ENUTRITION

Installation Manual of Open Space Cooling System

Excelair M&E Industrial co., Ltd.

27.09.2016

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Part 1
Related Installation and Maintenance Information

Installation Procedure

1.The maintenance platform should match the ventilator and harmonized with the circumstance. If the machine install on the roof, the outlet of air duct should install vertically . On the metal roof, air duct should be supported firm by the solid steel crosspiece (detail refer to the standard installation plan).

2.Installation Process:refer to the User's Manual.

3.Use the special plastic pipe with two tie-in to connect the water supply and inlet valve (tie-in of the inlet connector is 3/4" screw thread, tie-in of the water supply connector is1/2" screw thread. And ask the customer to install a 1/2" faucet at the head of water supply for manual operate conveniently),and then connect the outlet valve to the Φ40mmPVC pipe under the base. If there is too much mud or other impurity in water, the impurity may jam the inlet valve then the machine can not work properly,in this case, the water purifier should be mounted before the water inlet.

4.Connect the control cable and power cable into indoors (be care on sealed), use the cable slot to guide the cable to connect with the MCU controller and the socket. (if the length of the cable is over 2 meters, the use the separate slot of the control cable and power wire to avoid the power interference.)

5.The wall controller should be installed in the place where is clean, conveniently operation, mount on 1.6 meters high. Controller should be mounted on the nonconductor or in the special protective box, unlade the front cover and insert the connector into the controller socket, final close the cover.

6.The power supply switch should have specialty protection as over current, overload and leakage current.

7.Check the fan motor cable, water pump, solenoid-valve carefully, and make sure that all the control cables are connected correctly.

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Main point of Daily Checking

Ⅰ.Check if the working parameter is normal

1. The power supply voltage is 220V±5%, special noted the high voltage might happen in nighttime.
2. The circuit current is 5.7A, if current is overload then need to find out the reason:

(1) High current

(2) The bearing oil-lacking or broken

(3) The fan vanes be locked

(4) heat caused by motor short circuit

(5) electric leaking of socket

Ⅱ. Check the water supply

1. If the water pressure is normal,(refer. 0.15-0.3Mpa.)
2. If the water pipe jammed
3. If the water supply and outlet solenoid working properly
4. If the 4 pieces of filter pad wet averagely
5. Check if the water is clean, if any sediment jam the water pump and water level sensor

Ⅲ. Check if any kindling around

1. If there are the weld, solder and remains cigarette
2. If there are the tinder and corrosive thing

Ⅳ.Check if the switch fuse works properly

Ⅴ. Check all the sockets; especially check the socket of power supply and machine.

1. If socket rust
2. If any distortion
3. If it is overheat or burnt
4. The connection is loose

Ⅵ.Check if has the machine has cacophony and shake obviously

Ⅶ.Check if the working program of the machine working properly

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Periodic Maintenance Method of Evaporative Ventilator

1. Turn off the power supply.
2. Unlade the OASIS Pad one by one and check it. Clean the OASIS Pad by water and soft brush.
3. Take apart the cover and spray pipe, clean it by water. Remount the spray pipe firm after ensuring all the pipe is clean.
4. Clean the inlet valve and the accessories, put out the filter cup and clean it then put it back and check if the water pressure reach or above 1.5kg/cm2.
5. Clean the outlet valve by tap water and clean off sediment. Press the outlet valve core several times to check if it work expedite.
6. Check the water basin, clean the sediment. Check if wash pipe jam, clean the blowhole.
7. Clean the water pump, open the bottom cover of the water pump to check whether the axes is fraied. Clean the sediment change the fraied axes and gasket, restitute the water pump and check if it work well.
8. Pull out the water sensor canister from the base, clean the sediment on the base and dirty water sensor canister. Restitute it and press float ball to check if the it move expedite.
9. Clean the fan impeller and motor, if bearing of motor damage then change it, if not add lube.
10. Check if all the component restitute, if the current switch is normal, and the voltage is in the 220V ±5%.
11. Remount the OASIS pad.
12. Turn on and check if each button is ok, LCD display is correct, and can auto clean well. Check to sure that water was pumped to the OASIS Pad and wet it, notice if the water level is normal.
13. Let the machine operate under the ventilator function in order to drain the water in the base and dry the OASIS Pad, at last break off the water and power supply.
14. If machine would not turn on for a long time, put dustproof cover on the machine after finishing the maintenance process above. Water pipe need the heat preservation when it on the frost place so that machine can be protect well.

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Turn on Ventilator

Turn on Procedure Number:

Before turn on the machine, please read the user manual.

Ⅰ**.Notice**	YES	NO	REMARK
1.Fasten the safety belt for hight work and pay attention to the safe on power supply and operation.			
Ⅱ**.Indoor Part**			
1.If the air duct installation, the direction and size accord with the drawing.			
2.The facture of air duct,swerve duct, branch, path change, hang pad is accordant with the criterion.			
3.All the flange and hang pad should be painted.			
4.Choose the proper diffuser, installation at right position and the guide board should be			
5.The power cable of the diffuser should accordant with the criterion.			
6.Controller of ventilator should be mounted firm convenient for operation.			
7.Each machine has specialty leakage current switch and over current protect switch, and power supply is 220VAC.			
8.Clean up the package and scrap . The accessories of air duct, diffuser etc.should be neat.			
Ⅲ**.Outside Part**			
1.Installation position of main machine accord with drawing request, air is enough and clean.			
2.Distance between machine and wall ⩾40cm. 50cm arround the machine should have not barrier.			
3.Installation method of main machine accord with criterion.5m around the ventilator there is not heat resource or exhauct emission.			
4.The horizontal of the machine and platform should below 30'. The loading of the platform and pole should be average.			
5.platform, stairs and handrail should be installed firm, safety and convenient for operation.			
6.Pre-do the skidproof, anti-split, anti-pervasion, anti-leak, anti-aging.			
7.The position of air duct entrance should accord with criterion..			
8.Waterproof cover should be made on the roof.			
9.Power supply of outdoor should be at right position, the socket should bemounted away from water(better installed indoor).			
10.Water supply of outside should at the right position,each machine should be equipped with faucet connect with fittings tube, and enough water pressure.			
11.The drain pipe should be leaded to the barrel-drain or offtake.			
Ⅳ**.Main Machine Part**			
1. Check to ensure all the screws are fitting on the OASIS pad, the crust and OASIS padwould not be damaged or transfiguration during the transport or installation.			

2.Remove the OASIS pad to check if the water pump,power controller, water sensor, fan, fan base is installed correctly and firm.			
3.The connection of the spray pipe, flume cover, clean pipe, PVC water pipe is connected firm.			
4.The spring on the top cover is firm and ametabolic.			
5.The connect cable of power control is correct and firm. Turn on the switch on the power controller.			
6.Base is clean.			
7.Remount the OASIS pad and screw tightly the filter pad (according to drawing orthe customer resquest).			
8.Check the connect cable in the controller is correct and firm.			
Ⅴ.Main Machine Operation (Operate for 30 minutes)			
1.After the machine operating, outlet valve automatically turn on, the time of draining isabout 4 minutes.			
2.Press Turn On button first,the press 1,2,3,4,5,6 each speed, the fan running immediately,the inlet will turn on after drainage.			
3.Fan operate equably, fan vane is balanced, main body has no abnormity shake, and the air duct does not shock.			
4.The noise 1 meter aroud the main machine is in the normal range.			
5. Trun off the machine, fan stop running. The outlet valve turn to drain, and lasting forabout 4 minutes.			

After debugging, the guider should teach the machine operator to operate the ventilator.

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Main point on wash the Ventilator

1. Check the Out-look

①If the crust and filter pad were broken, If any part was shrinking ,loose or lack (including the screw and the top-cover spring).

②If the dust on the filter pad affect the absorb efficiency or jam the filter pad.

③If the water supply is normal, If the water pipe is jammed or leakage, If any lichen growing on the accessory parts.

④If the maintain platform is loose or rust.

⑤If power voltage is normal, if the wire broken or aging.

⑥Check if LCD controller and the remote controller need to change the battery, if the out-look is good and with normal function.

2. Check inside

①Remove 4 pieces of filter pad from the ventilator, and then wash by water, the water must be clean and low pressure. Be careful not to destroy the filter pad. After cleaning, check If the filter pad is in good condition, smooth surface and no water to splash out.

②Open the top-cover to remove the sprinkling pipe, check If the shape of the pipe cover is normal. Clean the sprinkling pipe and clean the dust inside the pipe and unblock the sprinkling hole, re-install the sprinkling pipe, fasten all the screw and clip, breakwater cover must be put on the right position.

③Check If the wash pipe is jammed.

④Check If the motor working normally and the bearing is in good condition. Use the diesel oil to clean the bearing and add new lube; clean the dust on the winding inside the motor, re-install the motor and check If the insulated resistance is normal, the bearing is running smoothly without cacophony.

⑤Check If the fan vanes are in good condition and no crack. Check If the collet is normal, the screw is tight. After clean all the fan vanes, re-install them firmly, and move the fan vanes to check If in balance and without cacophony.

⑥Check If all the sockets inside MCU controller are connect tightly and no rust or burn.

⑦Open the MCU controller to check If any dust and wet on the electronic board, If any part be burnt, and If the cable connection is tight.

⑧ Remount the 4 pieces of filter pad and firm them.

3. After washing, turn on the machine for testing running to ensure all the working program is correct, the result is reach normal standard.

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Maintenance & Wash Process

Ⅰ	Process	Yes/No
1	check the LCD normal or not	
2	check the diffuser motor, fan vanes, guide board inside the duffuser (turn off the power of LCD, fasten the safe belt and go to check the cooler)	
3	check the water in /out valve, drainage pipe	
4	remove the filter pad, turn off the MCU power	
5	clean the basin, water pump	
6	check all the cable/wire connector	
7	clean the spray pipe	
8	remount the spray pipe and parts (spray pipe cover and cover spring)	
9	(turn on the MCU power supply)	
10	remount the filter pad and screws	
11	test running	

Ⅱ **Record of the parts exchanged or repaired**

Model: Code of the unit:

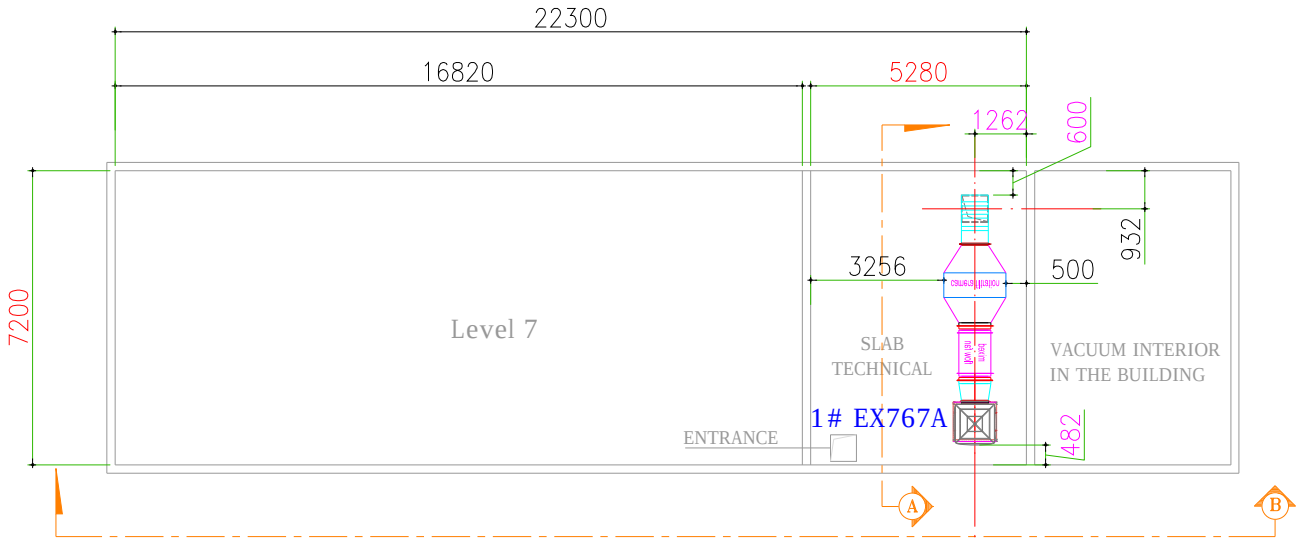
Name	Reason	Remark

Signature: Date:

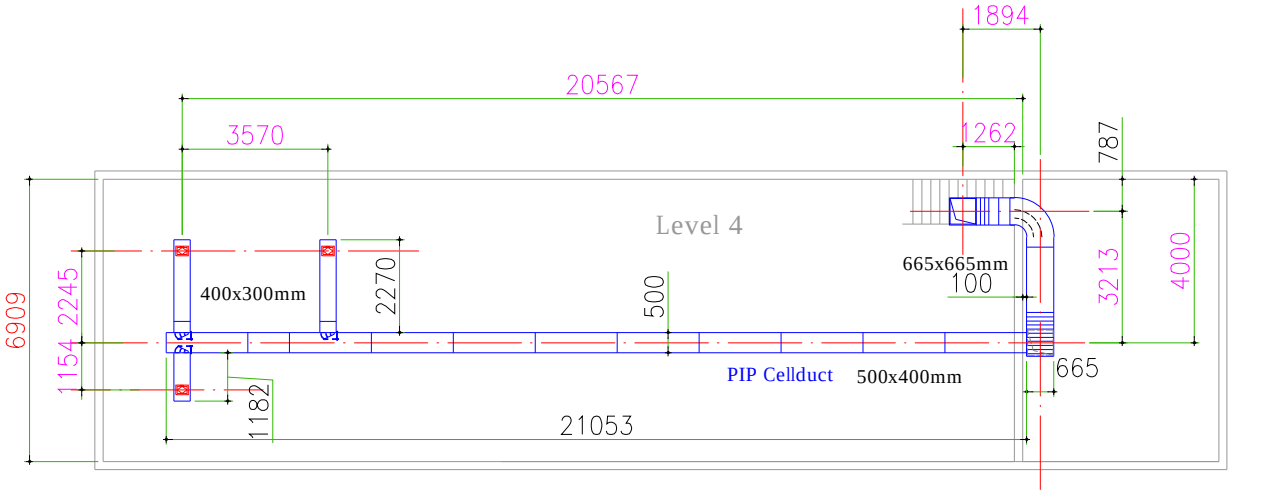
Part 2
Supply Air System

Color Label of Combined Duct (ENUTRITION--- Laboratory)		
Unit Mark	Combined Duct Mark	Identification For Cooler
1#	A1～A63	

