

## 238000 Decentralized HVAC Equipment

### Sections Included In This Standard:

- 1.1 Fan Coil Units
- 1.2 Humidifiers
- 1.3 Chilled Beams
- 1.4 Computer Room Air Conditioners
- 1.5 VRF
- 1.6 Mini Split
- 1.7 Exhaust Fans

### 1.1 FAN COIL UNITS and AIR POWERED TERMINAL UNITS

#### A. ACCESS

1. Adequate clearance shall be provided for all service, repairs, and component replacement including valves. If the clearances are anything other than the manufacturer recommended clearances a deviation must be requested.
2. Provide access panels as needed when units are located above hard ceilings. Access panels need to be large enough for maintenance access.

#### B. LUBRICATION: Specify externally accessible fittings for lubrication.

#### C. DRAIN PANS: Drain pans shall be tapered and angled to ensure proper drainage.

1. FCUs serving animal care space, or other areas with critical air temperature control requirements shall only employ systems (switches or sensors, depending on primary or auxiliary pan) that alarm the BAS. They will **NOT** shut off chilled water, heating hot water, or fan motors.
2. Refer to Standard 259000 for FCU and Drain pan (primary and secondary) controls.
3. Primary Drain Pan:
  - a. Material shall be 304 stainless steel.
  - b. The pan shall be drained by gravity.
  - c. Drain Pan Pumps: Are not preferred. Any installation that requires these needs to be reviewed and approved (in writing) by Facilities Services.
    - i. If approved a pump can be installed on the primary pan only. This pump shall be one intended for this purpose and rated to pump a volume of condensate at least 1.5x higher than the highest designed load. It shall also have a low voltage switch installed back to the chilled water valve and fan motor to shut both off and an alarm that is tied to the BAS if the pump fails.
4. Secondary Drain Pan:
  - a) Secondary drain pans, which capture overflow if the primary drain is clogged, are required when the FCU is above a ceiling; in a telecommunications room (or other

room with mainly electronics); serving a lab; animal care space; electrical room, or other areas with critical air temperature control requirements; or in a room with no floor drain.

- b) Material should be galvanized steel or, if factory-provided, plastic.
- c) Secondary drain pan shall extend 3" past the primary pan and underneath the chilled water control valve.
- d) Secondary drain pans shall have a water sensor (versus a low voltage float switch) or drain to an obvious location.
  - a. The less preferred method is to have the auxiliary pan piped to drain in a manner that serves as a signal to occupants that there is a problem (with such draining causing no damage or safety issues, even if draining for several days)

D. **FILTRATION:**

a. Baseline requirements for air filters are given in Section 234000. The following are supplemental requirements applicable only to installations of air handling units with coils:

- i. All new Fan Coil and Air Powered Terminal Units shall have appropriately sized filtration installed on them.
- ii. All new Fan Coil and Air powered terminal units that are ductwork installations shall have an appropriately sized filter-backed grill installed in the ceiling grid or wall instead of having the filter installed at the FCU above the ceiling. The preferred size of the grill would be 24" x 24", lay in; however needs to be sized to the application.
- iii. For un-ducted FCUs and Air powered terminal units, 24" access to the filter face is required, along with sufficient room to remove and replace recommended filter(s).

E. Fan Coils units that bring in outside air and are used to condition occupied spaces, shall be treated like Air Handlers and will meet all Air handler requirements in these standards. For example: Shall have UV lights installed on the cooling coils with all safety interlock systems.

F. ACCEPTABLE MANUFACTURERS: Airtherm; Carrier; Trane; York; ~~McQuay~~; Daikan; Titus

## 1.2 **HUMIDIFIERS**

A. ACCESS: Adequate clearance shall be provided for service, repairs, and component replacement including valves. If the clearances are anything other than the manufacturer recommended clearances a deviation must be requested.

B. APPROVED TYPES

- 1. Steam Grid Type: Steam grid type with stainless steel distribution.
- 2. Other Types: Other types of humidifiers, besides the steam grid type, may be used with written approval of the operations & maintenance entity.

C. PROHIBITED TYPES: Spray types are not allowed.

D. SOURCE

1. Domestic water shall not be used for humidification.
2. Reverse osmosis (RO) water – 1MΩ or greater – should be used for humidification in places where clean steam is required.
3. Building steam may be used as a source for steam, as a less preferred alternative to RO water.

1.3 **CHILLED BEAMS**

A. ACCESS: Adequate clearance shall be provided for service, repairs and component replacement including valves. If the clearances are anything other than the manufacturer recommended clearances a deviation must be requested.

B. APPLICABILITY

1. Chilled beam systems shall only be specified for appropriate buildings and spaces, and only in buildings that are positively pressurized.
2. Chilled beams shall not be used for spaces with large fluctuating thermal loads, such as loading docks or classrooms with widely varying occupancies .
3. Chilled beam systems shall be designed to accommodate normal operating temperature ranges of the spaces served (e.g., 72 deg F for office space).

C. TYPE: Only active chilled beam systems are permitted (not passive chilled beam systems).

D. ISOLATION: Isolation valves shall be provided for each individual chilled beam, with no impact on other beams or systems.

E. VENTING: Include flex hoses to allow for venting by tilting the chilled beams.

F. INSULATION: Supply and Return piping for chilled beams shall be insulated.

1.4 **COMPUTER ROOM AIR CONDITIONERS**

A. ACCESS

1. Adequate clearance shall be provided for service, repairs, and component replacement. If the clearances are anything other than the manufacturer recommended clearances a deviation must be requested.
2. If the unit rests on the floor and requires an auxiliary drain pan (see FCUs section above), the unit shall be elevated to allow access doors to open over the drain pan lip. The material used to raise the unit up shall be stable enough to support the unit and resistant to corrosion.

B. DRAIN PANS: See and apply guidance provided above on drain pans for Fan Coil Units.

**1.5**      **VARIABLE REFRIGERANT:**

- A. Variable refrigerant (VRF) systems are a possible solution for space cooling and should be considered only where chilled water is not available.
- B. The use of these needs to be approved in writing through Facilities Services.

**1.6**      **MINI SPLIT:**

- A. Mini split systems with fresh air supply are another possible alternative for HVAC systems.
- B. The use of these needs to be approved in writing through Facilities Services.

**1.7**      **EXHAUST FANS**

- A. It is preferred that all exhaust fans be direct drive.
- B. It is preferred that the fan motor and other points needing regular maintenance are outside the airstream.
  - a. Access to grease fittings shall not require any removal of panels or use of ladders.
  - b. Remote grease fittings shall be piped with copper lines only.
- C. For any exhaust system that supports multiple processes (i.e. a bank of exhaust fans that all processes in a building are ducted to) redundancy needs to be designed into the system to allow for individual fans in that system to be taken out of service for maintenance without impacting the processes connected.

END OF SECTION