

SECTION 23 36 00

AIR THERMAL UNITS

PART 1 GENERAL

1.01 SUBMITTALS

- A. Product Data:
 - 1. Terminal Units component and accessories list.
 - 2. Ratings and nameplate information.
- B. Quality Assurance Data:
 - 1. Certified production test reports or mill test reports.
 - 2. Test reports for previous design, and documentation showing previous design ratings and configurations.
 - 3. 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.
- C. VAV units shall be in full compliance with UL-181 and NFPA 90A and shall meet bacteriological standards of ASTM C665. Project Record Documents:
 - 1. Shop Drawings:
 - a) Terminal unit ratings, capacities, flows, dimensions and construction materials.
 - b) Wiring and termination drawings.
- D. Operation and Maintenance Data:
 - 1. Operating and maintenance procedures.
 - 2. Complete set of manufacturers drawings.
 - 3. Complete documentation of inspections and tests performed, including any logs, curves, and certificates. Documentation shall note any replacement of equipment or components that failed during testing.
 - 4. Spare parts lists.
 - 5. Data sheets updated to reflect field installation conditions.

PART 2 PRODUCTS

2.01 VARIABLE-VOLUME AIR TERMINAL UNITS

- A. Manufacturer:
 - 1. Anemostat
 - 2. Environmental Technologies
 - 3. Metal-Aire
 - 4. Tempmaster
 - 5. Titus
 - 6. Trane
- B. Configuration: Diverting-damper assembly inside unit casing with control components located inside a protective metal shroud.
- C. Casing: 0.034-inch steel or 22 gage minimum.
 - 1. Casing Lining: 1/2-inch-thick, coated, fibrous-glass duct liner complying with ASTM C 1071; secured with adhesive.
 - 2. Air Inlet: Round stub connection for duct attachment.

3. Air Outlet: S-slip and drive connections.
 4. Access: Removable panels for access to diverter and other parts requiring service, adjustment, or maintenance; with airtight gasket.
 5. Casing shall be solid double wall for healthcare, cleanroom, or lab applications.
- D. Hot-Water Heating Coil: Copper tube, mechanically expanded into aluminum-plate fins; leak tested underwater to 200 psig; and factory installed.
- E. Sound attenuation section: Included as a factory provided component.
- F. Controls: DDC controls provided by section 25 00 00 Integrated Automation. Refer to Section 25 50 00 Integrated Building Automation System (IBAS) for interface requirements.

2.02 CONSTANT-VOLUME (FAN POWERED) AIR TERMINAL UNITS

- A. Manufacturers:
1. Metal-Aire
 2. Anemostat
 3. Environmental Technologies
 4. Tempmaster
 5. Titus
 6. Trane
- B. Configuration: Volume-damper assembly and fan in series or in parallel arrangement inside unit casing with control components inside a protective metal shroud.
- C. Casing: 0.034-inch steel or 22 gauge minimum.
1. Casing Lining: 1/2-inch- thick, coated, fibrous-glass duct liner complying with ASTM C 1071; secured with adhesive.
 2. Air Inlets: Round stub connections or S-slip and drive connections for duct attachment.
 3. Air Outlet: S-slip and drive connections.
 4. Access: Removable panels for access to dampers and other parts requiring service, adjustment, or maintenance; with airtight gasket and quarter-turn latches.
 5. Casing shall be solid double wall for healthcare, cleanroom, or lab applications.
- D. Volume Damper: Galvanized steel with peripheral gasket and self-lubricating bearings.
1. Maximum Damper Leakage: ARI 880 rated, 3 percent of nominal airflow at 3" wg inlet static pressure.
 2. Damper Position: Normally closed.
- E. Fan Section: Galvanized-steel plenum, with direct-drive, forward-curved fan with air filter and backdraft damper.
1. Motor: Multispeed. Comply with requirements in Division 23 Motors.
 - a) Speed Control: Infinitely adjustable with pneumatic-electric and electronic controls.
 - b) Fan-Motor Assembly Isolation: Rubber isolators.
 2. Air Filter: Refer to specification section 23 40 00 HVAC Air Cleaning Devices.
- F. Hot-Water Heating Coil: Copper tube, mechanically expanded into aluminum-plate fins; leak tested underwater to 200 psig; and factory installed.
- G. Sound attenuation section: Included as a factory provided component.
- H. Factory-Mounted and -Wired Controls: Controllers shall be by Integrated Controls Systems, Inc. provided by the controls contractor to be factory mounted. Electrical components shall be mounted in control box with removable cover. Incorporate single-point electrical connection to power source.

1. Control Transformer: Factory mounted for control voltage on electric and electronic control units with terminal strip in control box for field wiring of thermostat and power source.
 2. Wiring Terminations: Fan and controls to terminal strip, and terminal lugs shall match quantities, sizes, and materials of branch-circuit conductors. Enclose terminal lugs in terminal box that is sized according to NFPA 70.
 3. Disconnect Switch: Factory-mounted, fused type.
- I. Control Panel Enclosure:
1. NEMA 250, Type 1, with access panel sealed from airflow and mounted on side of unit.
 2. Factory-wired control panel in accordance with NEC.
- J. Control Sequence:
1. Refer to Specification Section 23 90 00 Integrated Auto Control Sequences for Facility.
 2. Connect to Integrated Building Automation System. Refer to Section 25 50 00 - Intelligent Building Automation System (IBAS) for interface requirements.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install air terminal units level and plumb. Maintain sufficient clearance for normal service and maintenance.
- B. Connect ducts to air terminal units according to Specification Section 23 31 00 HVAC Duct and Casing.
- C. Hot-Water Piping: In addition to requirements in Specification Section 23 11 13 Hydronic Piping, connect heating coils to supply with shutoff valve, strainer, control valve, and union or flange; and to return with balancing valve and union or flange.

3.02 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
 1. After installing air terminal units and after electrical circuitry has been energized, test for compliance with requirements.
 2. Leak Test: After installation, fill water coils and test for leaks. Repair leaks and retest until no leaks exist.
 3. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 23 36 00