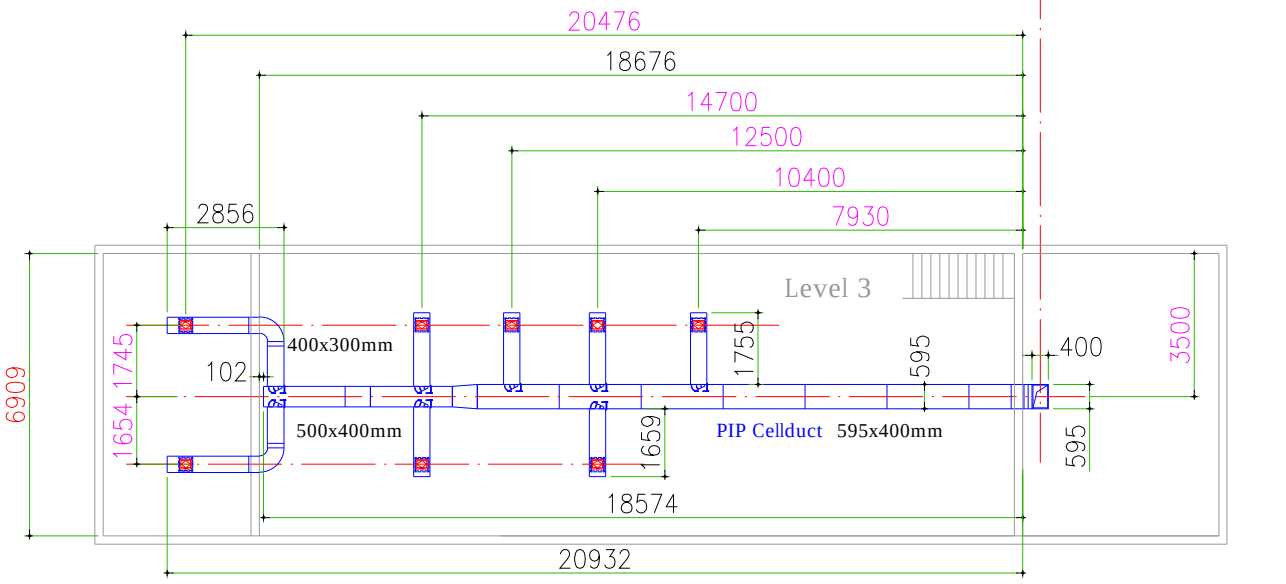
ENUTRITION -- Laboratory Project Plan of Ventilator



Level 7 layout

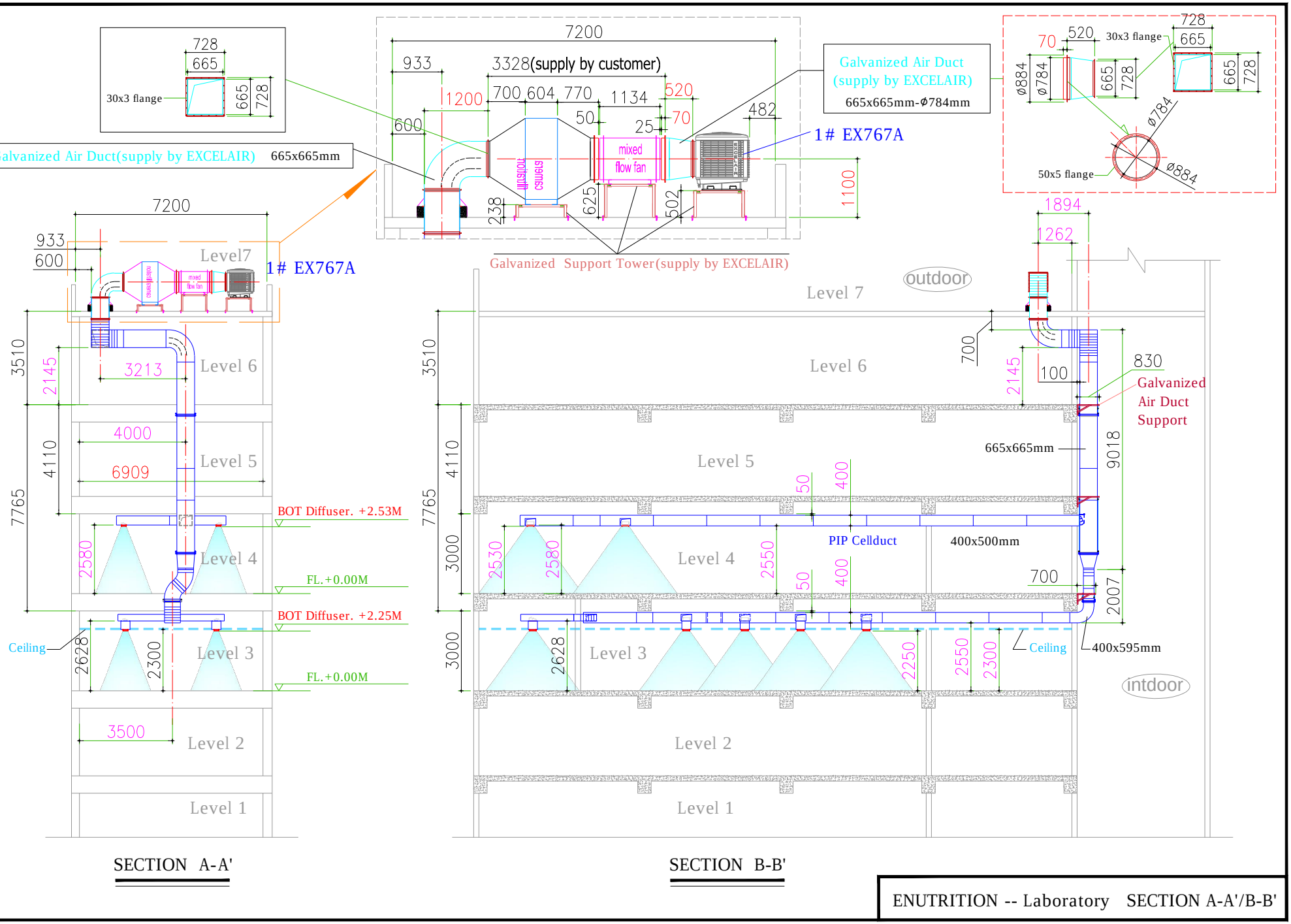


Level 4 layout



Level 3 layout

Model And Qty. of Diffuser	
Model	FR2
Legends	
Qty.	11



SECTION A-A'

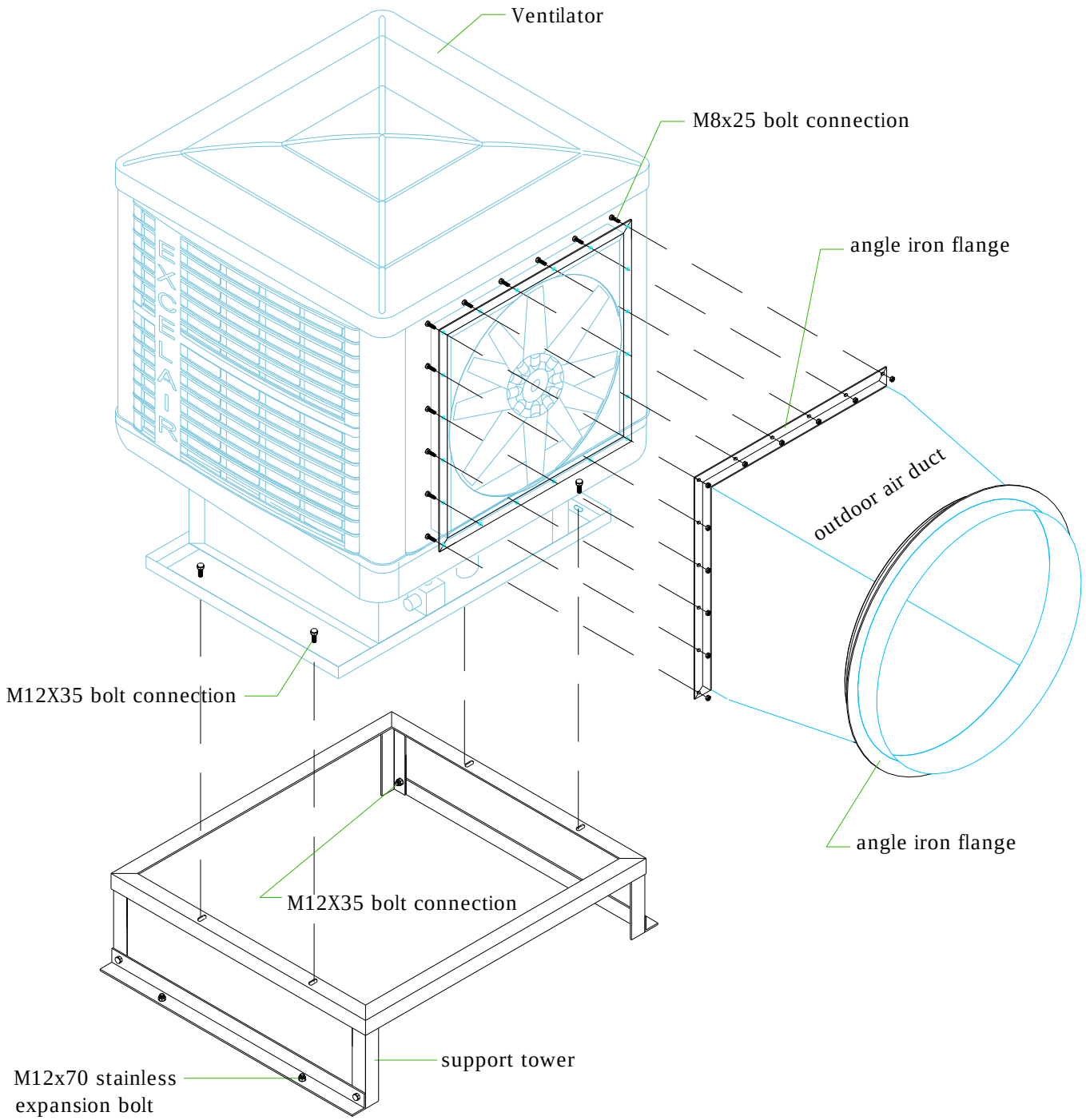
SECTION B-B'

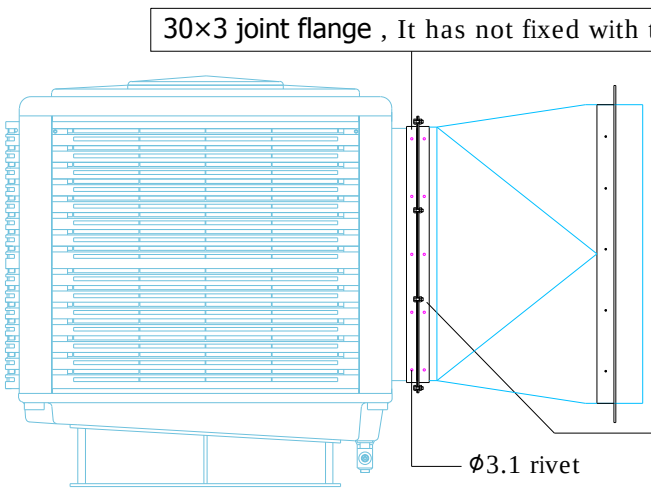
ENUTRITION -- Laboratory SECTION A-A'/B-B'

Supply Air System

DWG NO.:DWG002

Assembly sketch map of ventilator and support tower

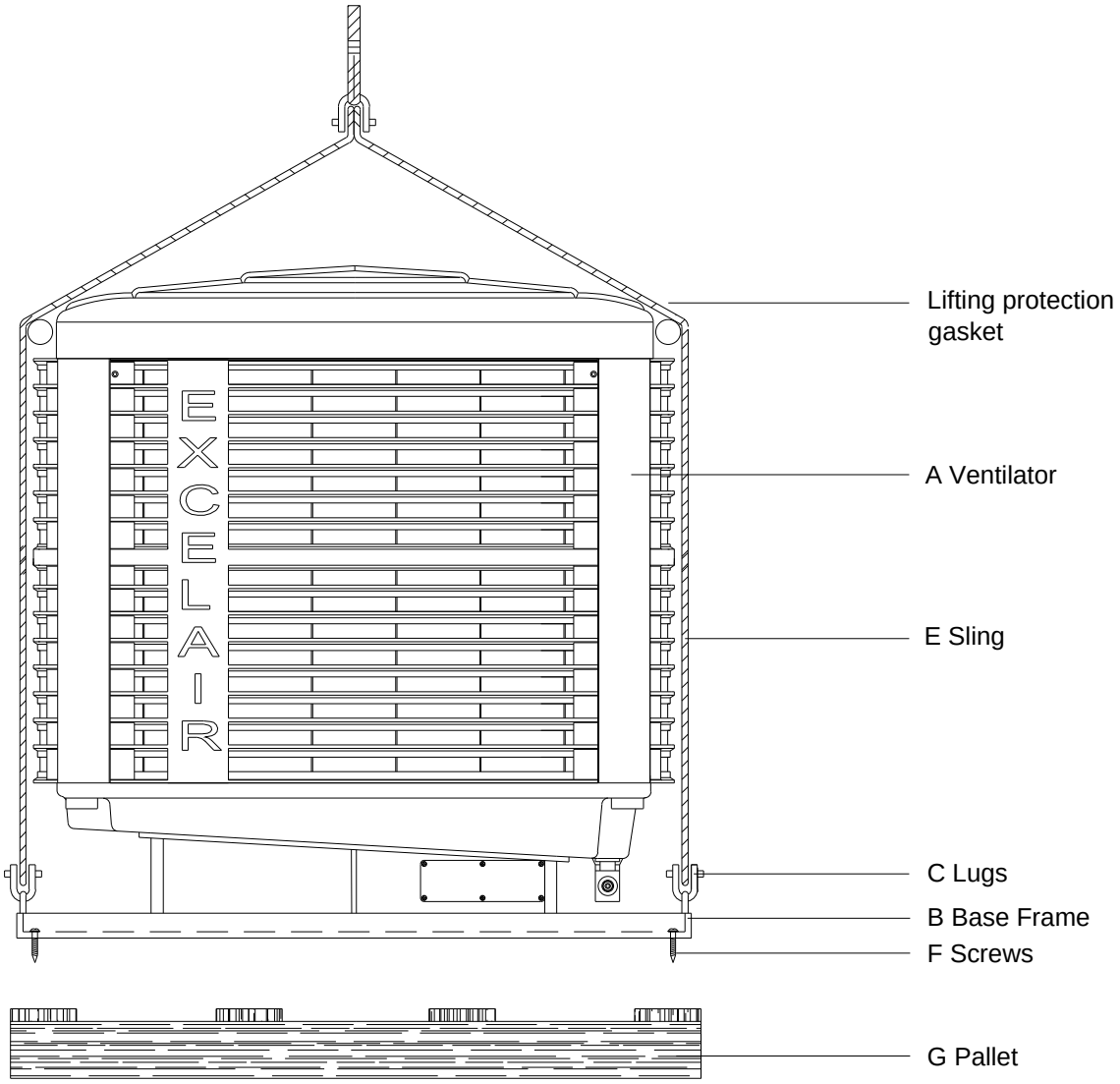




Specification of installation

1. Angle iron flange must be fixed with the ventilator outlet or switch hole of duct by rivets .
2. Seal with the anti-leakage glue in the gap between angle iron , ventilator outlet, air duct and flange.

