used in series when two or more drivers are used.
- ※ The parallel connection may cause failure of LED light bar lighting up or insufficient luminance.

3.5 Label Description

A label is posted on the right of the sign, with the sample as follows:

Aircraft Stand Identification Sign			
Model		ASIS-H-P-LED	
No.	O1	Longitude and latitude	N 34 44.2 E 112 23.0
Visible light size	1635*2000	Light source	LED 12W*5
Power	60W	Power supply	220V 50/60HZ
Date of production	Jun 07, 2017	Factory No.	AS20170010070001

Airsafe

The label contains the following information:

Name, label (position number of the signboard), signboard size, power, production date, longitude and latitude, light source type and quantity, input power supply and factory number

4.0 Introduction to human machine interface (HMI)

4.1 Lamp Driver

M sign is applicable to constant voltage driving of 220V power supply.

The constant voltage driving in the sign is input by 220V AC power supply, with 180~300V wide voltage input and overvoltage and high temperature protection. The driver input is connected to the LED light bar with the special LED connecting cable. Take 100W as an example, a driver may drive 12 light bars, which may be configured randomly.

S sign is applicable to constant current driving of 2.8~6.6A power supply.

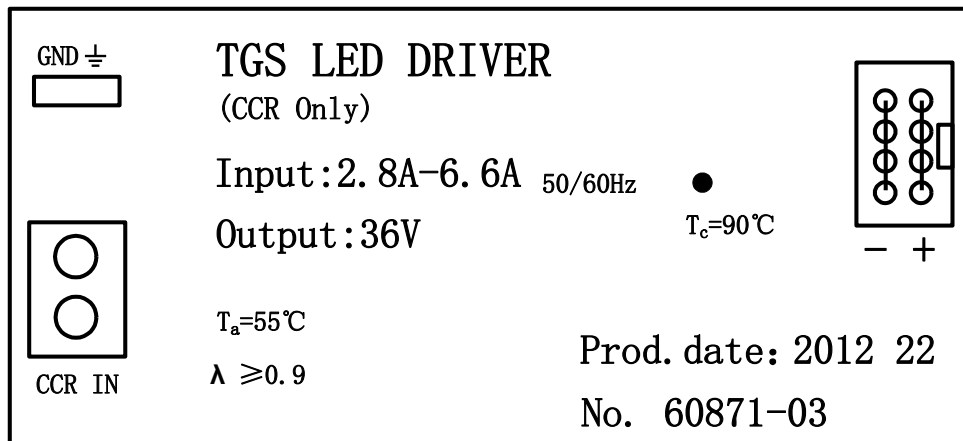
The high performance constant driving circuit in the sign is powered up by CCR, which is input into the driver through the isolation transformer, with the input current of 2.8A-6.6A. The driver output is connected to the LED light bar with the special LED connecting cable and a driver may drive 3-10 light bars, which may be configured randomly.

4.2 Input and Output Port of Driver

For the drive of M sign, the input power source specification, output wiring method and relevant requirements are indicated on the driver, as shown below:



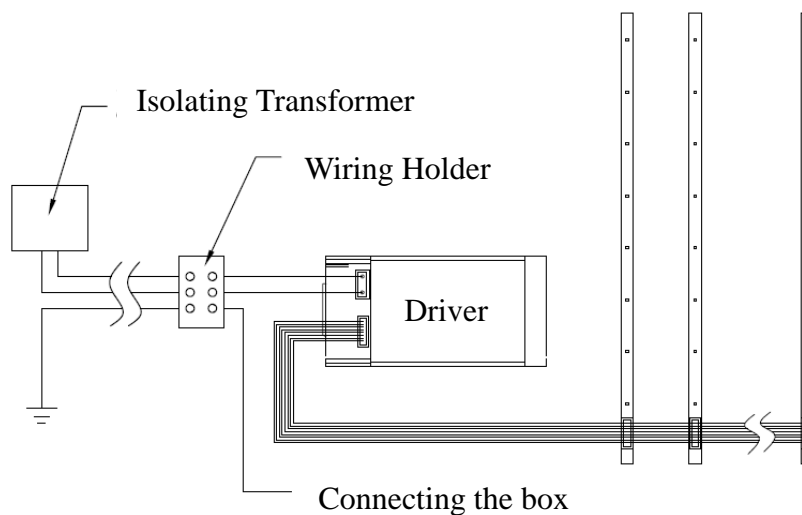
For the drive of S sign, the input power source specification, output wiring method and relevant requirements are indicated on the driver, as shown below:



