



YBFC-J Fan Coil Unit

Installation, Operation &
Maintenance Manual

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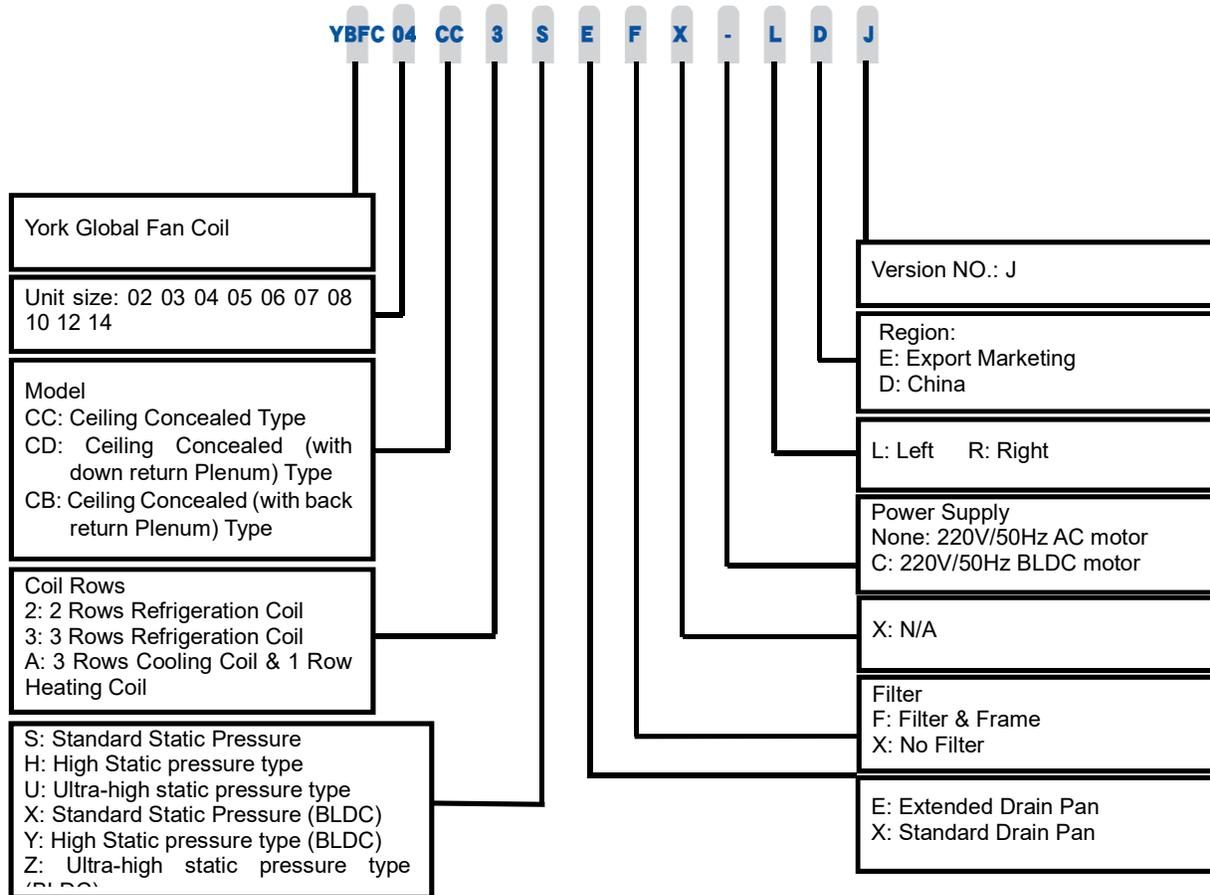
Contents

1. OVERVIEW OF PRODUCT	1
1.1 EXPLANATION OF MODELS	1
1.2 CHARACTERISTICS OF FAN COIL UNIT	2
1.3 WORKING CONDITION OF FAN COIL UNIT	2
2. TRANSPORTATION & INSTALLATION	2
2.1 TRANSPORTATION	2
2.2 INSTALLATION	2
3. STARTUP & RUNNING OF PRODUCT	4
4. MAINTENANCE & SERVICE OF PRODUCT	5
5. WARNINGS.....	5
6. HYDRAULIC TEST	5
7. TROUBLESHOOTING.....	7

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 Characteristics of Fan Coil Unit

