

# **SPRAY BOOTH**

## **ITEM NO: EE-7202**

### **USER MANUAL**



**KEEP THE MANUAL NEAR THE MACHINE ALL TIME AND MAKE SURE ALL USERS HAVE READ THIS.**

**FOLLOW THE INSTRUCTIONS CAREFULLY TO GRANT THE MACHINE A CORRECT FUNCTION AND LONG SERVICE LIFE.**

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## SPRAY BOOTH USER MANUAL


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## Chapter 1 General Introduction

### 1.1 General Introduction



- **Read the manual carefully before proceeding to start the booth.**
  - This manual has the aim of supplying the user all the necessary information so that, besides a correct use of the booth, he is able to use it in the most auto and secure possible way.
  - This manual is suitable for our different kinds of standard spraying/baking booth. Such as **EE-7202, EE-7302 and other similar nonstandard model**. we select **EE-7302** as a sample to give the instruction about the spraying/baking booth in this manual, also we will make some explanation for some special parts in the following chapter.
  - It is including the Technical aspect, Function, Machine stopper, Maintenance, Spare parts and Safety.
  - Before carrying out any operation on the Booth, the Operators and the Qualified Technicians have to read the instructions contained in the present publication carefully.
  - If there is any doubt on the correct interpretation of the instructions, will consult our technical department for the necessary explanations for you.
- 
- 
- The manual is an integral part of the Booth, it has to be taken care of by the buyer, it has to be positioned in the immediate vicinity of the Booth, inside a special container and, above all, protected from liquids and anything that is liable to jeopardize its legibility.
  - In the case of deterioration the construction firm will be happy to send another copy. in such a case it is necessary to communicate to the technical office the characteristic data stamped on the special identification nameplate. The manual has to stay with the machine in the event that it is sold..
  - The contents of the present manual conform to the directive 2006/42/EC and any consequent modifications. Normally we make the spray booth with some electrical components without CE certificate. And remark that if you need CE certificated make.
  - Data and drawings are only illustrative; the builder, having a pacific of constant development and updating of the product, may make changes without any warning. It is forbidden for anyone to divulge, modify or use this manual for personal reasons.

## Chapter 2 Spray Booth Description

### 2.1 The Struction Description

The spray booth is composed of the following parts:( shown in Fig.2.1)

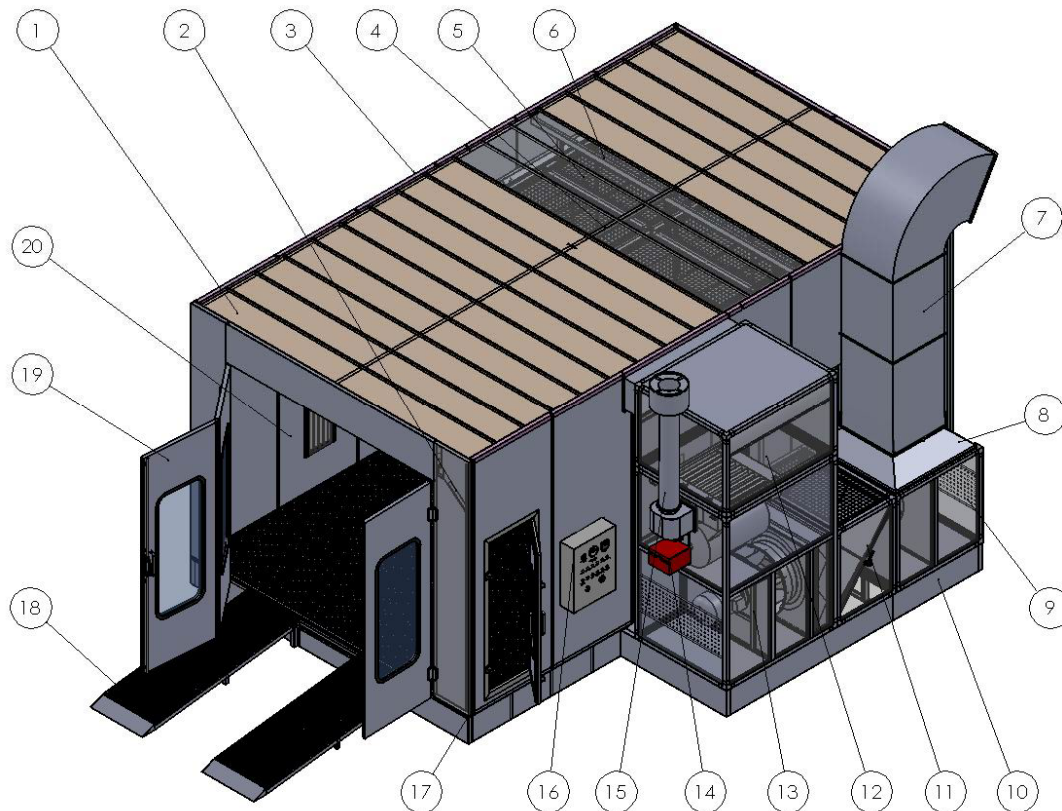


Fig. 2.1

#### 1) The main room:

- The base parts: Side metal panel,Back metal panel,Front metal panel,Middle supporting,Strengthen bar for basement,Support net for filter,Galvanization air block panel,Floor filter grids,Ramp for auto enter.
- The body parts: wall board(20) with or without side light,front door(19) with (including horizontal board and stand board,safe door(17),surround pieces of wall board ect.
- The top parts(air cabinet) : top sealed board(5),lighting frame(2),filter slot panel,supporting for the filter,roof supporter beam(4,6),filter,roof cover(1).
- Ramp(18):grids style or vein board style.

#### 2) Generator parts

- Bottom of heat-air generator
- Middle frame of generator(13) :including the intake fans and heat exchanger
- Burner(14),diesel burner for standard model and gas burner for optional.
- Top-frame for generator(12)、the connection part between top frame and air cabinet

- Damper(11) for change between painting and baking system.
  - Exhaust system: exhaust fan with pre-filter(9),Active carbon environment system as option(11)
  - Smoke tube(15):connect with heat-exchanger,take the heat out.
  - Air duct(7):exhaust duct is necessary and intake duct as option.
- 3) Oil tank with frame.
- 4) Control system(16): control the motor,burner,light system ect.

### 2.1.1 The Main Room

The spray painting environment is the closed place when the spray painting and the drying process is carried out. it is divided into the following parts:

#### 1) Side walls

The side walls are necessary to isolate the spray painting environment from the outside,both from the thermal and acoustic point of view, and above all so as not to disperse the paint and solvents residue into the environment, it is formed by: (shown in Fig.2.2)

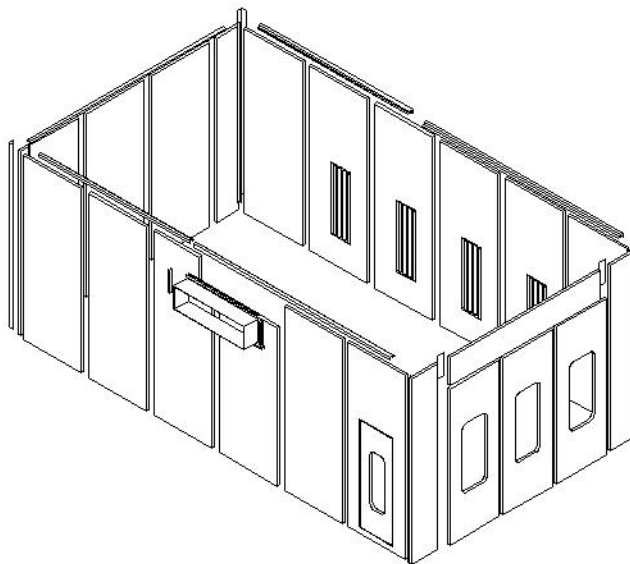


Fig 2.2

- Side walls made of panels, with a thickness of 50 mm, modular types with tongue and groove jointed, inserts with added seals. The thermic insulation of the spray painting environment is warranted by the layer of expanded polyurethane or rock wool contained in the panels.
- Back walls, panels made of the same type as the side walls.
- Metal covers up the wall, are necessary for the up cover of the walls, which make each panel connect together and easy to install the ceiling cover.
- Back corners, that are necessary for the connection between the side walls and the back wall.

#### 2) Front walls

The front wall of the booth is composed of : (shown in Fig.2.3)

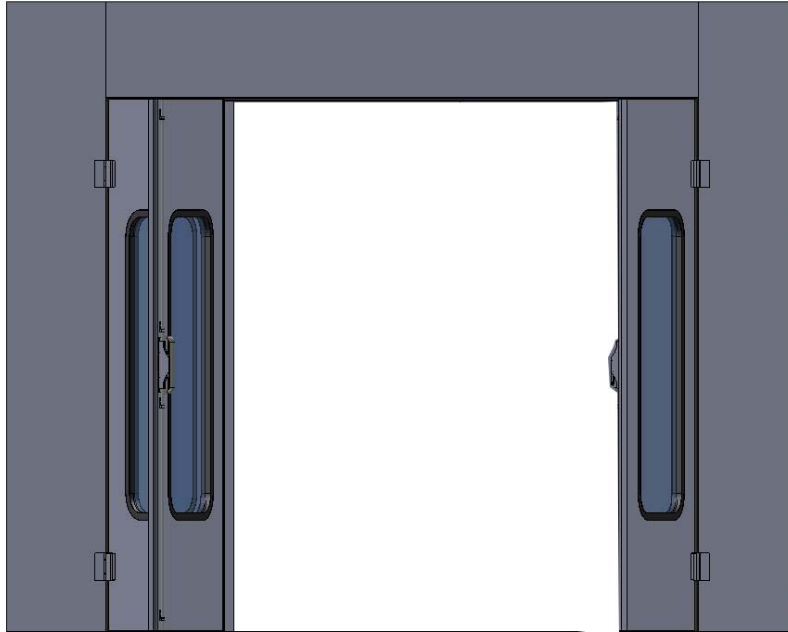


Fig. 2.3

- The header horizontal panel, is necessary for the plenum chamber and as a closure of the head part of the front wall.
- Maid door with the glass window, for the entry-exit of the operator, equipped with a spring release opening.
- Side erect panel, is necessary to support the maid door and connect to the side wall panel.
- The installed fitting parts: such as the door lock, handle, hinges, connection bar for horizontal panel and erect panel.

### 3) Illumination system

- The internal illumination is warranted by the overhead lights ( shown in Fig.2.4 ) inserted into the top of the side panels, positioned at an angle of 45° to warranty a sufficient and uniform illumination.

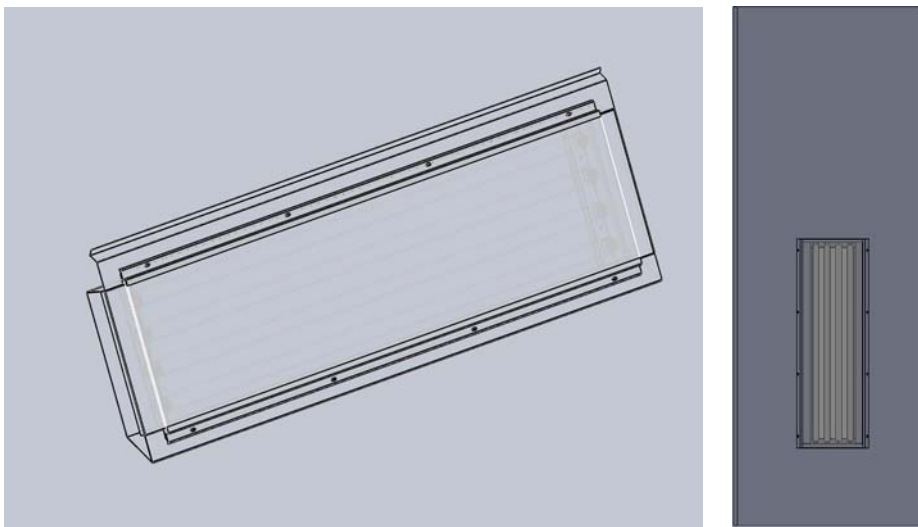


Fig. 2.4

- The overhead lights are steel plates coated with paint ,in which four neon holders are positioned, each of which fits four neons of 36 W, the neons are isolated from the spray painting environment by panes of glass as the same type of it used for the doors.
- In order to reach the better illustration effect,we usually install the side light in the side wall, the neons are isolated from the spray painting environment by panes

#### 4) Ceiling

The ceiling acts as both a cover for the spray painting environment and supporting for the air filters at the entrance, it is composed of: (shown in Fig.2.5)

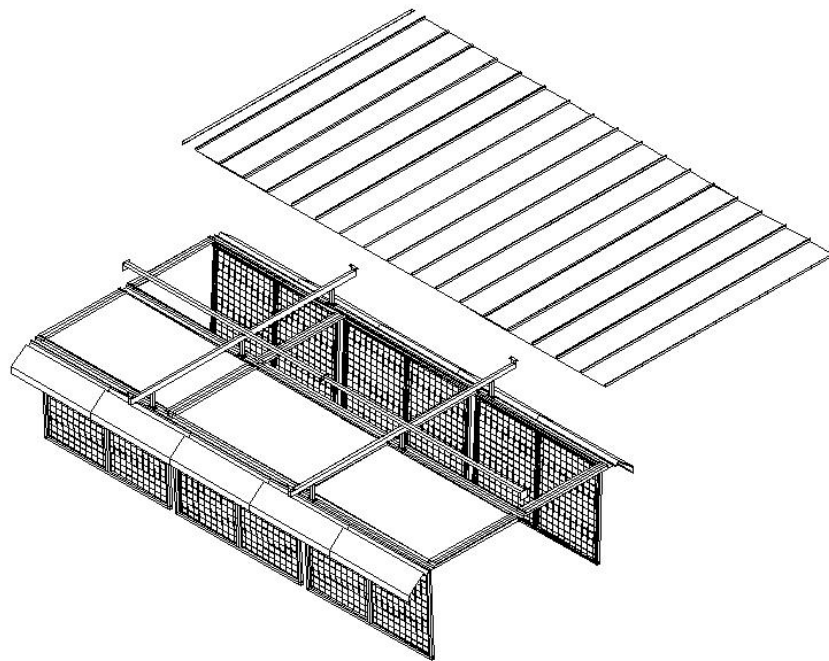


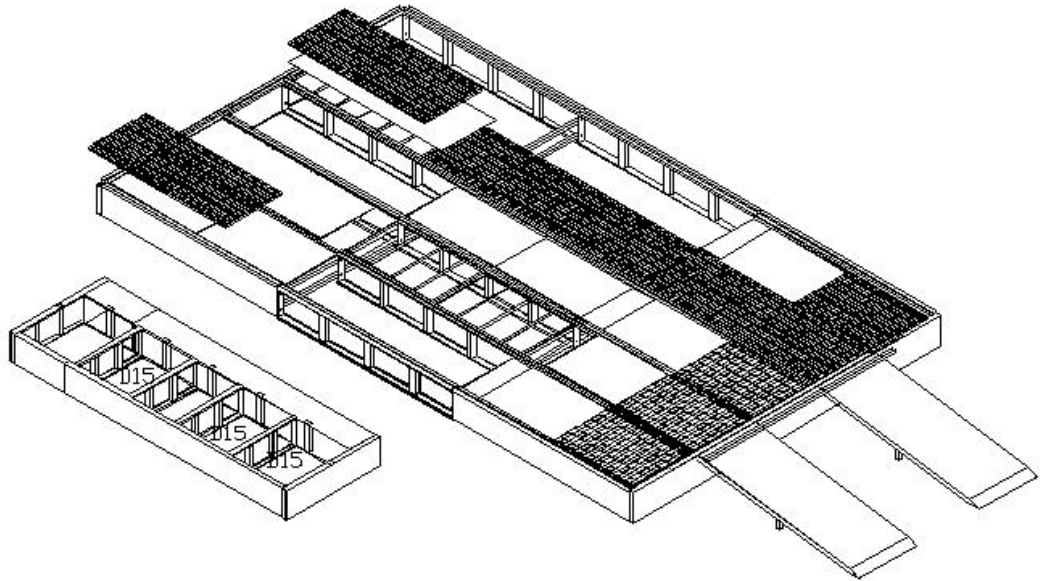
Fig. 2.5

- Top lights, including the neons of the illumination of the booth, they are the parts of the air cabin.
- The filter frame, which are hanged with the top sealing panel.
- Roofs, they are plates of zinc plate that are necessary for the cover of the booth.
- The iron supporting beams, intercross by horizontal beams and longitudinal beams,which are used for supporting the ceiling.
- Top sealing panel is installed on the supporting beams.And the top sealing pannel are necessary to cover the ceiling and hold up the filter frame

