

# CDX-HW SERIES

## 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. Current **Maintenance Program** is available at [www.firstco.com](http://www.firstco.com) under "Product Information".

#### **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.

#### **FAN COIL UNIT**

The installer must adhere strictly to all local and national code requirements pertaining to the installation of this equipment.

These units are designed for installation in a horizontal position.

#### **\*\*\*\*\* WARNING \*\*\*\*\***

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

The CDX-HW is designed for free return installation (non-ducted return air), therefore 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.

All CDX-HW units are U.L. listed for installation with zero inches clearance to combustible materials. This includes the unit cabinet, discharge plenum and connecting ducts.

#### **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 are provided with a 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.***

#### **INSTALLATION PRECAUTIONS**

Installation of this fan coil 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.

- Always use proper tools and equipment.

- 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.
- Always review the nameplate on each unit for proper voltage and control configurations. This information is determined from the components and wiring of the unit and may vary from unit to unit.
- 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.
- 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.***

- Units must be installed level to ensure proper drainage and operation. These fan coils have a pitched drain pan for improved condensate drainage.
- Check unit prior to operation to ensure that the condensate water will drain toward the drain connection. An overflow drain or an auxiliary drain pan under the fan coil may be required as a back up to a clogged primary drain.
- Be sure that the drain pan is free from foreign material prior to start up.
- 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.
- Ensure that the air distribution system does not exceed the external static rating of the unit.

## COOLING COIL PIPING

The CDX-HW fan coil units are supplied with a direct expansion refrigerant coil. The refrigerant metering device is a fixed orifice piston and is installed at the factory. This permits the unit to be matched with either a standard condensing unit or heat pump. The suction and liquid refrigerant lines must be sized in accordance with the outdoor unit manufacturer's recommendations.

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 and a minimum trap of 1-1/2 inches should be provided in the drain line to assure proper drainage. The fan coil unit 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.

**NOTE:** *If a Condensate Overflow Shut-off Switch, that is designed to be installed in the drain line, is used in place of a secondary drain line, then the cut-off switch should be located in the primary drain line between the fan coil unit and the P-trap.*

## HOT WATER COIL PIPING PRECAUTIONS

- Flush all field piping prior to connection to remove all debris.
- Use wet cotton rags to cool valve bodies when soldering.
- Open all hand valves midway prior to soldering.
- 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.
- 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).
- Avoid rapid quenching of solder joints as this will produce joints of inferior quality.
- Connect all piping per accepted industry standards and observe all regulations governing installation of piping systems. When all connections are complete the system must

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

***When connecting piping 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.***

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

**NOTE:** *A water heater is designed to produce hot water. Hot water represents a serious safety hazard due to potential scalding. The temperature of water normally required to provide space heating (135 to 140 degrees) may be hotter than certain codes allow for domestic hot water. An "anti-scald valve" can be installed in the hot water piping that would allow the domestic water to be supplied at a lower temperature than the space heating water. These can be obtained locally and should be installed according to the manufacturer's installation instructions.*

## HOT WATER COIL PIPING

Refer to Flow Control Module installation instructions for proper pump installation, if used.

The hot water coil connections are 1/2" inch nominal (5/8" OD) copper. All piping between the water heater and fan coil unit should be 3/4" nominal (7/8" OD) to prevent excessive head pressure losses and should not exceed 200 feet of total piping. (Consult the factory for other piping applications.)

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

***An expansion tank may be required if a back-flow preventer is installed in the system.***

It is also recommended that all piping be adequately insulated to prevent freezing when piping is run in an unconditioned space.

**NOTE:**

*The CDX-HW fan coil unit comes with a hot water coil freeze protector. This device may not sufficiently protect the water lines if the fan coil is located in ambient air locations (attics, crawl spaces, etc.) or within structures that may be unoccupied during freezing conditions. Consult the factory for additional information.*

**Solder Connections** - All copper joints in the water lines must be made with **low temperature - non lead solder.**

**"T" Connections** (at the water heater)- Water lines to and from the fan coil unit **must** be taken from the horizontal connection of the "T" fittings in the vertical hot and cold water supply lines at the water heater. This ensures that any air in the system will be purged each time water is used in the dwelling. (See figure 1)

**Isolation Valves** - Two valves are recommended to be installed within the circulating loop to permit servicing of the system if required and to assist in purging the system.

## OPERATION AND START-UP

### Pre-start Check

- Check that supply voltage matches nameplate data.
- Ensure that the unit is properly grounded.

- With power off, check blower wheel set screws for tightness and ensure that the blower wheels rotate freely and quietly.
- Check that the water coil, valves and piping have been leak checked and insulated as required.
- Ensure that all air has been vented from the hot water loop.

**NOTE:**

*It may require purging several gallons of water so have a means of discarding the water.*

- Install any filters which may have been removed during the installation process.

### Start-up

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.***

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

## MAINTENANCE

### Fan

The fan should be inspected and cleaned, in conjunction with maintenance of the motor and bearings. It is important to keep the wheels 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.

### Coil

The coils must be kept clean, any dust or other contaminants which accumulate on the heat transfer surfaces interferes with the air flow and impairs heat transfer. Inspect annually or more frequently if required and clean as required.

### Filter

The air filter should be cleaned or replaced every 30 days or more frequently if severe conditions exist. 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

### 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.

**\*\*MAINTENANCE UPDATES\*\***

***For a current copy of the Maintenance Program log on to [www.firstco.com](http://www.firstco.com) and look under "Product Information"***