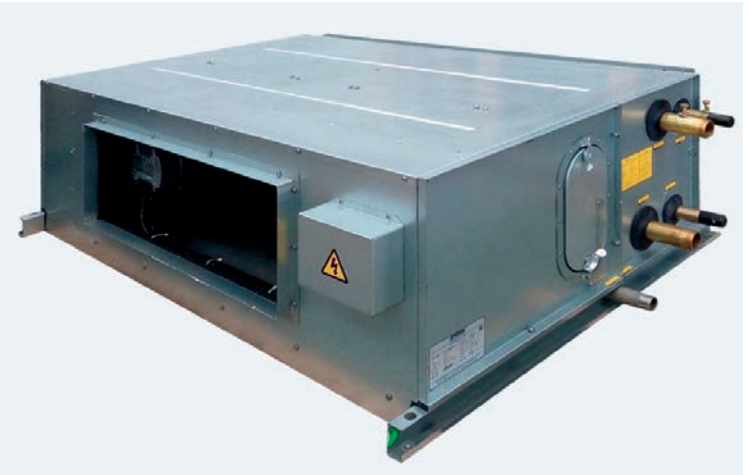
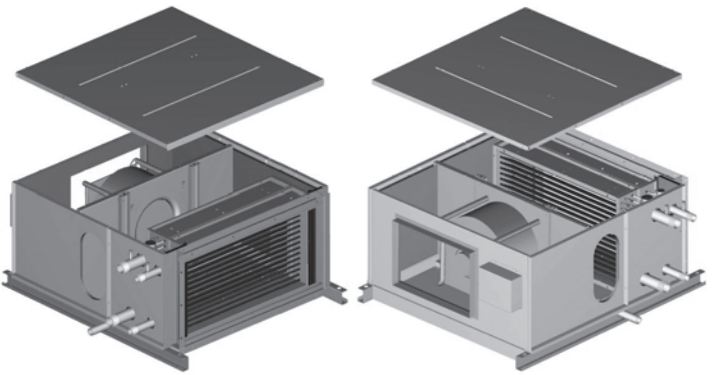
YORK®	YECAH ceiling mounted cabinet fan coil units
Installation, Operation and Maintenance Manual	FORM NO.: 6A4X–A01A–NB–EN