#### 5) basement

The basement serves as a plenum chamber which lead the exiting air from the booth. It is composed of(shown in Fig.2.6)



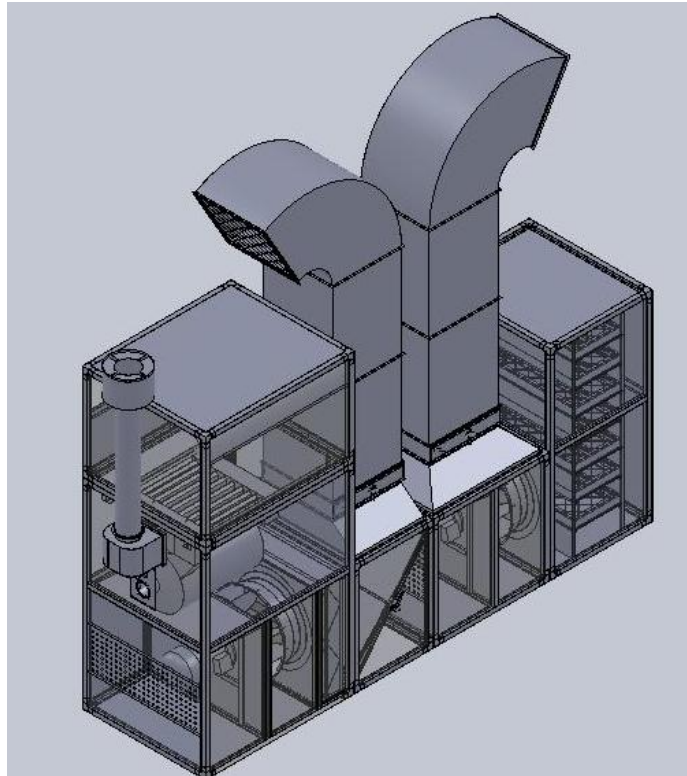


**Fig. 2.6**

- Basement, made of front panel,back panel,side panel,middle supportor and strengthen bar placed longitudinally and connected together. The pieces composing the basement are made of zinced pressure folded plates.
- Floor filter supported frame and panel placed under the filter,the side rows and middle row with the panel for keeping air off when all rows grids as optional. And the No 2 and No.4 rows with the supported frame for air ventination.
- Floor filter,is necessary for painting filtration.Usuallyly cover row of No.2 and No.4 with the floor filter.And cover all five rows with floor filter when all grids as optional.
- Grids, that are inserted in the basement necessary for the flooring. There are five rows in total,Row 2 and Row Four should be the grids,and Row 1,Row 3 and Row 5 should be vein boards. but row No.2 and No.4 in the area in which the air is aspired the grids are only used, in order to allow the air to pass.

### **2.1.2 Generator Part**

The generator unit is necessary to start the forced ventilation needed for an optimal aerification and a homogeneous distribution of the paint to produce the quantity of heat necessary for the drying process.All the components of the generator unit are to be found in a closed booth . And the spray painting booth consisting of (shown in Fig.2.7)



**Fig. 2.7**

- Connector, for the connection between the generator unit booth and the spray painting environment. Anti-vibration coupling in canvas is option so that the mechanical vibrations produced by the motor are not transmitted to their booth.
- Combustion room , equipped with a stainless steel heat changer and anti-exploding porthole as optional.
- Burner: Riello Diesel oil burner for standard. And the gas burner for option.
- Centrifugal fan , action by an electric motor.
- Enter filter frame, for pre-filtering incoming air.
- Damper system, which is pneumatic drive. it is necessary to a partially recycle the air to be introduced in the painting and drying process phase.
- Air duct: take the exhaust out of the working area.
- Chimney: take the exhaust heat out of the working area, is connect with flange.
- Active carbon environmental system as option

## **2. 1.3 Control panel**

The control panel is composed of the following switches and indicators ( Shown in Fig.2.8 )

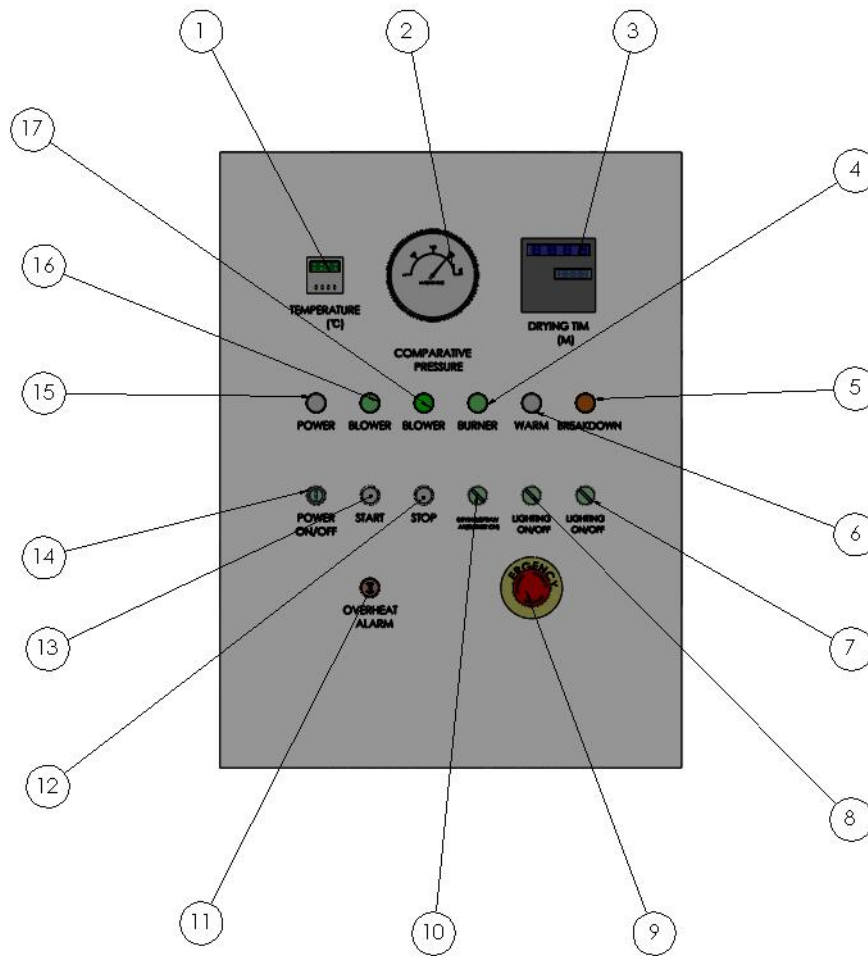


Fig. 2.8

- Switch to block main doors
- Drying process Timer(1), it is necessary in order to regulate the drying process.
- Pressure meter(2), test the pressure difference between inside and outside of the booth.
- Temperature meter(3), it is necessary to regulate the temperature of the air both for the spray painting and drying process.
- Burner indicator(4), it indicates the burner is operation or not.
- Constant temperature indicator(6), it indicates the temperature inside the booth is constant or not.
- Burner Break down alarm(5), it alarms if there are something wrong about the burner.
- Light switch(7)&(8), turn on or turn off the up and side light.
- Emergence stop button (9), which can cut off the power when the emergence happen.
- Selector switch of Painting and drying process(10), allows the passage from the spray painting phase to the drying process and rise temperature painting.
- Over load alarm(11), it alarms if the motor over-load or over-heat.
- Stop button(12), press it when you want to start the fans.
- Start button(13), press it when you want to start the fans.
- Power ON/OFF(14), turn the key when you want to start or close the power.

- Power Indicator(15), it indicates the power is on or off.
- Motor operation Indicator(16)&(17), it indicates the motor is on or off.

### 2. 1.4 Some Optional parts

#### 2.1.4.1 Ceiling railway

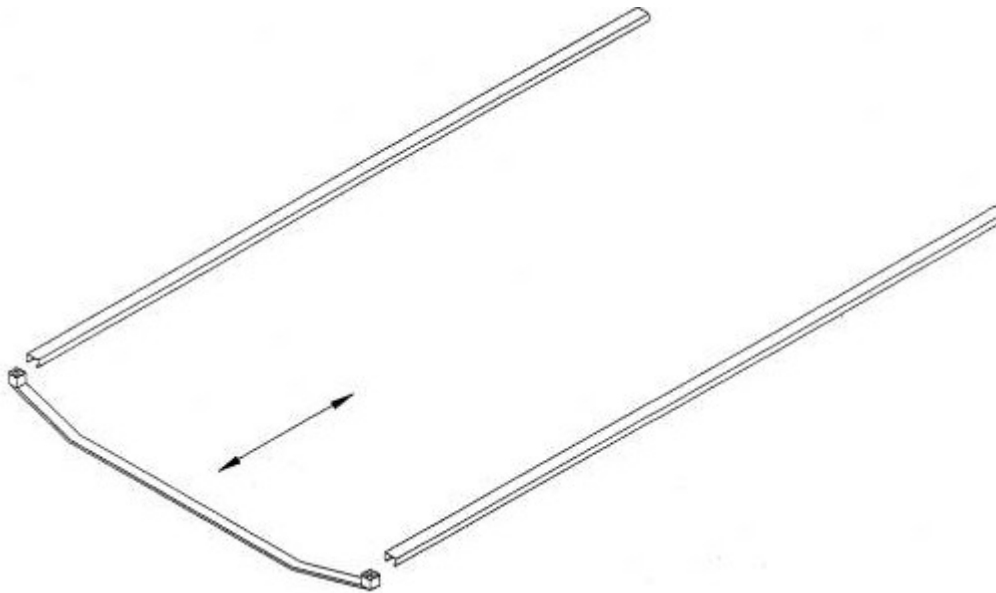


Fig. 2.9

The bonnet trolley is necessary in order to hold up and manipulate the parts of the bodywork that are spray painted separately from the body of the vehicle. It is a tubular, rectangular section, that can run along rails (placed lengthwise and anchored to frame housing filter) thanks to a couple of wheels connected to it.



**ATTENTION:** It is recommended that you do not surpass the maximum applicable load to the trolley indicated in the chart of the chapter Technical characteristics'.

#### 2.1.4.2 Safety Thermosta

The safety thermostat(shown in Fig.2.10), placed in the generator group near to the heat exchanger, switches off the electric system if the air flow reaches a temperature superior to 90°C



Fig. 2.10

#### 2.1.4.3 Anti-vibration Joint

The anti-vibration joint (shown in Fig. 2.11), placed between the generator groups, and exhaust air unit with active charcoals and the spray booth, is necessary to isolate the vibrations produced by the motor and the fan. The joint is formed by two edges of zinc-plated plate connected by a belt of PVC that by contorting does not transmit the vibrations to the work environment.



Fig. 2.11

#### 2.1.4.4. Anti-fire Device

The anti-fire device with flame trap shutter, placed between the generator group and the spray painting booth (shown in Fig. 2.12), is necessary to isolate the booth from the generator in case there is a fire. In normal condition the shutter is kept in an open position by a metallic object which at the melting temperature of 100°C sets off a spring release which forces the shutter into a closing position. The closing of the shutter involves also the intervention of the thermal release, with the consequent interruption of the electric system signaled by the appropriate indicator placed on the control panel.



Fig. 2.12

#### 2.1.4.5 Active carbon system



Fig. 2.13

The exhausting air unit with active charcoals shown in Fig.2.13, which the air from the spray painting environment and to decrease the percentage of polluting agents. It is composed of:

- Metal frame, there rock in the panel which can keep the temperature
- Filtration group, composed of seven layer of active charcoal which remove the solvent fumes (purification plant).

## 2.2 The principle of the spray booth

The spray booth is in a dustproof closed environment in which a flow of air of the capacity and temperature necessary to make the booth function circulates. It works in two ways, one to carry out the spray painting phase/flash period and one for the drying phase. The pressure inside the booth is kept slightly greater than the atmospheric pressure (60mm H<sub>2</sub>O), so that it can prevent the dust get into the booth during the operation.

## 2.2.1 Spray Painting Phase

During the painting phase, both the intake fan and exhaust fan are open, and the damper shutter is in the position shown in Fig. 2.14. The air capacity, aspirated from the outside by means of the generator fan, is prefiltered passing through the pocket filters, heated to the desired temperature (about 20°C), and introduced into the plenum. Here an even distribution is obtained and there is a second filtration through the ceiling filter. After the filtration, the air crosses the booth from the top to the bottom part picking up the paint pigments and the solvents left by the spray painting, it is then aspirated by the exhaust air unit passing through the filters placed in the purification plant. (shown in Fig. 2.14)

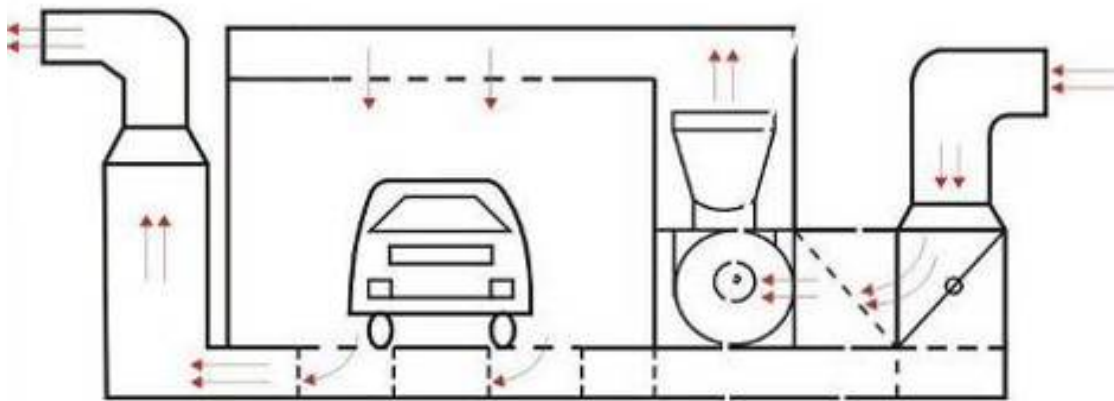


Fig. 2.14

## 2.2.2 Drying Phase

During the drying phase, the exhaust fan will be turned off, the intake fan still operates, the damper changes to the position shown in Fig. 2.15. At the same time, the burner starts to operate and supplies the heating for the booth through the heat-exchanger, and the air enters the internal cycle system. The ventilation style is similar to the painting phase, but the air through the basement will be taken into the intake fan again and form the internal cycle system. The temperature of the air has to be fixed according to the type of paint. Usually the set temperature should be 60°C.

