

FAN COIL AIR CONDITIONERS

INSTALLATION, OPERATION, & MAINTENANCE Supersede

Supersedes: Form 115.20-NOM2 (1199) Form 115.20-NOM2 (105)



MODEL YHBC - Ceiling Concealed Model



MODEL YHH - Ceiling Concealed Model with Electric Heat



MODEL YPHBC – Ceiling Concealed Model with Insulated Return. Plenum and Filter

MODEL YPHH – Ceiling Concealed Model with Electric Heat, Insulated Return Plenum and Filter



MODEL YCHBC – Ceiling Cabinet Model











MODEL YPHYB – High Capacity Ceiling Concealed Model with Insulated Return Plenum and Filter

Notes:

- 1. 2-Pipe units have one water coil. 4-Pipe units have two water coils.
- 2. Changeover is used to select heating or cooling mode.
- 3. YORK International does not recommend "fan cycle" applications for cooling on unit mounted thermostats.
- 4. For proper operation, control valve must be normally closed.
- 5. Aquastats provided where required.
- 6. Electric Heat is only available in the YHH and YPHH units. These units require a remote thermostat (low voltage 4 wire thermostat).

***** WARNING TO INSTALLER, SERVICE PERSONNEL AND OWNER *****

Altering the product or replacing parts with non authorized factory parts voids all warranty or implied warranty and may result in adverse operational performance and/or a possible hazardous safety condition to service personnel and occupants. Company employees and/or contractors are not authorized to waive this warning.

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Reference Documents:

- IOM for YVC-YVF-YVS
- IOM for YSHW, YSHX
- IOM for YSVW, YSVX
- Parts List

Form 115.20-NOM3 (Latest) Form115.22-NOM5 (Latest) Form 115.22-NOM2(Latest) Form 115.20-RP2(Latest)

These documents can be ordered through Publications Dept. or downloaded @ http://intranet.york.com/web0003/library/default.asp



YORK INTERNATIONAL

RECEIVING

Material in this shipment has been inspected at the factory and released to the transportation agency in good condition. When received, a visual inspection of all cartons should be made immediately. Any evidence of rough handling or apparent damage should be noted on the delivery receipt and the material inspected in the presence of the carrier's representative.



If damage is found, a claim should be filed against the carrier immediately.

STORAGE

If the equipment is not to be immediately installed, store it in a dry location with the motor protected against moisture, dust, corrosion and physical damage.

PREPARE CEILING FOR MOUNTING

Depending upon building construction, provisions for mounting the unit must be made by the contractor according to architects; drawings.

It is important to ensure that the fan coils are securely mounted and the structure is sufficient to support the weight of the equipment. All anchors for mounting the equipment must be placed and sized to ensure a safe and durable installation.

The YHBC, YPHBC, YRHBC, YHH, YHHS, YPHH, YHYB, and YPHYB units are designed for installation in a horizontal position above a dropped ceiling. The YCHBC is a cabinet unit intended for horizontal exposed surface mounting.

In free (non-ducted return air) return installations of YHBC, YHH, YHHS and YHYB units; the furred down area must be completely sealed (except return air grille) to ensure that all return air is pulled from the conditioned space and not from other areas of the building structure.

Access must be provided for servicing the unit. If this access is provided by a removable ceiling panel, ample space must be allowed for removal of the blower panel and to provide access to electrical and plumbing controls.



Unit must not be operated during building construction due to excessive airborne dust and debris. The units must not be operated under any circumstances without an air filter in place.

WIRING

All wiring must comply with the local and national code requirements. Units are provided with wiring diagrams and nameplate data to provide information required for necessary field wiring.

For power wiring a 4×4 electrical box is provided on the cabinet for connection of power supply and is located on the same side as piping.

On YHBC units, the box is shipped unattached, it is field attached to the unit in a location convenient to electrical entrance.



Any devices such as fan switches or thermostats that have been furnished by the factory for field installation must be wired in strict accordance with the wiring diagram that is supplied with the unit. Failure to do so could result in damage or injury.



FIG. 2 – HORIZONTAL UNITS - TYPICAL WIRING

T334 THERMOSTAT

Heat-Off Cool, Fan Auto-On, 24V, Manual changeover, 4-Wire Thermostat (R, G, Y, W) Adj. Heat Anticipator, Fixed Cooling Anticipator, Fan Cycling (Cooling) or (Heating/Cooling), No Heating Required.

