

# HBC, PHBC, RHBC and CHBC HORIZONTAL HYDRONIC FAN COIL UNITS

## INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS

**\*\*\*\*\* 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.

### GENERAL

The manufacturer assumes no responsibility for equipment installed in violation of any code requirement.

These instructions give information relative to the installation of these fan coil units only. For other related equipment refer to the proper instructions.

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.

**\*\*\*\*\* WARNING \*\*\*\*\***

***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.***

### FAN COIL UNIT

The installer must adhere strictly to all local and national code requirements pertaining to the installation of this equipment. The HBC, PHBC, and RHBC units are designed for installa-

tion in a horizontal position above a dropped ceiling. The CHBC is a cabinet unit intended for horizontal exposed surface mounting.

In a HBC free return installation (non-ducted return air), 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.

While most fan coil units are U.L. Listed for installations with zero clearance to combustible materials, reference should be made to the marking on the particular unit being installed where specific information regarding clearances is provided.

### AIR DISTRIBUTION DUCTS

All duct work must be installed in accordance with National Fire Protection Association Codes 90A and 90B. Ducts should be adequately insulated to prevent condensation during the cooling cycle and to minimize heat loss during the heating cycle. All return air must be filtered to prevent dirt buildup on the coil surface. If there is no ducted return, applicable installation codes may limit the unit to installation only in a single story residence. In many cases it is acceptable

to use ducting of the same size as the fan coil connections. However, unique arrangements or long duct runs must be confirmed by a local professional. The manufacturer will not be responsible for misapplied equipment.

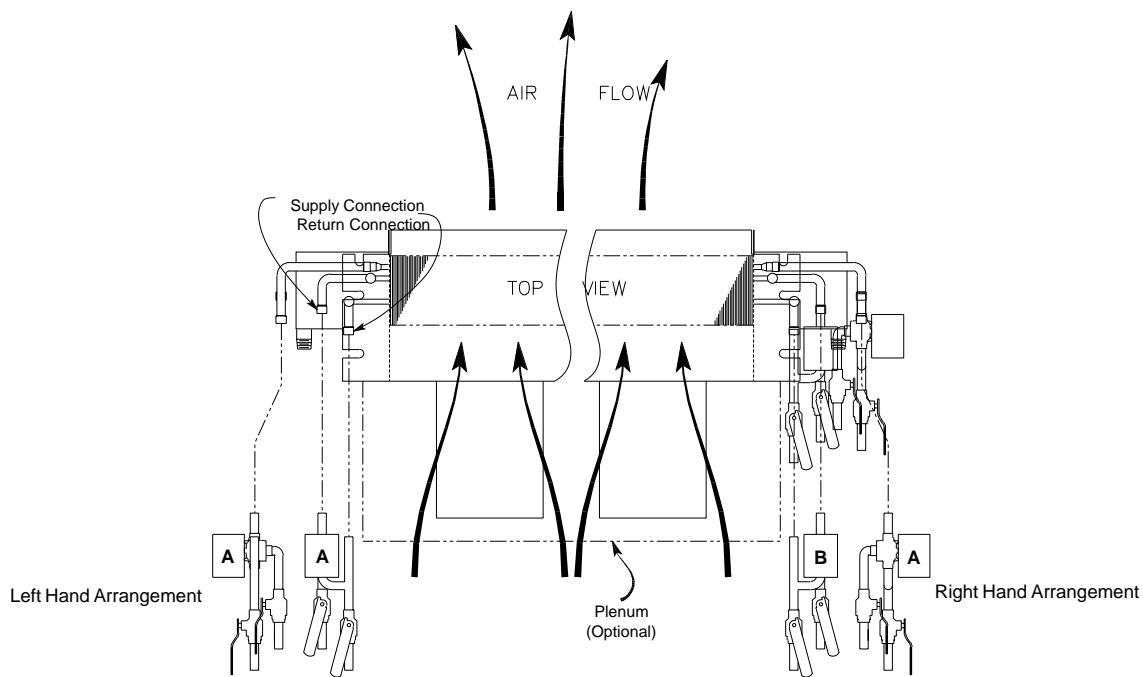
### ELECTRICAL

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

These units may be provided with an optional Class 2 transformer for 24-volt control circuits. Should any add-on equipment also have a Class 2 transformer furnished, care must be taken to prevent interconnecting outputs of the two transformers by using a thermostat with isolating contacts.