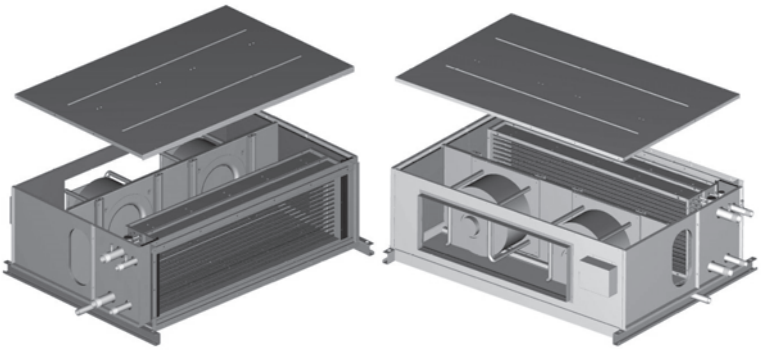


Air Flow：750~1500 L/S

Contents



Single EC Fan Unit



Double EC Fan Unit

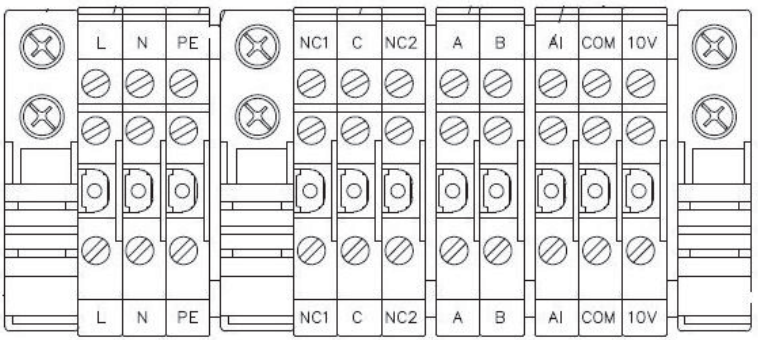
Plug EC Fan

1、Unit Introduction

1-1 Brief Introduction

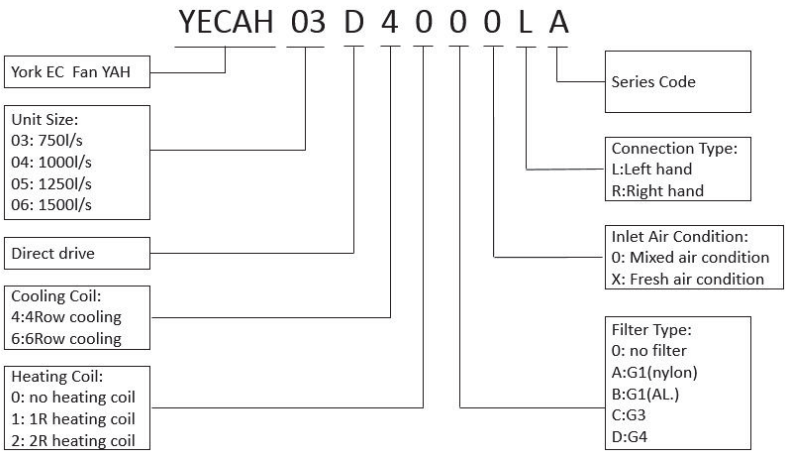
Johnson Controls YORK® YECAH ceiling mounted cabinet fan coil units are highly energy efficient, variable air volume, high airflow and static pressure HVAC terminal units. YECAH fan coil units include integrated direct drive fan with EC motor and variable speed drive.
YECAH cabinet fan coils are the ideal solution for air-conditioning of commercial buildings with ducted air distribution applications.
YECAH cabinet fan coils have a range of 4 different models.
Each model includes variable speed EC fan(s), with multiple row coil types for each model
(The 2 pipe system has 4 and 6 rows, 4 pipe system has 4+1, 4+2, 6+1 and 6+2 rows).
The air flow ranges from a nominal 750 L/s to 1500 L/s, with a cooling capacity range from 9 kW to 25 kW.
The external static pressure capability is from 175 Pa to 375 Pa depending on required air flow.
Each YECAH unit is made of high strength galvanized steel with 15 mm high density non-combustible inner thermal insulation.
Cooling and heating coils use copper tubes with corrugated aluminum fins.
YECAH units incorporate a full stainless steel drain pan with an easily removable access panel for inspection.
The single or dual EC plug fan(s) provide variable airflow and pressure from a remote 0 - 10 VDC control signal.

Each EC plug fan is factory wired to the customer terminal strip.



Terminal Strip

YECAH nomenclature：



1-2 Main Parameters

Model	Air Flow (L/S)	External static pressure (Pa)	Normal cooling capacity(kW)				Normal heating capacity(kW)			
			23/17℃		35/24℃		21℃		7℃	
			4 Row	6 Row	4 Row	6 Row	1 Row	2 Row	1 Row	2 Row
YECAH03	750	175	9.1	11.7	23.6	26.5	9.9	21.6	13.2	29.1
YECAH04	1000	175	13.2	17.4	27.4	39.4	15.5	34.2	20.4	45.5
YECAH05	1250	175	14.0	19.3	34.6	39.3	16.9	38.6	22.4	51.3
YECAH06	1500	175	18.2	23.8	44.0	53.2	20.6	47.0	27.2	62.3

Model	Fan and motor	Power Supply	Motor rated current (A)	Motor rated power (W)	unit weight(kg)	
					4 Rows	6 Rows
YECAH03	EC Plug Fan	230V-1P-50Hz	3.3	750	109	118
YECAH04			3.3	750	140	152
YECAH05			3.3 x2	750x2	155	167
YECAH06			3.3 x2	750x2	171	186

Note：

1、The weight listed in the table is the shipping weight. The operation weight of unit is about 20% more than the shipping weight.

2、Standard air cooling conditions: chilled water inlet/outlet at 6°C/13°C.

3、Standard air heating conditions: hot water inlet/outlet at 80 C/60°C.

4、For four-piped unit, heating coil is in the front of the cooling coil in the direction of air flow.