Ventilator Installation



Installation Steps:

1 Ventilator(A), Base Bracket (B) and Pallet (G) have been packed together before delivery.

2 When lift the ventilator,remove the 4 screws (F) which connect the Base Bracket(B) and Pallet (G), then (B) and (G) will be disjoined.

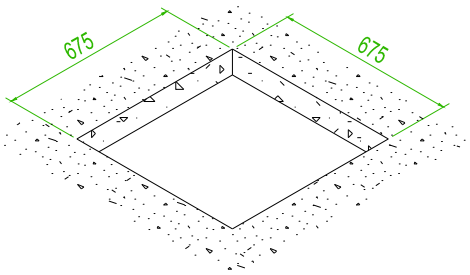
3 Base Bracket (B) and Ventilator(A) should be installed together all along, the base of ventilator (A) connect air duct,connect by 3 pcs of M8X20 screw bolt each side.Using 4 pcs of M12X35 screw bolts to connect Base Bracket (B) and installation bracket.

4 Connect the electrical and control cables to the power socket and control panel respectively via the air duct.

5 When lift the ventilator, please use protect gasket to avoid damage. As shown in the diagram.

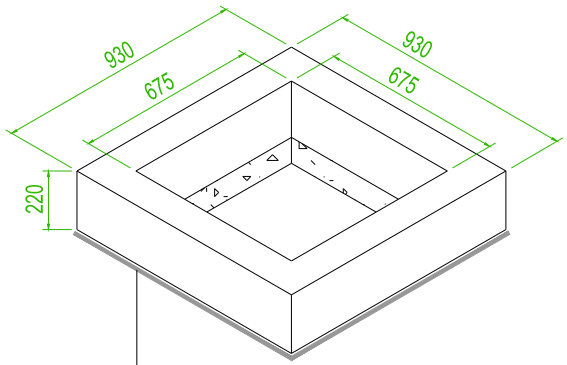
Step of outdoor air duct mount on the cement roof

① As picture shows, positioning and drill a hole (675x675 mm)



Remark:
Roughen the floor, drill the hole and cement plaster .

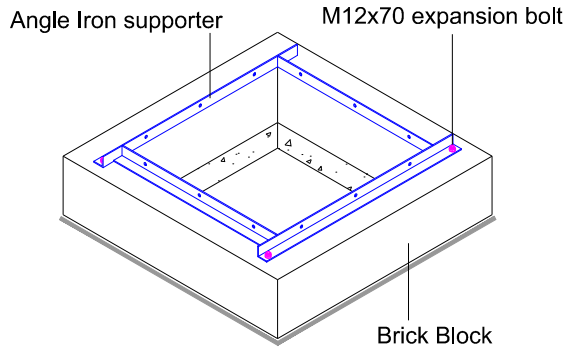
② Make the base, dimension see as below .



Seal with asphalt or cement (add with waterproof agent)

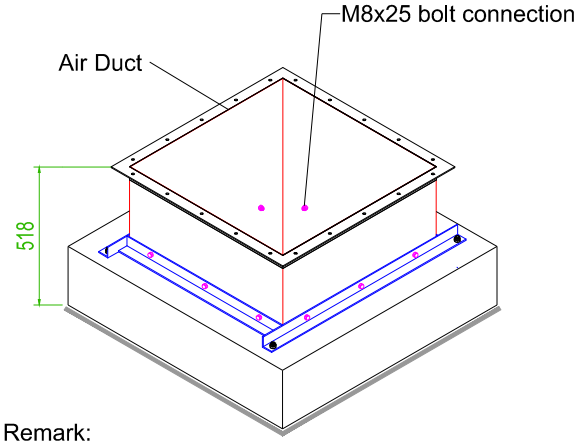
Material:
500# cement, bricks, sand, asphalt or waterproof agent .

③ Mount the Angle Iron supporter, fix Angle Iron with M12X70 expansion bolt on the brick block .



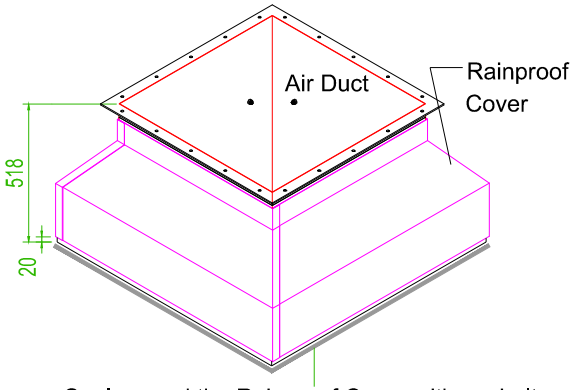
Remark:
Expansion Bolt should be pushed when the brick block gets dry in order to protect the base .

④ Set up the main Air Duct. Fix with M8X25 bolt on the angle iron supporter , air duct is above the roof ~518mm .



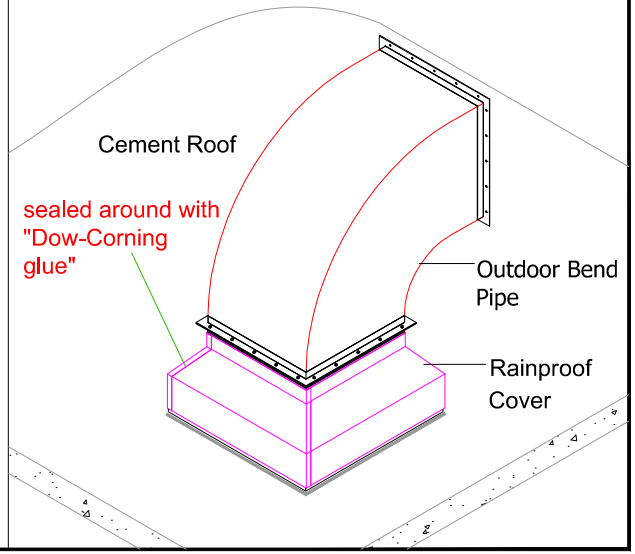
Remark:
The horizontal degree of the Air Duct should not exceed 30' .

⑤ Set up the Rainproof Cover. Insert the Rainproof Cover through Air Duct, cover the brick block. This should be above the roof approximate 20 mm (Note: attached see the assembling method of Rainproof Cover).

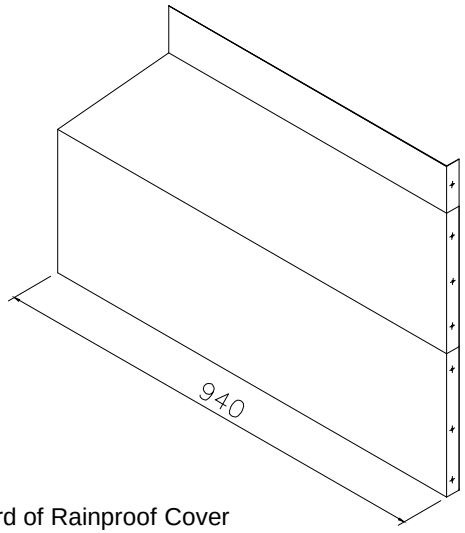


Seal around the Rainproof Cover with asphalt or cement (add with Rainproof agent)

⑥ Install the outdoor bend pipe.All the gap should be sealed by "DOW-Corning" glue .

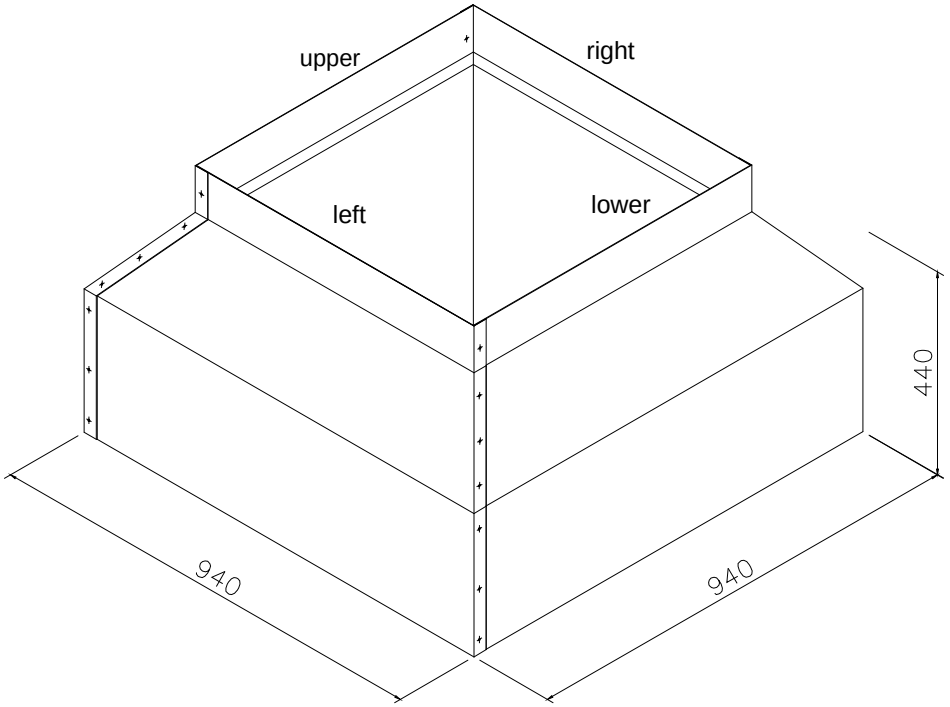


Installation instruction:
According to the drawing, connect the board of Rainproof Cover orderly then fixed with Ø3.2x8 round head rivet.



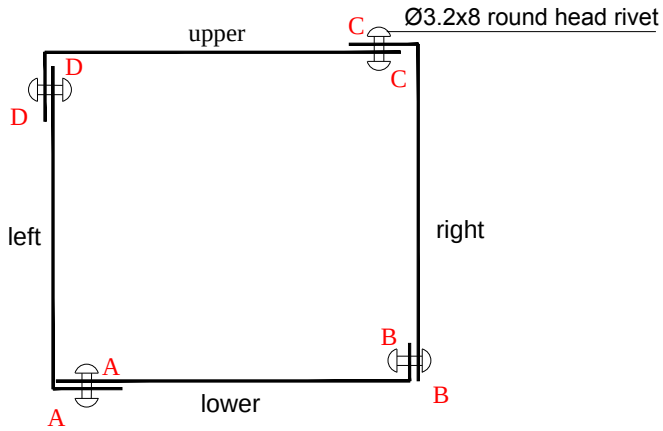
Board of Rainproof Cover

Qty: 4 pieces per unit



Drawing of the Rainproof Cover

Sketch Map of the connection



Drawing of the Rainproof Cover

Sketch map of making ducting of ventilator 1#

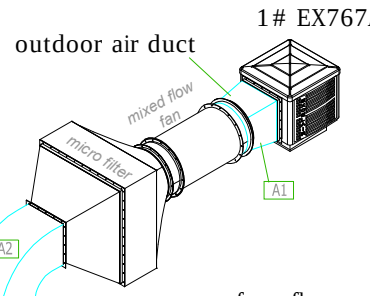
Location Mark

Color Identification

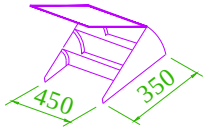
QUALIFIED QC : DATE:

Project Number	1892-1621E
Cooler Number	1#
Air Duct Joint Number	A2

1# EX767A

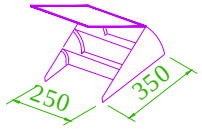


air extractor (450x350)



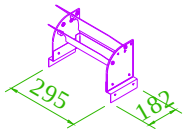
Qty. 1pcs

air extractor (250x350)



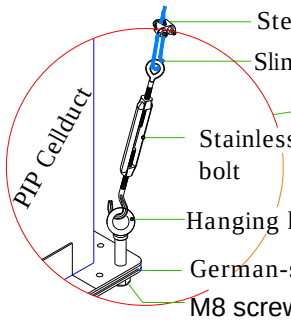
Qty. 11pcs

air extractor (295x182)



Qty. 8pcs

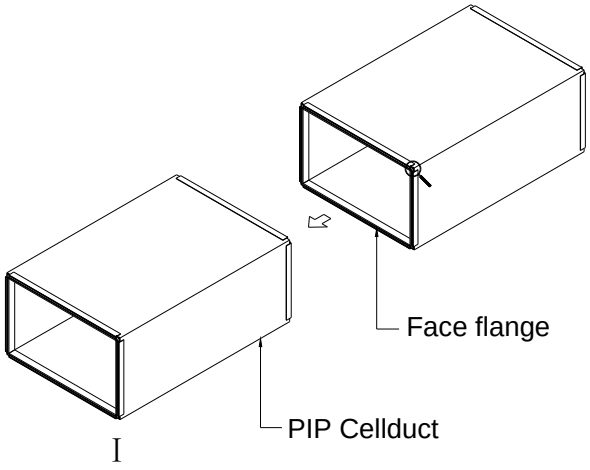
sling hanger set	
specification	quantity
665×665	3
595×400	7
500×400	13
400×300	23



Diffuser , It has not fixed with the duct when it leave the factory.

Diffuser , It already fixed with the duct when it leave the factory.

