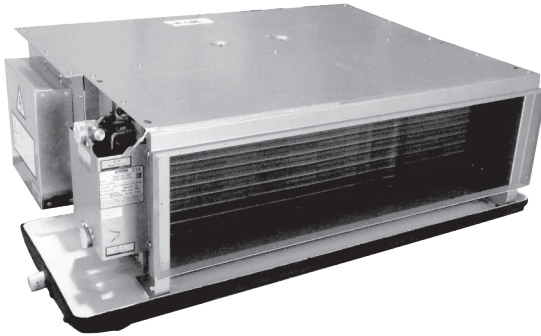




## YEDFC Fan Coil Unit

Installation, Operation &  
Maintenance Manual

FORM NO.: 6A8V-A01Z-NA-EN



Air Flow: 680~3400m<sup>3</sup>/h

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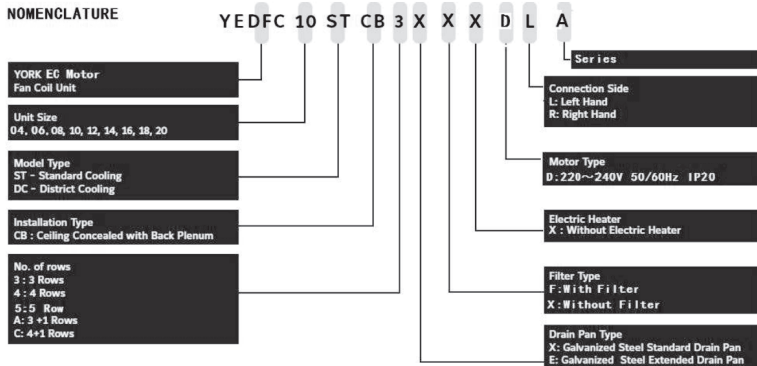
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# 1. Overview of Product

## 1.1 Explanation of Models

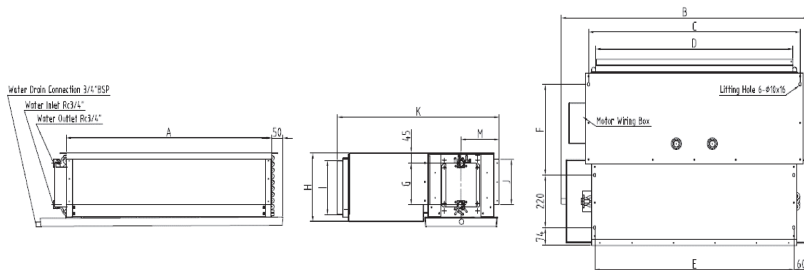
YORK Corporation can supply many types and models of fan coil unit. Users can select applicable products according to their own taste, the installation space and position, etc. Detailed types and models are explained as below.