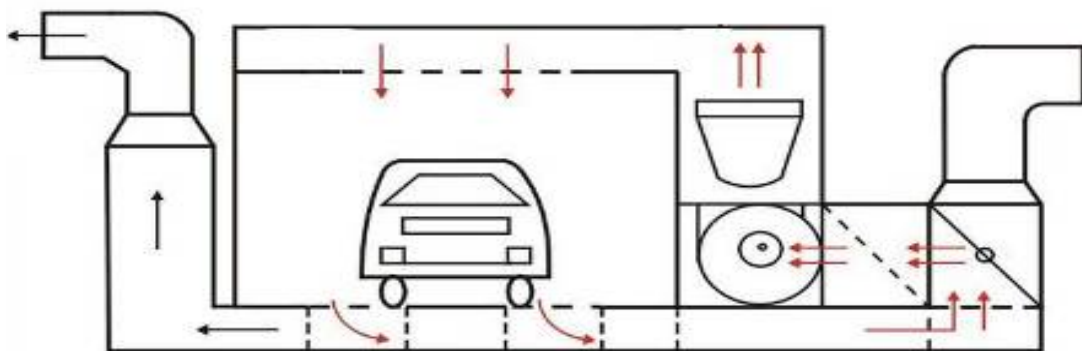


Fig. 2.15

## 2.3 Technical Parameter Difference

Sheet 2-1

Model Parameter	EE-7202	EE-7302
External Size(M)	8.7X5.6X4.23	8.7X5.6X4.23
Internal size(M)	8.6X4.0X3.4	8.6X4.0X3.4
Main Door size(M)	3X3.35 (WXH)	3X3.35 (WXH)
Thickness of steel(mm)	0.326	0.376
Filled material thickness	50mm(PE)	50mm(PE)
Fan capacity(M3/S)	30000	35000
Air velocity (m/s)	0.3-0.5	0.3-0.5
Drying Temperature	60℃-80℃	60℃-80℃
Power (KW)	13	22.5
Intake Fan(KW)	11	11
Exhausted Fan(KW)	7.5	11
Switch Damper	Pneumatic style	Pneumatic style
VCD adjust damper	No	No
Top Light Box	12×4×40W	12×4×40W
Side Light Box	No	10×4×40W
Ceiling frame	5 pcs	8 pcs
Floor	3 rows of veins board, 2 rows of grids	All grids
Ramp	2 pcs vein board style	2 pcs grids style
Burner	Italy RIELLO G20S	Italy RIELLO G20S
Motor star method	Y/△ start connect	Y/△ start connect
Pressure Meter	No	No
Auto Suitable	Mid-bus	Mid-bus
Remarks	--	--



## Chapter 3 The Installation of the Spray Booth

### 3.1 The Installation Environmental Characteristics

Before beginning the assemblage work it is necessary to make sure that the environment where the booth is to be kept conforms with the characteristics below:

1. The electric power circuit has to be measured in order to ensure the correct function based on the installed power.
2. The face of the structure has to be smooth and leveled to warranty a perfect function
3. The support plan of the structure has to be of compacting material, sufficiently resistant to bear the weight of the whole machine
4. For the correct function of the booth it is necessary that it has around it the minimum space as shown in Fig.3.1.
5. The pipeline system has to be predisposed to allow the influx of fuel to the burner.
6. it is necessary to ensure the exit of the emission pipelines and of the air extraction furthermore it is necessary that the ends of these two pipelines are positioned in such a way that the discharged air is not aspirated.

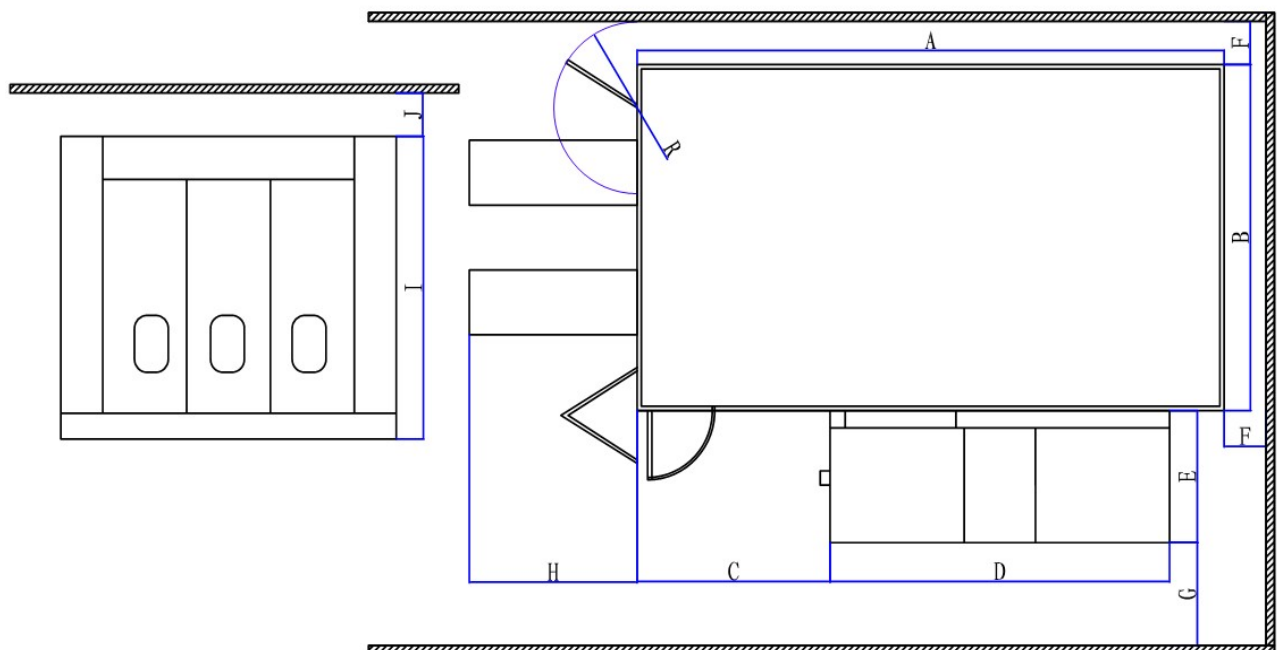


Fig. 3.1

Model (mm)	A	B	C	D	E	F	G	H	I	J
EE-7202	8700	4100	2300	3490	1525	500	1500	2100	4300	500
EE-7203	8700	4000	2300	3950	1525	500	1500	2100	3500	500

## 3.2 Some Necessary Tools

We will not offer the installation tools for the user,so you should prepare some necessary tools as shown Fig.3.2



Fig.3.2

## 3.3 Installation Methods and Steps

### 3.3.1 Basement installation

The basement installed step shown as the following step(shown in Fig.3.3)

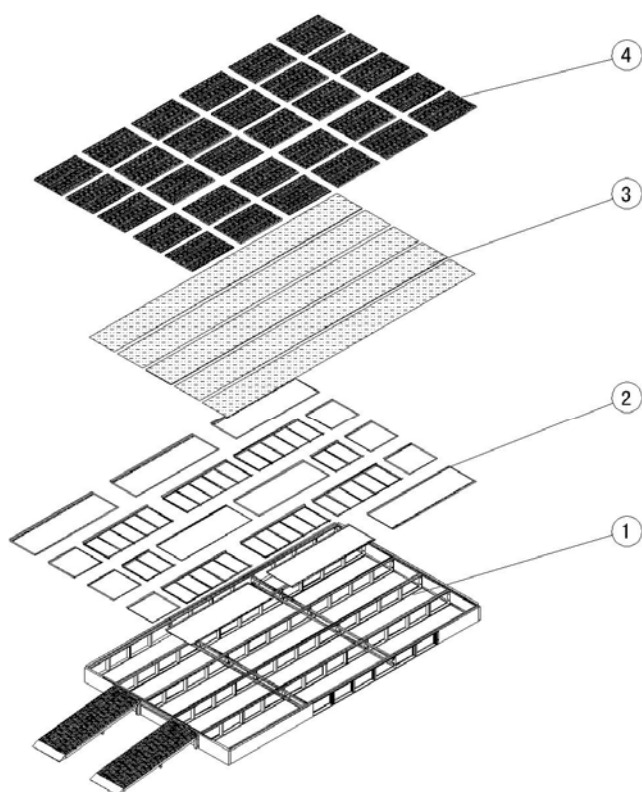


Fig. 3.3

1. Put the metal board(front,back,sides)and middle bracket in the right place,and connect them with bolt M8\*20 according to the demand of the installation chart.then screw down.Shown in Fig.3.4.

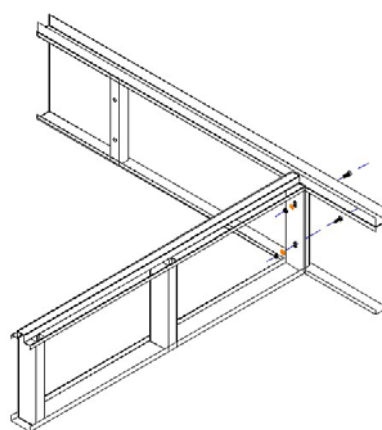


Fig. 3.4

2. Adjust the level of the connect point: find the highest point with the level measure apparatus, then elevate other points with something. Shown in Fig.3.5
3. Adjust the uprightness: adjust the side boards and middle bracket with beeline, and distribute the distance between the rows, so that we can put the grids easily. Shown in Fig.3.5.
4. Check that all the longitudinal pieces have been mounted perfectly perpendicular to the end heads, to do this measure the two diagonals between the corner of the anterior end head and the opposite corner of the anterior end head, if they show the same values we are certain that it is assembled correctly. and the error value should be less than 5mm (shown in Fig.3.5).
5. Install the bottom of the heat-air generator: the air out mouth should be connect with the metal sides board. (shown in Fig.3.5)

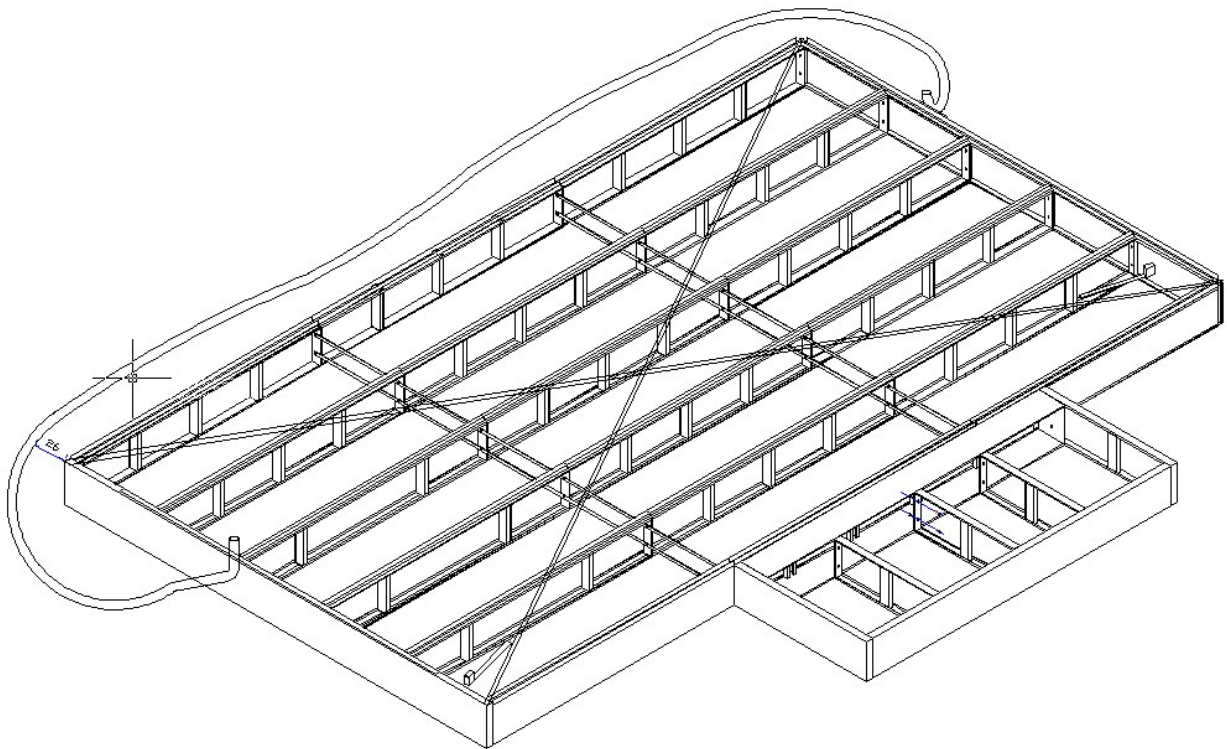


Fig. 3.5

## 3.3.2 Main room installation

### 1. Front door installation

Install the front door frame (shown in Fig.3.6)

- 1) Put the left and right side panel (B01&B03) on the ground, connect the horizontal panel (B02) with the side panel. make sure that the gap should be smallest.
- 2) Measure the diagonal of the length and width, when they are suitable for the demand of the door frame size (shown in Fig.3.6),  $L1=L2$ , fix the door frame with appoint connect board (B04). Pay attention to that check the sizes of the door frame after fixing.

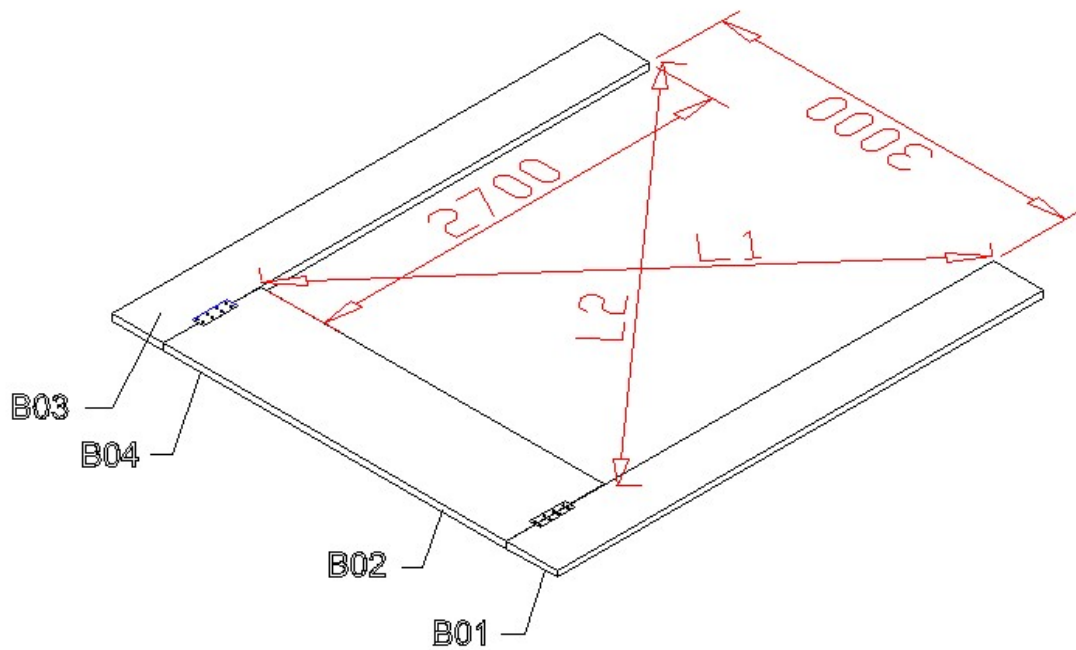


Fig. 3.6

3) Take the Front door frame on to the front panel of the basement by two workers, then one worker holds the door frame and another worker takes the safe door and one wall panel on another side, connect them to the door frame with nails. At last take four bolts M8\*20 to connect the bottom of the door frame and the front panel of the basement, shown in Fig.3.7. So the door frame can stand steadily.