1. Special hyperbolic windowed-fins and Y-type heat-exchange copper pipe are adopted, which strengthens disturbance of air current. Fins spacing is regulated to optimize pipeline setting and promote heat exchange efficiency of coil comprehensively.
2. According to the performance curve of fan, optimize structure of motor to make the performance curve of fan comply with that of motor with which the deviation of air volume can be reduced to maximum extent when fan load changes.
3. Water separating & collecting header made of single forged molding brass makes refrigerant water inflow and outflow coil be arranged more equally and make water pressure drop be smaller which greatly raise heat-exchange efficiency and reduces water pressure drop in water system.
4. Optimal design of drainage port of condensate drain pan can drain condensate water thoroughly which can reduce the growth of bacterium and microbial.
5. TiO₂ sterilizer (optional component) is installed on unit, which can kill most of bacterium and virus in air and improve air quality completely.
6. The external casing made of galvanized steel plate with high tension and excellent anti-corrosion performance is formed by punching and bending process. 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 insulation, which avoids secondary cold bridge.
7. Single-phase 3-speed permanent-magnet capacitance –driven asynchronous motor is the important power drive part. Motor central rotor has been hardened and tempered, chrome-plated and antiseptic-treated. Equipped with high-precision permanent-lubrication Japan NSK rolling sealing bearing to meet the requirement of high efficiency and hyper-low noise level.
8. Starting capacitance is completely sealed in metallic casing. The external power supply cable of motor is packaged by flexible metal tube, which meets international fire-prevention safety standards.
9. Double intake centrifugal fan with forward-curved impeller made of galvanized steel plate is regulated and tested by static and dynamic equilibrium testing strictly, the processed air is streamline sent out which reduces vortex air current and greatly reduces noise caused by air current friction. The unit will run more stably and calmly.
10. Before ex-factory, operation test, high-voltage test and insulation test are performed. All terminals of unit are set in metallic box so as to guarantee more security operation.
11. Each coil is leak-detected by 3.2Mpa nitrogen and overpressure gas-tight test. The maximum working pressure allowed is 1.6Mpa so as to guarantee performance and quality of each unit.

1.3 Working condition of fan coil Unit

1. The temperature of refrigerant water should not be lower than 5°C, so as to avoid dewing. And hot water temperature should not be higher than 80 °C (usually 60°C).
2. Clean and soft water quality is required.
3. Running temperature ≤40°C and relative humidity ≤95%.

2. Transportation & Installation

2.1 Transportation

1. During the course of transportation, the unit should not be knocked, fallen, crushed and suffered from rain and snow.
2. The unit should be placed in clean, dry, fire-protection and ventilated site, without any corrosive gas around it
3. Please handle the unit with care. Do not stretch your hands into fan volute to carry it so as to avoid distortion of impellers.

2.2 Installation

1. Fan Coil unit should be installed by personnel who knows well about such products and local relative regulations.
2. In order to confirm the unit is not damaged during transportation, leakage inspection (1.0Mpa) for coil is

required before installation.

3. Before installation, please confirm prior preparation be ready or not, such as air duct, water pipe, wiring interface and clamping screws, etc.
4. Vertical-exposed type unit should be installed on horizontal ground. Ceiling-exposed type unit should be lifted. 6-8mm full-thread screws and plain washer, spring washer and nuts are adopted to hold it. Lifting should be firm and hard. The lifting point should be tightened, and it should have enough strength to bear weight of unit and vibration when unit runs. When lifting unit, please keep drain pan has 5°slope angel against drainage pipe so as to drain condensate water.
5. When installing unit, water pipes and unit should be connected by flexible pipe and adhesive tape. Torque should not exceed 50 N.M so as to avoid water leakage.
6. When the unit is installed, it is suggested that the interface between the air inlet of the unit and the air duct is connected with the canvas.
7. A water filter should be installed on inlet water pipe to avoid coil being blocked by contamination. Inflow water should be softening so as to guarantee heat exchange efficiency of coil.
8. Valves should be installed in inlet and drainage duct, which can regulate flow volume and cut off water source when maintaining and inspecting. Pipeline should be pre-heat preservation so as to avoid leakage of condensate water.
9. Filter should be installed in inlet of condensate water pump to avoid coil being blocked by contamination. For the unit without air filter, please install filter screen in return inlet to avoid dust blocking coil fins.
10. Installation of CC series-ceiling concealed type unit: Insert the reserved screws on ceiling to the four kidney-shaped holes. Fix them by plain washer, spring washer and nuts.
11. Installation of VC series- vertical concealed type unit: This kind of unit can be fixed from the rear of unit by installing 6-8mm embedded full-thread screw, equipped with plain washer, spring washer and nuts. About 50 angle of inclination should be left by adjusting the foundation so as to drain condensate water freely.
12. Before wiring, please check voltage, frequency and phase and confirm whether they accord with requirement of unit or not. Deviation of voltage should not exceed 10% of rated voltage. Power and switches connection should be installed according to electric schematic diagram strictly. Earth lead should be connected credibly. Wiring diagram is as follows; Fig. A applies to AC motor unit , Fig. B applies to BLDC motor unit.