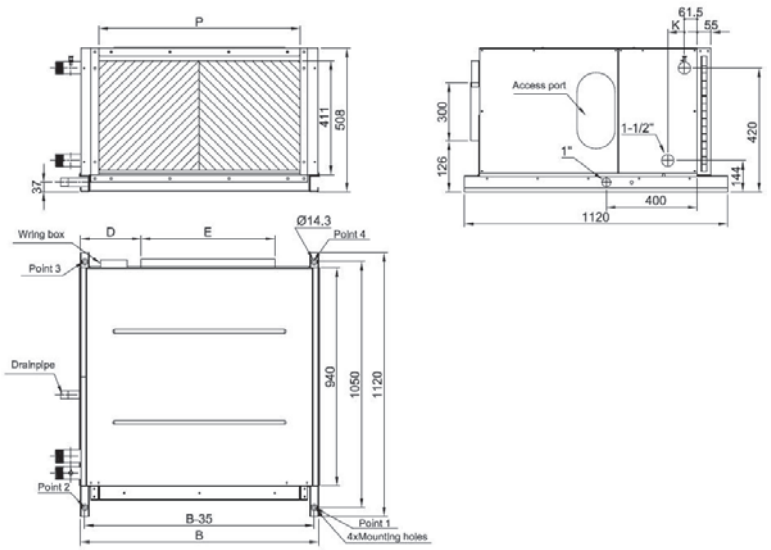
The unit performance is based on 5m altitude, the variance of altitude will affect the unit performance.

Altitude correction factors：

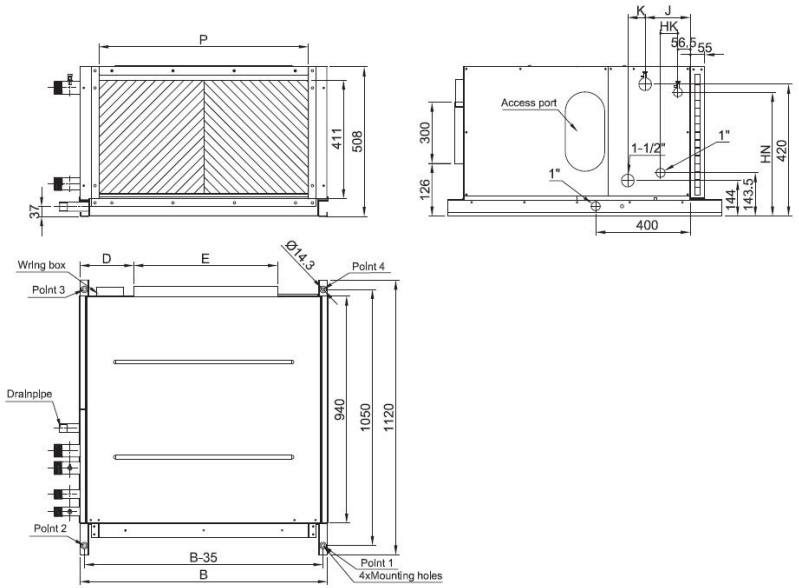
Altitude(m)	300	900	1200	1500	1800
Total capacity	0.99	0.97	0.96	0.94	0.93
Sensible capacity	0.96	0.90	0.86	0.93	0.80

1-3 Unit Drawing

Cooling coil:



Cooling coil + Heating coil:



Model	W	Outlet flange size		Inlet flange size	Piping position							
					J		K		HK		HN	
	B	D	E	P	with 1R HC	with 2R HC	4 rows	6 rows	1 row	2 rows	1 row	2 rows
YECAH03	950	326	450	804	160.5	182.5	66	110	44	66	407	420
YECAH04	1500	451	600	1360	160.5	182.5	66	110	44	66	407	420
YECAH05	1500	329	950	1360	160.5	182.5	66	110	44	66	407	420
YECAH06	1750	376	1200	1610	160.5	182.5	66	110	44	66	407	420

Model	Point Load(Kg)							
	4R Cooling Coil+1R Heating Coil				6R Cooling Coil+1R Heating Coil			
	Point 1	Point 2	Point 3	Point 4	Point 1	Point 2	Point 3	Point 4
YECAH03	38	38	31	31	40	40	35	35
YECAH04	50	50	41	41	52	52	45	45
YECAH05	56	56	42	42	58	58	47	47
YECAH06	60	60	49	49	63	63	55	55

Note：
1、 The coil pipe connections use male threads(thread code R2),
The corresponding outer imperial diameters are:
34mm—1" 48mm—1-1/2"
2、 The condensate pipe connections use 34mm O.D. male threads (thread code R2).
3、 All dimensions are SI unit (mm).