PIP Cellduct connection



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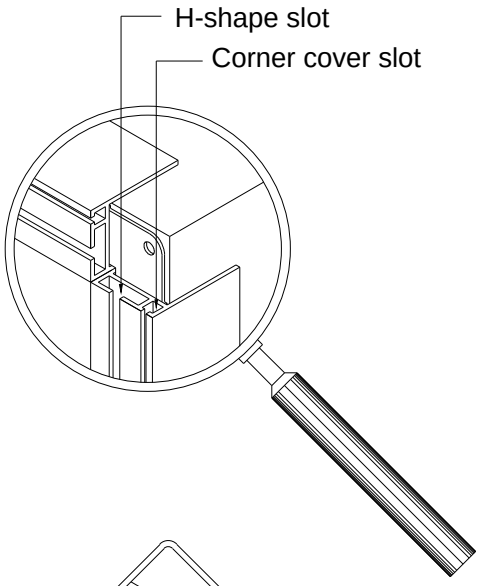

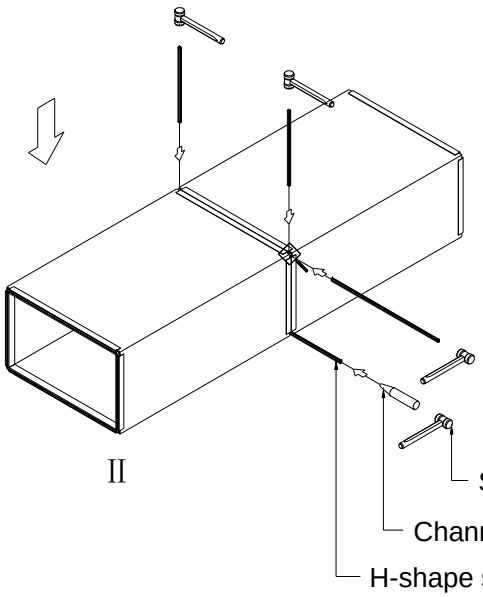

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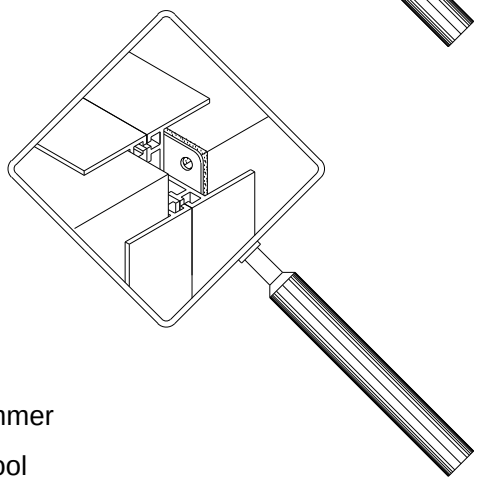
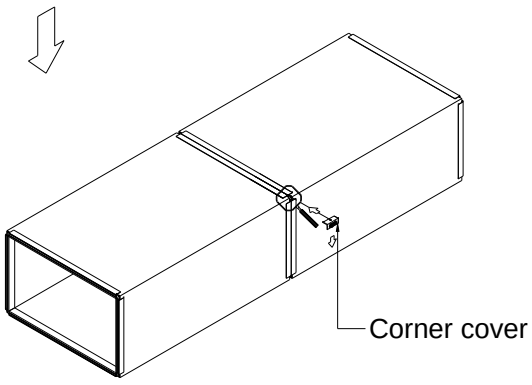
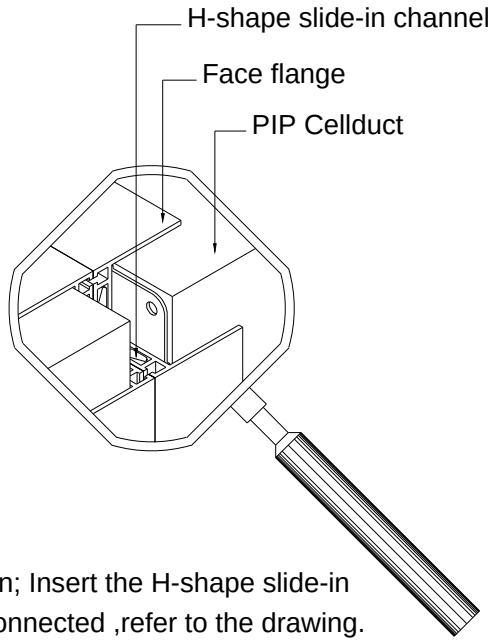




III



Air duct connection

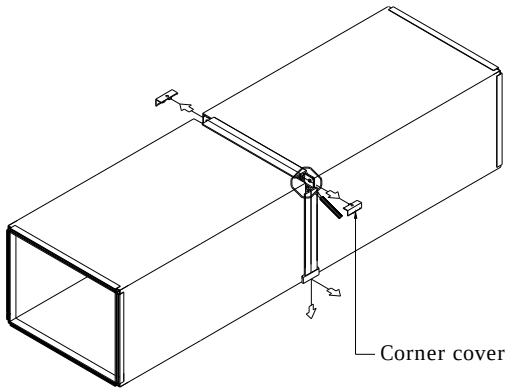
1.Connect the same diameter PIP cellduct section by section; Insert the H-shape slide-in channel to the H-shape slot, then the two ducts can be connected ,refer to the drawing.

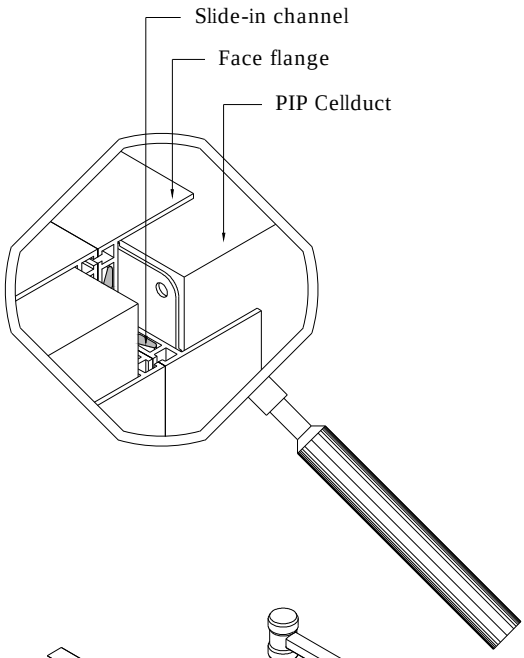
2.Install the corner cover; Insert the longer insert bolt at first,then insert the shorter one.

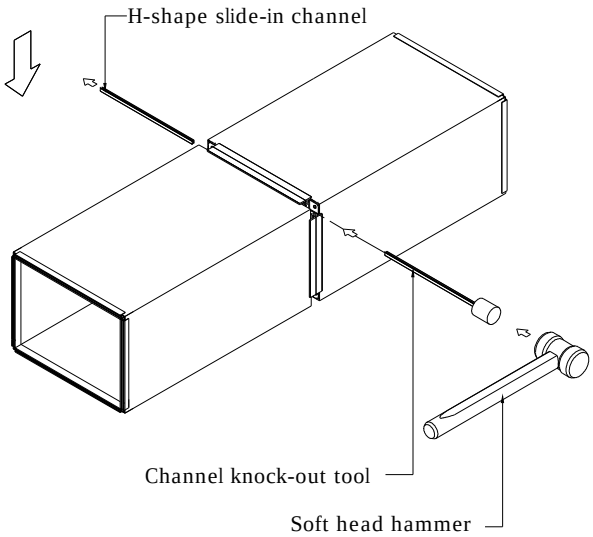
3.Drawing below is the connection drawing for straight duct, it is similar to other kind of ducts.

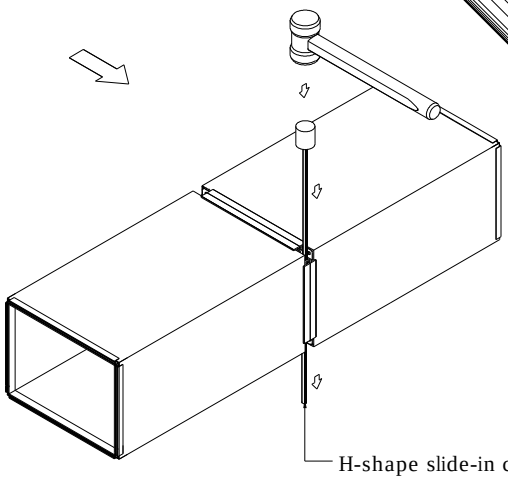
4.After connected several sections, it can be hanged.

Disconnect the PIP Cellduct



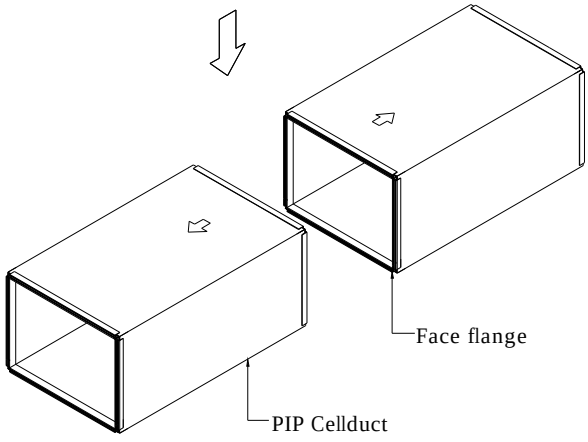




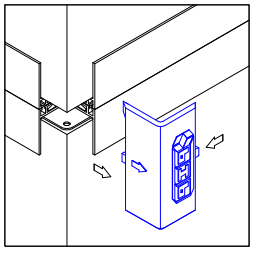


Disconnect the air duct

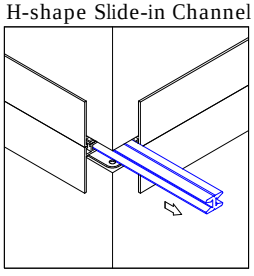
1. Dismantle the corner cover ; take out the shorter bolt at first , then take out the longer one.
2. Take out the H-shape slide-in channel from it's slot ; Push the H-shape slide-in channel by channel knock-out tool at first , then use hammer knock it out.
3. After knocked out the slide-in channel, the air duct can be disconnected.
4. Drawing below is the disconnecting drawing for straight duct , it is similar to other kind of ducts.



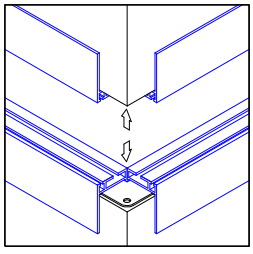
Corner Cover

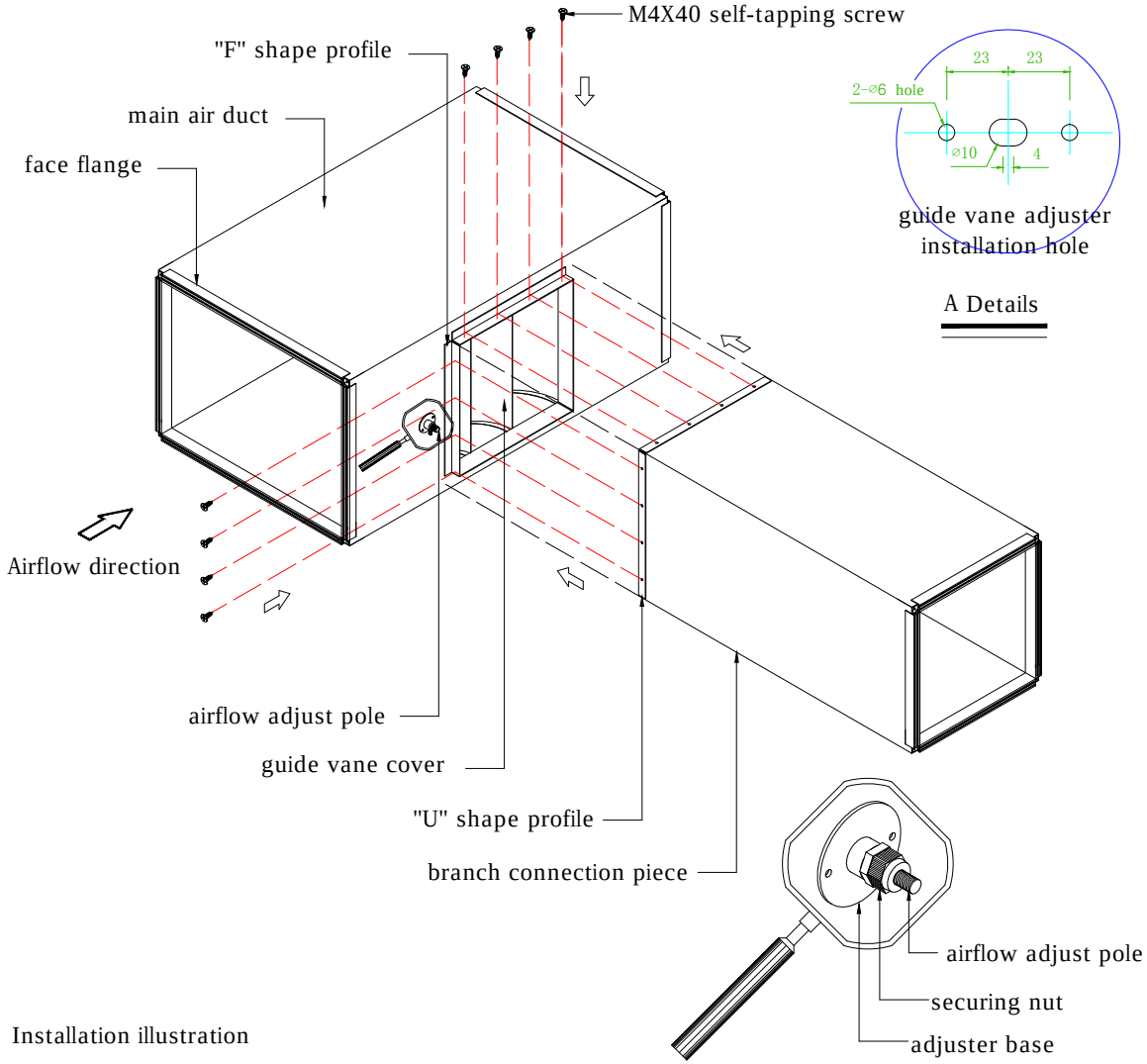


H-shape Slide-in Channel



Face Flange

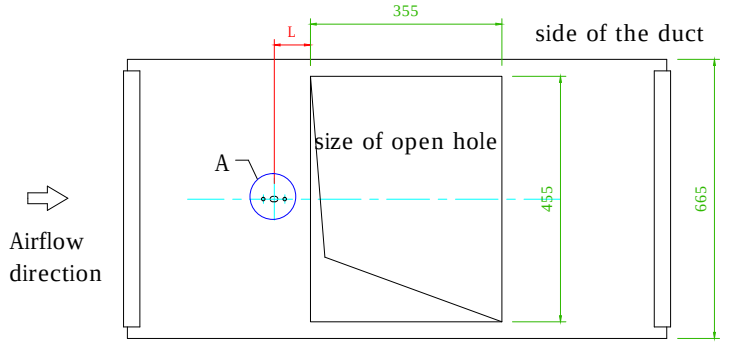




Installation illustration

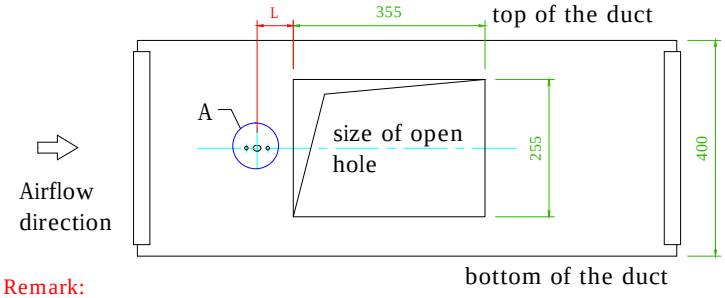
1. Positioning the installation hole .(refer to drawing1 ,drawing 2 and drawing 3)
2. Install adjustable guide vane. (refer to the installation sketch map of "adjustable guide vane cover")
3. Put the branch connection on the F shape profile of outside at first, then fix it on the F shape profile by M4X40 self-tapping screw.
4. Adjust the airflow adjust pole according to the airflow branch air duct needed.