**\*\*\*\*\* WARNING \*\*\*\*\***

***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 to components and will void all warranties.***



**Figure 1 - Determination of Right-hand/Left-hand References**

## 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.

The piping connections on the equipment are not necessarily indicative of the proper supply and return line sizes. To minimize restrictions piping design should be kept as simple as possible.

**Caution:** Prior to connecting to the fan coil all external piping must be purged of debris.

All chilled water piping must be insulated to prevent condensation.

Condensate drain lines must be installed with adequate slope away from the unit to assure positive drainage. Since the drain pan is located on the suction side of the blower, a negative pressure exists at the drain pan. RHBC and CHBC fan coil units require a minimum trap of 1-1/2 inches be provided in the drain line to assure proper drainage. HBC and PHBC 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 in case a negative condition should occur, the unit would drain properly.

## PIPING 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. Connect all piping per accepted industry standards and observe all regulations governing installation of piping systems. When all connec-

**\*\*\*\*\* WARNING \*\*\*\*\***

***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.***

tions are complete the system must be pressure tested. Repair any solder joint leaks and gently tighten any leaking valve packing nuts and piping accessories as required. Hydronic systems are not designed to hold pressurized air and should only be tested with water.

### PIPING INSULATION

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

Note: Many valve packages will not physically allow all components to fit over an auxiliary drain pan. It is the installers responsibility to insulate all piping to ensure adequate condensation prevention.

### DUCT WORK

All duct work must be installed in accordance with industry accepted practices, and all applicable national and local code requirements.

### NOISE

These fan coil units are designed for quiet operation, however, all air conditioning equipment will transfer some amount of noise to the conditioned space. This should be taken into consideration when planning the location of the equipment.

### MOUNTING

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.

These units are provided with six (6) mounting holes. Metal washers and nuts of the proper size are to be provided by the installer. When nec-

essary use shims to obtain the proper level. This will ensure that the condensate will drain from the unit.

### INSTALLATION PRECAUTIONS

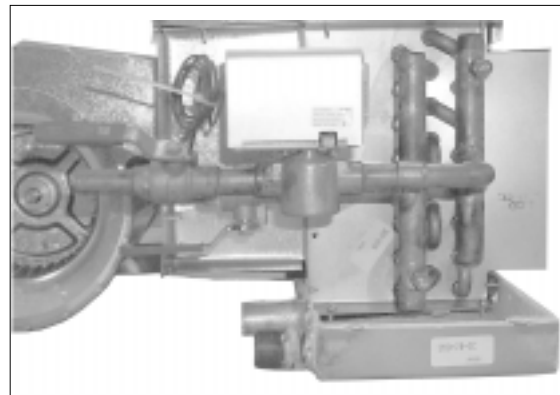
Installation of this equipment should only be performed by properly trained personnel to ensure proper installation and the safety of the installer. The following are some precautions to be followed for typical installations.

1. Always use proper tools and equipment.
2. No wiring or other work should be attempted without first ensuring that the fan coil is completely disconnected from the power source and locked out. Always verify that a good ground connection exists prior to energizing any power sources.
3. Always review the nameplate on each unit for proper voltage and control configurations. This information is determined from the components