T404 THERMOSTAT

Heat-Off Cool, Fan Auto-On, 24V, Manual changeover, 6-Wire Thermostat (R, G, O, Y, W, B) Adj. Heat / Fixed Cool Anticipator, Fixed Cooling Anticipator, Fan Cycling. (O & B can be used for cool and heat relays respectively, or for cool & heat water valves.)

T200 THERMOSTAT OPTION (W/CONTROLLER)

Heat-Off Cool, Fan -On, 24V, Manual changeover, 7-Wire Thermostat (R, C, Hi, Med, Lo, 24V Heat, 24V Coil), Auto fan speed control, digital readout, auto-overide.



FIG. 3 – WIRING SCHEMATIC FOR HBC/PHBC/CHBC/RHBC/HYB/PHYB

These units are provided with six (6) mounting holes *(see drawings for details)*. Metal washers and nuts of the proper size are to be provided by the installer. When necessary, use shims to obtain the proper level. This will ensure that the condensate will drain from the unit.

PIPING

These units employ a hydronic coil designed for use with either hot or chilled water.

All piping must be adequately sized to meet the design water flow requirements as specified for the specific installation. Piping must be installed in accordance with all applicable codes.

PIPE SIZES

All models except YHYB/YPHYB:

- HW/CW coils are 3/8" OD tubing.
- Tubing connections are 5/8" OD.

Models YHYB/YPHYB:

- HW/CW coils are 1/2" OD tubing.
- Tubing connections are 7/8" OD.

Manual air vents are provided standard on all coils

All chilled water piping must be insulated to prevent condensation.



Prior to connecting to the fan coil, all external piping must be purged of debris.



When connecting piping or valve kits to fan coil units, do not bend or reposition the coil header tubing for alignment purposes. This could cause a tubing fracture resulting in a water leak when water pressure is applied to the system.

PRECAUTIONS

- 1. Flush all field piping prior to connection to remove all debris.
- 2. Use wet cotton rags to cool valve bodies when soldering.

- 3. Open all valves (mid-way for hand valves, manually open on motorized valves) prior to soldering.
- 4. When soldering to bronze or brass, heat the piping while in the socket/cup and begin introducing the solder when the flux boils rapidly. Avoid direct flame into the solder joint.
- 5. Heat can only be applied to the cup of the valve body for a minimal time before damage occurs (even with the use of wet rags.
- 6. Avoid rapid quenching of solder joints, as this will produce joints of inferior quality.
- 7. The valve package will not support the weight of the connecting pipes. All pipes, which are connected to the units, must be completely supported prior to connection to the unit.
- 8. Provisions must be made for expansion and contraction of piping systems. All horizontal and vertical risers, including runouts, must be able to withstand significant movement with temperature changes. Failure to do so will result in damage and failure of piping, fittings and valves throughout the building.
- 9. Never insulate the heads or motorized portion of control valves. Damage can occur in the form of excessive heat build up and interference to the operation and moving parts will result.
- 10. All piping made in the field should be installed with consideration of additional space for any electrical routing that may be required.
- 11. Hydronic systems are not designed to hold pressurized air and should only be tested with water.

After the system has been proven leak free, all lines and valve control packages must be insulated as specified on the building plans.



Many valve packages will not physically allow all components to fit over an auxiliary drain pan. It is the installers responsibility to ensure adequate condensation prevention. The installer must also ensure that there is no condensate drippage onto electrical components beneath insulated components.

VALVE CLUSTER

2-Way Motorized Valve Assemblies

- 1. The motorized valve assembly should be attached to the supply header, which is the connection nearest the air outlet flange on the unit.
- 2. Prior to soldering the joints, operate all the hand valves to ensure that the handles will fully open and close without interference to other valves, ceiling, wall, plenum or other accessories.
- 3. All valves will operate at any angle with the exception of the motorized valve, which must be installed with the power head above horizontal. The actuator box requires a 3/4" clearance for removal.



FIG. 4 - 2 WAY MOTORIZED VALVE ASSEMBLY

3-Way Motorized Valve Assembly

- 1. The 3-way valve assemblies will mount to the coil in only one position. On four-pipe right hand systems, a "B" valve assembly is required for the chilled water connection and an "A" valve assembly is required for the hot water connection. On left hand systems, an "A" valve assembly is required for the chilled water connection and the hot water connection. (See figure 4.)
- 2. Prior to soldering the joints, operate all the hand valves to ensure that the handles will fully open and close without interference to other valves, ceiling, wall, plenum or other accessories.
- 3. All valves will operate at any angle with the exception of the motorized valve, which must be installed with the power head above horizontal. The actuator box requires a 3/4" clearance for removal.



