

SUGGESTED SPECIFICATIONS RETROFIT AIR TERMINAL UNITS

SECTION 1. GENERAL

- 1.1 **Basic Unit.** Furnish and install METALAIRE Retrofit Air Terminal Units. The units shall be the size and capacity as outlined in the plans and specifications. Casing dimensions shall be checked to ensure the terminals fit the available space.
- 1.2 **Quality, Agency, Standards.** Air terminals shall be certified under the Air Conditioning, Heating and Refrigeration Institute (AHRI) Standard 880-08 Certification Program and carry the AHRI seal. All NC values shall be calculated per AHRI Standard 885-08. Units with NC values calculated per AHRI-885-90 or 98 will not be accepted. Terminal units shall be either ETL® or UL® listed as a complete assembly. Terminal electrical components, including actuators and low voltage controls shall be UL® listed. All electrical components including both line voltage and low voltage shall be mounted in a metal control enclosure. Units shall have a single point field wiring connection. Units shall be manufactured and wired per UL-1995 and in accordance with the National Electric Code.
- 1.3 **Shipping.** All terminals shall be shipped as a single unit requiring no field assembly.

SECTION 2. CONSTRUCTION

- 2.1 **General.** Retrofit Terminal Units shall be METALAIRE Air Terminal Units. The units shall be the size and capacity as outlined in the plans and specifications. Casing dimensions shall be checked to ensure the terminals fit the available space.
- 2.2 **Casing.** The air terminals shall be constructed of galvanized steel. The casing shall be a minimum of 22-gauge. The terminal primary air inlet valve shall have a round or square inlet for field duct connection. The terminal unit discharge shall allow for a round or square duct connection. Units shall have a universal control-mounting panel constructed of minimum 22-gauge steel. Control panel shall include stand-offs to allow controls to be mounted without penetrating the terminal casing. Control panels without stand-offs are not acceptable.
 - 2.2.1 **Optional Sliding Door Control Panel Cover.** Provide a sliding control panel cover that slides towards the primary inlet and prevents the cover from being removed.

SECTION 3. PRIMARY INLET AIR VALVE

- 3.1 **Inlet Tube.** Primary inlet air valve assembly shall have a seamless butt weld on round inlet tube to minimize leakage and prevent the damper from binding on overlapping seam welds. Inlet tubes with overlapping welds or non-continuous, skipped welds are not acceptable. Inlet air valve shall have three structural beads machine formed into the tube. One external bead shall be provided for the attachment of flexible duct. Inlet air valves without three structural beads are not acceptable.

3.2 Flow Sensor. Primary inlet air valve flow sensor shall be multi-quadrant averaging sensor with flow sampling of both velocity pressure and flow differential pressure from four quadrants, and shall contain two control ports and two accessory ports. Flow sensors sampling only velocity pressure in all four quadrants are not acceptable. Sensors reading differential pressure with fewer than 8 measuring points are not acceptable. All piping connections to the flow sensor must be made with external ports that extend through damper tube. Units with piping connections made in the primary air stream are not acceptable. Flow sensors with plastic piping connections of any kind are not acceptable. At an inlet velocity of 2000 fpm, the differential static pressure required to operate any terminal size shall not exceed 0.14" wg. for the basic terminal.

3.2.1 Optional Removable Sensor. Air terminals with inlet flow sensing devices shall be provided with a gasketed access door to permit removal, inspection and cleaning of the air flow sensor.

3.3 Damper Assembly. Damper shaft shall rotate in a self-lubricating, long life, low friction thermo-plastic bearing. Damper shaft construction shall be one piece, continuous extruded aluminum. Damper shaft end shall include a permanent cast damper position indicator. Damper tube shall be free of obstructions including damper stops to allow the free rotation of the damper. Mechanical damper stops located in the inlet tube are not acceptable. A flexible gasket-mounted damper blade without adhesives shall provide damper seal. Damper gasket shall include slit partitioning around the perimeter to prevent damper noise at low flows near full close off. Damper gaskets without perimeter slit partitioning are not acceptable. Mechanically fastened damper assembly shall be double layer, 18 gauge equivalent, galvanized steel with integral blade seal. Leakage through the damper assembly shall be less than 1% of maximum CFM at 3" static pressure.

SECTION 4. INSULATION

(Square retrofit has insulation, round retrofit does not have insulation)

- 4.1 Standard Fiberglass Insulation.** Air Terminals shall be internally insulated with (½" or 1") thick, 1.5 lb. /ft³, dual density fiberglass. Insulation and edges shall be coated to prevent air erosion to 6000FPM surface velocity. Insulation shall comply with UL 181 and NFPA 90A.
- 4.2 Optional Foil-Faced Fiberglass Insulation.** Air Terminals shall be internally insulated with (½", ¾", 1") thick, 1.5 lb. /ft³ dual density or 1" 4 lb. /ft³ dual density, fiberglass covered with scrim backed foil facing. All surfaces and edges of the insulation shall be sealed with scrim backed foil facing so that there is no exposed fiberglass in the airstream. Insulation shall comply with UL 181 and NFPA 90A.
- 4.3 Optional Closed-Cell Foam Insulation.** Air Terminals shall be internally insulated with (½", 1") thick, 1.5lb. /ft³ density, closed-cell foam insulation and shall be Thermopure for fiber free application. Exposed fiberglass is not acceptable. Insulation shall comply with UL 181 and NFPA 255 (25/50). Material shall be chemically resistant to most hydrocarbon based solvents. Material shall not support mold growth or demonstrated degradation while subject to air erosion when tested in accordance to UL 181 and UMC 10.1.2.

SECTION 5. SOUND

- 5.1 Sound Ratings.** The terminal manufacturer shall provide ARI certified sound power data for radiated and discharge sound for round retrofit units. All NC values shall be calculated per AHRI standard

885-98. Verify sound ratings for the terminal do not exceed specified value at scheduled static pressure. Sound performance shall be AHRI certified. Each individual terminal unit shall bear an AHRI label.

- 5.2 Attenuators.** Sound attenuator shall be provided where scheduled to meet acoustical performance requirements. The attenuator and terminal unit shall be single piece construction. Attenuator insulation shall be the same as the unit casing insulation.

SECTION 6. CONTROLS

- 6.1 Digital Controls.** Factory mounting and wiring of DDC controls shall be as specified in the schedule. Mounting shall include manufacturer's flow sensor, transformer (if required by DDC controls manufacturer), and an enclosure protecting DDC controls and wiring.
- 6.2 Analog Controls.** Analog electronic controls with flow adjustments shall be as specified in the schedule and be provided by the terminal unit manufacturer.
- 6.3 Pneumatic Controls.** Pneumatic controls shall be as specified in the schedule. Manufacturer shall provide terminal units with factory set flow adjustments as required per the Terminal Unit schedule.