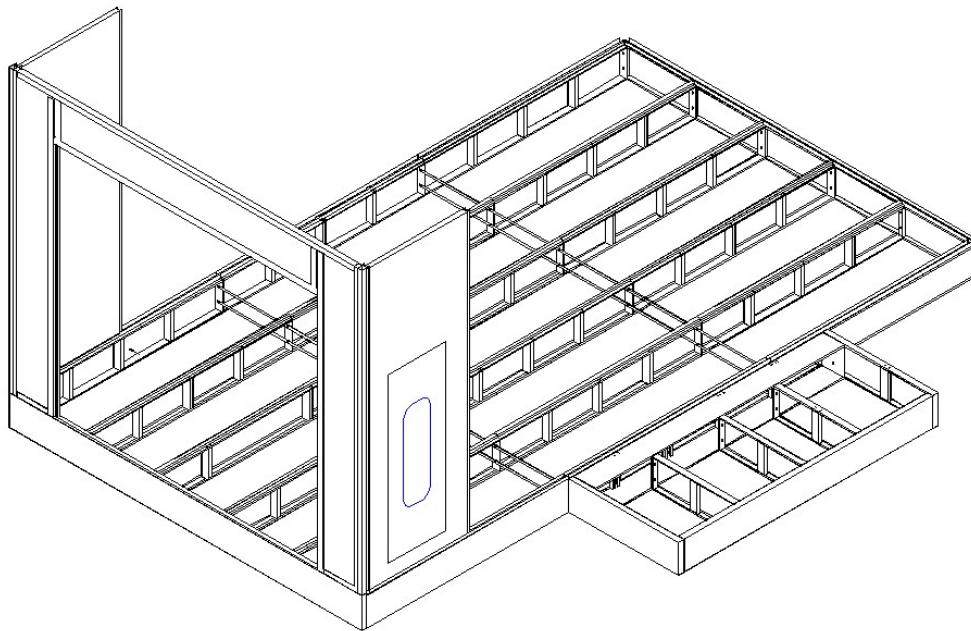


Fig. 3.7

## 2. Wall panel installation

1) connect the wall board in turn and fix them to the down U style slot with nail, make sure the gap should be smallest. Check the whole length of two sides wall board should be suit for the demand. (shown in Fig.3.8)

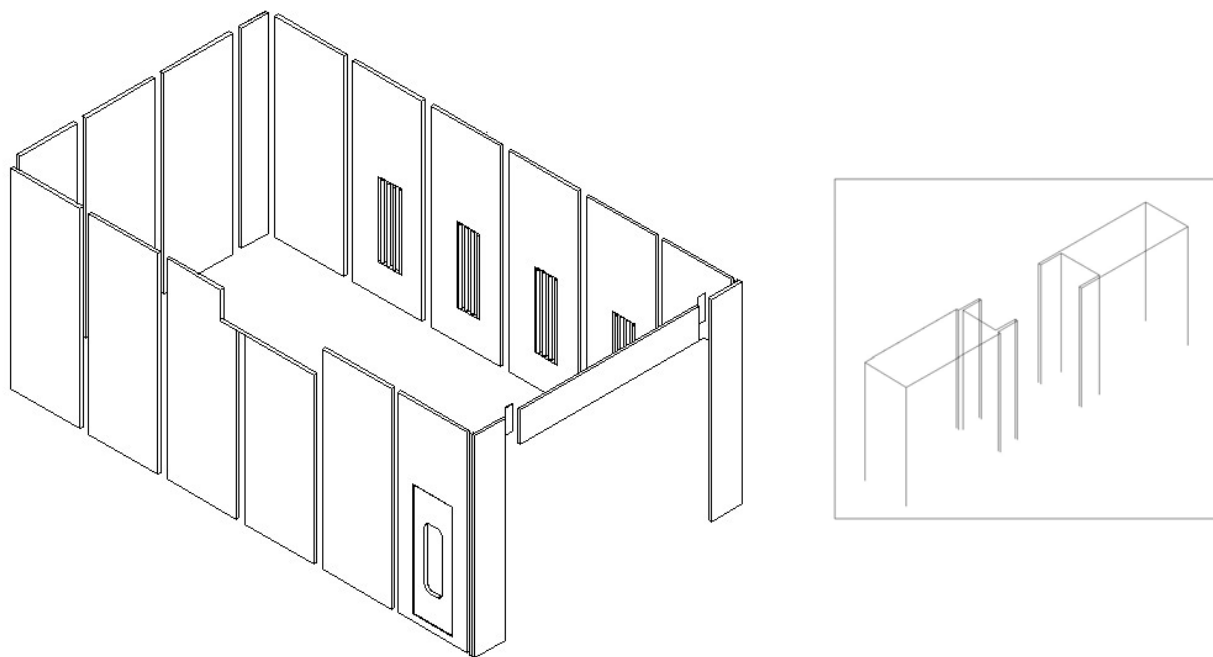


Fig. 3.8

- 2) Installate the edges inside and outside.(shown in Fig.3.9)
- 3) Installate the cover of the wall panel(shown in Fig.3.9)
- 4) Air enter connector installation

The air enter connector is necessary between the top frame of generator and air cabin.(shown in Fig.3.9). Install the cover of the shorten panel,then connect to zinc panel with nail and do some sealing.

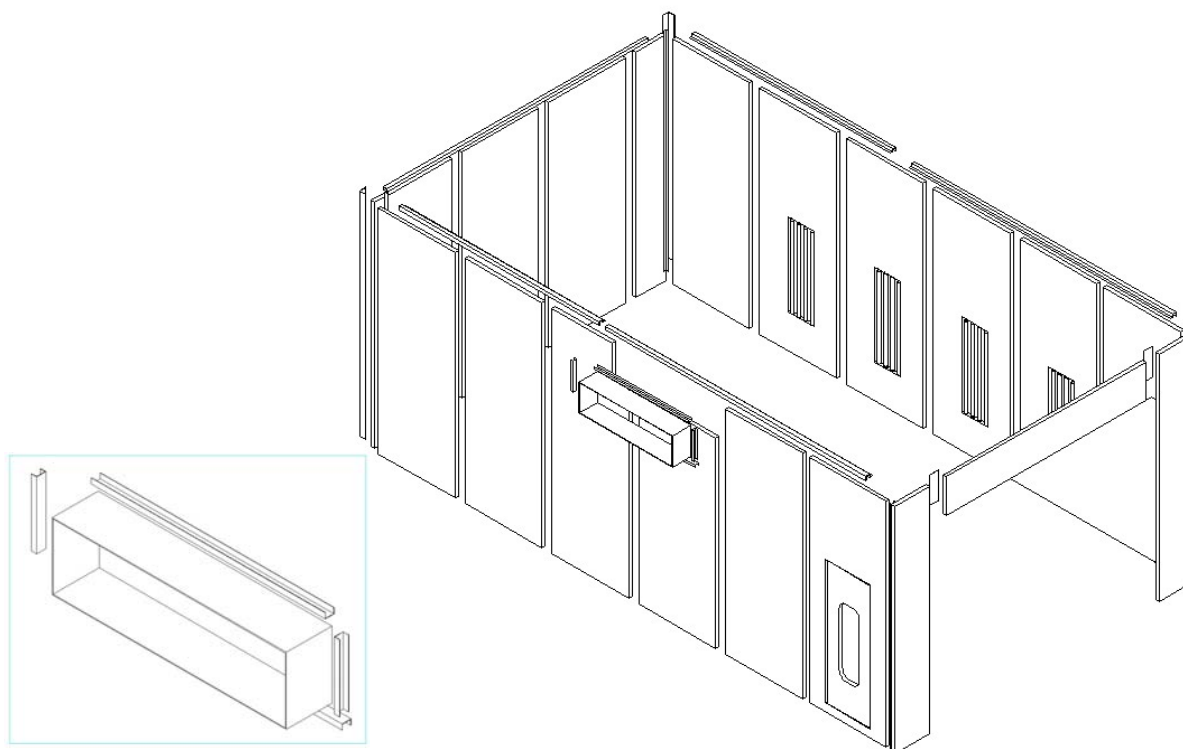


Fig. 3.25



## 4. Main door installation

Installate the door,including the lock,hinge,handle,plastic sealing bar and so on. (shown in Fig.3.10)

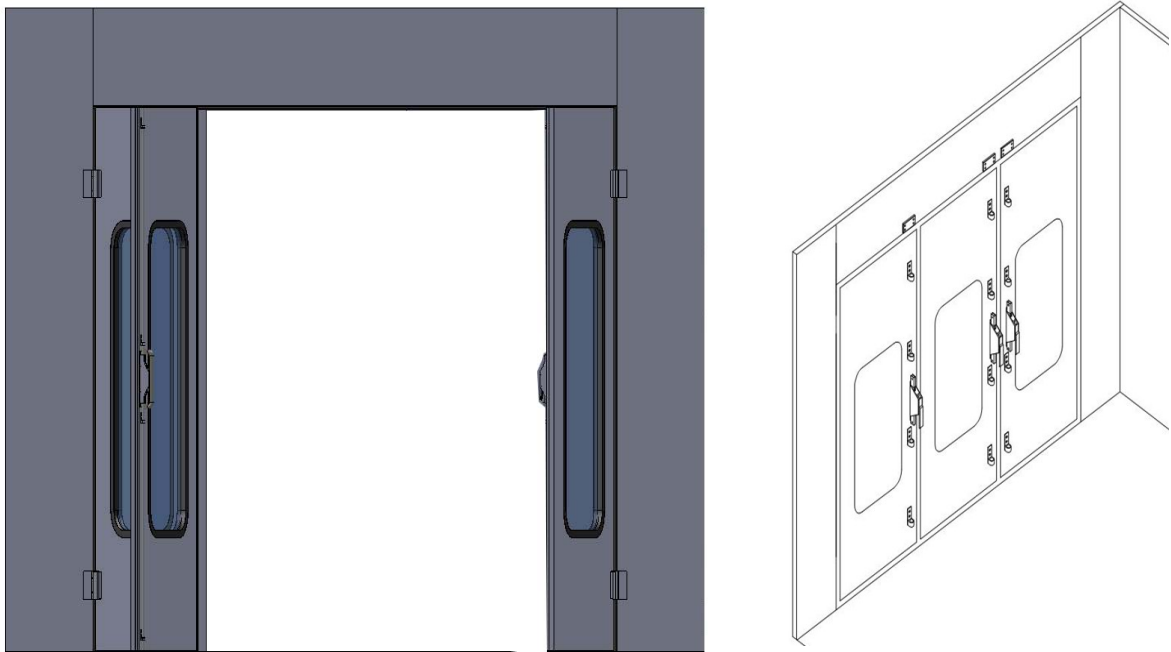


Fig. 3.10

## 5. Safety door installation

Safety door is necessary for protecting the worker's safety when they working inside the booth. When the pressure inside the booth is over large, the pressure lock of safety door will be open automatic. Install it shown in Fig.3.11. The pressure lock can be adjusted, not too tight and too loose is ok.

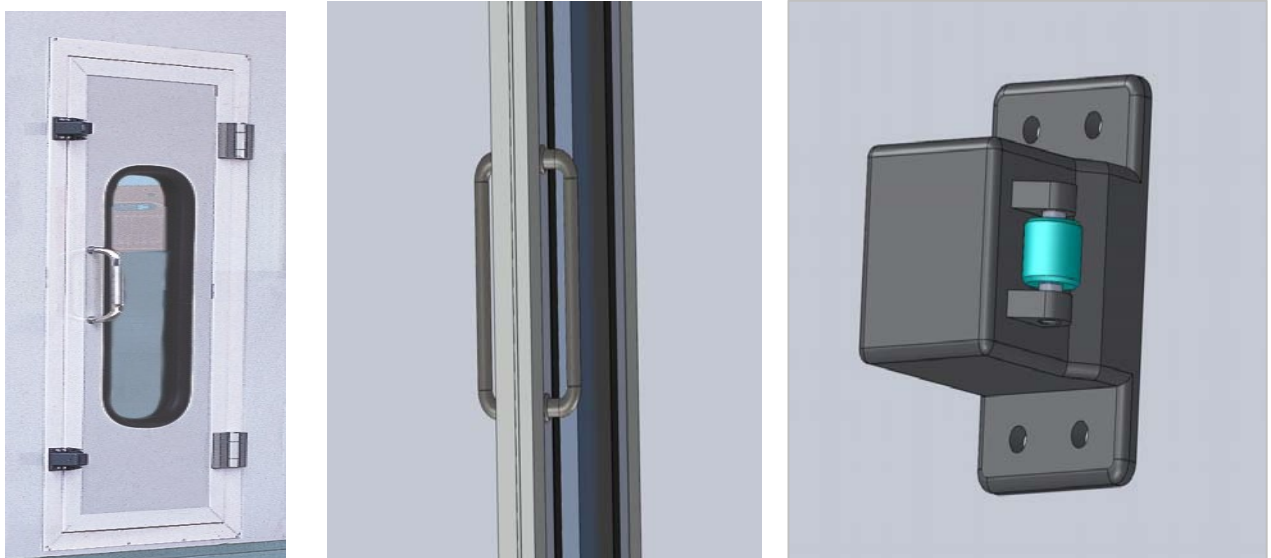


Fig. 3.11

## 3.3.3 Ceiling Installation

The ceiling shown in Fig.3.12

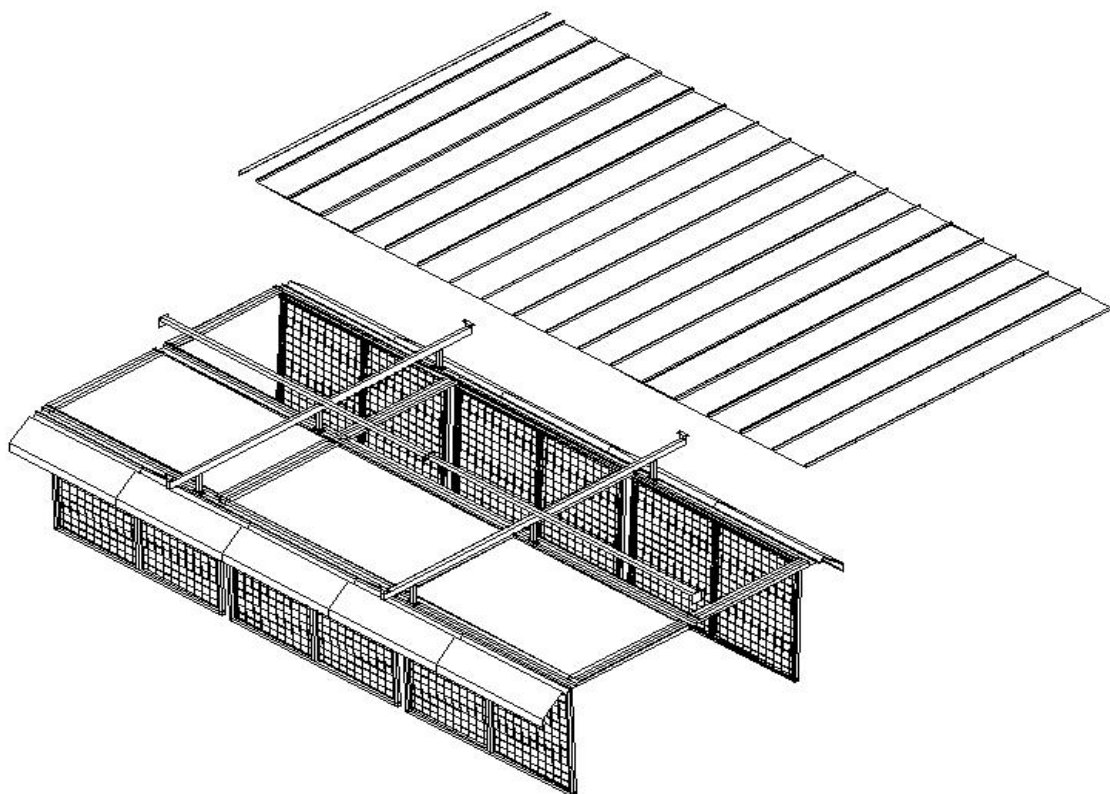


Fig. 3.12

1. Supporting beam installation(shown in Fig.3.13)
- 1) Installate the horizontal beam to the up rim of side wall panel with the bolt.
- 2) Installate the vertical beam to the front and back wall with nails.
- 3) Connect the horizontal and vertical beam together with the nails.