## 1.2 Outlines & Dimensions & Weight

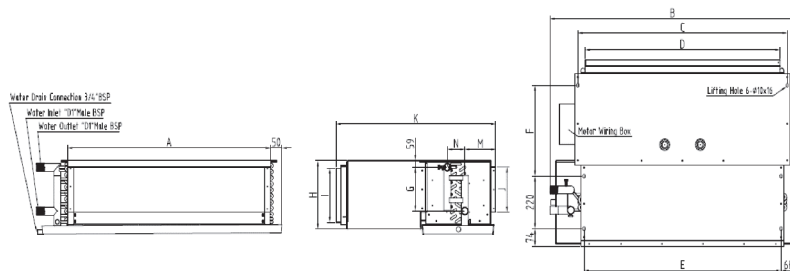
### Units Drawings ST Type

04~12 3R Model Cooling; 04~08 4R Model Cooling



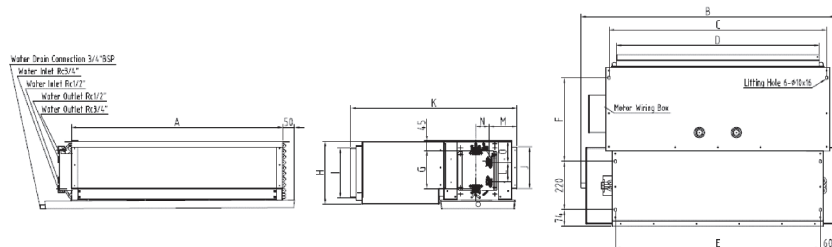
Size	A	B	B1	C	D	E	F	G	H	I	J	K	M
04 ST3/4R	830	1050	1210	860	768	800	380	173	289	225	190	775	184
06 ST3/4R	990	1210	1340	1020	928	960	380	173	289	225	190	775	184
08 ST3/4R	990	1210	1340	1020	928	960	380	215	340	275	240	775	184
10 ST3R	1120	1340	1480	1150	1058	1090	380	215	340	275	240	775	184
12 ST3R	1120	1340	1480	1150	1058	1090	380	215	340	275	240	775	184

## 14~20 3R Model Cooling; 10~20 4R Model Cooling



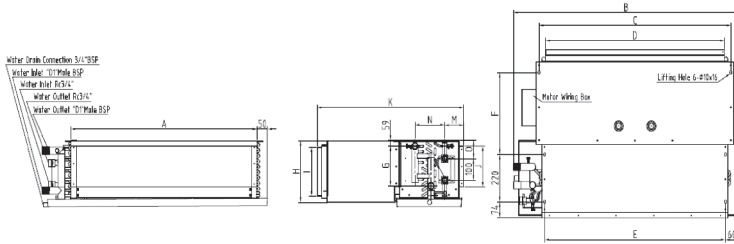
Size	A	B	B1	C	D	E	F	G	H	I	J	K	M3R	M4R	N3R	N4R	D1
10 ST4R	1120	1340	1480	1150	1058	1090	380	218	340	275	240	775	/	157	/	74	25
12 ST4R	1120	1340	1480	1150	1058	1090	380	218	340	275	240	775	/	157	/	74	25
14 ST3/4R	1120	1340	1480	1150	1058	1090	420	253	390	325	280	815	148	157	56	74	38.1
16 ST3/4R	1260	1480	1610	1290	1198	1230	420	253	390	325	280	815	148	157	56	74	38.1
18 ST3/4R	1390	1610	1710	1420	1328	1360	420	253	390	325	280	815	148	157	56	74	38.1
20 ST3/4R	1560	1780	1880	1590	1498	1530	420	253	390	325	280	815	148	157	56	74	38.1

## 04~12 AR Model Cooling; 04~08 CR Model Cooling



Size	A	B	B1	C	D	E	F	G	H	I	J	K	L	O3+1R	O4+1R	M3+1R	M4+1R	N3+1R	N4+1R
04 STA/CR	830	1050	1210	860	768	800	380	173	289	225	190	775	92	96	106	131	123	62	70
06 STA/CR	990	1210	1340	1020	928	960	380	173	289	225	190	775	92	96	106	131	123	62	70
08 STA/CR	990	1210	1340	1020	928	960	380	215	340	275	240	775	134	96	106	131	123	62	70
10 STAR	1120	1340	1480	1150	1058	1090	380	215	340	275	240	775	134	96	106	131	/	62	/
12 STAR	1120	1340	1480	1150	1058	1090	380	215	340	275	240	775	134	96	106	131	/	62	/

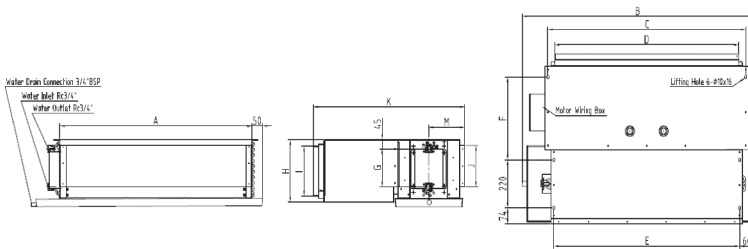
## 14~20 AR Model Cooling; 10~20 CR Model Cooling