Drawing 1, open installation hole for branch duct (500x400mm)



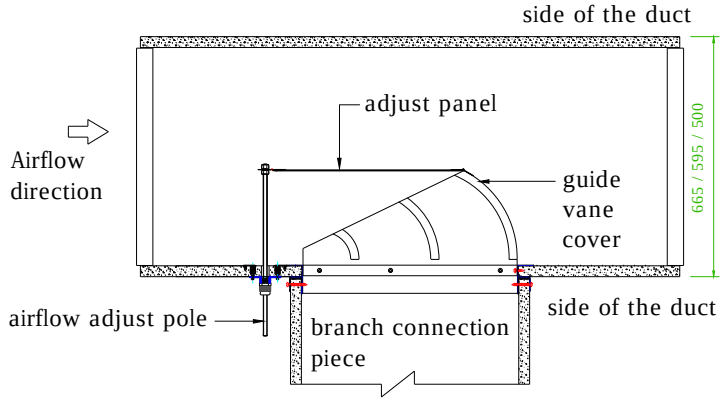
Remark:
Please adjust the pole to fix position of L base upon guide vane cover.

Drawing 2, open installation hole for branch duct (400x300mm)

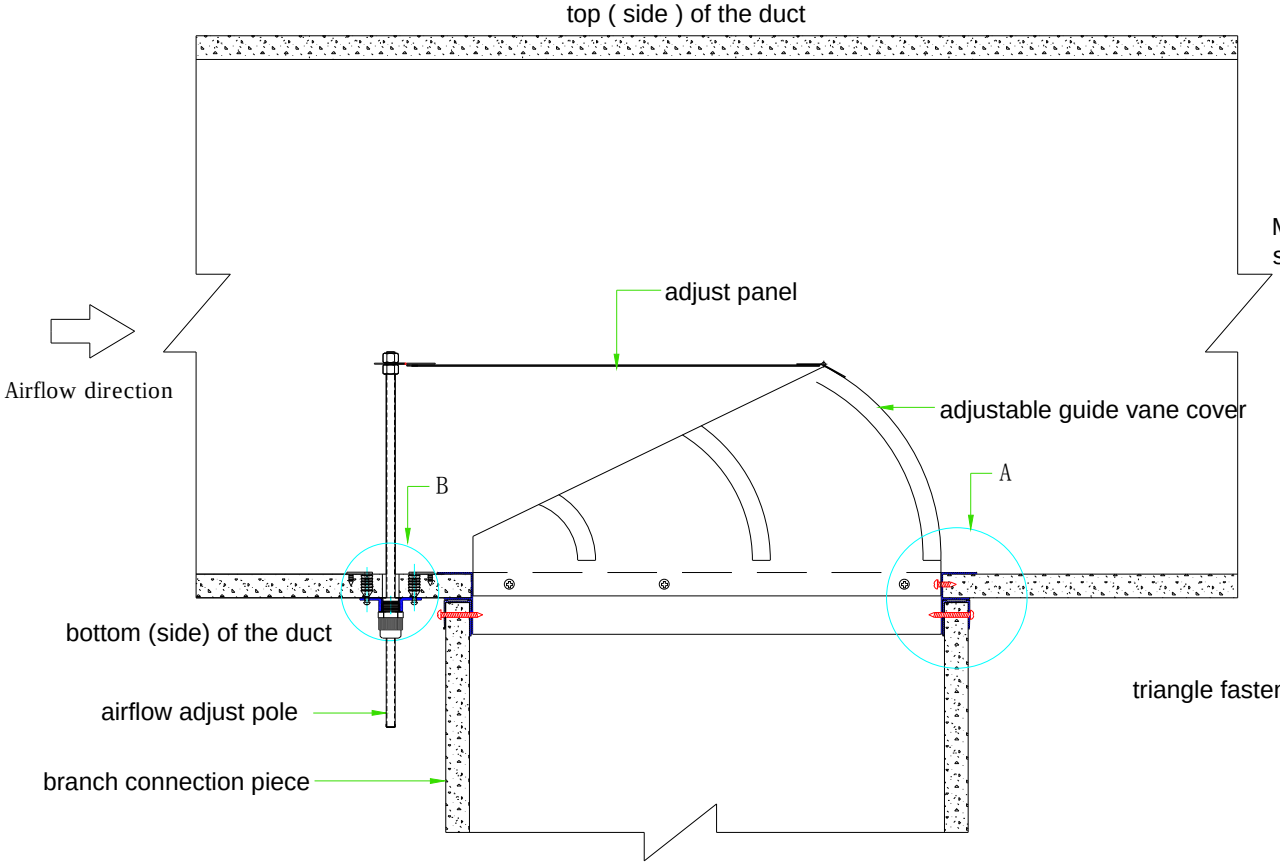


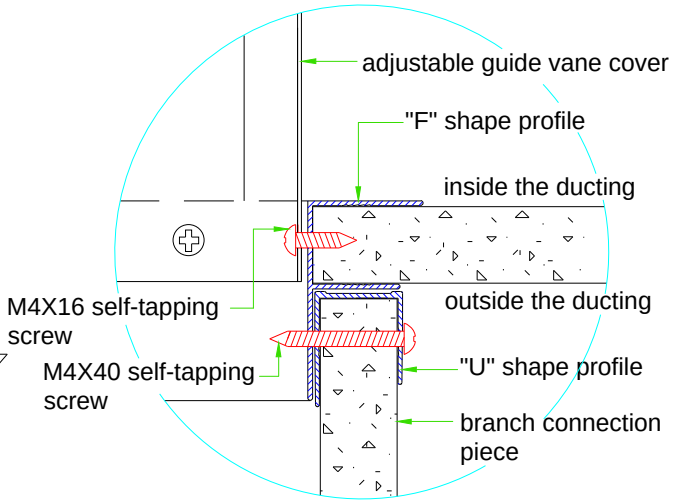
Remark:
Please adjust the pole to fix position of L base upon guide vane cover.

Drawing 3, Install adjustable guide vane. (refer to the installation sketch map of " adjustable guide vane cover ")

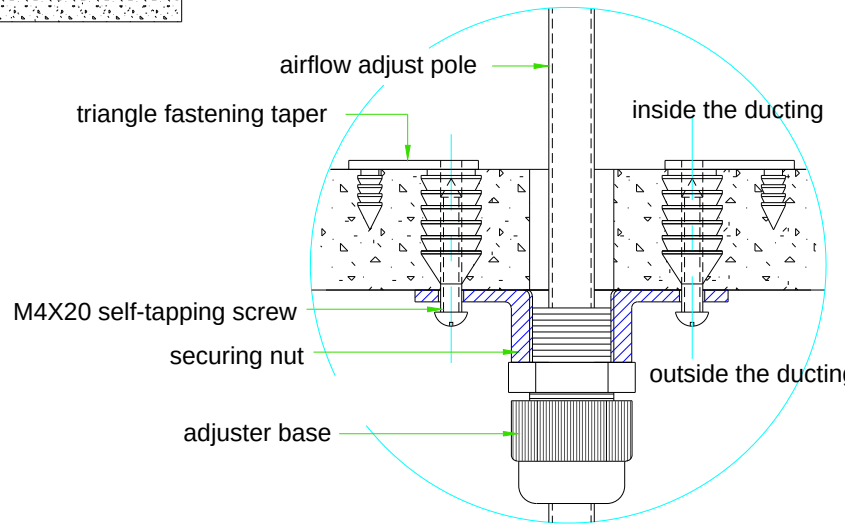


Connection of main air duct and branch connection piece ①





A Details

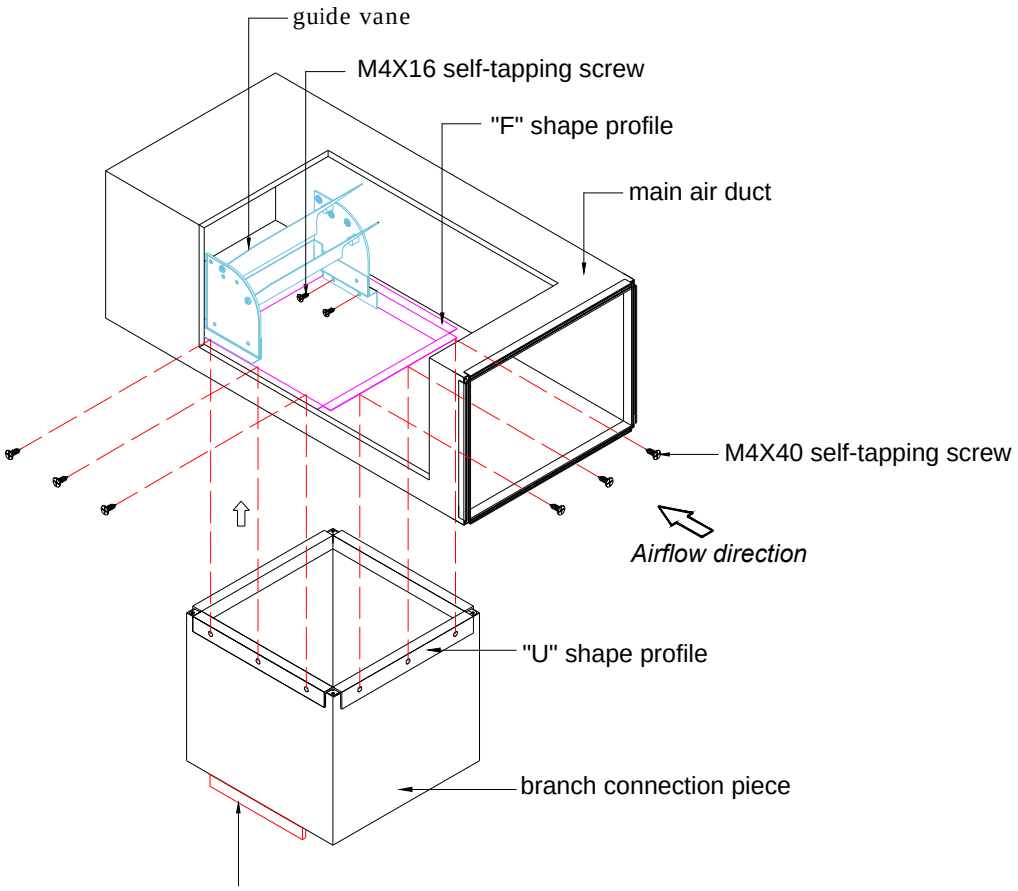


B Details

Installation illustration:

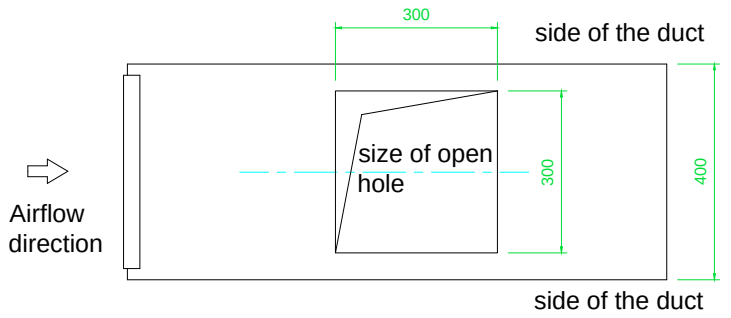
1. Install F shape flange, put the F shape flange on the hole.
2. Put the guide vane cover into the inner of the "F" shape flange, and fix it on the flange with M4X16 self-tapping screw.
3. Put the branch connection on the F shape profile of outside at first, then fix it on the F shape profile by M4X40 self-tapping screw.

Sketch map of adjustable guide vane cover

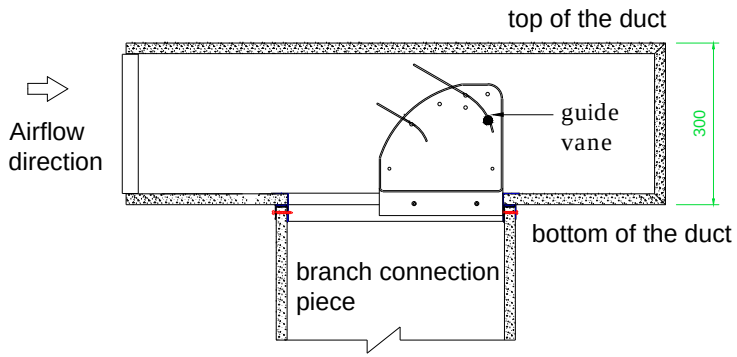


Diffuser , It already fixed with the duct when it leave the factory.

Drawing 1, open installation hole for branch duct (345x345mm)



Drawing 2, Install guide vane.