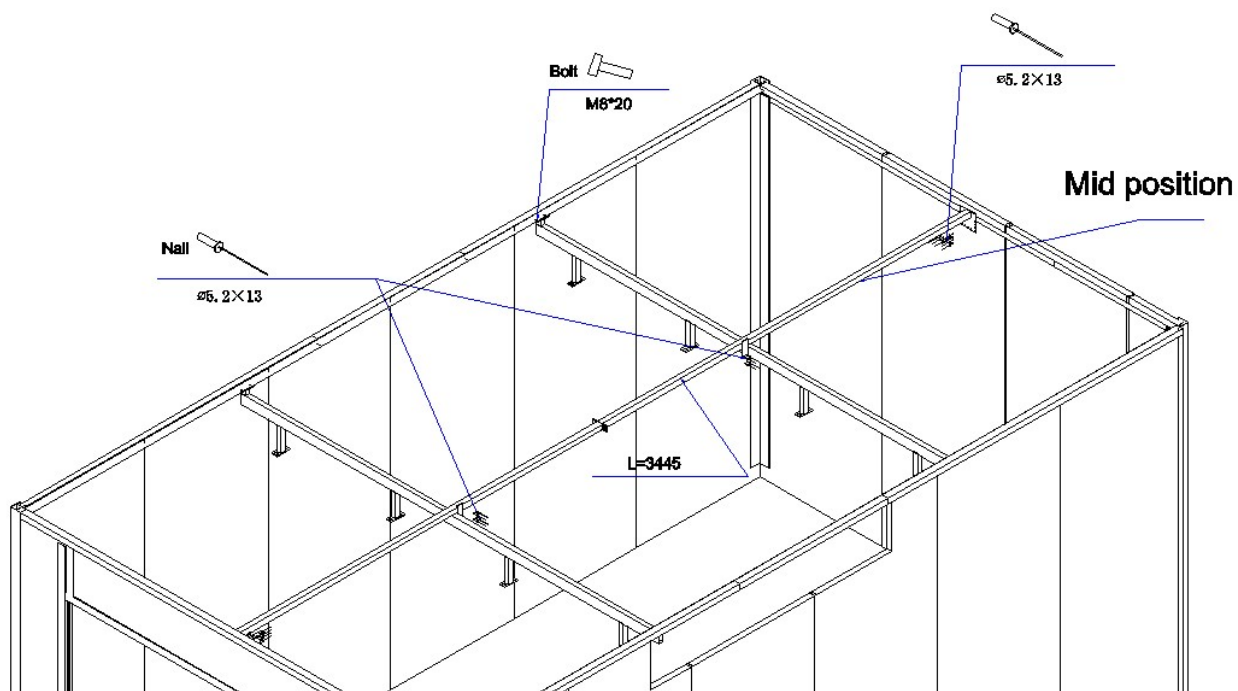


Fig. 3.13



2. Installate the top sealed board and cotton slot shown in Fig.3.14

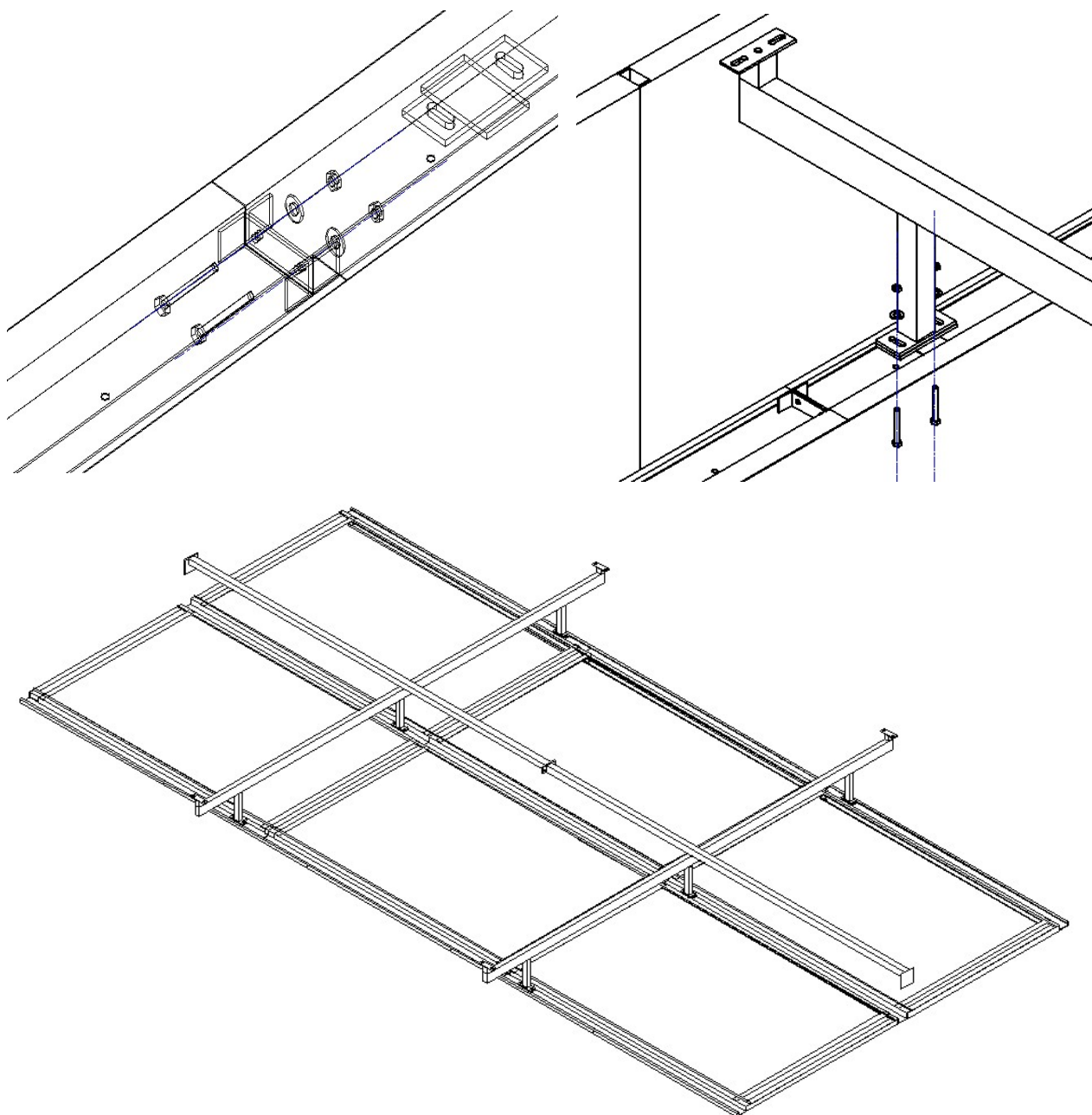


Fig. 3.14

3. Installate the light box with nails and do some sealing with the transparent pastern shown in Fig.3.15

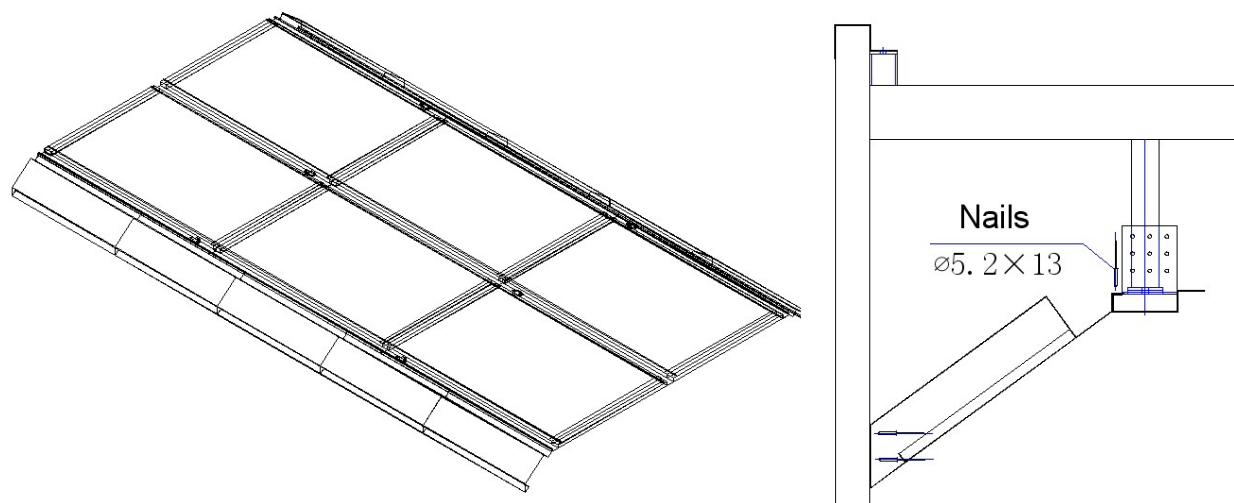


Fig. 3.15

4. Installate the roof cover ,connect one by one,then fix them on to the roof support beam with nails.And do some sealing with the transparent pastern shown in Fig.3.16

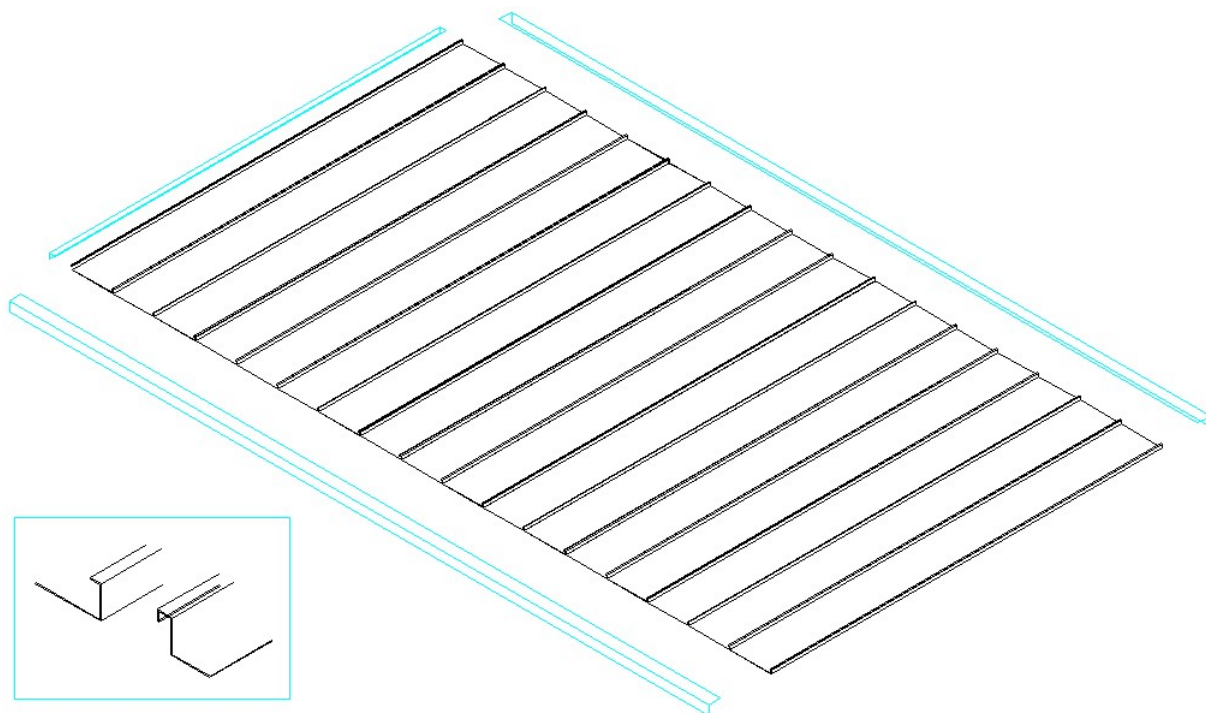


Fig. 3.16

5. Filter frame installation shown in Fig.3.17. Fix the filter on the frame with frame slot first,then installate the filter frame with the hinge.

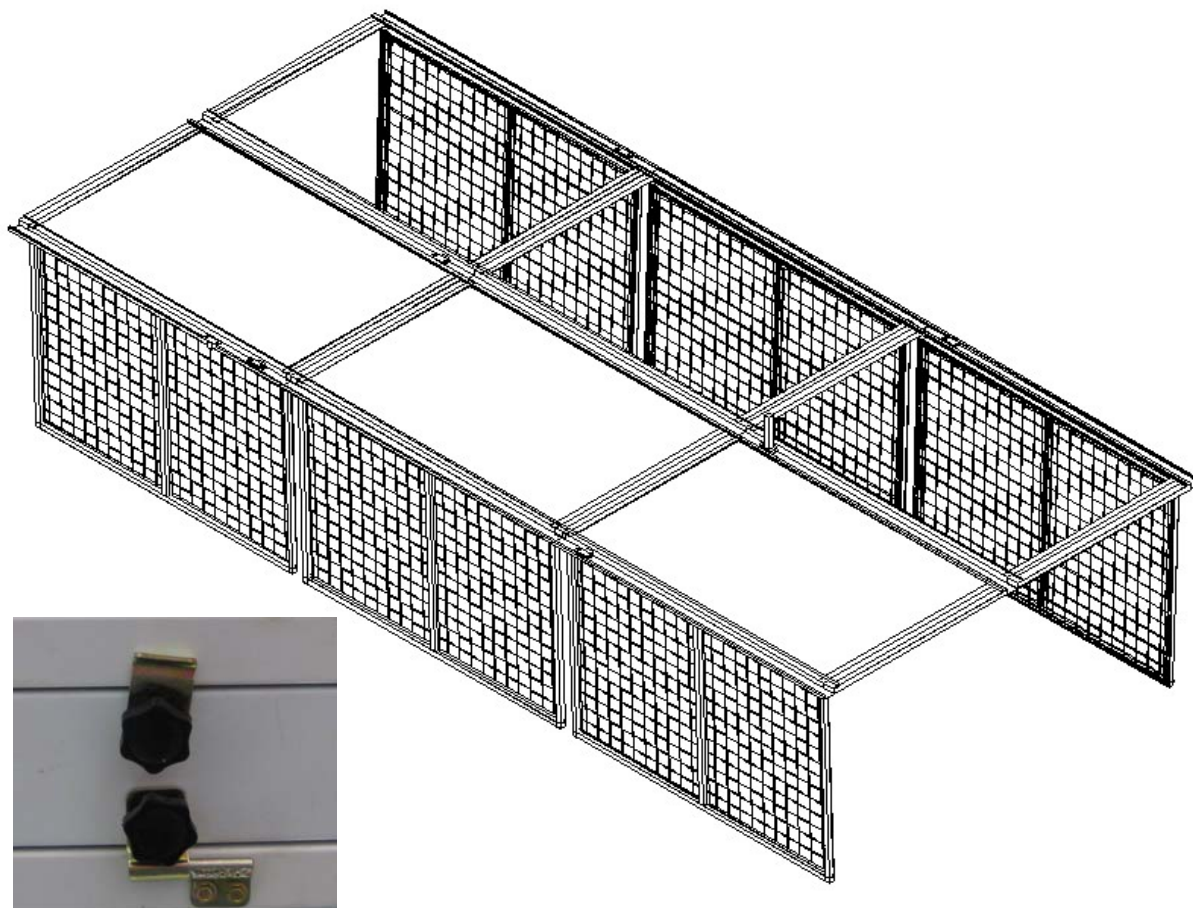


Fig. 3.17

### 3.3.5 Generator Installation

#### 1. Main part installation

The generator part is the main part of the spray booth, the operative part had been installed before delivery. Connect them together shown in Fig. 3.18 is ok. The generator is heavy, so please pay attention to move them on to the basemen. Take with the Fork car would be better if you have.