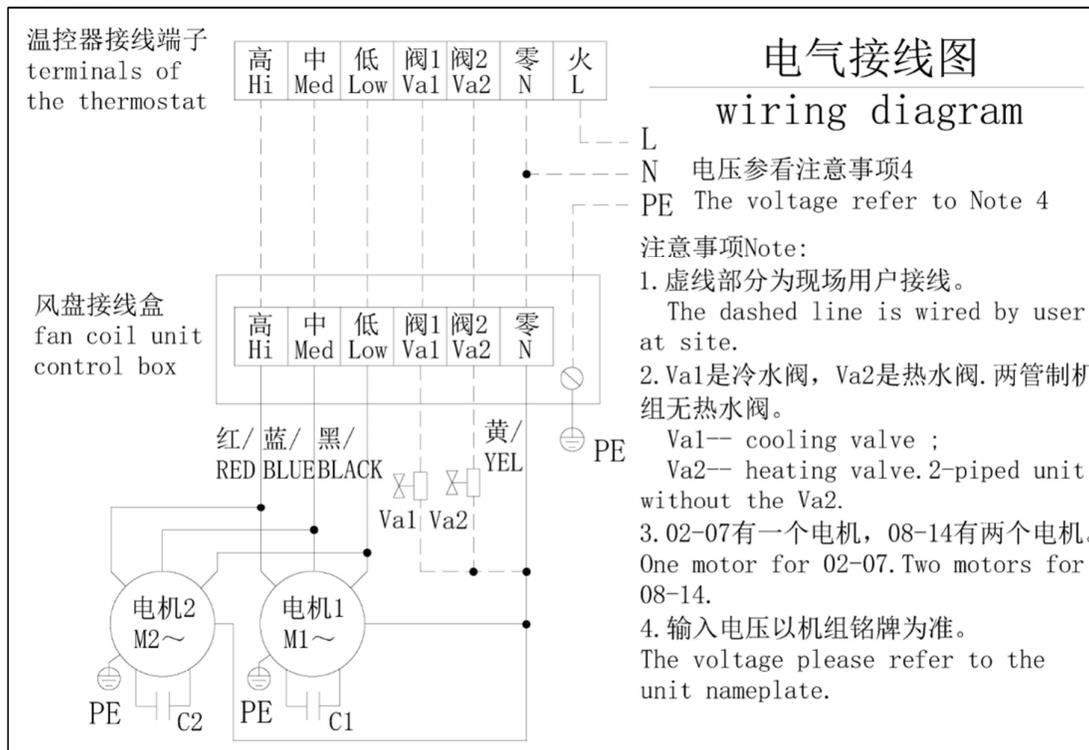


Fig. A AC motor unit wiring diagram

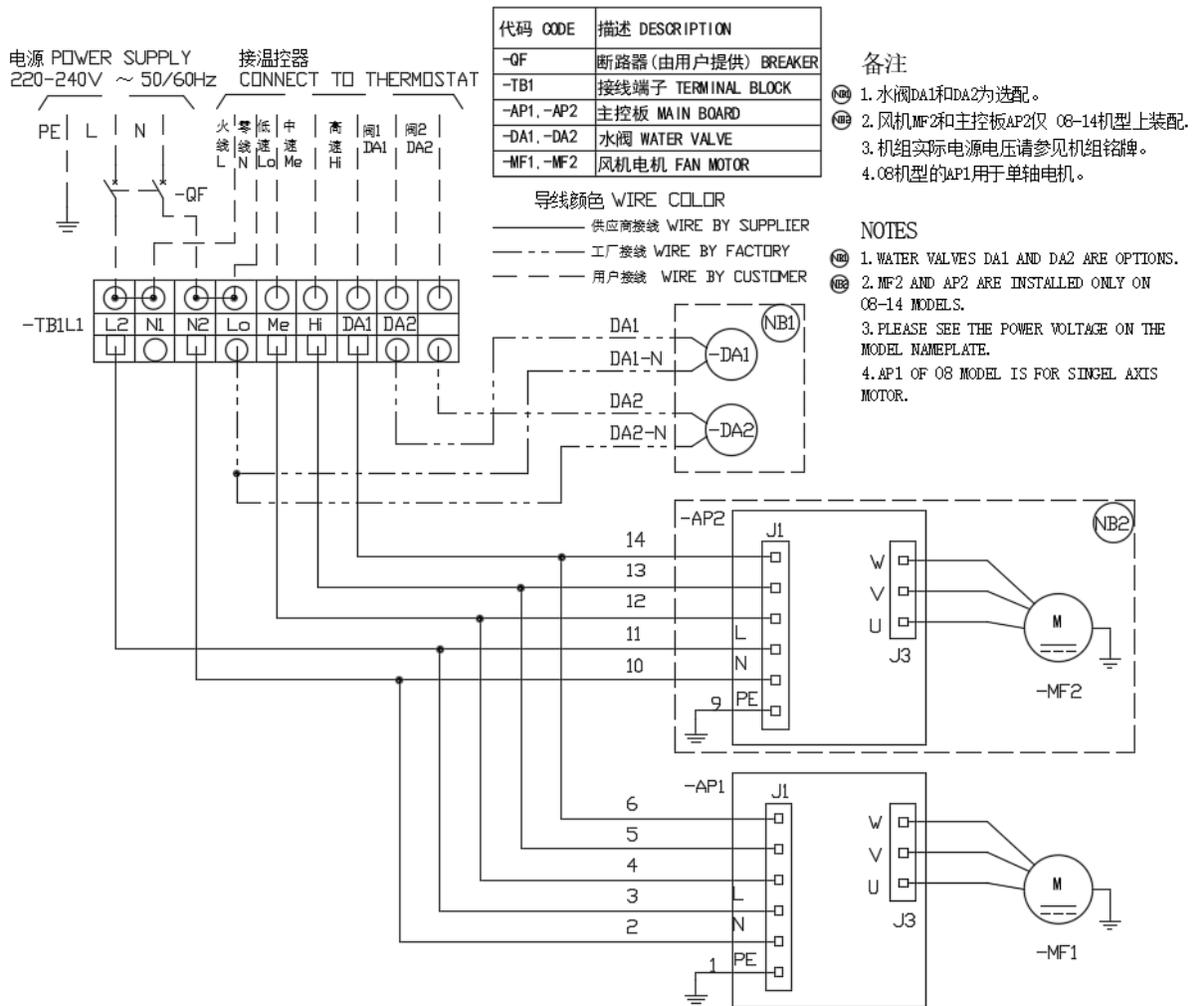


Fig. B BLDC motor unit wiring diagram

3. Startup & Running of Product

- After finishing installation of unit, please rotate wind wheel manually. If there is no mechanical friction sound, switch on power and inspect the rotation direction of wind wheel.
- Before operating the unit, please eliminate foreign matters in drain pan, in air duct and around coil. Check the installation points, such as water pipes, electrical wiring, and so on.
- Before operating the unit primarily, please close inlet and drainage valves. After cleaning refrigerant water pipeline system, open the inlet and drainage valves.
- Release valve on outflow water pipe should be opened in initial running so as to exhaust air in pipeline. Do not close valve until water outflows.

4. Maintenance & Service of Product

1. Air conditioning unit should be maintained by professional staff. Daily monitoring and periodical maintenance for the unit are required. Strict position guide system and operating instructions should be established. Regular maintenance, service, examination and repair should be done.
2. Filter screen should be cleaned once every three months.
3. Pipes should be cleaned periodically. Eliminate collected dust outside pipes and scale crust in pipes so as not to affect heat exchange and ventilation.
4. When fan coil unit is non-use, the coil should be filled with water in summer so as to avoid rust corrosion. Winter must do the unit antifreeze protection, when the temperature is below 5°C, the following antifreeze measures must be taken: Add antifreeze fluid (recommended use of ethylene glycol), drain out the water in the coil or ensure the continuous operation of the circulating pump.
5. When examining and repairing fan coil unit, power should be shut off and caution board with "Maintaining.....Please do not switch on" should be set in the place of power so as to avoid danger.

5. Warnings

1. Screw down connecting pipelines with right force. Otherwise it will cause structural destruction of coil.
2. Null line should be connected in connecting point of null line. Otherwise motor will be burnt out.
3. Establishing pressure test plan should follow the principle as follows: Water flows from lower place to higher place; water inflows storey by storey and abiding by the attentions which pressure testing and adding water are required. Otherwise it will probably cause structural destruction of fan coil unit and system pipelines.

