

SECTION 15930

AIR TERMINAL UNITS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Variable Air Volume Terminal Units.

B. Related Sections:

1. Section 15010 - Basic Mechanical Requirements.
2. Section 15050 - Basic Mechanical Materials and Methods.
3. Section 15240 - Mechanical Sound and Vibration Control.
4. Section 15900 - Ductwork and Accessories.
5. Section 15936 - Air Inlets and Outlets.
6. Section 15950 - Controls.
7. Section 15990 - Testing, Adjusting and Balancing.

1.02 REFERENCES

- A. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE).
- B. Sheet Metal and Air Conditioning Contractor's National Association (SMACNA).
- C. National Fire Protection Association (NFPA).

1.03 SYSTEM DESCRIPTION

A. Design Requirements:

1. VAV Systems in General:

- a. Variable volume air distribution systems should be used to vary the air flow rates as the cooling loads vary rather than falsely loading the system with reheat or mixing at the terminal units.
- b. By having the heating system independent of the cooling system, between-season change-over cycle problems are minimized and economies of operation can be obtained by shutting off the air cooling system during unoccupied hours.

- c. A simple system design using zoned perimeter baseboard to fin-tube radiation (BBR) offset the transmission heat loss through the walls and glass or other exposed components and a separate VAV cooling system to balance the heat gain from solar, lights, equipment and people is preferred, with each VAV zone interlocked with the corresponding BBR.
- d. Since there are several types of VAV Systems, manufacturers, and proprietary features, the Design Engineer shall review his proposed design and qualify manufacturers with the University in a preliminary submittal for approval before finalizing design.
- e. All occupied spaces shall have their own VAV and temperature control unless approved by UCCS personnel.
- f. Proposed VAV Cooling System should include the following features:
 - 1) A 100 percent outside air economy cycle.
 - 2) Maintenance or service requirements in the occupied space should be minimal.
 - 3) All air filtering requirements should be accomplished in the central station equipment.
 - 4) The amount of air balance required to make the system operate should be minimal.
 - 5) Space air outlets should be aspirating types to prevent dumping of air into occupied spaces at minimal volumes.
 - 6) Design for flexibility to revise zoning with only minimal changes in ductwork and controls.
 - 7) Specify control provisions to open units to full ventilation volume if required for life safety smoke control.
 - 8) Provisions should be made to always provide at least the required minimum outside air (ventilation air) for an occupied space, even when the supply air flow rates are reduced because of decreased cooling load.

2. VAV Terminal Units:

- a. Show terminal unit size and design air flow rate setting on each terminal unit on the Drawings.

- b. Units to include damper control section and sound attenuation section
as a complete factory assembled unit. Specify damper control outside of units.
Specify factory-installed Kreuter reset volume controller.
- c. Insulation lining in accordance with NFPA Standard 90A requirements.
- d. Units capable of handling minimum 5 inches static pressure.
- e. Units independent of pressure variations and capable of operating satisfactorily throughout their range, from minimum to maximum air flow.
- f. Volume control calibrated to identify air volume in increments of percent of maximum air flow
- g. Specify that terminal unit performance and sound rating shall be tested and rated in accordance with ARI 880 "Industry Standard for Air Terminals" and shall bear the ARI certification seal.
- h. Specify that VAV unit shall be in full compliance with UL 181 and NFPA 90A and shall meet bacteriological standards of ASTM C665.
- i. If VAV unit is to be used in a healthcare, clean room, or lab facility, specify a special VAV unit liner as required to minimize the amount of liner erosion. Follow healthcare facility standards as required.
- j. VAV units shall be selected so required RC sound levels in various spaces are not exceeded at 1.5" w.g. inlet pressure. Both unit-casing radiated sound levels (as attenuated by ceilings when present) and discharge sound levels shall be considered in terminal unit selection.
- k. VAV units that provide room ventilation effectiveness shall be used unless approved otherwise by UCCS personnel.

PART 2 - PRODUCTS

2.01 VARIABLE AIR VOLUME TERMINAL UNITS

- A. Manufacturer:
 - Carrier
 - Titus
 - Trane

PART 3 - EXECUTION

3.01 INSTALLATION

- A. In general, for project specifications, remove "Design Requirements" sub-paragraph A in Part 1, paragraph 1.03 "System Description" of this Design Guide and use list to expand on specific requirements of installation.

END OF SECTION