FIG. 5 – 3 WAY MOTORIZED VALVE ASSEMBLY

DRAIN PIPING

Condensate drain lines must be installed with adequate slope away from the unit to assure positive drainage. YRHBC and YCHBC fan coil units require a minimum trap of 1-1/2 inches be provided in the drain line to assure proper drainage. YHBC, YPHBC, YHH, YPHH, YHYB, and YPHYB fan coil units may be located where the return air space is large enough that a negative pressure is not present, however, a trapped condensate line is recommended to ensure proper drainage of unit in case a negative condition should occur (*see Installation Drawings for locations and sizes*).

The drain should always be connected or piped to an acceptable disposal point sloped away from the unit at least 1/8" per foot



FIG. 6 – TYPICAL CONDENSATE PIPING

TABLE 2 - DRAIN LINE SIZES

UNIT	PRIMARY	SECONDARY
YHBC	3/4 MPT	5/8 OD
YPHBC	3/4 MPT	3/4 MPT
YRHBC	3/4 MPT	3/4 MPT
YHH	3/4 MPT	7/8 OD
YPHH	3/4 MPT	7/8 OD
YHYB	3/4 MPT	3/4 MPT
YPHYB	3/4 MPT	3/4 MPT

Ceiling Concealed Model – MODEL YHBC



Filter Note:

YHBC units are not available with filters. YHBC units can be field converted YHBC to YPHBC by adding an accessory plenum. See instruction below for details on field conversion.

FIELD CONVERSION YHBC TO YPHBC

Remove 2 screws holding the motor/blower assembly to the fan coil unit; remove and discard the drip guard; remove the bottom panel from the plenum; attach the plenum box to the fan coil unit using 5 screws; re-install the motor/blower assembly to the fan coil unit; for wiring, remove the motor leads from the j-box and attach the box to the outside of the plenum; route the motor leads to the j-box; replace the bottom panel; install the filter; if hanger brackets are needed, attach to the plenum, both ends.

PHYSICAL	DIMENSI	ONS (inches)	
MODEL	А	В	С	D
3YHBC	30-1/8	27-1/4	20-1/8	25-1/4
4YHBC	36-1/8	33-1/4	26-1/8	31-1/4
5YHBC	40-1/8	37-1/4	30-1/8	35-1/4
6YHBC	40-1/8	37-1/4	30-1/8	35-1/4
8YHBC	46-1/8	43-1/4	36-1/8	41-1/4
10YHBC	52-1/8	49-1/4	42-1/8	47-1/4
13YHBC	59-1/8	56-1/4	49-1/8	54-1/4

NOTES:

1. Model 3 YHBC has only one blower

2. Model 13 YHBC has four blowers and two motors



YHBC - 4 PIPE UNIT SHOWN



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	PHYSICAL DIMENSIONS - INCHES							
MODEL	Α	В	С	D	E	FILTER SIZE		
3YPHBC	24	22	20-1/8	30-1/8	27-1/4	10 X 24 X 1		
4YPHBC	30	28	26-1/8	36-1/8	33-1/4	10 X 30 X 1		
5YPHBC	34	32	30-1/8	40-1/8	37-1/4	10 X 34 X 1		
6YPHBC	34	32	30-1/8	40-1/8	37-1/4	10 X 34 X 1		
8YPHBC	40	38	36-1/8	46-1/8	43-1/4	10 X 40 X 1		
10YPHBC	46	44	42-1/8	52-1/8	49-1/4	10 X 46 X 1		
13YPHBC	53	51	49-1/8	59-1/8	56-1/4	10 X 53 X 1		

NOTES:

1) Return plenums are insulated

2) YPHBC units are provided with filters in the plenum.

3) Standard plenums are end return and can be field converted to bottom return by trading the blockoff and face panel of the plenum.

4) Filter has seperate filter access panel for easier service.

CEILING EXPOSED CABINET – MODEL YCHBC



FEATURES:

1) Side panels are removable for easier valve access.

2) Plastic thumb screws are provided for easy filter access.