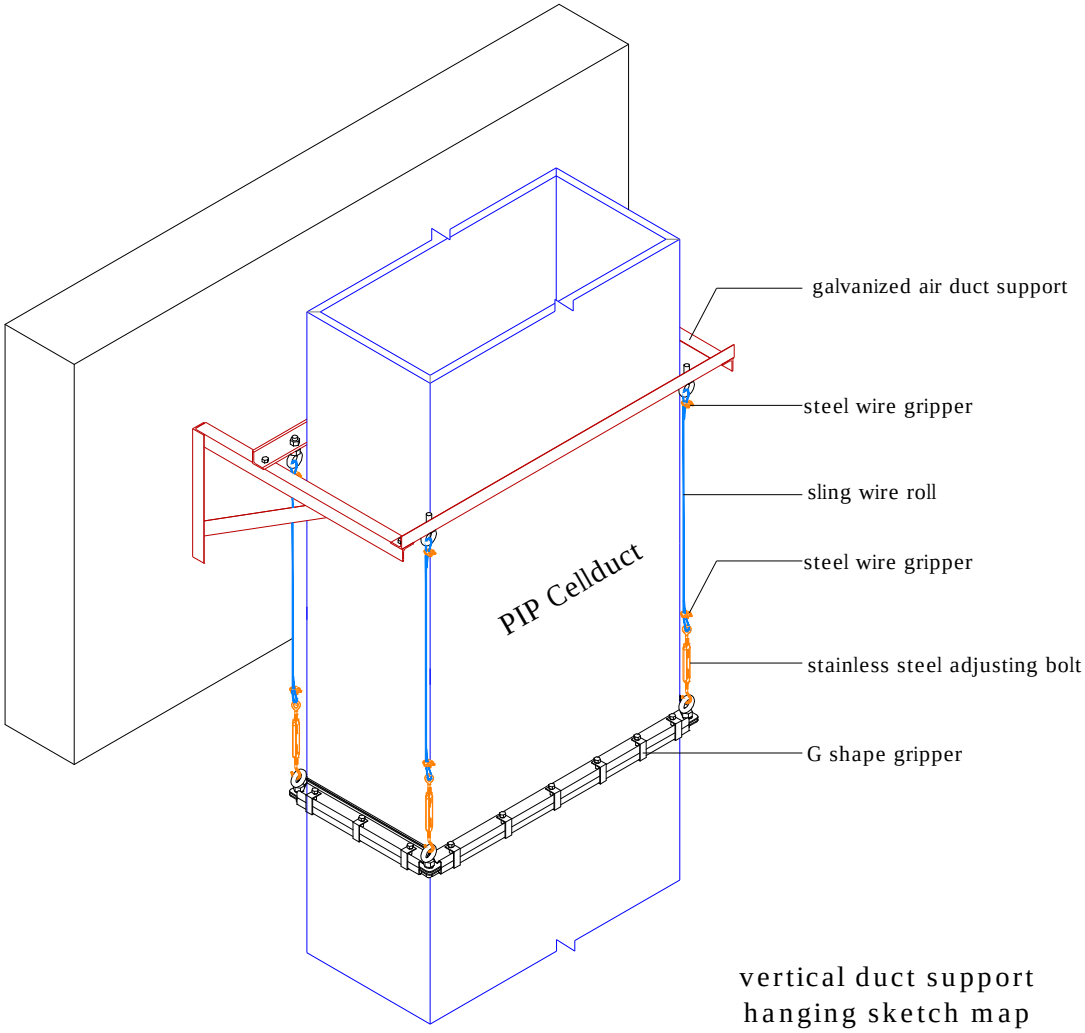


Installation illustration

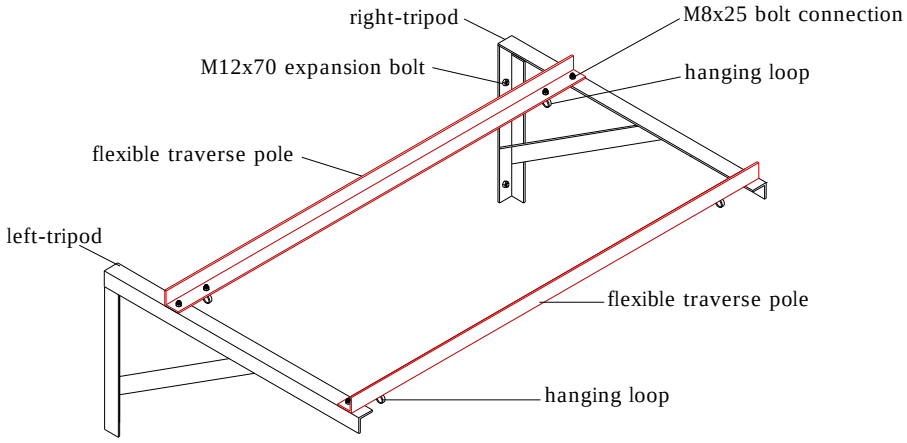
1. Positioning the installation hole .(refer to drawing1)
2. Install F shape flange, put the F shape flange on the hole.
3. Install guide vane . Put the guide vane cover into the inner of the "F" shape flange, and fix it on the flange with M4X16 self-tapping screw. (The guide vane is 35° face the wind.)
4. Put the branch connection on the F shape profile of outside at first, then fix it on the F shape profile by M4X40 self-tapping screw.

Connection of main air duct and branch connection piece ②

Vertical Duct Hanging Support Sketch Map



vertical duct support hanging sketch map

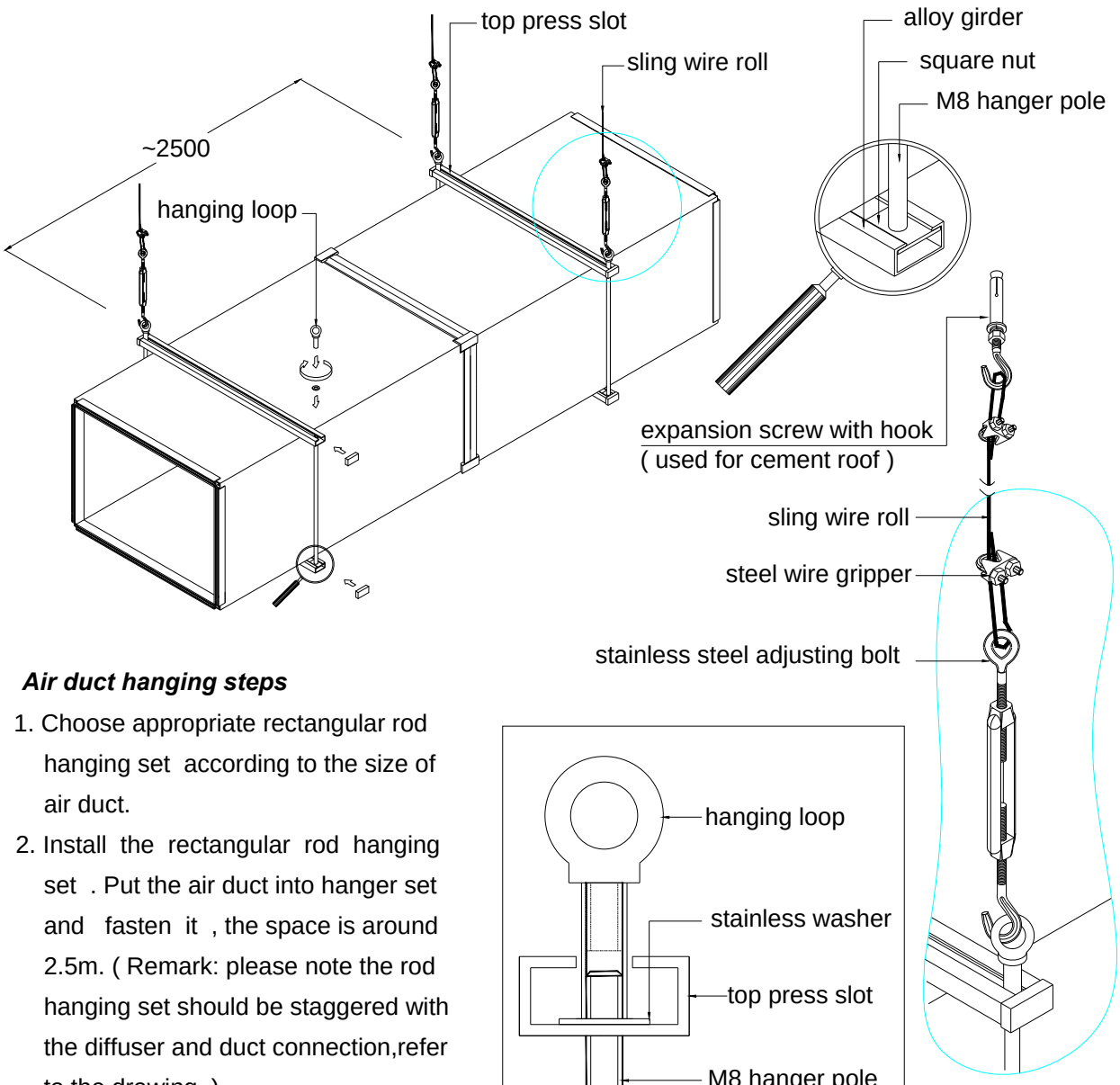


vertical duct support sketch map

Remark:

1. Air duct support is divided into one section per. It is composed by 2 parts: tripod and flexible traverse pole,all of them can be assembled.
2. When installation:
   Use M12x70 expansion-bolt to fix tripod on the wall at first , then use M8X25 bolt to fix the flexible traverse pole on the tripod .

Sling Hanger Hanging

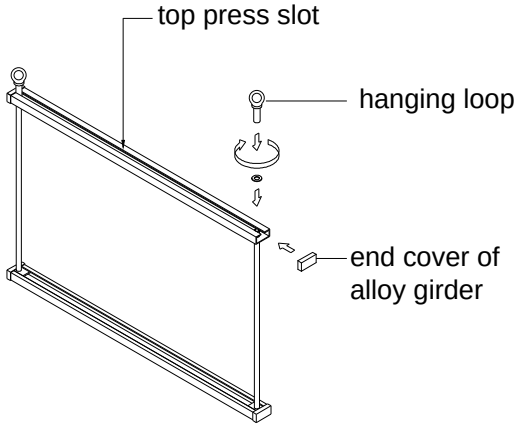


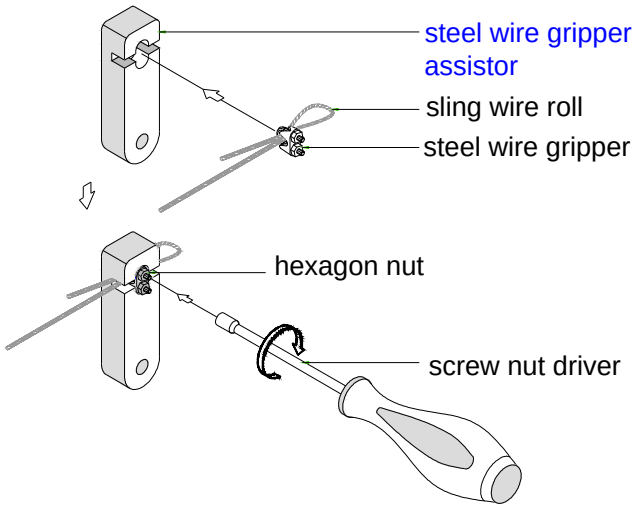
Air duct hanging steps

1. Choose appropriate rectangular rod hanging set according to the size of air duct.
2. Install the rectangular rod hanging set . Put the air duct into hanger set and fasten it , the space is around 2.5m. (Remark: please note the rod hanging set should be staggered with the diffuser and duct connection,refer to the drawing.)
3. Hang the air duct by hanger sling and adjust it till it's level .