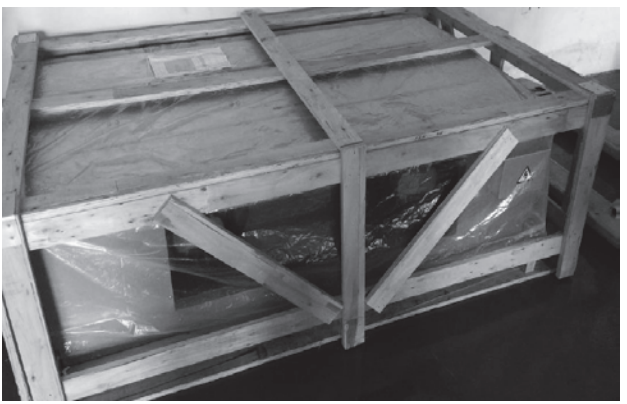
2、Transportation & Installation

2-1 Transportation

a. Units are normally shipped ex-works. They are inspected, tested, and packaged prior to dispatch, carefully loaded into containers, shipped to country of destination, unloaded, and delivered to jobsite.

b. Immediately upon receipt at jobsite, inspection should be made for any damage, which must be reported to Johnson Controls within 24 hours of receipt of goods.

c. When moving the fan coil unit, please handle with care and prevent the coil water inlet, outlet and drain pipes from getting bent or damaged. Use only approved lifting equipment.



2-2 Acceptance

a. All items must be checked against customer purchase order, delivery docket, and submittal drawings for correctness and any claims for non-compliance or short supply reported to Johnson Controls within 72 hours of delivery.

2-3 Storage

If the unit is stored on the jobsite, it should be protected against exposure to the elements.
Specifically units should be securely protected from theft, accidental damage, water ingress, moisture damage, rusting, or dust.

2-4 Lifting of the Unit

During the installation process, be careful to prevent the unit from any damage due to improper lifting and rigging. Use only approved lifting equipment. Safety should always be a priority. Only authorized lifting equipment and trained installers should be used. Equipment should be installed in accordance with all national safety codes.

2-5 Points for Attention before Installation：

Before the unit is installed, the following should be verified during the construction of the building:
1. Water Supply
2. Power Supply
3. Supply air, return air, and outside air ducting
4. Ceiling Mounting points
5. Service Access

2-6 Points for Attention during Installation：

For ceiling installation, hang the unit on threaded rods using the mounting holes provided. Alternately rubber isolators or spring mounts can be used. YECAM units

exhibit low levels of unit vibration and have high levels of balance as each direct drive EC fan / motor assembly is provided as a single manufactured and tested entity from the supplier.

Ensure correct spacing and alignment of mounting points directly above the mounting points on the unit chassis. This is important where the suspension points have been fixed into the concrete slab directly above the unit.

During the installation, be careful to avoid building materials damaging unit panels or components.

Do not remove protective covers from the coil connections until the unit is ready to be piped up.

Before the unit starts operation, any debris in the drain tray and the drain piping should be removed.

Ensure sufficient side clearance to enable air filter removal (units fitted with optional air filters).

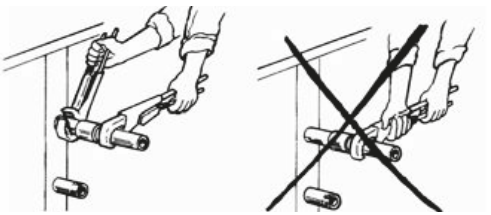
Fan and fan motor service is achieved through a removable service panel. Fan service panels are fitted to both sides of the YECAH unit. For units with two EC fans (Model 05 and 06) service access must be available from both sides of the unit. Allow at least 600mm service clearance.