6. Hydraulic Test

Before pressure test is operated, firstly, pressure testing plan should be established, applicable pump is selected, and reasonable waterway is set up. During the course of pressure test, please record the condition of pressure test carefully and inspect the changing of pressure at any moment. The following items must be considered when pressure test plan is drawn up:

Open the release valve on drain header before adding water into coil. Close valve after air in coil is exhausted.

1. Hydraulic testing should be operated with temperature above 5°C. Otherwise anti-freezing measurement should be taken.
2. Hydraulic testing should be performed with pressure increasing step by step. Pressure should be increased slowly and equally. After water pump stops running and hydraulic pressure is stable, please check all joints carefully so as to confirm water leakage exists or not. Mending cannot be done under hydraulic pressure.

Water Treatment

Dirt, grease, and other impurities will adversely affect the efficiency of the heat exchanger and the performance of the unit. The foreign matter in the chilled water will increase the water pressure drop of the heat exchanger, reduce the water flow, cause mechanical damage to the heat exchanger tube clusters, and even block the water channels.

Please check the water quality of the water system strictly in accordance with the water quality requirements of the unit to ensure that the water quality in the unit meets the requirements in the table.

 Item	Unit	Reference Value (Recycled Water)	Tendency	
			Corrosion	Scaling
PH Value (25°C)		7.0-9.0	○	○
Conductivity (25°C)	μS/cm	<800	○	○
Chloride (Cl ⁻)	mg(Cl ⁻)/L	<200	○	
Sulfate (SO ₄ ²⁻)	mg(SO ₄ ²⁻)/L	<200	○	
Acid Consumption (PH=4.8)	mg(CaCO ₃)/L	<100		○
Total Hardness	mg(CaCO ₃)/L	<200		○
Calcium Hardness	mg(CaCO ₃)/L	<150		○
Silicon Dioxide (SiO ₂)	mg(SiO ₂)/L	<50		○
Iron (Fe)	mg(Fe)/L	<1.0	○	○
Sulfide (S ²⁻)	mg(S ²⁻)/L	不得檢出	○	
Ammonia (NH ⁺)	mg(NH ⁺)/L	<1.0	○	
Copper (Cu)	mg(CU)/L	<1.0	○	
Free Chlorine (Cl)	mg(Cl)/L	<0.5	○	
Carbon Dioxide (CO ₂)	mg(CO ₂)/L	<10	○	
Dissolved Oxygen (O ₂)	mg(O ₂)/L	<0.1	○	
Phosphoric Acid (PO ₄ ³⁻)	mg(PO ₄ ³⁻)/L	<0.5		○

Attention:

- The reference item requirements must be met, otherwise the heat exchanger will fail. It is recommended to meet reference item requirements to ensure the heat exchange work in the best state.
 - The user needs to regularly check the water quality before installation and during use of the unit. Please ensure that the water quality meets the requirements of the above table. Once the water quality exceeds the allowable value for a long time, the heat exchanger may be corroded and leaked and severely scaled.
 - Corrosion-prone items indicate that long-term water quality exceeding the allowable value can cause corrosion and leakage of heat exchange tubes, making the unit unable to operate normally and affecting normal use.
 - Projects with a tendency to fouling indicate that long-term water quality exceeding the allowable value will cause serious fouling of the heat exchanger, affecting heat exchange, and directly leading to a decline in the cooling (heating) effect of the unit.
 - The loss caused by the user's water quality shall be borne by the user.
3. Adding water, exhausting and testing storey by storey are required.
 4. If pipelines have no leakage, thermal insulation treatment for pipelines is necessary according to setting plan.

7. Troubleshooting

1. Over-high Noise:

Possible Reasons:

- a. Motor shaft is destroyed.
Suggestion: Replace motor.
 - b. Clamping screws of fan are loosened.
Suggestion: Tighten screws.
 - c. Volute distorts and impeller knocks.
Suggestion: Replace fan.
-

2. Condensate water doesn't discharge freely:

Possible Reasons:

- a. Pipes block.
Suggestion: Check pipe valves to find whether they are open or there is any foreign matters in it or not.
 - b. Inclination degree is not enough.
Suggestion: Regulate the height of unit to set angle of inclination.
-

3. Motor is burnt out:

Possible Reasons:

- a. Incorrect wiring.
Suggestion: Replace motor and wiring according to wiring diagram strictly.
4. Air volume is not enough:

Possible Reasons:

- a. Resistance of duct exceeds the setting value.
Suggestion: Reduce resistance of duct or re-select unit.
- b. Incorrect unit type.
Suggestion: Re-select unit.
- c. Low voltage.
Suggestion: Regulate voltage or re-select unit.



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