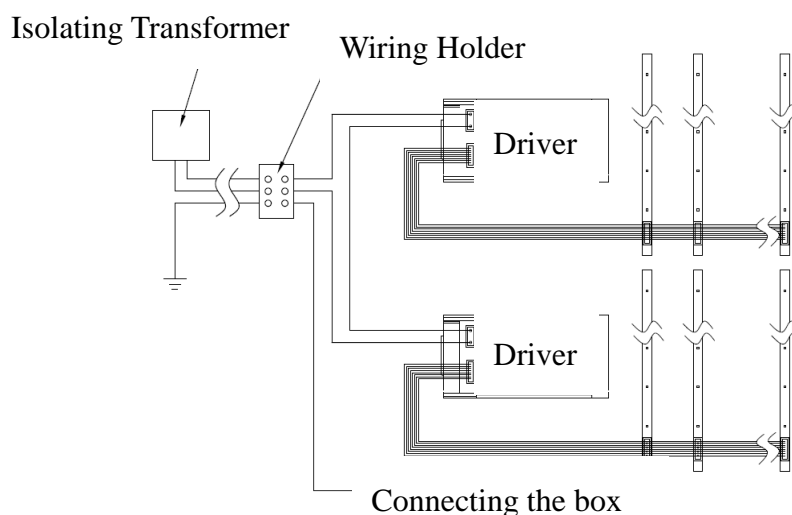
4.3 Wiring of LED Light Bar

The driver in the S-type sign is configured according to the number of LED light bars. One driver may drive maximum 10 LED light bars and two drivers in series may drive maximum 10 LED light bars. The rest can be done in the same manner. The drivers may be continuously added only if their power does not exceed that of the isolation transformer.

The sign is not long. When only one driver is required, the input and output wiring is shown in Figure below. During installation, please check the transformer capacity to avoid CCR circuit oscillation due to overload:



During installation, please check the transformer capacity to avoid CCR circuit oscillation due to overload:

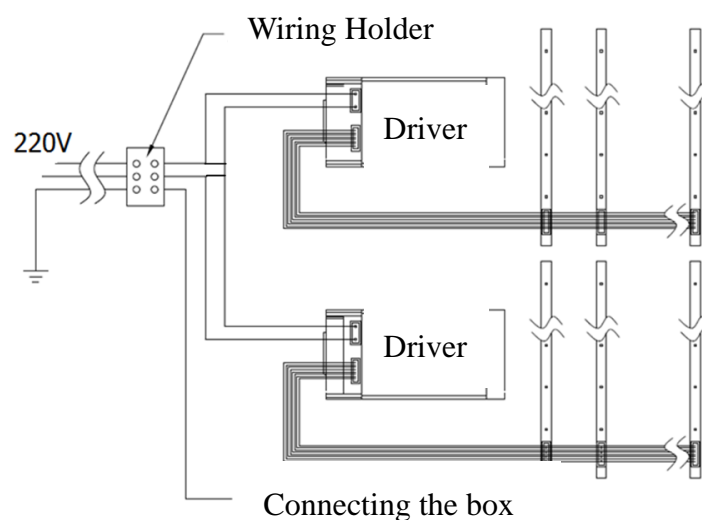
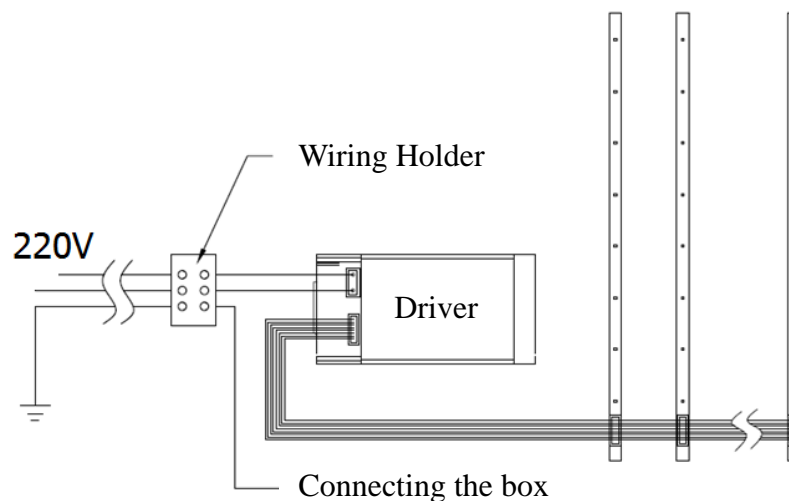




- Constant current CCR power supply is specifically used for the sign driver and using other power supplies are prohibited.
- ※ Otherwise it may make LED failed, or even burn out the LED light bar and drive.

The driving power supply of M-type signboard is configured according to the number of LED light strips. One driver can drive up to 12 LED light strips, and two drivers can drive up to 24 LED light strips in parallel. And so on. As long as the power of the driving power supply is not exceeded, the driving can continue to be increased.

220V input wiring diagram is shown in Figure below:



5.0 Maintenance

Daily maintenance suggestions supplied in this section are only for reference. The airport may refer to other provisions or maintenance experience of its workers to make its own daily maintenance criterion. The manufacturer does not specify it.