2-7 Brief Introduction to the Installation

2-7-1 Water Piping

Flow and return water pipes IN and OUT are marked on the unit and water pipework should be connected through flexible couplings to avoid transmission of vibration and to allow for pipework expansion and contraction. YECAH water connections incorporate male pipe threads as scheduled in the table in this manual. Do not overtighten the water connections. Excessive tightening torque will damage the coil headers. Significant care should be taken when attaching water pipes or water valves to the coil connections.

Use a pipe wrench to restrain the pipe connections of the coil when connecting external pipework.



2-7-2 Piping Support

The weight of all connecting water pipes should be independently suspended and should not be borne by the unit.

Provide a minimum of 600mm service access to all water inlet, outlet and drain pipe interfaces.

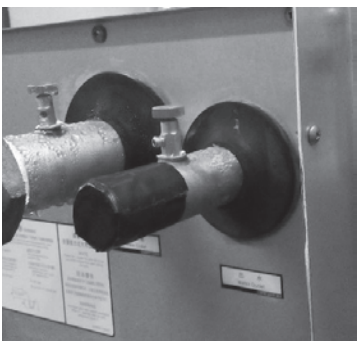
2-7-3 Determination of Water Handing of the Unit

The water inlet and outlet pipe interfaces can be arranged in the right or left side of the unit. When viewing from the unit air inlet (or along the air flow direction), if the water inlet and outlet ducts are at the right side of the unit, the unit is called a Right-handed Unit; conversely, it is a Left-handed Unit.

Ensure correct handing of the unit to be installed.

2-7-4 Air Venting of the Coil

Each unit has a manual venting valve at the highest point of the coil. With the valve opened, the gas trapped in the coil can be released. Elimination of air from the water piping system is essential for reliable performance.



2-7-5 Condensed Water Drainage

Install the YECAH fan coil level using a spirit level. Adjust the hanger rods to achieve minimum 5 mm side to side slope towards the drain outlet pipe. Do not install the unit with a slope away from the drain outlet pipe.

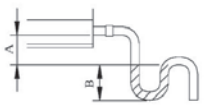
The external drain piping should slope downward and away from the fan coil unit.

A trap must be externally installed in the drain piping so that the drain will function correctly.

When external trap and pipework is installed, verify that the drain functions correctly.

Warning

Dear users,
Before the installation and commissioning of your unit, please connect the water seal (not provided by our company) with the condensed water drain pipe according the following condition.
The coil is positioned in the negative pressure side:
P= Absolute Negative Pressure Value (Pa)
A= B ⩾ P/10+20 (mm)



2-7-6 Water Treatment

Chilled and hot water systems must be filled with clean and properly treated water.

Water circuits must be adequately flushed to remove construction debris.

Poor quality water must be adequately filtered to remove impurities.

Water treatment chemicals shall be applied to prevent scale and corrosion of water circuits.

Water treatment shall be carried out by authorized professionals and shall be tested on a periodic basis.

2-7-7 Air Duct Connection

The connecting between the return air duct and the return air opening or return air plenum and that between the air outlet flange and the supply air duct or plenum must be flexible. The hard connection between the unit and the air outlet flange must be prohibited. During the installation, all air duct(s) should be provided with adequate support. Ductwork should not be supported directly by the fan coil unit.

2-7-8 Electrical Connection

The YECAH is designed for single phase power. The EC fans include integral variable speed drives.

220-240 volt power wiring including neutral and earth (Ground) is required. The supply must have a suitable power isolation switch mounted nearby to the fan coil unit, and appropriately labelled. Wiring must be in accordance with national codes and standards.

2-7-9 Control requirements

YECAH features a control terminal strip for 0-10v DC speed control, volt free alarm outputs per fan motor, an RS485 MODBUS connection, and a 10vDC output for testing fan operation by varying its speed via a 10k ohm potentiometer. (Potentiometer is supplied by others)

YECAH incorporates variable speed fans that operate from a 0-10v DC control signal. Fan speed can be continuously varied between maximum and minimum values based on the control voltage limits established in the control device.