Size	A	B	B1	C	D	E	F	G	H	I	J	K	O3+1R	O4+1R	M3+1R	M4+1R	N3+1R	N4+1R	D1
10 STCR	1120	1340	1480	1150	1058	1090	380	218	340	275	240	775	/	121	/	142	/	98	25
12 STCR	1120	1340	1480	1150	1058	1090	380	218	340	275	240	775	/	121	/	142	/	98	25
14 STA/CR	1120	1340	1480	1150	1058	1090	420	253	390	325	280	815	136	147	124	142	81	98	38.1
16 STA/CR	1260	1480	1610	1290	1198	1230	420	253	390	325	280	815	136	147	124	142	81	98	38.1
18 STA/CR	1390	1610	1710	1420	1328	1360	420	253	390	325	280	815	136	147	124	142	81	98	38.1
20 STA/CR	1560	1780	1880	1590	1498	1530	420	253	390	325	280	815	136	147	124	142	81	98	38.1

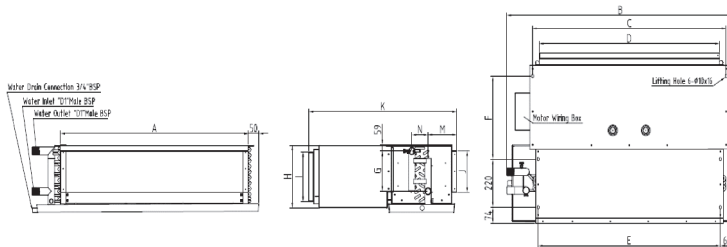
## Units Drawings DC type

### 04~12 3/4/5R Model Cooling



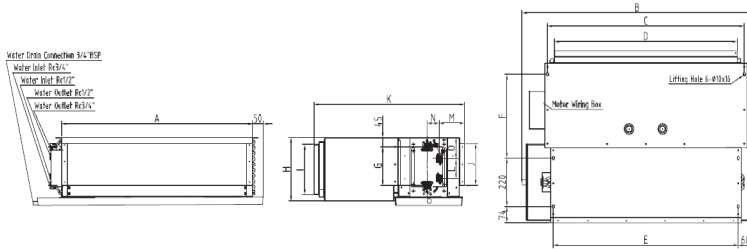
Size	A	B	B1	C	D	E	F	G	H	I	J	K	M
04 DC3/4/5R	830	1050	1210	860	768	800	380	173	289	225	190	775	184
06 DC3/4/5R	990	1210	1340	1020	928	960	380	173	289	225	190	775	184
08 DC3/4/5R	990	1210	1340	1020	928	960	380	215	340	275	240	775	184
10 DC3/4/5R	1120	1340	1480	1150	1058	1090	380	215	340	275	240	775	184
12 DC3/4/5R	1120	1340	1480	1150	1058	1090	380	215	340	275	240	775	184

### 14~20 3/4/5R Model Cooling



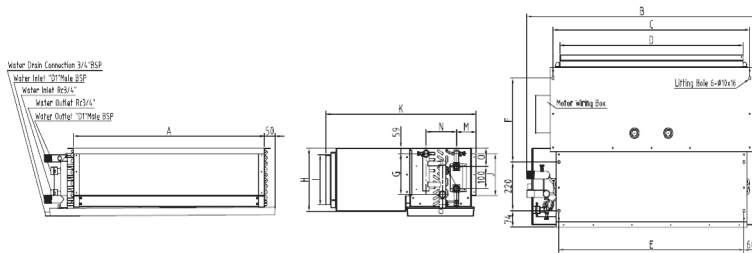
Size	A	B	B1	C	D	E	F	G	H	I	J	K	M3R	M4R	MSR	N3R	N4R	NSR	D1
14 DC3/4/5R	1120	1340	1480	1150	1058	1090	420	253	390	325	280	815	148	157	157	56	74	73	38.1
16 DC3/4/5R	1260	1480	1610	1290	1198	1230	420	253	390	325	280	815	148	157	157	56	74	73	38.1
18 DC3/4/5R	1390	1610	1710	1420	1328	1360	420	253	390	325	280	815	148	157	157	56	74	73	38.1
20 DC3/4/5R	1560	1780	1880	1590	1498	1530	420	253	390	325	280	815	148	157	157	56	74	73	38.1