For maintenance of the airport lighting fixtures, please refer to 1.0 Preface. Maintenance is performed by the professional.

5.1 Daily Maintenance

Interval	Check	Activity
Every day	Hasp	Confirm that it is buckled.
Every week	Cleaning	Clean the outside of the sign panel.
	Screw	Check whether the connection between the column and the box is abnormal
Every two months	Nut	Check whether the connection between the column and the embedded parts is locked
	Seal ring	Whether the sealing ring of front frame and panel is normal



- Cleaning the transmitting film of the internal surface with sharp article or chemical corrosive item is strictly prohibited.
- ※ Otherwise it may damage the transmitting film of the internal surface.



- Making sure that each lock hasp is locked in place after maintenance.
- ※ It is possible that water has penetrated into the interior of the box.



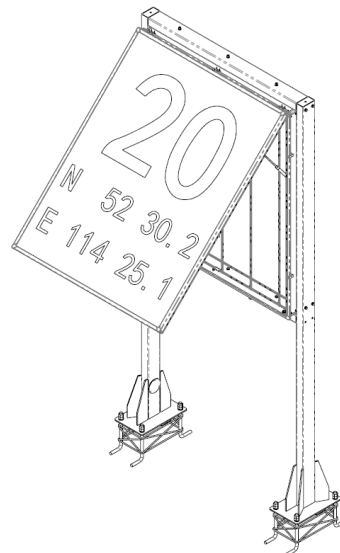
- It is necessary to carefully check whether the column connection is firm.
- ※ The sign is hit by the gas injection from the aircraft tail and typhoon throughout the year.



- It is necessary to carefully check whether the nuts on the bottom plate of the column and the anchor bolts are securely fastened.
- ※ The sign is hit by the gas injection from the aircraft tail and typhoon throughout the year.

5.2 Replacement of LED Light Bar

1. Loosen the hasps of three sides of the sign, open the front frame assy.
2. Unplug the terminal block from the light bar.
3. Remove the old light bar from the circlip and install the new light bar.
4. Assemble the front frame assy and buckle the hasps.



5.3 Removal of Common Faults

SN	Fault Phenomenon	Countermeasures
1	Non-uniform sign luminance	Clean the panel Check and replace the LED light bar whose luminance is non-uniform
2	Not lighting up of LED light bar	Check the power lead Check the connection between the LED light bar and lamp leg Lamp leg and driver wiring Replace a new LED light bar Replace the driver.



- The sign driver shall be purchased from the original manufacturer.
- ※ Otherwise it may cause abnormal LED work, or even burn out the LED light bar.



- The sign LED light bar must be purchased from the original manufacturer.
- ※ Otherwise it may cause abnormal LED work, or even burn out the LED light bar.

6.0 List of Components and Ordering of Spare Articles and Accessories

The table in this chapter lists the components, spare articles and accessories of this product and relevant ordering information. Spare articles and accessories of this product needs to be ordered additionally, and the manufacturer accepts the order in assembly mode and separate order of components. When ordering, please contact the manufacturer or any distributor according to order number listed in the table.

The manufacturer suggests that some important components should be purchased from original factory to ensure various indicators of the lighting fixtures.

List of components and spare articles:

Structure No.	Component Name	Order No.	Description
1	Front frame assy	94664X	Front frame+ PC board The character information and sign size shall be provided X=5 800 letter high X=1 600 letter high
2	LED light bar	960A03 960A01	LED light bar (2008) LED light bar (1330)
3	LED Driver	LPV-100-48	
4	Gas spring support	6089L	
5	Rear frame	94665X	Rear frame X=5 800 letter high X=1 600 letter high
6	Crossbeam	46183-XXX	XXX: length
7	Column	46181	
8	Embedded parts	60901	Embedded parts 440×240
9	Support frame	6089I	
10	Pole support	6089J	
11	Hanger	946527	
12	Z-shaped hook	46527-2	
13	Triangular steel frame	46572	
14	Embedded parts	60914	Embedded parts 600×600

* When ordering, provide the character information on the sign surface

* Ordering of the rear frame is unacceptable

* The power lead is the column lead and the external flexible metal tubing wiring method shall be specifically indicated

* If the customer has other special requirements, they shall be described in writing in detail.



■ If the sign drive is damaged, order it from us.

※ Drive of other brands may cause lamp damage and use fault.



■ If LED light bar is damaged, order it from us.

※ Light bar of other brands may cause use fault of the sign.

7.0 Packaging, Transportation and Storage

7.1 Packaging and Weight

Packaging: Packaging methods are different according to different sign sizes

Weight: Weight is different according to different sign sizes

Volume: Packaging volume is different according to different sign sizes

7.2 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.

7.3 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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