The 0-10v control signal can be provided by a building automation system (such as Johnson Controls Metasys) or from an advanced thermostat with a 0-10v variable speed fan output (such as Johnson Controls TEC3000 range).

YECAH is equipped with high level interface connection via RS485 MODBUS. Data available from the EC fan variable speed drive can be transmitted to a building automation system to support operational and energy information requirements.

YECAH also has a set of volt free contacts for each fan motor to indicate when the motor is in fault or alarm condition.

Minimum control voltage would typically be set between 2 and 4.5 volts DC to achieve minimum fan airflow requirements.

Maximum control voltage would be typically set between 6 and 10 volts DC to achieve design fan airflow at design fan static pressure.

Note: maximum control voltage should not permit excess coil velocity greater than 2.65 m/s.

When YECAH are installed in applications with a high percentage of outside air which

may contain higher levels of humidity, the maximum control voltage shall be set to avoid moisture carryover issues. Typically under these conditions YECAH would operate at a coil velocity of 2.5 m/s or less.

Note: for jobsites where remote electric duct heaters are installed, minimum airflow settings should enable the duct heaters to operate without safety device intervention due to excessively low airflow.

Unit performance of airflow and static pressure vs control voltage can be found in the YECAH catalog.

3、Start, Commissioning and Running

3-1 Check before Start up

Check the YECAH unit before it is started:

1、 Remove any foreign material from the interior and exterior of the unit.
2、 Check all components are securely fixed
3、 Check fans can rotate freely.
4、 Check power and control wiring and available power is correct
5、 Check that the condensate drain system is installed and functioning correctly
6、 Perform air bleed and system water pressure tests.
7、 Check whether the rough filter has been installed in place
8、 Check whether the duct has been installed properly
9、 Check the water flow is balanced to design requirements.

3-2 Electric Connection

1、 The dashed lines is wiring provided by customer and it should be connected according to Fig.1. Please ensure that all connections are correct and tightened.
2、 All electric connections should comply with local electric installation codes.
3、 The earth wiring must be connected to the ground terminal in the control panel.

4、 Customer should connect the power with the appropriate isolation and safety devices

5、 The BMS or thermostat are connected and set to correct airflow limits and set-point temperatures