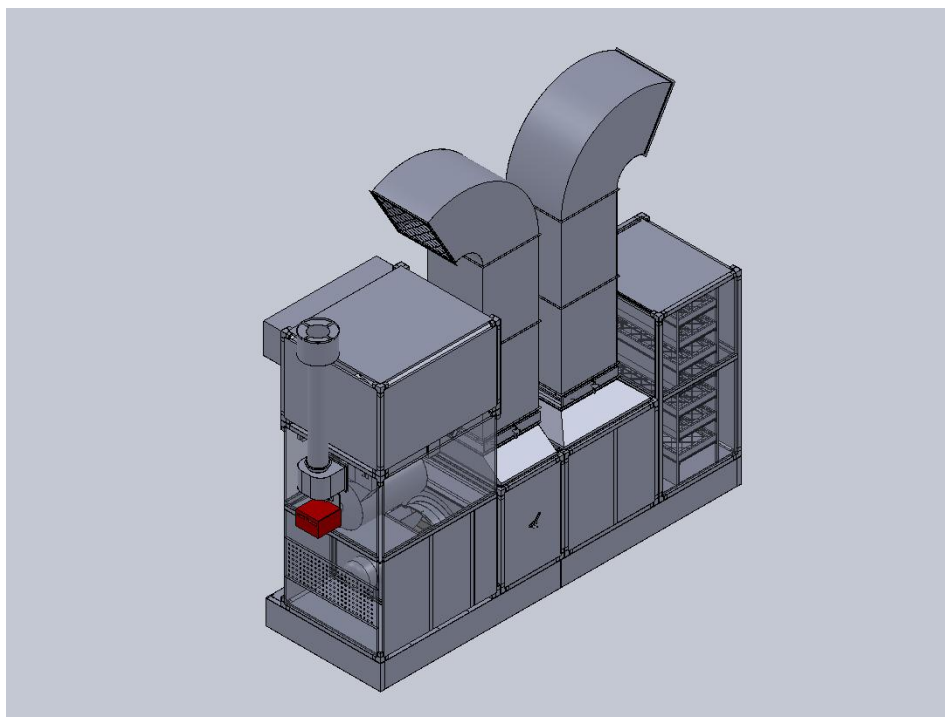


Fig. 3.18

## 2. VCD adjustable damper installation

The VCD adjustable damper is installed with the air enter and exhaust duct, which is used for adjusting the air pressure inside and outside of the booth shown in Fig.3.19. Our standard model is manual control, open or close the damper by hand directly. And the electrical control for option, control by the switch on the control box.

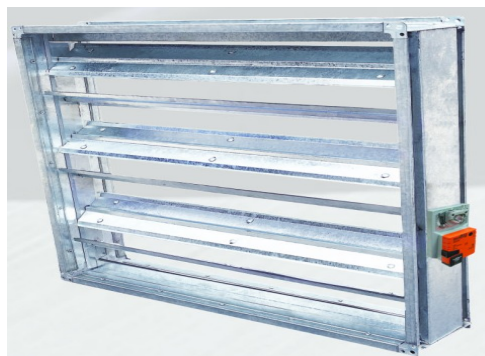
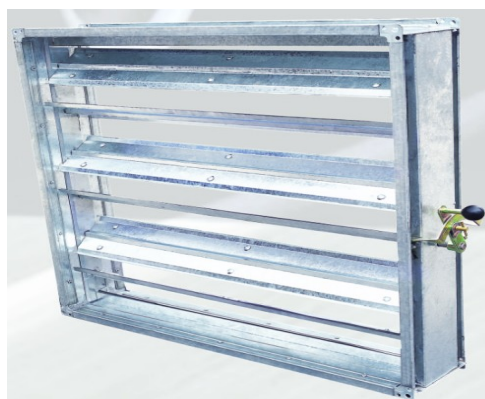


Fig. 3.19

### 3. Duct installation.

Considering the shipping space,the duct have not been installed,user should assemble them by yourself.The connection method shown in Fig3.20.

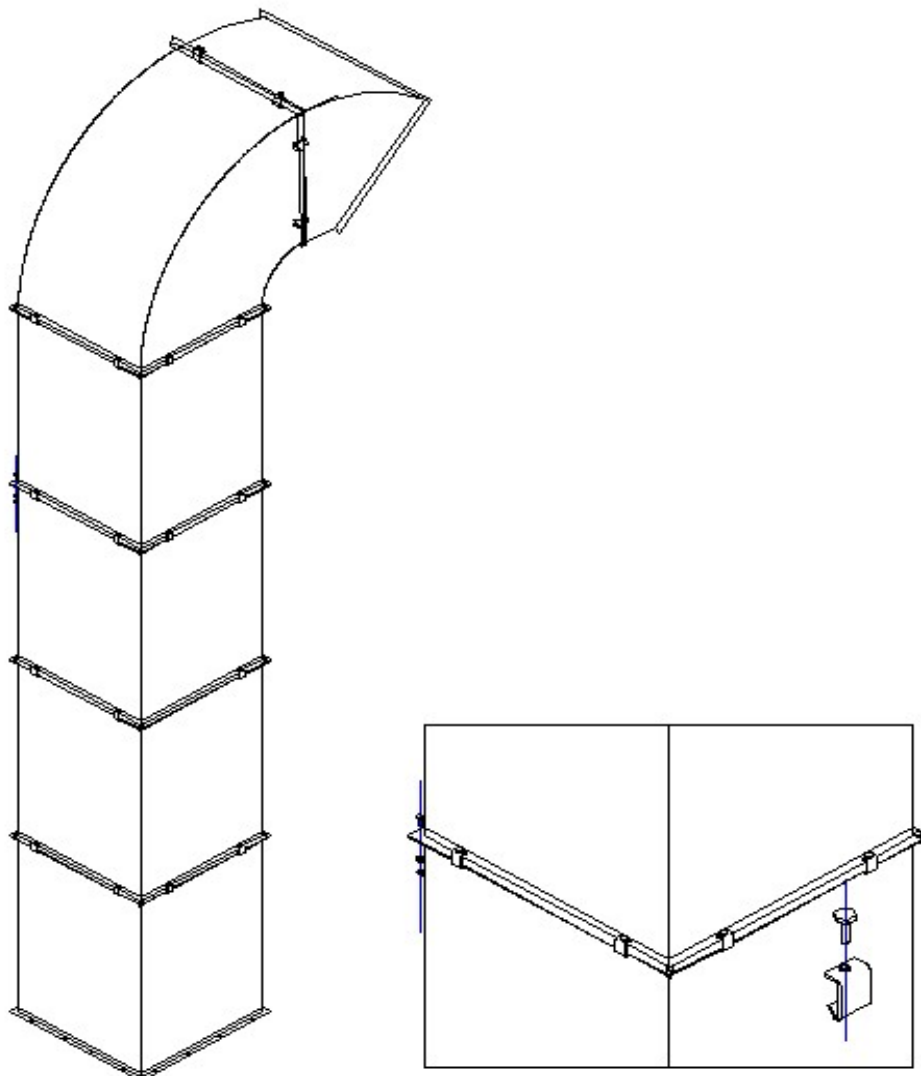


Fig.3.20

### 4. Chimney installation

The chimney should be connect to the fire outer of the heat-exchanger,and extent to outside.All the chimney had been assembled . So you connect it one by one. That is ok.Shown in Fig.3.21



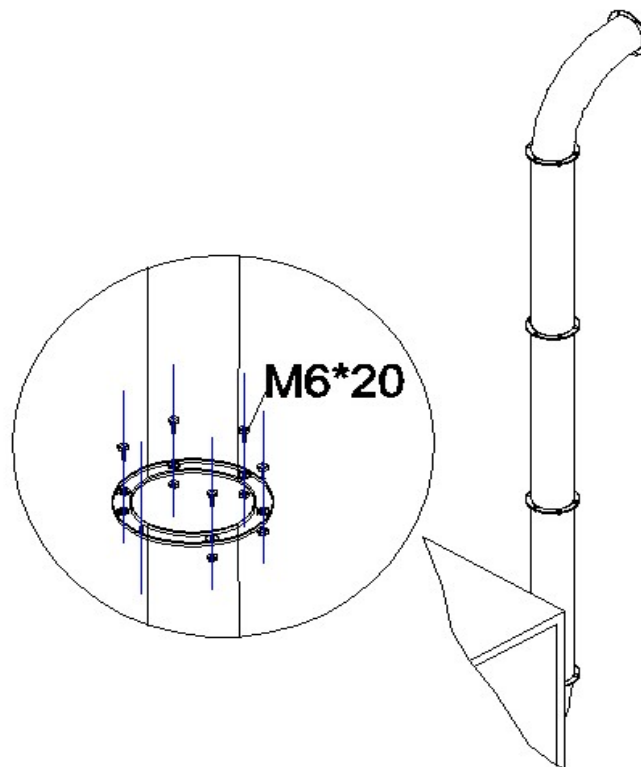


Fig. 3.21

### 3. 3.6 Control System Installation

#### 1.Control damper installation

The damper is exchanger between painting and baking system.the installation and test shown in Fig.3.22. Connect the air pile according to the following pictures,and the air compressor should be prepared by the user.The pressure should be setted to 0.4~0.6Mpa as the pressure meter.Take the screw up and turn to adjust.



Fig.3.22



**ATTENTION:** There is a vane inside the damper shown in Fig.3.23. When the vane is in the position A, that is the painting system, and when the vane is in the position B, that is the baking system. You can test it when you operate it. If you find the wrong position, change the air pipe Port C and Port D shown in Fig.3.24. That is ok.



Fig. 3.23

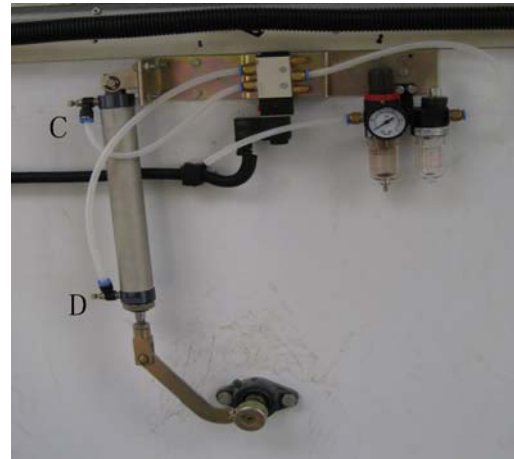


Fig.3.24

## 2. Burner installation

1) Install the burner to the connection mouth of the heat-exchanger, then fix it with bolts shown in Fig.3.25



Fig. 3.25

2) Connect the burner and oil tank with the oil pipe, and don't forget to connect the oil cup, shown in Fig.3.26.



Fig. 3.26

### 3. Temperature testing system installtion

Installate the temperature explorer at the middle of the ceiling inside the booth, and the wire connect to G port of the temperature meter directly through the ceiling air cabin shown in Fig.3.27

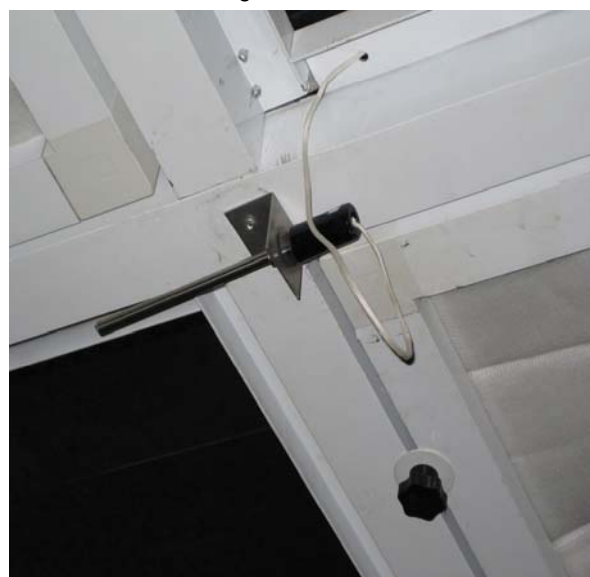


Fig. 3.27

### 4. Compressure meter testing system installtion

No loop for the pressure meter, just use one transparen air pipe insert one port of the meter, and another



port of the meter should be plug up. The other side of the air pipe should be put into the painting room through the ceiling air room. shown in Fig.3.28



Fig. 3.28

5. The control box installation and wire connecting

1) Install the control box into to wall panel near the generator shown in Fig.3.29, and install the installation panel onto the wall with nail, then install the control box on to the panel.

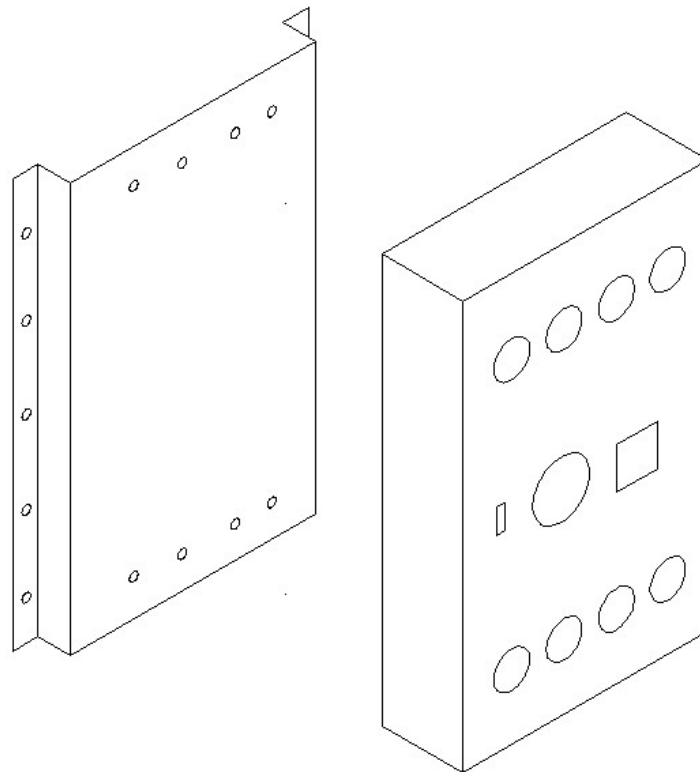


Fig. 3.29

2) Wire connection

The main component have been connected before delivery, the connection to the control box. you should do as follow in Fig.3.29:

Connect the power supply into the control box and connect the control box to the burner, motor, light and

control damper with electric wires according to the electrical chart we offer.