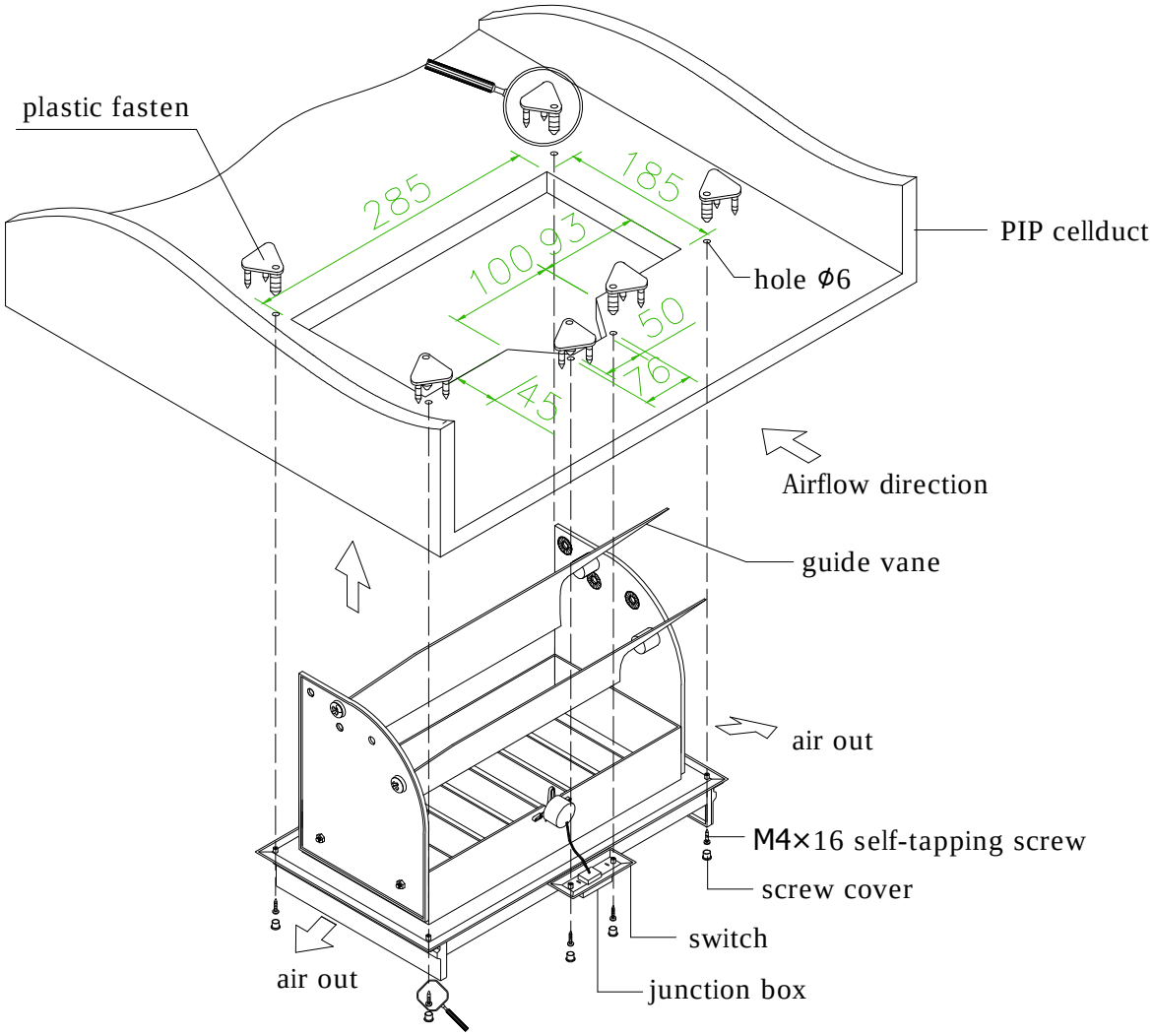
partial assembly drawing

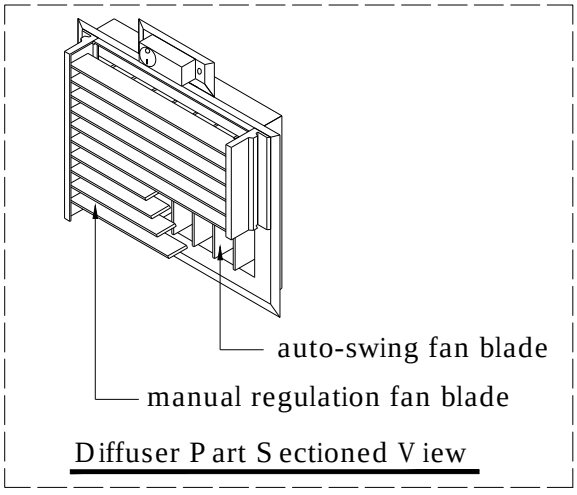
sling hanger set

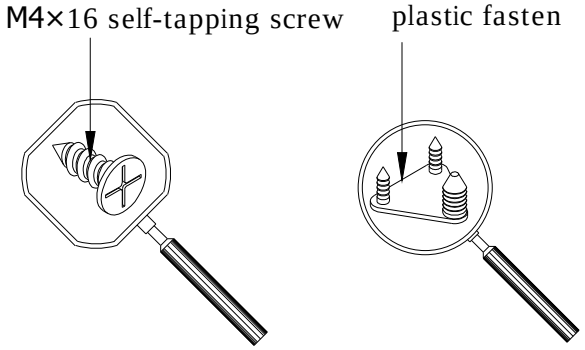




Sketch map of diffuser FR2-H installation

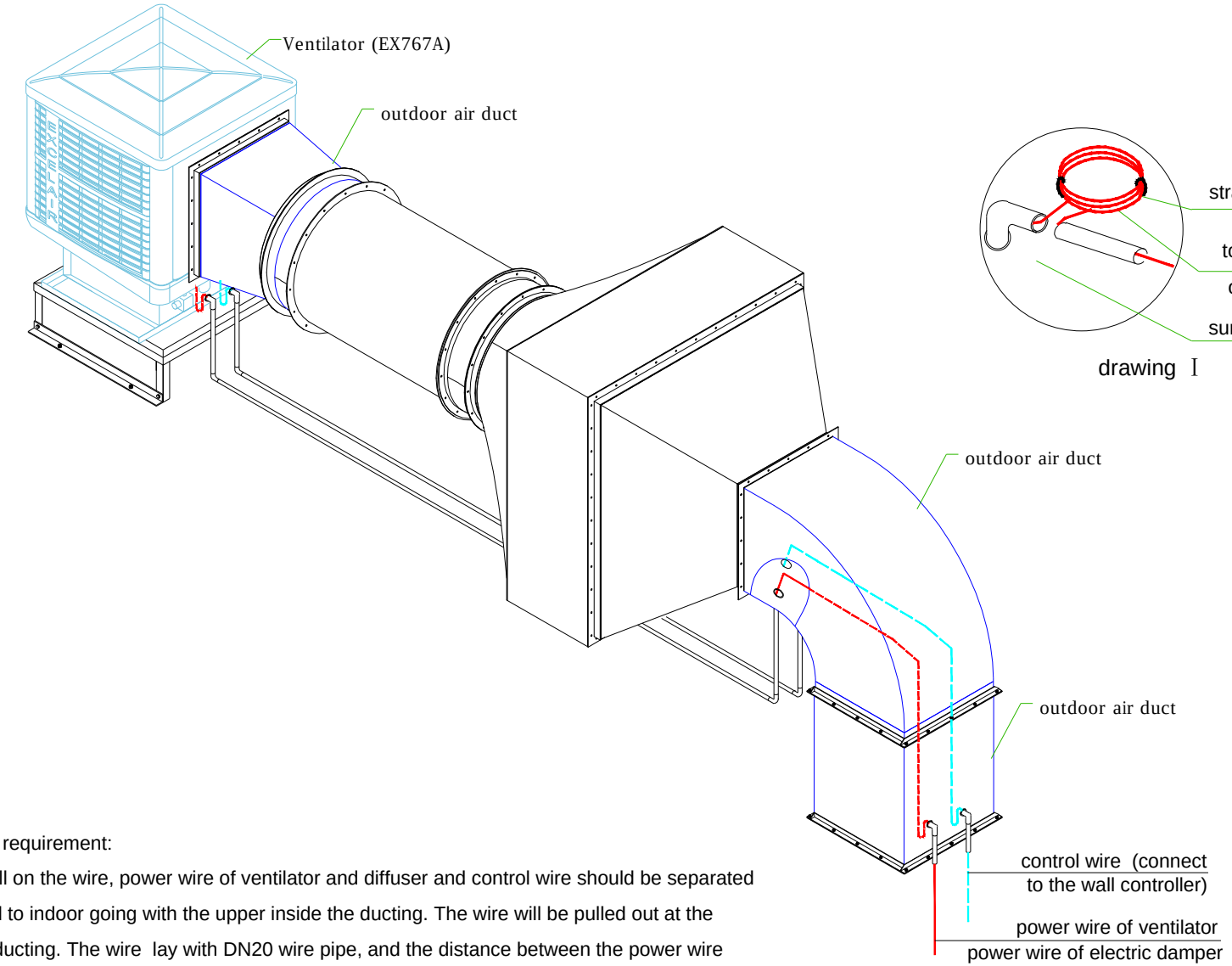






Step of mounting:

1. Open the square (285X185) on PIP cellduct .
2. Drill 6XΦ6 hole on the air duct, the position of the hole must match with diffuser, and then insert the plastic fasten into the Φ6 hole from inner to outer.
3. Connect the diffuser and plastic fasten with screws. (The guide vane is 35° face the wind.)
4. Power supply of diffuser motor is AC 220V.



drawing Ⅰ

Technique requirement:

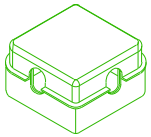
1.When pull on the wire, power wire of ventilator and diffuser and control wire should be separated and extend to indoor going with the upper inside the ducting. The wire will be pulled out at the top of the ducting. The wire lay with DN20 wire pipe, and the distance between the power wire and control wire should be large than 100mm.

2. If the power wire or control wire is too long, it must be packed the excessive part and on the top of the ducting,then cover the wire pipe, refer to the drawing Ⅰ.

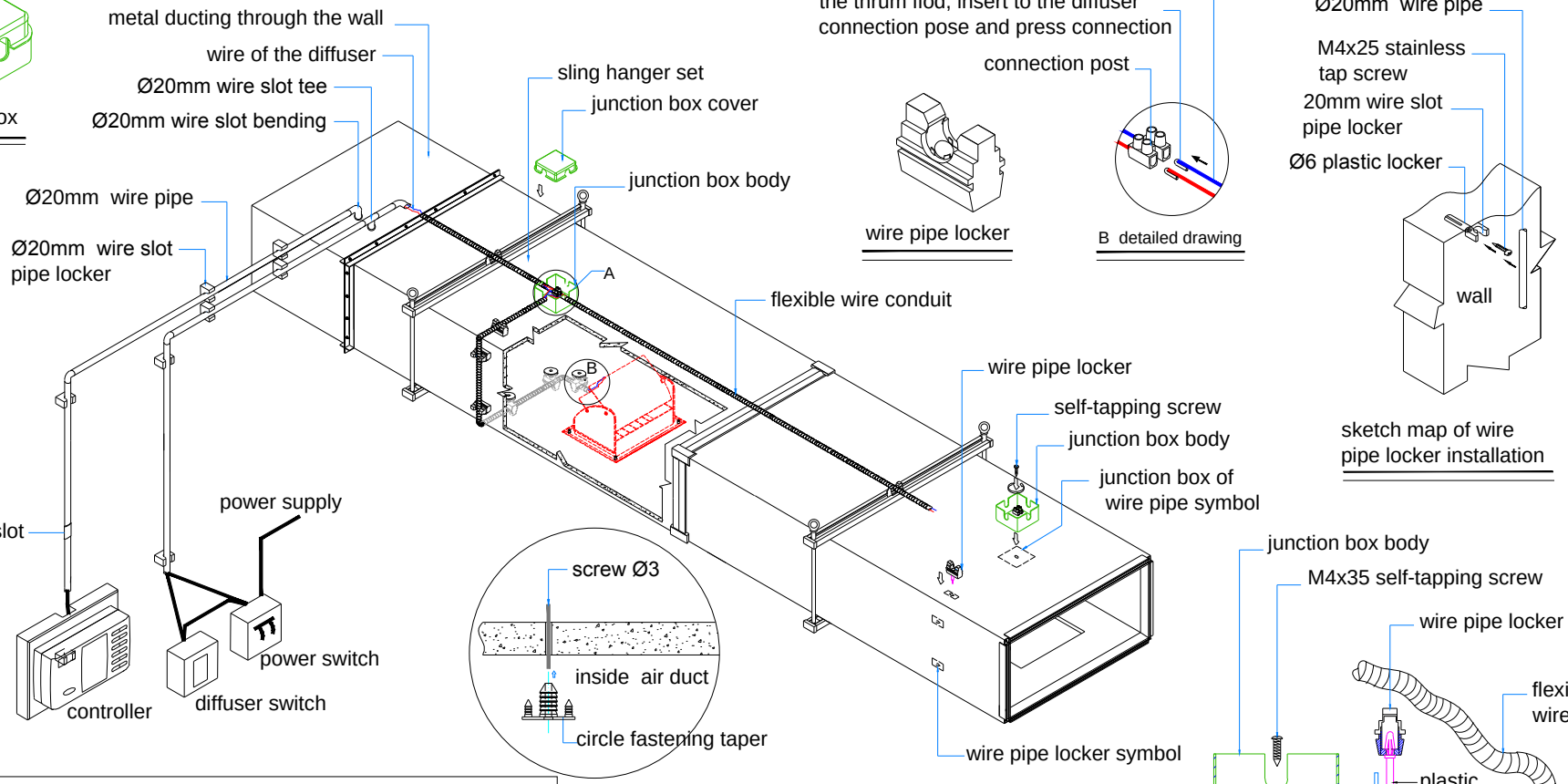
Sketch map of the wire layout for the roof installation

Supply Air System

DWG NO.:DW016



junction box



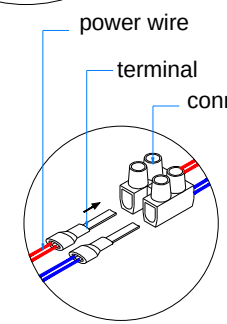
wire pipe locker

B detailed drawing

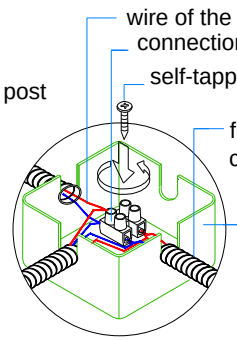
sketch map of wire pipe locker installation

Installation Steps :

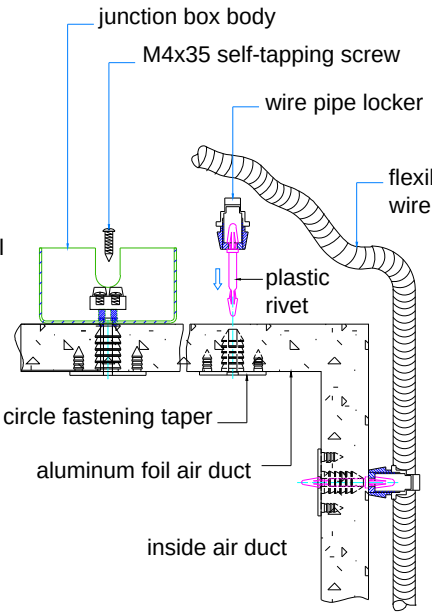
1. Fix the branch duct installation site . Open installation hole. Please refer to branch duct installation sketch map" for hole size.
2. Fix the installation site of junction box and wire pipe locker at the outside of air duct. Tap the **screw Ø3** or Cylindrical objects into the PIP air duct from duct outside. Then, tap the fastening taper from duct inside to duct outside through the air diffuser installation hole. Fix the junction box on the fastening taper with self-tapping screw and fix the wire pipe locker with plastic rivet.
3. Install the main power wire conduit of air diffuser. Fasten the wire conduit which with main power wire inside to the wire pipe locker of the sling hanger set well as the wire junction box. Besides, connect the main power wire with the wire connection.
4. Install the branch power wire conduit. Lay out the branch power wire to the wire pipe locker. Press the locker to fasten the branch power wire. One end of the wire should connect with the wire connection of the junction box , the other should connect with the wire connection of the diffuser.



Sketch map of internal wiring diagram in the junction box



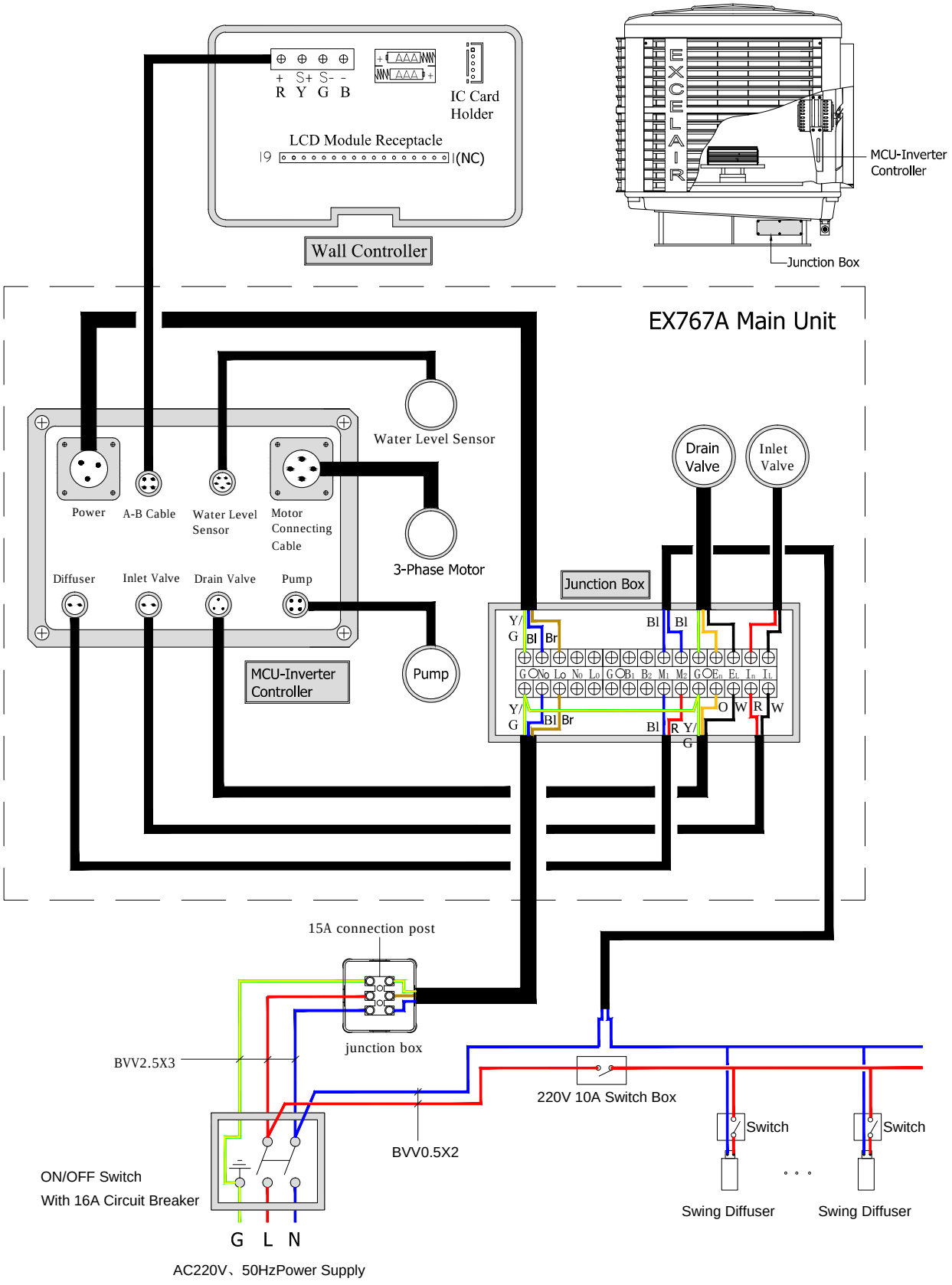
A detailed drawing



Sketch map of flexible wire conduit installation

Sketch Map of Wire for Diffuser

EX767A Circuit Diagram



Remark:

1. Within the broken line is the connection line of ventilator interior, beyond the broken line is the external connection line for installation.
2. Please connect line carefully according to the drawing when installation.
3. If the circuit breaker is installed in scope of 5 meters away from ventilator, the power wire can connect directly with circuit breaker without adding junction box.