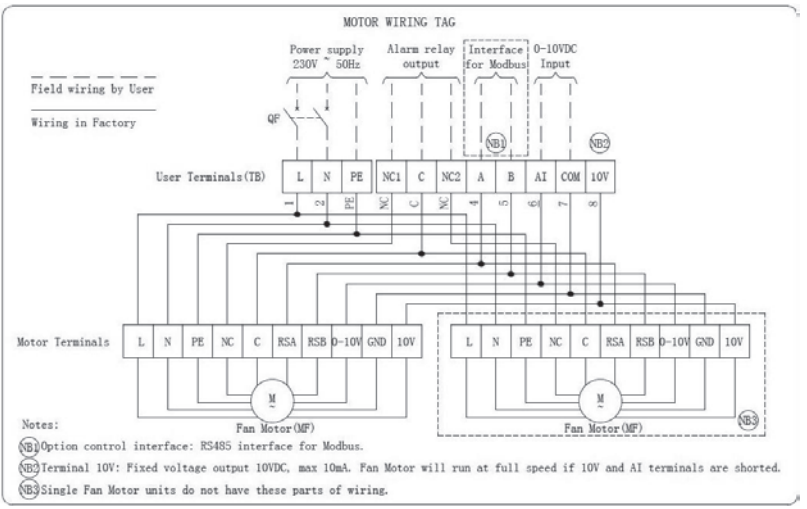


Fig 1

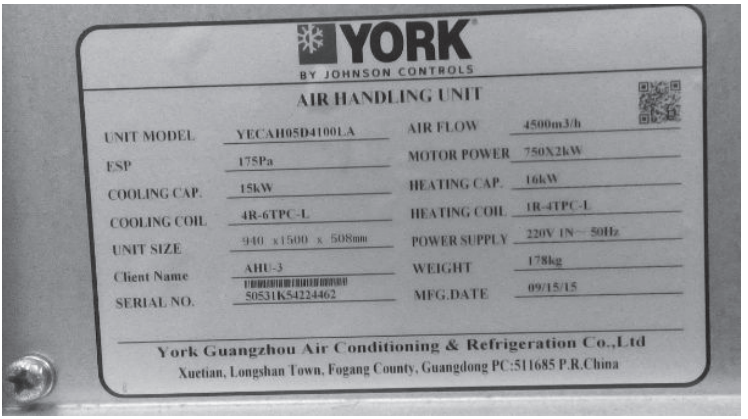
3-3 Cold area operation

When operating the fan coil unit in climates where ambient temperatures could result in coil freezing, ensure that the heating energy source is enabled, heating water is up to temperature, and heating water flow is available prior to stating the unit. Once the unit is enabled, open the outside air damper as required. This is to prevent coil frosting which may damage the unit. This is particularly important for units with air on coil conditions based on a high percentage of outside air.

For units that require seasonal drainage of water from the coils, when stopping the unit, close the fresh air damper first, isolate the power to the fan(s), and then isolate the water supply to the unit. Use the water piping drain point to drain the water in the coils to prevent damage from potential freezing.

3-4 Nameplate

You can get the unit information and simple performance parameters from the nameplate.



4、Maintenance

4-1 Air Filter

Air filters should be checked and cleaned, or replaced, as necessary on a periodic basis.

Typically inspect air filters every 3 months, but filter cleaning and replacement frequency is dependent on run hours and outside air quality.

The filter can be removed from the unit by dis-assembling the cover plate in the side or on the bottom of the filter frame.

Filters are either washable or throwaway type. For washable filters, clean it per the manufacturer’s instructions, dry it as required, and reassemble it back to the filter frame.

4-2 Cooling coil and Heating Coil

1、 On an annual basis, observe for dirt accumulated on the coil heat exchanger and clean coil fins it if required (it is recommended to clean it with the low pressure compressed air from the air outlet side).

2、 Ensure the coil fins are not damaged. Comb coil fins as required.

3、 If there is evidence that air has entered the water system, use the coil air vent to bleed air out of the system.

4、 If any coil needs to be replaced, consult with the manufacturer

4-3 Fan and Motor assemblies

On an annual basis inspect the EC fan /motor assemblies.

1、 Before any work is carried out on the fan or motor, isolate the power and lockout / tagout with appropriate warning signs.

2、 Remove the appropriate side access panel to gain access to the fan/motor assembly.

3、 Check whether the fan can rotate freely.

4、 Clean the fan blades as required.

5、 The normal service life of the fan bearing used in the YECAH unit can be up to 75,000 working hours without service. Bearings are of the sealed type.

6、 Check the tension of all motor terminals

7、 If a motor needs to be replaced, consult with the manufacturer.

5、Failure Analysis

5-1 Low Air Flow Rate

The actual static pressure needed in the outside of the unit is greater than the design static pressure and the air flow rate is turned into the static pressure. Thus, the air flow rate is lower than the design value.
Increase fan speed as required.

5-2 High Air Flow Rate

The actual static pressure needed in the outside of the unit is lower than the design static pressure, and the static pressure is turned into the air flow rate, making the air flow rate higher than the design value. The increased air flow rate increases coil velocity and increased unit noise level.
Increased air flow rate leads to risk of moisture carryover where coil face velocity exceeds 2.5 m/s.
Decrease fan speed as required.

5-3 High Noise and Vibration level

Check for correct unit isolation.
Verify that there are no vibration paths via duct or pipe to the structure.
Verify there are correctly installed flexible connections between unit, the return air, and the supply air ductwork. Verify flexible connections are correctly installed to connecting water pipes.
Ensure the unit is correctly hung, and any installed vibration isolators are installed and functioning correctly.

YORK Guangzhou Air Conditioning & Refrigeration Co., Ltd.
Phone：+86 763 4681111
Fax：+86 763 4681114

Johnson Controls

www.johnsoncontrols.com

FORM NO.: 6A4X-A01A-NB-EN
SUPERSEDES: 6A4X-A01A-NA-EN

Printed on recycled paper

* Johnson Controls is committed to the continuous product improvement.
Please note the product design may change without notification.

** This manual is for reference only. For the specific product specifications and performance, please refer to the purchase agreement.

SAP NO.: 5180228