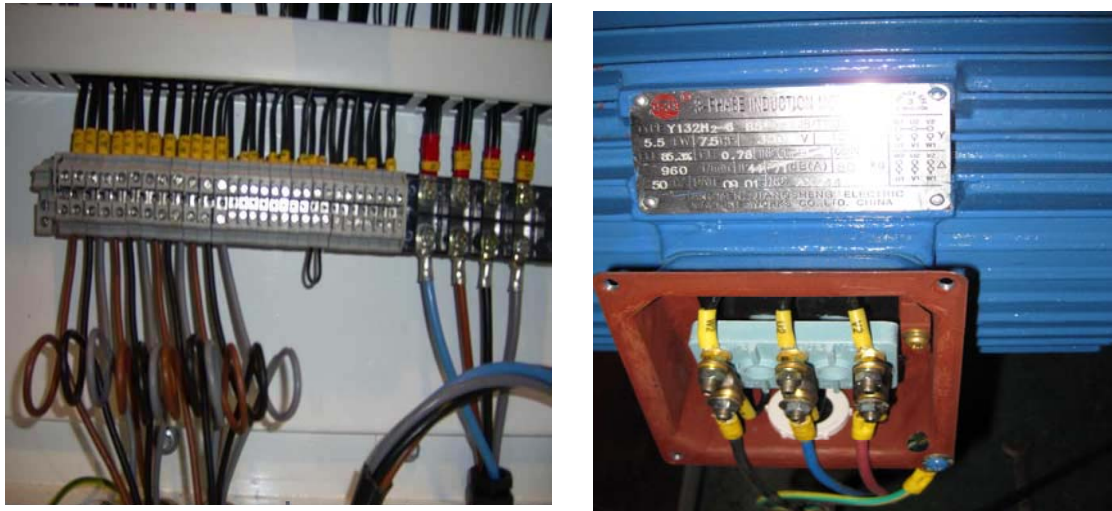


Fig. 3.30



**Attention:** You must connect the motor wire according to the electrical chart offered. And you must be attention to the start method of the motor, Generally our spray booth have two start methods: motor direct start connection and Y/ $\Delta$  start connection. When you choose the direct start of motor, The Up and Down ports of the motor should be connected with the metal pad, and then connect three ports (Up or Down) to the control box shown in fig.2.31. When choose Y/ $\Delta$  start connection, you must take the metal pad out, and connect to the six connection ports in the motor.

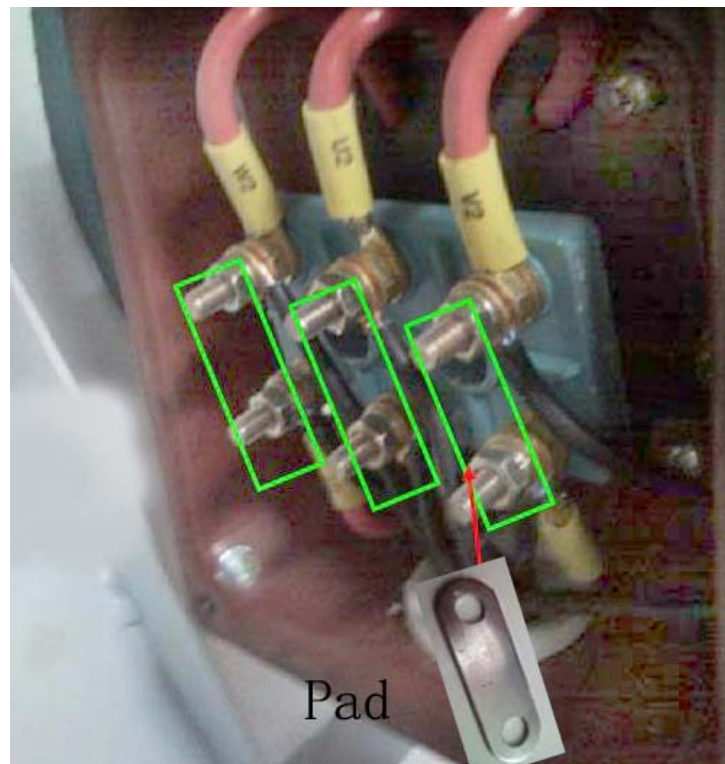


Fig. 3.31

## Chapter 4 Test and Operation

### 4.1 Preparation Before

#### 4.1.1 Preparation before testing and operation

- Prepare three phase electric power supply which is suitable for the motor connection.
- Prepare the air compressor for the control damper.
- Check the control system connection of the damper, the testing method as the chapter 3 mention.
- Prepare enough diesel oil in the oil tank.

#### 4.1.2 Attention before testing and operation



- Check the connection of the electric chart according to the chart we offer. Make sure that you must ask someone who has the qualification of the electrical work.
- Check the connection of the diesel oil pipe and the connector, the leakiness phenomenon is forbidden.
- Keep to all the signaling of danger and safety posted on the booth.
- The qualification of the personnel, The personnel employed to work on the booth, before beginning the work, has to have studied the "SAFETY " because during the work there will not be time. This is important above all for the personnel who only work sporadically.
- During the painting process, it is forbidden for the personnel to go into the booth, with non-regulation clothing ( including necklaces, bracelets, rings etc.).

#### 4.1.3 Test the rotation of the blower

- Intake blower testing: Open the pre-filter cabin in the generator and check the rotation of the fan, make sure the air can be taken in when the fan turn on.
- Exhaust blower testing: Take out the cover panel of the exhaust cabin, check the rotation of the fan, make sure the air can be taken out when the fan turn on.

#### 4.1.4 Test the damper system

The main function of the damper is the transition between the painting system and baking system. the test method shown in Chapter three.

### 4.2 Attention Norms



- In the paragraphs below are listed all the regulations and prohibitions to be observed in order to prevent possible accidents:
- Prepare and keep paints in a place outside of the spray painting environment.
  - Clean the inside surfaces of the oven and the glass of the overhead lights from possible paint residue or solvents.
  - Use the spray paint gun correctly: spray only in the direction of the surfaces to be painted, in order to keep the operator in clean air.
  - Make sure that inside the vehicle there are not dangerous objects or substances.
  - Make sure that the emergency exit is free of objects that may hinder the opening in emergency cases.
  - Make sure that all the discharge air and smoke ducts are protected by the appropriate grates and that the air passage is not obstructed.



Inside the spray painting environment, it is **FORBIDDEN** as follows

- To introduce the vehicle to be painted without first removing the petrol tank and the battery.
- To smoke
- To use equipment that can produce sparks or flames and any kind of electric apparatus.
- To use incandescent objects.
- To paint when the temperature of the spray painting environment is more than of 25°C.
- To enter during the drying process phase.
- To use more than 150 g of paint for 1000 Nm<sup>3</sup>/h of air ( corresponding to a max of 2. 7 Kg/h of paint)
- To keep objects or dangerous substances such as aerosol bombs, containers and solvents,
- To wear overalls or other garments dirty with paint residue or solvents.
- To have or consume food or drinks
- To climb on the roofing of the spray painting booth, the exhaust air runoff and the generator.

## 4.3 Operation

The spray booth has two working station:Painting station and drying station,the two station have been connected each other and have the different operation.And during low temperature environment in the winter,we should open the burner and rise the temperature about to20~25°C during the painting station.The control panel is shown if Fig.4.1

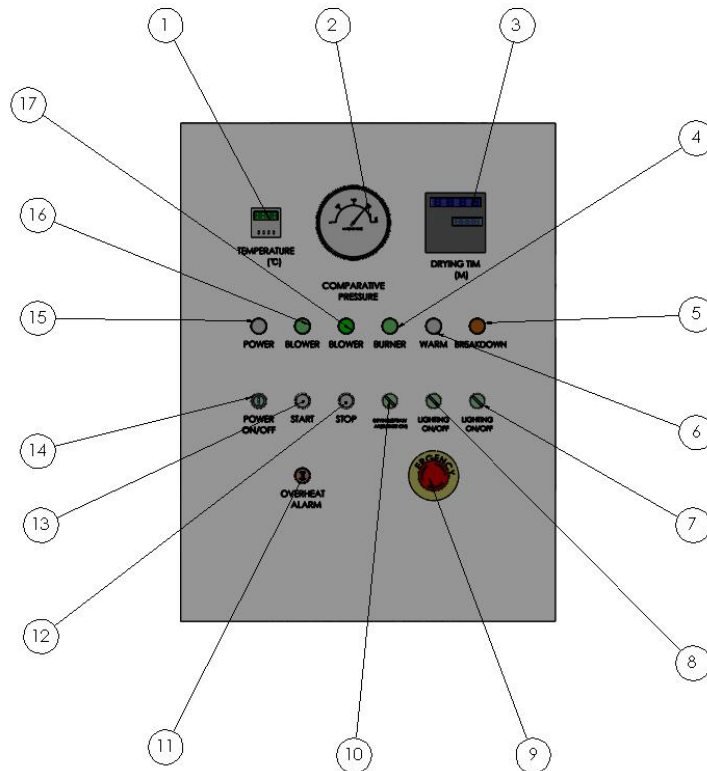


Fig. 4.1

#### 4.3.1 Painting station

After having cleaned and prepared the vehicle, the operations functions for the painting phase as following steps.

1. Turn on the key switch to open the power supply, and press the light switch to turn on the lights
2. Drive the vehicle into the spray booth, and close the main door.
3. Check the setting value of temperature meter and drying timer, normally the value had been set by the manufacturer. And the drying temperature should be 60°C and the drying time should be about 30~45 minutes.
4. Check the position of the damper is in the right position
5. Press the motor button to open exhaust, you can see the indicator of the motor turn on, and the intake fan will start about 10 seconds later.
6. The worker get into the booth through the safety door and do the painting. If the temperature is low, turn the drying/painting switch to left and open the burner and rise the painting temperature (during the heating painting system the burner will stop automatic when the temperature rise to 25°C, and when the temperature go down to about 20°C, the burner will start again).
7. The worker get out from the booth through the safety door when finish the painting. Then change to baking station.

#### 4.3.2 Drying station

The operations to follow in the drying process phase are:

1. Make sure that all the spray painting functions are ended and that the operator has gone out of the spray painting environment.
2. Check there is enough diesel oil in the oil tank and no leaking of the oil pipe.
3. Check the setting value of temperature meter and drying timer, normally the value had been set by the manufacturer. And the drying temperature should be 60°C and the drying time should be about 30~45 minutes.
4. Turn the drying/painting switch to right to open the burner. At the same time the damper will turn to another position and the light will turn off automatic. And the exhaust fan will turn off, but the intake fan is keeping operation.
5. The spray booth will be working automatic till the setting drying time finished.
6. When the setting drying time is finished, the burner will stop automatic first, then the motor will stop about 5 minutes later.
7. The light will be turn on again after the motor stopping.



**Attention:** Don't do any setting for the temperature meter. We have reset all the data for the program. The setting you can do is only setting the drying temperature (Default data is 60°C) and the drying time (Default data is 30 minutes)

### 4.3.3 Machine Stop

To stop the booth before the foreseen time it is necessary to:

1. Turn the burner switch onto the OFF position (Middle position) .
2. Open the gate of the booth and let the vehicle out.
3. Switch off the lights if they are on
4. Turn the general switch onto the OFF position.
5. Wait for about 15 minutes in order to get the air condition inside the booth,then close the main doors.



**ATTENTION:** After drying,if there is more heating or exhaust air inside the booth,it is necessary to start again from the spray painting cycle in order to allow the reinstatement of the initial condition with an adequate ventilation.

## Chapter 5 Maintenance and Repair

### 5.1 Ordinary Maintenance

Maintenance has to be a preventive and planned activity, seen as fundamental need to obtain safety, as a presupposition that the machines and the apparatus are subject to wear which is a potential cause of breakdowns. Therefore the safety of the booth depends also on a good preventive maintenance that allows the substitution of the objects subject to wear out before the verification of the technical faults.



Please carrying out the maintenance intervention /cleaning as the following ordinary maintenance and frequency verification instructions:

- Keep the booth clean and keep the intake and exhaust duct be open.
- Change the top filter after painting 200sets of auto or use more than one year, But in the more dust situation, that should be shorten the filter changed period according to the actual condition.
- Change the Pre-filter after painting 200sets of auto or use more than one year.
- Change the flour filter after painting 200sets of auto or use more than one year.
- Clean the filter oil cup and fire nozzle of the burner each week, keep the oil route be through.
- Add the diesel oil is forbidden when the burner is working.
- Make sure there are more than 5L oil in the oil tank, use Non diesel oil is forbidden.
- Check the filter net of the activated charcoal environmental cabinet after painting 20sets of auto or use more than 1 month. If the painting adhibit to the filter net full, change the filter net in time and keep the ventilation be through.
- Check the heat exchanger every two months, examine whether have the bad welded phenomena, make sure safety enough.
- Clean the dust adhered to the fans and blades semiyearly
- When you don't operate the booth for a long periods, cut off the general power, and open the door for ventilation every three days, in case accumulate the moisture air inside the booth.
- Change the heat exchanger and all of the electric wire when using more than 8 years.



Maintenance in time is necessary, but the appropriate maintenance is also very important, you should abide to the following mainly maintenance method and attention problem

### 5.2 Ordinary Maintenance Instruction



The procedures of ordinary maintenance as a rule are done by qualified and authorized personal and however, before beginning the maintenance, the following functions have to be done.

- Remove the motorvehicle from the spray painting environment.

- Turn the main switch to be off..
- Disconnect the control panel switching off by means of the switch place on top..
- Close the general switch with the padlock and keep the key during the phases of maintenance.



**ATTENTION:** All the used filters (pocket filters, ceiling filters, basement filters, synthetic filters and bunker activates ) cannot be disposed of as normal urbanwaste, neither can they be burnt, but they must be given to the appropriate authority for disposal.

### 5.3 Some Spare Parts for Maintenance

- Ballast for the light tube.
- Fuse for control box.
- Light tube for lighting
- Filter for dust prevent



## Chapter 6 Packing,shipping and Storage

### 6.1 Packing

The spray booth is generally delivered in various sub components palletized and in different packaging. The handling of the packages has to be done using the correct means of capacity transport for the weight to be lifted.

In some cases the components are systematized loose in the loading bay ( container, truck, etc. ) in such cases it is necessary to unload and move the various individual parts and in such a way as to warranty the maximum safety for working personnel. Some package shown as the following picture.



Fig.6.1

## 6.2 Shipping



During the handling operation it is forbidden for third persons to go near the lifted load.

- The points indicated with the arrows are those to be used for lifting.

- In case a crane is used verify that the capacity of the hemp bands is enough for the weight to be lifted.

If the generator unit and exhaust air unit with active charcoal are supplied already assembled they are to be moved with a dolly elevator of sufficient capacity ( see figure ) forking the unit as indicated.

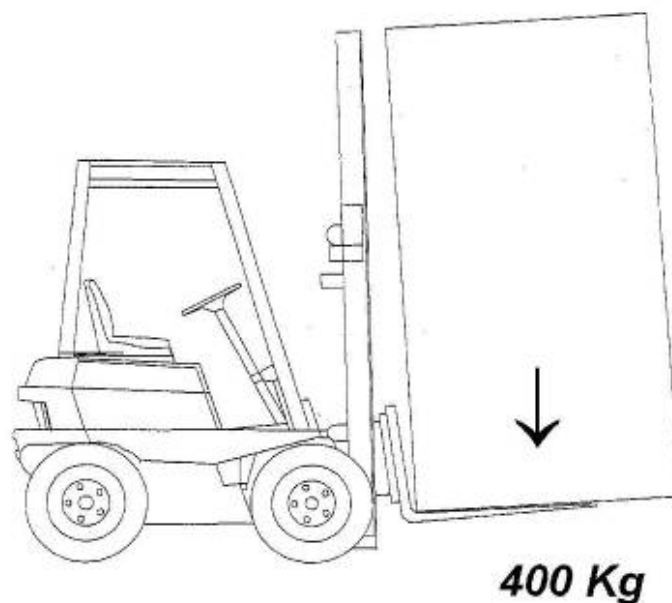


Fig.6.2

## 6.3 Storage

Under the case of storage of the booth before unpacking, it is necessary to put it in a place protected from bad weather, that is fresh and dry.