	GENERAL DIMENSIONS						
MODEL	UNIT WIDTH	MOUNTING WIDTH	SUPPLY LOUVERED	RETURN LOUVERED	FILTER SIZE (INCL)		
	Α	В	PANEL WIDTH	PANEL WIDTH			
			С	E			
3YCHBC	38	34	26	31-1/2	10 X 37 X1		
4YCHBC	44	40	31-1/2	37	10 X 43 X1		
5YCHBC	48	44	37	42-1/2	10 X 46 X1		
6YCHBC	48	44	37	42-1/2	10 X 46 X1		
8YCHBC	54	50	42-1/2	48	10 X 53 X1		
10YCHBC	60	56	48	53	10 X 59 X1		
13YCHBC	67	63	53	58-1/2	10 X 65 X1		

RECESSED CEILING – MODEL YRHBC









NOTES:

- 1. Telescoping panel allows the cabinet to be installed to within 2 inches of the ceiling line.
- 2. Telescoping access panel shipped as seperate item.
- YRHBC units are available with filters on units with louvered access panels ONLY.

All 1-1/2" dia. K.O.;s
* 4-Pipe system only



TYPICAL SLOT

LD010220

			GENER	AL DIMENSIONS	6 (Inches)		
MODEL	PANEL	UNIT	SUPPLY	LOUVERED	MOUNTING	RETURN	FILTER
	WIDTH	WIDTH	OPENING	PANEL'WIDTH	WIDTH	OPENING*	SIZE
	(A)	(B)	(C)	(E)	(H)	(I)	(INCL)
3YRHBC	41	38-3/8	29	36-5/8	35	14	10 x 37 x 1
4YRHBC	47	44-3/8	35	41-3/4	41	20	10 x 43 x 1
5YRHBC	51	48-3/8	39	47-1/4	45	24	10 x 47.5 x 1
6YRHBC	51	48-3/8	39	47-1/4	45	24	10 x 47.5 x 1
8YRHBC	57	54-3/8	45	52-1/2	51	30	10 x 53 x 1
10YRHBC	67	60-3/8	51	57-7/8	57	36	10 x 59 x 1
13YRHBC	70	67-3/8	58	63-1/8	64	42	10 x 65 x 1
	* Field cut for above ceiling return.						





PHYSICAL DIMENSIONS (INCHES)

Notes:

- 1. Fuse size and wire size per ampacities on unit nameplate. Follow NEC guidelines in absence of local codes.
- 2. YHH units are not available with filters.



MODEL

3YHHS

4YHHS 6YHHS

6YHH 8YHH **10YHH**

12YHH

10'





Right hand model shown - left hand model has drain and piping connections on opposite side of fan coil.

	PHYSICAL DIMENSIONS (INCHES)						
MODEL	OVERALL WIDTH A	MOUNTING WIDTH B	SUPPLY OPENING C	PLENUM WIDTH D	RETURN OPENING E	FILTER (INCL)	
3YPHHS	25	19-11/16	15	20	18	10 X 20 X 1	
4YPHHS 6YPHHS 6YPHH 8YPHH	40	34-11/16	30	34	32	10 X 34 X 1	
10YPHH	46	40-11/16	36	40	38	10 X 40 X 1	
12YPHH	52	46-11/16	42	46	44	10 X 46 X 1	

YPHH FEATURES: 1) Return Plenums are insulated.

2) All plenums include throw away filter.

MODEL YHYB – High Capacity Ceiling Concealed Model

<u>YP HYB</u> - <u>126</u> - <u>3</u> <u>RH</u> <u>12</u> NOM. CFM (100's) 12,16 or 20 **Coil Connections** (looking with airflow, from blower end) RH = Right Hand Unit Style _ LH = Left HandY -high capacity ceiling concealed YP - with return plenum & filter Coil Configuration HYB - Horizontal Blower Coil 3 = 2 Pipe Coil, 3 Row 4 = 2 Pipe Coil, 4 Row 6 = 2 Pipe Coil, 6 Row Unit Voltage 31 = 4 Pipe Coil, 3 Row Cool, 1 Row Heat 126 - 120V - 1 Ph - 60 Hz 32 = 4 Pipe Coil, 3 Row Cool, 2 Row Heat 277 - 277V - 1 Ph - 60 Hz 41 = 4 Pipe Coil, 4 Row Cool, 1 Row Heat 42 = 4 Pipe Coil, 4 Row Cool, 2 Row Heat Notes: 1. YHYB units are not available with filters. 61 = 4 Pipe Coil, 6 Row Cool, 1 Row Heat 2. YPHYB units are provided with filters in the plenum. 62 = 4 Pipe Coil, 6 Row Cool, 2 Row Heat