## 04-12 A/CR Model Cooling



Size	A	B	B1	C	D	E	F	G	H	I	J	K	L	O3+1R	O4+1R	M3+1R	M4+1R	N3+1R	N4+1R
04 DCA/CR	830	1050	1210	860	768	800	380	173	289	225	190	775	92	96	106	131	123	62	70
06 DCA/CR	990	1210	1340	1020	928	960	380	173	289	225	190	775	92	96	106	131	123	62	70
08 DCA/CR	990	1210	1340	1020	928	960	380	215	340	275	240	775	134	96	106	131	123	62	70
10 DCA/CR	1120	1340	1480	1150	1058	1090	380	215	340	275	240	775	134	96	106	131	123	62	70
12 DCA/CR	1120	1340	1480	1150	1058	1090	380	215	340	275	240	775	134	96	106	131	123	62	70

## 14-20 A/CR Model Cooling



Size	A	B	B1	C	D	E	F	G	H	I	J	K	O3+1R	O4+1R	M3+1R	M4+1R	N3+1R	N4+1R	D1
14 DCA/CR	1120	1340	1480	1150	1058	1090	420	253	390	325	280	815	136	147	124	142	81	98	38.1
16 DCA/CR	1260	1480	1610	1290	1198	1230	420	253	390	325	280	815	136	147	124	142	81	98	38.1
18 DCA/CR	1390	1610	1710	1420	1328	1360	420	253	390	325	280	815	136	147	124	142	81	98	38.1
20 DCA/CR	1560	1780	1880	1590	1498	1530	420	253	390	325	280	815	136	147	124	142	81	98	38.1

**Notes:**

1. B is the length of drain pan
2. B1 is the length of unit including extended drain pan
3. All dimensions are in mm
4. Facing the air outlet, the left type unit has pipes on the left side, right type unit opposite.

Model	Unit Weight				
	3 Rows	4 Rows	5 Rows	3+1 Rows	4+1 Rows
	kg	kg	kg	kg	kg
04	33	34	35	35	36
06	38	39	40	40	41
08	47	48	49	49	50
10	53	55	56	56	58
12	53	55	56	56	58
14	59	61	63	63	64
16	64	66	68	68	69
18	67	69	71	71	72
20	70	76	78	78	80

Notes: Unit weight is without water content.

### 1.3 Characteristics of Fan Coil Unit

- Special hyperbolic design fins enhance heat transfer efficiency fins spacing is optimized to promote heat exchange efficiency and minimize air pressure drop.
- All fans are statically and dynamically balanced, forwardly curved, DWDI centrifugal type. The EC fan motor assembly is designed for low-noise operation, while having compact dimensions and permitting easy installation and replacement. Fans shall be mounted inside the insulated return air plenum.
- High efficiency electronically commutated (EC) motors is fitted as standard on all units. Motor can be regulated by 0-10VDC signal supplied by a BMS, thermostat or DDC controller. The motor is resiliently mounted, self aligning and oiled for life.
- YEDFC fan coil units have a variable speed driven permanent magnet motor and as such have an extremely wide operating envelope.
- The installing contractor is responsible to commission fan coil units with minimum and maximum control voltage settings commensurate with the units design operating range.
- The header provides water distribution through the water circuits for high heat exchange efficiency and reduced water pressure drop.
- The coil maximum working pressure is 1.6Mpa. Each coil is leak tested by a 2.8Mpa nitrogen overpressure test.
- Optimal design of drainage port of condensate drain pan can drain condensate water thoroughly which can reduce the growth of bacterium and microbial. The metal sheet below the coil is Powder coating plate to avoid corrosion.
- The external casing made of galvanized steel plate with high tension and excellent anti-corrosion performance is formed by punching and bending process. Thickening 6mm PE insulation is pressed and adhered on inner wall of panel, which avoids cold bridge. Base surface of drain pan is packaged and adhered strictly by primary hot-press molded 6mm Armflex (class1) insulation, which avoids secondary cold bridge.
- All factory wiring is provided to terminals located in a metallic box for customer connection.