After having transported the booth package to the place destined for the installation, remove the wrapping and verify that:

- a. The content of the package corresponds to what was agreed upon in the order.
- b. That there are not visibly damaged parts.

In both cases, in case problems are encountered, do not proceed with the assemblage of the booth and warn the builder immediately of the damage and/or of the missing parts ascertained. on the opening the wrapping.



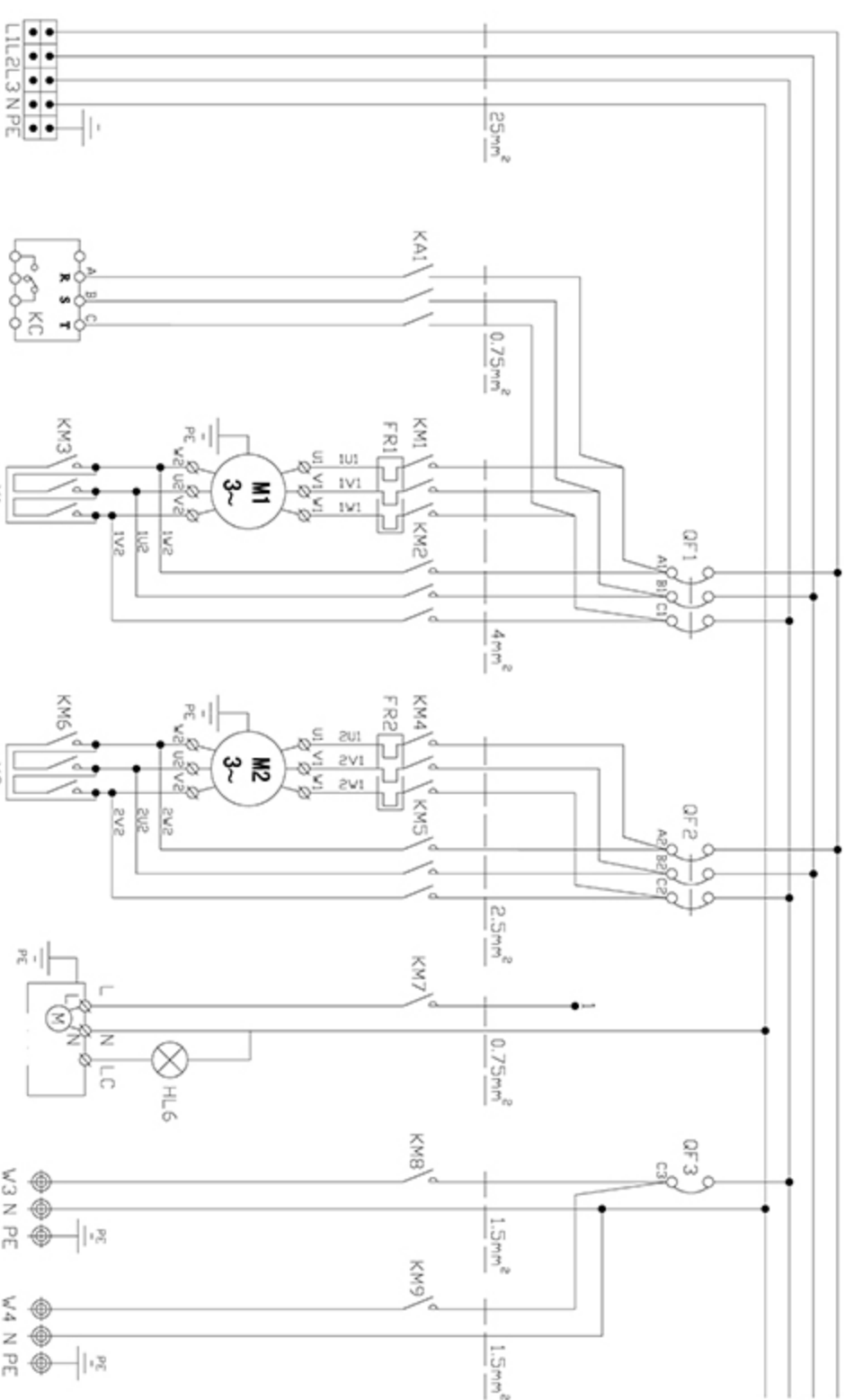
The residue material of the packing is disposed of in accordance with the actual normative in force with respects to waste disposal

## Appendix I : Malfunction and Remedy

MALFUNCTIONING	PROBABLE CAUSE	REMEDY
The moter can not Start	<ol style="list-style-type: none"> <li>1. Fusing fault</li> <li>2. Thermal relay in operation</li> <li>3. The motor,wires circuit break</li> </ol>	<ol style="list-style-type: none"> <li>1. Change new fuse</li> <li>2. Push button of thermal relay reposition</li> <li>3. Change the moter and wires</li> </ol>
The Capacity of the fan is small	<ol style="list-style-type: none"> <li>1.Pre-filter Jam</li> <li>2.Damper have been right open or not open enough position</li> </ol>	<ol style="list-style-type: none"> <li>1.Clean or change the filter</li> <li>2.Open the damper completely</li> </ol>
Burner malfunction light turn on after the burner have started 20 seconds	<ol style="list-style-type: none"> <li>1. Use out of oil in the reservior</li> <li>2. Oil pipe connector leakage</li> <li>3. Too dirty in the filter net of the oil intake pipe</li> <li>4. Electrical ege is too dirty</li> </ol>	<ol style="list-style-type: none"> <li>1. Add some diesel</li> <li>2. Reconnect the pipe</li> <li>3. Clean the fliter net</li> <li>4. Clean the eletrical ege</li> </ol>
The pump of burner does not start to work	<ol style="list-style-type: none"> <li>1. The pump strip is lock</li> <li>2. The setted time have finish</li> <li>3. The temperature valve have reach the setted valve</li> <li>4. The burner is out of fuel</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and clean the pump of the burner</li> <li>2. Reset the time</li> <li>3. Reset the temperature</li> <li>4. Check the level of fuel in the reservior</li> </ol>
Black smoke come out after the burner open	<ol style="list-style-type: none"> <li>1. The open position of burner damper is not enough</li> <li>2. The pressure of pump is not enough</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust the damper more to more big position</li> <li>2. Reset to the standard valve</li> </ol>
Temperature rise is slow	<ol style="list-style-type: none"> <li>1.The damper is not close or not closed completely</li> </ol>	<ol style="list-style-type: none"> <li>1.Closed the damper completely</li> </ol>
The lights do not work	<ol style="list-style-type: none"> <li>1. The fuses have blown</li> <li>2. Ballast is interrupted</li> <li>3. Connection ports loose</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the light fuses</li> <li>2. Replace the ballast</li> <li>3. Fix the connection ports</li> </ol>
The pressure inside the booth is higher than usual	<ol style="list-style-type: none"> <li>1. The motor of the exhaust ir unit is off or not working regularly.</li> <li>2. The extraction duct is obstructed</li> </ol>	<ol style="list-style-type: none"> <li>1. CheckThe exhaust air unit fuses Ensure the cable is connectyed to the motor and the the locks of the control panel</li> <li>2. Check the filter of the basement or the exhaust air unit and replace them if necessary.</li> </ol>
The pressure in the booth is lower than usual	<ol style="list-style-type: none"> <li>1.The motor of the generator is off or does not work regularly</li> <li>2.The emission duct is obstructed</li> </ol>	<ol style="list-style-type: none"> <li>1.Check the generator fuses. Ensure the cable is connected the motor and the locks of the control panel.</li> <li>2.Check there are not obstacles at the mouth of emission of the intake air unit.</li> </ol>

**Appendix II** : Electrical Drawing(Attached File)

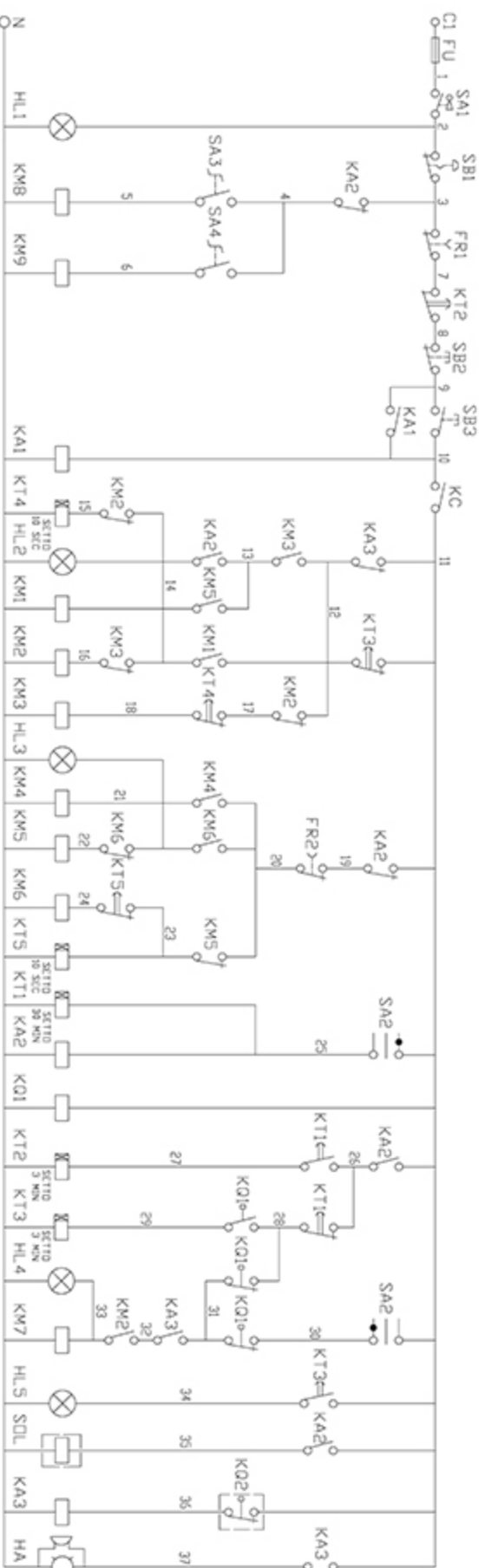
**Appendix III** : Installation Drawing (Attached File)



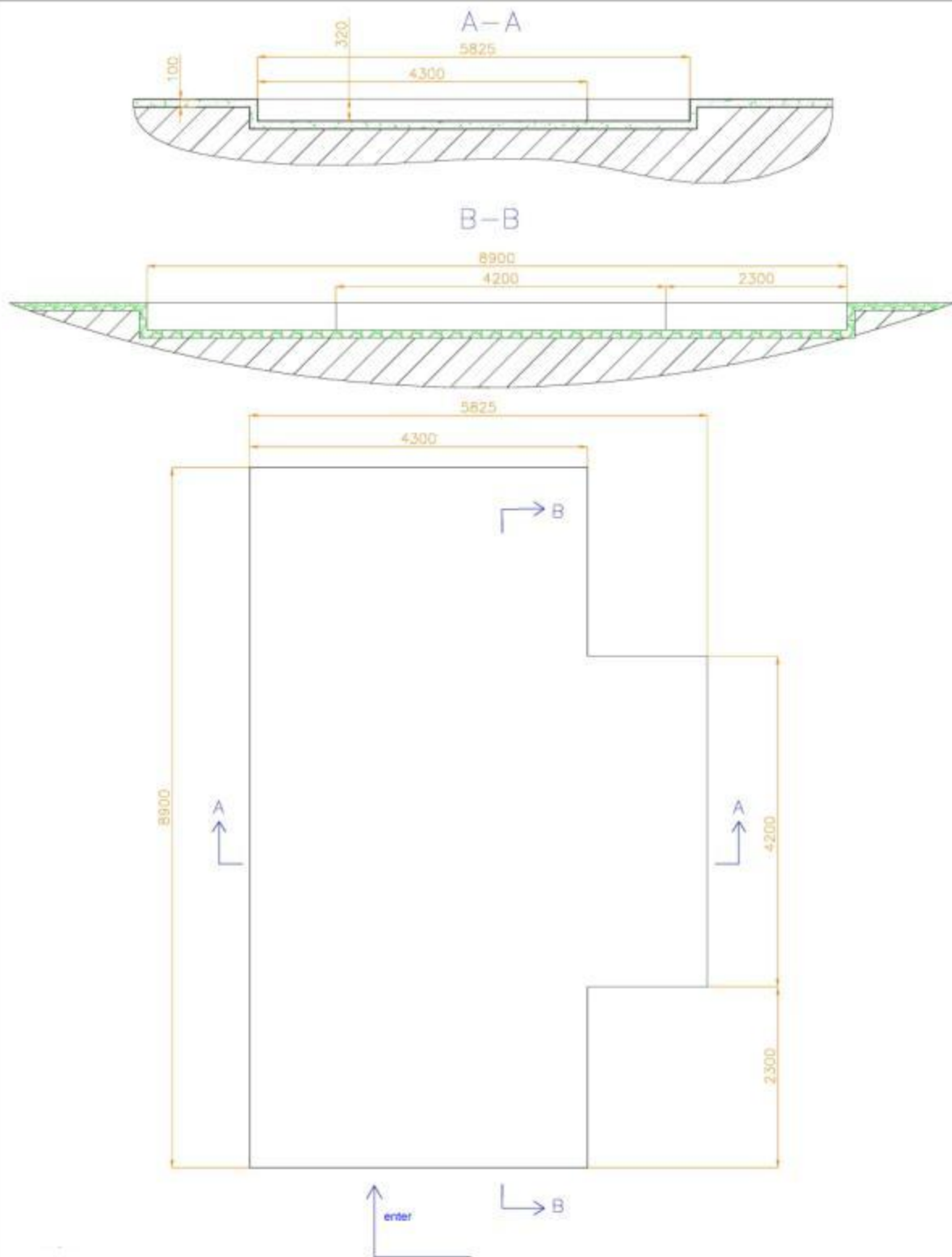
POWER IN (电源输入) 22.5KW  
 PHASE CONTROLLER (相序保护器)  
 IN FAN (送风机) 11KW  
 OUT FAN (引风机) 7.5KW  
 BURNER (燃烧机) 0.4KW  
 LIGHTING (上排灯) 1.92KW  
 LIGHTING (下排灯) 1.6KW

Power in (电源输入)	Motor1 (送风机)	Motor2 (引风机)	Triostat (风门)	Limit (限位器)	Burner (燃烧机)	Lighting (上排灯)	Lighting (下排灯)
L1	L2	L3	N	PE	IU1	1V1	1W1
IU2	1V2	1W2	PE	2U1	2V1	2W1	2U2
2V2	2W2	PE	35	N	PE	11	36
L	N	LC	PE	W3	N	PE	W4
N	PE						

Design	He Zhang
2007 rev. 1	2007 rev. 1
2007 rev. 2	2007 rev. 2
2007 rev. 3	2007 rev. 3



Design	He Zhang	2008-08-01	2008-08-01
Basic		2008-08-01	2008-08-01
Standard		2008-08-01	2008-08-01
Quality Control		2008-08-01	2008-08-01



#### Remarks

1. this drawing is for generator at right side location. For left location, please switch accordingly.
2. this drawing is for hiding-basement design, need to dig 320mm deep.
3. this drawing is for hiding-basement design, level error less than 10mm.
4. if for booth house close to wall, there should be a passway more than 500mm wide in between. If generator close to wall, passway more than 1500mm wide.

设计			图号	
描图			标记	
审核			重量	数量
更改				
日期	08-10	材料		