

23 82 19 - Fan Coil Units and Blower Coil Units

1. Introduction

- A. In general, air handling units should be used for any air conditioning system where more than 2,000 cfm of air is required to maintain the design conditions. These units are manufacturers' standard products. Custom designed and manufactured units are covered in Section 23 21 23 – Hydronic Pumps. Air handling units may be manufactured in one piece or may be modular units with sections for each function joined together. They typically consist of a casing containing a fan, a filter and cooling, heating and/or humidification coils. Depending on requirements, mixing boxes, return fans, damper sections and other equipment may be included. Units installed inside are typically referred to as air handling units (AHU); those installed exposed are rooftop units (RTU).
- B. Designers should coordinate with Duke Office of Project Management and Duke Utilities & Engineering Services, Department of Planning & Engineering (DUES Engineering) on all phases of projects requiring air handling units. These projects may include but are not limited to:
 - 1. New buildings
 - 2. Renovations to the existing building
 - 3. Replacement of existing equipment
- C. Designers are expected to share and review any project data, load calculations and site condition evaluations with DUES Engineering.

2. References

- A. ASHRAE Standard 52: Dust-spot testing of filters
- B. NFPA 90A: Flame spread, smoke developed characteristics of insulation
- C. ARI Standard 430: Centrifugal fan performance test
- D. ARI Standard 410: Rating of coils containing water or glycol/water
- E. ARI Standard 260: Method of rating sound data for ducted air conditioning equipment

3. Design Standards

- A. Fan Coil Units:
 - 1. Fan coil units shall have three speed fans with speed adjustment accessible without removing unit panels.

2. Fan coil units shall have control valves factory installed in a location which will be accessible after unit is installed.
3. All horizontal fan coil units shall have auxiliary drain pans with float switch to shut down unit.
4. All fan coil units to be installed exposed shall have full cabinet with insulation to prevent sweating. Insulation exposed to the airstream may not be a fibrous type material.
5. Fan coil units should not be used where an air handling unit can be used instead of several fan coil units.
6. Locations of fan coil units shall take into consideration likely furniture and equipment placement to allow for maintenance access.
7. All equipment must be supported directly by structural members with adequate load-bearing capacity and material integrity using appropriate anchoring/connection hardware. Under no circumstances may equipment be supported by connections to finish materials. For example, equipment hung from toggle bolts through plaster-on-lath, gypsum board or ACT ceilings is **not acceptable**.

B. Blower Coil Units:

1. Fan coil units shall have three speed fans with speed adjustment accessible without removing unit panels.
2. Fan coil units shall have control valves factory installed in a location which will be accessible after unit is installed.
3. All horizontal fan coil units shall have auxiliary drain pans with float switch to shut down unit.
4. All fan coil units to be installed exposed shall have full cabinet with insulation to prevent sweating. Insulation exposed to the airstream may not be a fibrous type material.
5. Fan coil units should not be used where an air handling unit can be used instead of several fan coil units.
6. Locations of fan coil units shall take into consideration likely furniture and equipment placement to allow for maintenance access.

4. Documentation and Review Requirements

- A. Documentation of factors used in equipment selection must be submitted for review at DD submittal and each subsequent submittal if conditions have changed. Summary of factors shall identify which factors are known and which are assumptions.

- B. Detailed equipment selection including sound levels for unit discharge and radiated sound.
- C. Cost of operations and maintenance shall be included in system Life Cycle Cost Analysis. This information shall be reviewed at DD submittal.

5. Installation and Performance Requirements

- A. All units shall be installed level.
- B. All units shall be installed so that there is sufficient space to perform normal maintenance. This space shall be shown on project drawings.
- C. Access doors shall be provided where units are installed above ceilings which are not easily removable.
- D. Tolerances for airflow:
 - 1. Office areas: -5%, +10%
 - 2. Classrooms: -5%, +10%
 - 3. Laboratories: +5%
 - 4. Residences: +/- 10%
 - 5. Kitchens: -5%, +10%
- E. Tolerances for heat removal: -5%, +10%
- F. Tolerances for heating: +10%
- G. Coordinate all commissioning efforts with Duke Utilities and Engineering Services (DUES).

6. As-Built Requirements

- A. Designer must provide drawings showing all equipment locations. Drawings must include final layout, details of all connection points and other pertinent data.
- B. Provide operations and maintenance manuals for each piece of air handling equipment. Where multiple units are covered by the same manual, duplicate manuals are not required. A list of all equipment (by equipment ID) will be provided in front of each section of the O&M manual with equipment location, title and publication number of appropriate manual shown for each piece of equipment. Equipment listing shall include a summary of unit design capacities.