### 1.4 Working operating range of fan coil Unit

- It is recommended the temperature of chilled water should not be lower than 5°C.
- It is recommended the temperature of hot water temperature should not be higher than 80°C.
- Conditioned and treated water quality is required.
- For maximum operating life the running temperature $\leq$ 40°C and relative humidity $\leq$ 95%.

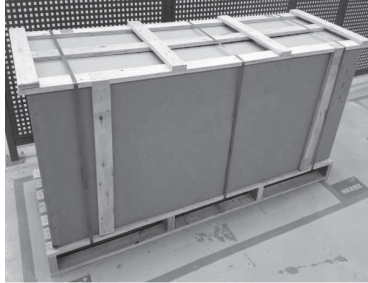
## 2. Transportation & Installation

### 2.1 Transportation

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.

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.

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. Do not carry the unit by the fan or motor assembly to avoid distortion.



### 2.2 Acceptance

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 (if applicable)
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.

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. Allow at least 600mm service clearance.

Installation of CB series-ceiling concealed type unit: Insert the reserved screws on ceiling to the six kidney-shaped holes.

## 2.7 Installation

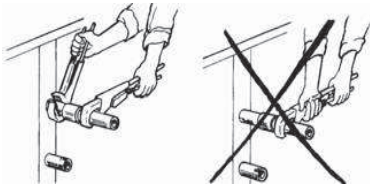
### 2.7.1 Water Piping

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. YEDFC water connections incorporate male pipe threads as scheduled in the table in this manual.

Do not overtighten the water connections. Significant care should be taken when attaching water pipes or water valves to the coil connections.

In order to confirm the unit is not damaged during transportation, leakage inspection (1.0Mpa) for coil is required before installation.

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 outlet (or reverse the air flow direction), if the water inlet and outlet pipes 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 Condensed Water Drainage

Install the YEDFC fan coil level using a spirit level. Adjust the hanger rods or mounting bolt tension 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.

Note: YEDFC units are a “blow through” design.

### 2.7.5 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.

### 2.7.6 Air Duct Connection

Where YEDFC are used in a ducted application, 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.

### **2.7.7 Electrical Connection**

The YEDFC 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.

### **2.7.8 Control requirements**

YEDFC features a control terminal strip for 0-10V DC speed control.

YEDFC incorporates variable speed fans that operate from a 0-10V DC control signal (less than 1V, the fan does not run; the fan speed is from min to max when control voltage from 1V to 10V)

Fan speed can be continuously varied between maximum and minimum values based on the control voltage limits established in the control device.

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

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 2.5 m/s.

Maximum control voltage should not exceed 10V, and negative control signal are forbidden, otherwise the fans would be damaged.

When YEDFC 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.

Note: for jobsites where remote electric heaters are installed, minimum airflow settings should enable the 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 YEDFC catalog.

## **3. Startup & Running of Product**

### **3.1 Check before Start up**

Check the YEDFC 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 air filter has been installed in place.
8. Check whether the duct has been installed properly (ducted unit applications).
9. Check the water flow is balanced to design requirements.
10. Check the BMS or thermostat are connected and set to correct airflow limits and set-point temperatures.

### **3.2 Electric Connection**

Before wiring, please check voltage, frequency, and phase and confirm whether they are correct. Power connection should be installed according to electric schematic diagram. Earth lead should be connected firmly. Wiring diagram is as Fig.1. The recommended wire size is as below sheet.