Electrical drawing for Excelair ventilator

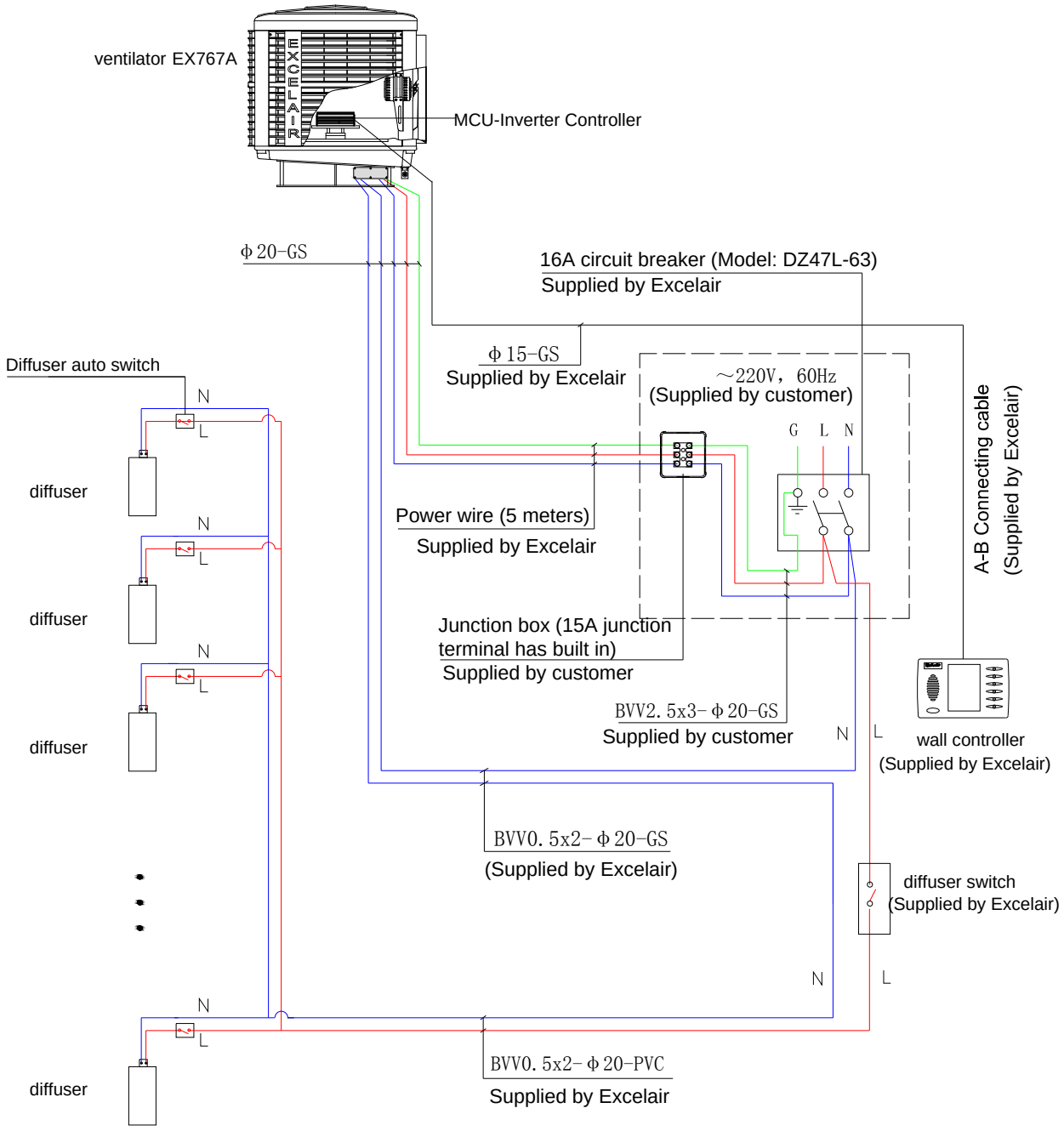


Illustration:

1. Customer should supply the single phase 220V power to ventilator in scope of 5 meters, and equip the junction box (15A junction terminal has built in) individually for each unit. (Note: If the circuit breaker is installed in scope of 5 meters away from ventilator, the power wire can connect directly with circuit breaker without adding junction box)
2. The power wire of the diffuser must be elicited from the box of circuit breaker.
3. The power wire must be connected with the terminal in the junction box, but not in the wire conduit.
4. The power wires of different units must be laid separately, and strong wire and weak wire also need to be laid separately.
5. The laid wire can be installed by plastic pipe or ∅20 galvanized pipe. Ground or ceiling installation should use galvanized pipe.
6. This drawing suits for the cooler attached with the diffuser control.

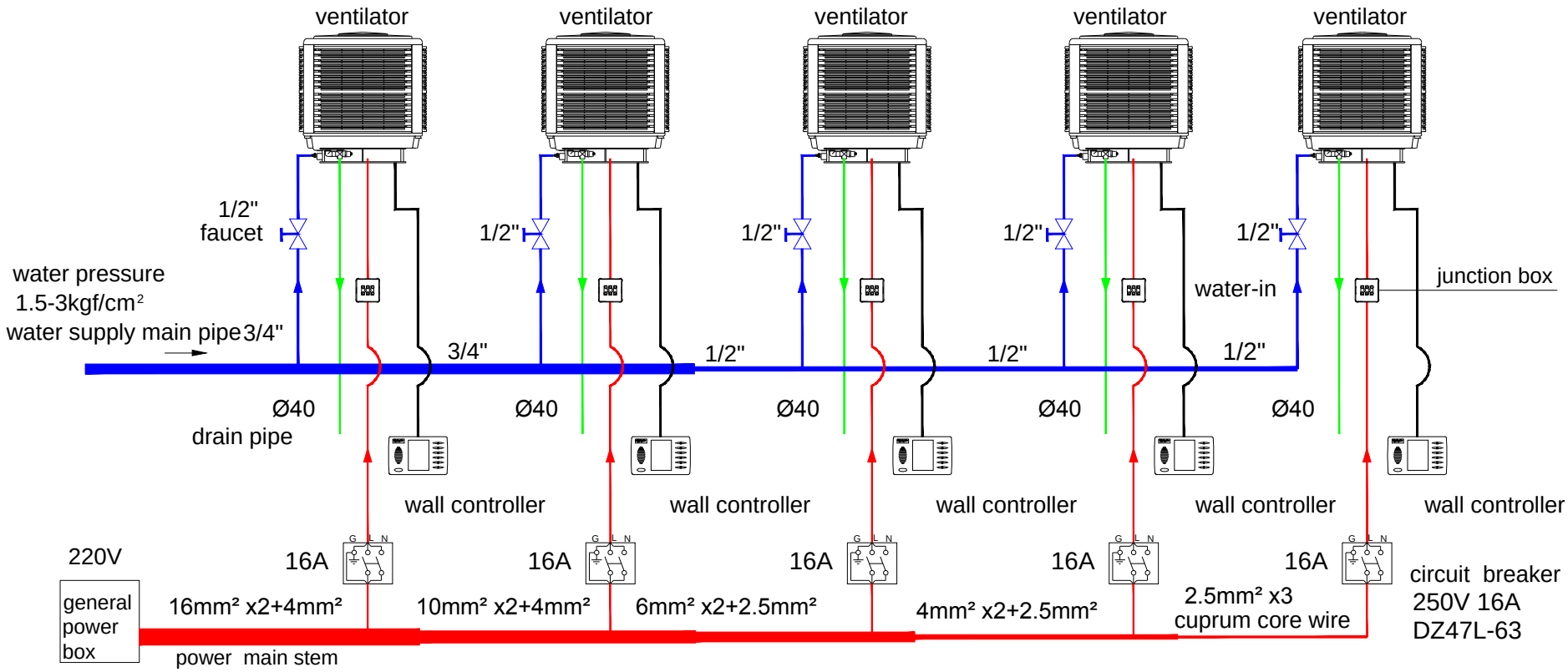


Illustration:

1. Customer should supply the single phase 220V power to ventilator in scope of 5 meters, and equip the junction box (15A junction terminal has built in) individually for each unit. (Note: If the circuit breaker is installed in scope of 5 meters away from ventilator, the power wire can connect directly with circuit breaker without adding junction box)
2. Customer must be offer the clean water supply to the ventilator around 0.2 metres, prepare three-tee pipe near the each ventilator in order to connect the branch pipe , water pressure requirement : 1.5-3kgf/cm²
3. When installing many units of coolers,please equally distribute the load of coolers to three-phase,so that the load of three-phase can be balanced.Also,installig the effective ground wire is a must when wiring.

Quantity	diameter of water pipe
16-30 units	2"
9-15 units	3/2"
6-8 units	"1
3-5 units	3/4"
1-2 units	1/2"

Label remark ： 6mm² x2+2.5mm² means 2Pcs of 6mm² wire plus 1Pcs of 2.5mm² ground wire。

2"water supply pipe , supply for 16-30 units

3/2" water supply pipe , supply for 9-15 units

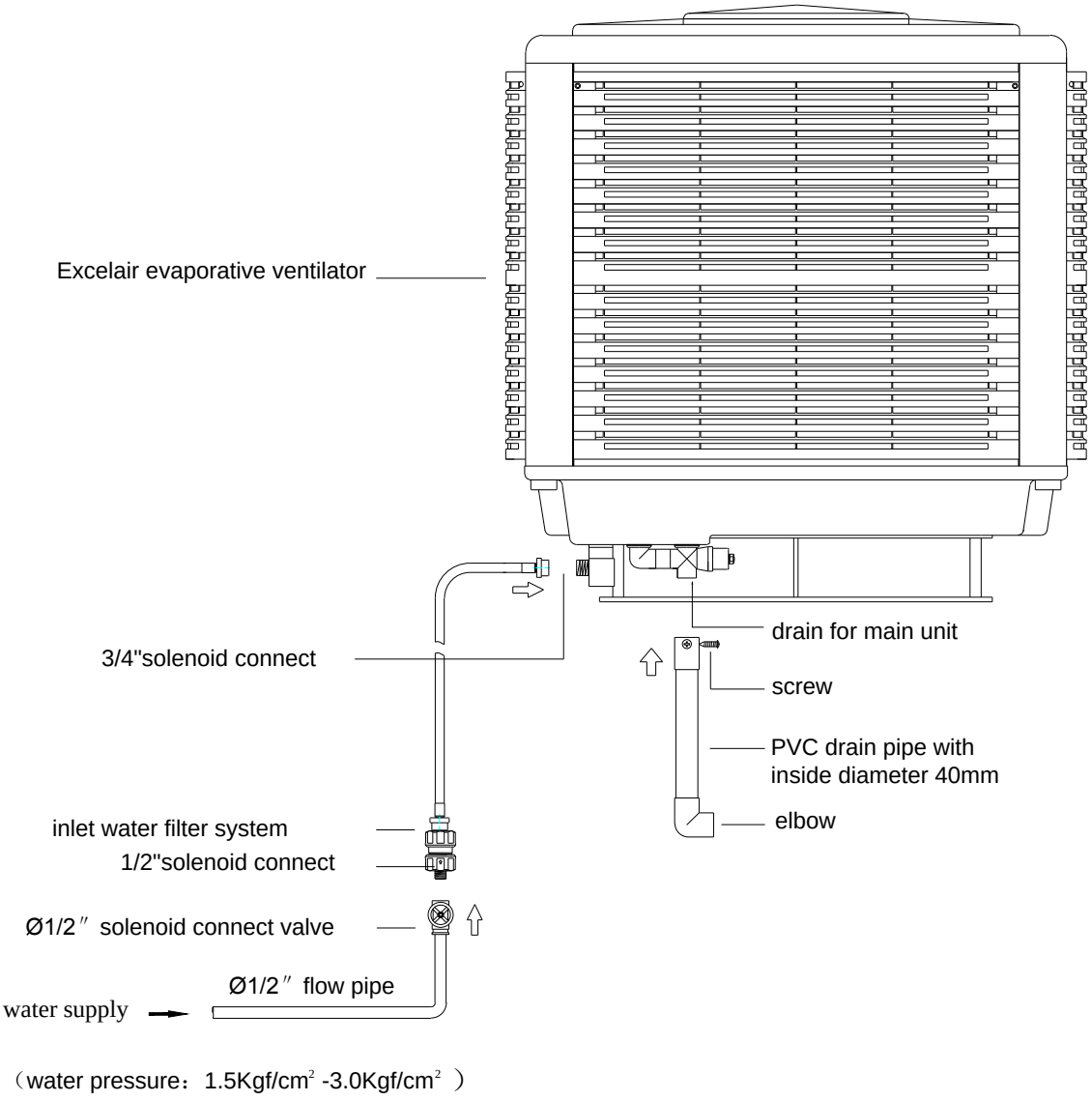
1″ water supply pipe , supply for 6-8 units

3/4"water supply pipe , supply for 3-5units

1/2"water supply pipe , supply for 1-2 units

Sketch map of water and power supply specification for Excelair ventilator

Water Supply and Drainage



Requirment:

1 The water supply would be clean, and the water pressure must be kept within 0.15～0.3MPa(1.5～3Kgf/cm²).

2 There must be a faucet connected with the water distributing pipe in order to maintenance for the future.

3 The drainpipe and out fall must connecting by M4x10 self-tapping screw for easy maintain. Do not stick them by glue.The elbow can be turned or removed.

4 The drainpipe must be extended to the sewer or the main watershoot.