

SECTION 233600
AIR TERMINAL UNITS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Constant volume terminal units.
- B. Variable volume terminal units.
- C. Variable volume regulators.
- D. Integral sound attenuator.
- E. Integral heating coils.
- F. Integral damper motor operators.
- G. Integral controls.

1.2 RELATED SECTIONS

- A. Section 23 05 13 - Motors.
- B. Section 23 09 13 - Instruments and Control Elements.
- C. Section 23 09 23 - Direct Digital Control Systems.
- D. Section 23 09 23 - Analog Control Equipment.
- E. Section 23 21 13 - Hydronic Piping: Connections to heating coils.
- F. Section 23 21 16 - Hydronic Specialties: Connections to heating coils.
- G. Section 23 31 00 - Ductwork.
- H. Section 23 33 00 - Ductwork Accessories.
- I. Section 23 37 00 - Air Outlets and Inlets.
- J. Section 26 05 05 - Equipment Wiring Systems: Electrical characteristics and wiring connections.

1.3 REFERENCES

- A. ADC 1062 - Air Distribution and Control Device Test Code.
- B. NFPA 70 - National Electrical Code.
- C. NFPA 90A - Installation of Air Conditioning and Ventilation Systems.
- D. UL 181 - Factory-Made Air Ducts and Connectors.

1.4 PERFORMANCE TOLERANCES

- A. Base performance on tests conducted in accordance with ADC 1062.

1.5 SUBMITTALS

- A. Submit under the provisions of Division 01.
- B. Shop Drawings: Indicate configuration, general assembly, and materials used in fabrication, and electrical characteristics and connection requirements.
- C. Product Data: Provide data indicating configuration, general assembly, and materials used in fabrication. Include catalog performance ratings which indicate air flow, static pressure, and NC designation. Include electrical characteristics and connection requirements.
- D. Include schedules listing discharge and radiated sound power level for each of second through sixth octave bands at inlet static pressures of one-to-4-inch-wg.
- E. Manufacturer's Installation Instructions: Indicate support and hanging details, and service clearances required.

1.6 SUBMITTALS AT PROJECT CLOSEOUT

- A. Submit under the provisions of Division 01.
- B. Record actual locations of units.
- C. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts lists. Include directions for resetting constant volume regulators.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with a minimum of five (5) years' documented experience.

1.8 REGULATORY REQUIREMENTS

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Price.
- B. Other acceptable manufacturers offering equivalent products.
 - 1. Titus.
 - 2. MetalAire.
 - 3. Trane.
- C. Substitutions: Under the provisions of Division 01.

2.2 MANUFACTURED UNITS

- A. Ceiling mounted variable air volume or constant supply air control terminals for connection to single duct, central air systems, with electric variable volume controls, hot water heating coils.
- B. Identify each terminal unit with a clearly marked identification label and air flow indicator. Include unit nominal air flow, maximum factory set airflow, minimum factory set air flow, and coil type.

2.3 SINGLE DUCT VARIABLE VOLUME UNITS

- A. Basic Assembly:
 - 1. Casings: Minimum 22 gage galvanized steel.
 - 2. Lining: Minimum 3/4-inch-thick neoprene or vinyl coated fibrous glass insulation, 1.5 lb./cu ft density, meeting NFPA 90A requirements and UL 181 erosion requirements.
 - 3. Plenum Air Inlets: Round stub connections or S slip and drive connections for duct attachment.
 - 4. Plenum Air Outlets: S slip and drive connections.
- B. Basic Unit:
 - 1. Configuration: Air volume damper assembly inside unit casing. Locate control components inside protective metal shroud.
 - 2. Volume Damper: Construct of galvanized steel with peripheral gasket and self-lubricating bearings; maximum damper leakage: 2 percent of design air flow at 3 inches inlet static pressure.
 - 3. Mount damper operator to position damper normally open.
- C. Attenuator Section: Line attenuator sections with 2-inch-thick insulation.
- D. Round Outlet: Discharge collar matching inlet size.
- E. Hot Water Heating Coil:
 - 1. Construction: ½ inch copper tube mechanically expanded into aluminum plate fins, leak tested under water to 200-psig pressure, factory installed.
- F. Automatic Damper Operator:
 - 1. Electric Actuator: 24 volts with high limit.
- G. Thermostat: Wall-mounted electronic type with appropriate mounting hardware. Refer to Section 23 09 23.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with the manufacturer's instructions.
- B. Provide ceiling access doors or locate units above easily removable ceiling components.
- C. Support units individually from structure. Do not support from adjacent ductwork.
- D. Connect to ductwork in accordance with Section 23 31 00.
- E. Verify that electric power is available and of the correct characteristics.

3.2 ADJUSTING

- A. Adjust work under the provisions of Division 01.
- B. Reset volume with damper operator attached to assembly allowing flow range modulation from 100 percent of design flow to 0 percent full flow.

END OF SECTION