	PHYSICAL DIMENSIONS (INCHES)						
MODEL	OVERALL	TOP	SUPPLY	MOUNTING	RETURN	FILTER	
	WIDTH	PLATE	OPENING	WIDTH	OPENING	(INCL)	
	Α	WIDTH	С	D	E		
		В					
12YHYB	41	35-1/2	28	31-1/4	23-1/4		
12YPHYB	41	35-1/2	28	31-1/4	23-1/4	14 x 28 x 1	
16YHYB	51	42-1/2	38	41-1/4	38-1/4		
16YPHYB	51	42-1/2	38	41-1/4	38-1/4	14 x 38 x 1	
20YHYB	60	51-1/2	47	50-1/4	47-1/4		
20YPHYB	60	51-1/2	47	50-1/4	47-1/4	14 x 43 x 1	

FEATURES:

- 1. Manual air vents
- 2. 4-speed direct drive motors
- 3. 1/2" copper tubing
- 4. Primary and secondary condensate drains on one end
- 5. 120/1/60Hz. motors (2)
- 6. 3-row and 6-row models available
- 7. Rubber isolation grommets
- 8. Insulated and coated drain pan



FAN COILS START - UP CHECKLIST

INSTALL CHECKLIST

	Equipment received as ordered.
	Unit checked for damage interior and exterior.
	Make sure all ductwork is complete and available for full air flow.
	Unit installed level to ensure proper drainage and operation.
	Unit installed with proper clearances.
	Ensure condensate water will drain toward the drain connection. An overflow drain may be required as a back up to a clogged primary drain.
	Check that coil(s), valves and piping have been leak checked and insulated as required.
	Main coil drain pan must be properly trapped and charged with water before units are started.
	Ensure that all air has been vented from the system.
	Return valves to their proper operating positions prior to start-up.
	Repair any solder joint leaks and gently tighten any leaking valve packing nuts and piping accessories as required.
	Install all panels.
NOTE.	If the motor and fan have not been operated in the last (4) four weeks or more, lubricate all the bearings and rotate the motor and fan monthly to prevent moisture from accumulating in the bearings. (See Form 50.20-NM3, Long Term Storage)

CLEANING CHECKLIST

Installer has cleaned out interior.
Ensure drain pan free from foreign material.
Ensure air filters are clean, installed properly and secured. Use the directional arrows or other information on the filter to determine the proper flow direction.

CONTROLS CHECKLIST

Check that supply voltage matches nameplate data.
Ensure that the unit is properly grounded.
Controls installation complete
Check all electrical connections for tightness.
Review electrical print for correct wiring.

Fan INSPECTION - The fan should be inspected and cleaned, in conjunction with maintenance of the motor and bearings. It is important to keep the wheel clean in order to avoid imbalance and vibration.
Check tightness of fan bearing locking collar.
With power off, check blower wheel set screws for tightness and ensure that the blower wheel(s) rotate freely and quietly.
Check tightness of all motor base and mounting bolts.
Check motor connections to ensure that they are secure and made in accordance with the wiring diagram
Rotate all moving components manually. Adjust as required.

MAINTENANCE

MOTOR

The blower motor should be cleaned annually and if it has oiling ports, it should be oiled with a good grade of SAE 20 oil. Normally a few drops of oil in each bearing is sufficient.

COIL

The coil must be kept clean by any of the following methods.

- 1. Cleaning with low-pressure compressed air.
- 2. Flushing or rinsing with water (a detergent is advisable for greasy surfaces).
- 3. Prior to the water system start-up and balancing, the chilled/hot water systems should be flushed to clean out dirt and debris, which may have accumulated during construction. All unit service valves are to be closed during this process. Strainers are to be installed in the piping mains to prevent this material from entering the units during normal operation.

FILTERS



Clean or Replace Air Filters Regularly

The intervals at which filters require replacement depend on local conditions.

Because of dust and lint in the room, room-air filters load up much more rapidly than outdoor-air filters. Under normal conditions, the room air filter requires replacement every six to eight weeks.

To ensure proper maintenance of the filters, it is best to follow an organized maintenance procedure. The following one is recommended:

Divide the total number of units on the job into six equal groups. Each week inspect, clean or replace the filters in each group, in rotation. This insures a uniform servicing interval. The interval may be lengthened or shortened as determined by experience. If inspection shows only the room-air filter to be dirty, this one alone should be replaced.



Dirty filters reduce the air and heating capacities of the Unit Ventilator. When the filters are excessively dirty, the unit heating capacity will be so reduced that it is ineffective for heating the room. When a room fails to heat, always check the filters.

CLEAN UNIT INTERIOR

Once a year clean the fans and coils of the unit thoroughly. Remove the access panel as necessary.

Wipe the interior of the unit clean with a rag. Wipe the motor and inside and outside of the fan housings. (In cooling units, clean out the drain pan.)



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