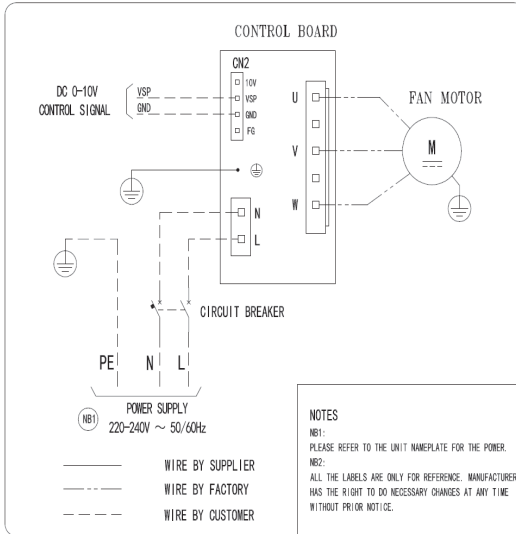
Several different models of unit sharing a single temperature controller are not prohibited.

Wire Size recommended is based on 40°C ambient temperature. Only copper wire can be used.

**Please follow the local electrical codes and wiring standards in all cases.**

A circuit breaker should be installed to the supply power.

**Fig.1 Wiring Diagram**



Model	Power	Wire Size	Recommended Breaker (with earth leakage protection)
YEDFC04	220~240V, 50/60Hz	1.0 mm <sup>2</sup>	10A 2P C Type
YEDFC06	220~240V, 50/60Hz	1.0 mm <sup>2</sup>	10A 2P C Type
YEDFC08	220~240V, 50/60Hz	1.5 mm <sup>2</sup>	16A 2P C Type
YEDFC10	220~240V, 50/60Hz	1.5 mm <sup>2</sup>	16A 2P C Type
YEDFC12	220~240V, 50/60Hz	1.5 mm <sup>2</sup>	16A 2P C Type
YEDFC14	220~240V, 50/60Hz	1.5 mm <sup>2</sup>	16A 2P C Type
YEDFC16	220~240V, 50/60Hz	1.5 mm <sup>2</sup>	16A 2P C Type
YEDFC18	220~240V, 50/60Hz	1.5 mm <sup>2</sup>	16A 2P C Type
YEDFC20	220~240V, 50/60Hz	1.5 mm <sup>2</sup>	16A 2P C Type

Check the control voltage between VSP and GND before connecting control signal to the control board.

Make sure that the control signal line is not too long (less than 5 meters is recommended) to avoid the control voltage between VSP and GND being too low, which may reduce fan performance.

Do not use intermediate transmission when connecting control signal, to prevent control signal drift and be interfered.

If the wire is too long or wiring environment has strong interference, anti-jamming process such as enlarge wire diameter and signal filtering needed before connecting to VSP and GND terminal on control board.

### 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 starting 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.

## 4. Maintenance & Service of Product

### 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, noting that filter cleaning and replacement frequency is dependent on run hours and outside air quality.

The filter can be removed from the unit by sliding the filter out of the return air plenum filter track.

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 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 system air vent to bleed air out of the system.
4. When fan coil unit is non-use, the coil should be filled with water in summer so as to avoid rust corrosion. In winter must do the unit antifreeze protection, when the temperature is below 5°C, the following antifreeze measures must be taken: Add antifreeze protection (recommended use of ethylene glycol), drain out the water in coil or ensure the continuous operation of the circulating pump.
5. 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 ductwork to gain access to the fan/motor assembly located in the unit's air plenum.
3. Check whether the fan can rotate freely.
4. Clean the fan blades as required.
5. Check the tension of all motor terminals
6. 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 is greater than the design static pressure and. Thus, the air flow rate is lower than the design value.

Increase control voltage to increase fan speed as required.

### **5.2 High Air Flow Rate**

The actual static pressure needed is lower than the design static pressure, 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 control voltage to decrease fan speed as required.

### **5.3 High Noise and Vibration level**

Check for correct unit isolation.

Check if the impeller is loose or stuck;

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.

### **5.4 No Air Flow Rate**

Check whether the power supply and control voltage are normal;

Check whether the electrical wiring is normal;

Check if the impeller is loose or stuck;

None of the above, please contact the after-sale replacement control board;



YORK Guangzhou Air Conditioning & Refrigeration Co., Ltd.

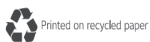
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SUPERSEDES: NOTHING

\* 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.

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