**Figure 2 - Installation of Valve Cluster Assemblies**

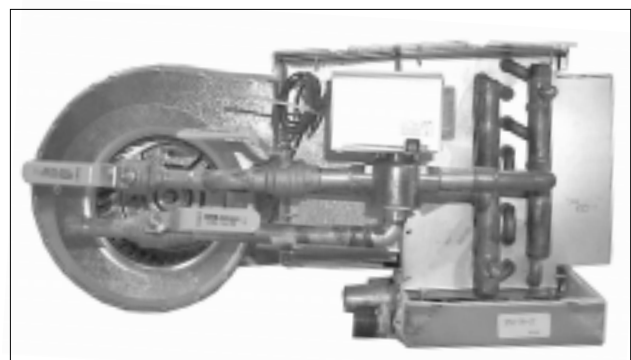
### 2-Way Motorized Valve Assemblies

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 never be installed with the power head below horizontal. The actuator box requires a 3/4" clearance for removal.



### 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 a "A" valve assembly is required for the hot water connection. On left hand systems a "A" valve assembly is required for the chilled water connection and the hot water connection. (See figure1.)
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 never be installed with the power head below horizontal. The actuator box requires a 3/4" clearance for removal.



and wiring of the unit and may vary from unit to unit.

4. When soldering or brazing to the unit it is recommended to have a fire extinguisher readily available. When soldering close to valve packages or other components heat shields or wet rags are required to prevent damage.
5. When the fan coil unit is in operation components are rotating at high speeds.

**\*\*\*\*\* WARNING \*\*\*\*\***

***Do not touch any rotating component with any object. Damage to the equipment and personal injury can occur.***

6. Units must be installed level to ensure proper drainage and operation.
7. Check unit prior to operation to ensure that the condensate water will drain toward the drain connection. An overflow drain may be required as a back up to a clogged primary drain.
8. Be sure that the drain pan is free from foreign material prior to start up.
9. Check filter media installation to ensure that it is installed correctly. Use the directional arrows or other information on the filter to determine the proper flow direction.
10. Ensure that the air distribution system does not exceed the external static rating of the unit.

## **OPERATION AND MAINTENANCE**

### **Pre-start Check**

1. Check that supply voltage matches nameplate data.
2. Ensure that the unit is properly grounded.
3. With power off, check blower wheel set screws for tightness and ensure that the blower wheel(s) rotate freely and quietly.
4. Check that coil(s), valves and piping have been leak checked and insulated as required.
5. Ensure that all air has been vented from the system.
6. Install all panels.
7. Install any filters which may have been removed during the installation process.

**\*\*\*\*\* WARNING \*\*\*\*\***

- ***Always wear eye protection.***
- ***When fan coil is operating, some components are operating at high speeds. Personal injury can result from touching these items with any object***
- ***All electrical and service access panels must be returned and secured in their proper place.***
- ***Clear surrounding area of all tools, equipment and debris.***
- ***Check the entire unit to ensure it's cleanliness.***

### **Inspection and Cleaning**

Before start-up all of the components should be given a thorough check. Optimal operation of this equipment requires cleanliness. Often after installation of this equipment additional construction activities occur. Care must be taken to protect the equipment from debris during these construction phases.

**\*\*\*\*\* WARNING \*\*\*\*\***

***The manufacturer does NOT WARRANT equipment subjected to abuse. Metal chips, dust, drywall tape, paint over spray, etc. can void warranties and liability for equipment failure, personal injury and property damage.***

### **Fan**

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.

### **Motor**

Check motor connections to ensure that they are secure and made in accordance with the wiring diagram.

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**

Any dust or other contaminants which accumulate on the heat transfer surfaces interferes with the air flow and impairs heat transfer. 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.

**Caution:** Be sure to return valves to their proper operating positions prior to start-up.

### **Filter**

The air filter should be cleaned or replaced as often as necessary to prevent restriction of air flow. Always replace the filter with the same type as originally furnished.

### **Drain Piping**

- The drain should always be:
- Connected or piped to an acceptable disposal point sloped away from the unit at least 1/8" per foot
  - Checked before summer operation
  - Periodically checked during summer operation

Note: A trap may be required per local codes and for odor containment.

### **Preventative Maintenance**

To achieve maximum performance and service life of each piece of equipment a formal schedule of regular maintenance should be established and maintained.