SECTION 230230 - UNIT VENTILATORS

PART 1 - GENERAL

Applicable Provisions of the Conditions of the Contract and Division 1 General Requirements govern the work in this section.

PART 2 - PRODUCTS

2.1 UNIT VENTILATORS

A. Unit Construction

1. Unit must be constructed of heavy gauge steel components welded together to form a rigid frame that is suitable for rigorous classroom duty. Unit frames that are not welded together are not acceptable. Unless painted for cosmetic reasons, the frame shall be entirely of pre-galvanized material to prevent corrosion.

2. Exterior panels must be constructed of heavy gauge pre-galvanized steel that have been cleaned and pretreated prior to painting to afford the maximum corrosion resistance possible, even after scratches that might appear during normal use. These panels shall be coated with at least 2 mil of the highest quality polyester baked-on powder paint.

3. Unit tops shall be constructed of heavy gauge pre-galvanized steel coated with a texture finish baked-on powder paint to resist both corrosion and marring during normal use.

4. Units shall be constructed such that normal unit operation is not affected by removal of front panels for routine maintenance or troubleshooting/adjustments of control components. Units requiring all front panels to be installed for correct unit operation shall not be accepted.

B. Insulation

1. The standard unit shall be constructed such that there shall be no fiberglass in the airstream.

C. Pipe Tunnel

1. Floor units shall have an integral pipe tunnel that can be used for piping across the unit with at least two pipes without increasing the normal depth of the unit. This tunnel shall be insulated from the unit and shall be accessible from both end compartments affording maximum flexibility of piping/installation.

D. Bar Stock Discharge Grille

1. Discharge grilles shall be welded steel continuous blade design with spacing no more than .230” such that normal pencils cannot penetrate. To further ensure that debris cannot be placed into the fans, the grille shall be backed by steel screen with spaces no larger than ¼ inch. The welded steel discharge grille shall be easily removable for maintenance and shall be attached to the unit with tamper resistant screws.

2. Adjustable deflection vanes shall be furnished by the manufacturer and factory mounted in the discharge of the unit to allow for side adjustment of airflow by the installing/balance Contractor.

E. Drain Pan

1. Drain pans shall be furnished on all units and be constructed of heavy gauge galvanized material. Pans shall be insulated to ensure that they do not sweat during the cooling season. Drain stubs shall be copper at least 7/8" O.D. Both left and right hand stubs shall be furnished on all units. Construction shall be field reversible.

2. Drain pans on ceiling units shall have drains located 5" above the bottom of the unit to allow for installation of traps on the drain line by the installing Contractor.

3. Trim flanges shall be furnished by the unit manufacturer and be painted with the same high quality finish as the ceiling unit. These flanges shall be furnished for the four sides of the unit.

F. Motors

1. Fan Motor (non-ducted):
All non-ducted units shall be furnished with a thermally protected permanent split capacitor motor for maximum efficiency. Unit shall have at least two speeds selectable from a switch located on the front of the unit control box. Motor speed shall be provided by means of a multi-tap autotransformer that is used to control the voltage of the main winding of the motor.

2. Fan Motor (high static)
All ducted units shall be furnished with a thermally protected, programmable, electronically commutated, polyphase motor that has been programmed with the capability of delivering at least three distinct air volumes. These air volumes shall be rated air for height, approximately 80% of rated air for medium, and approximately 70% of rated air for low. The motor shall be programmed to ensure that the motor delivers these airflows as conditions change during the normal operating course for the unit. Motors that are not programmable to ensure constant air delivery shall not be acceptable.

3. Unit shall be equipped with factory mounted, toggle type, disconnect service switch.

G. Fans

1. Fans shall be large diameter (at least 8") for low speed, quiet operation and shall be constructed of high impact mineral filled polymer material. Fans must be mounted on a continuous, precision ground hollow shaft that is supported on one end by a long life bronze bearing and connected to the motor shaft by a coaxial steel coupling with resilient inner ring.

2. Motors shall be easily removable and secured in a wire motor mount bolted to the unit frame. The wire mount shall be mechanically isolated from the frame of the unit by the resilient bushings at each mounting point of the motor mount assembly.

H. Outdoor Air Dampers

1. Outdoor air dampers shall be constructed of heavy gauge pre-galvanized steel for maximum strength and corrosion resistance. The damper shall be constructed such that its cross section forms a rectangle that affords maximum rigidity. Seals shall be deep pile polyester material on all edges. The damper shafts shall pass through trouble-free nylon bearings and be attached to the damper using through bolts and vibration resistant nuts.

2. The damper must be insulated with fiberglass insulation sandwiched inside the section. Cold weather damper must be provided for maximum cold weather protection.

I. Room (return) Air Damper

1. Room dampers shall be constructed of heavy gauge aluminum that has been stiffened with angles attached to the dampers to ensure proper sealing along its entire length. Seals shall be deep pile polyester material on all sides of the blade to provide maximum sealing. Damper shafts shall pass through trouble-free nylon bearing and be attached to the damper blade utilizing vibration resistant fasteners.

J. Face and Bypass Damper

1. Face and bypass dampers must be constructed of heavy gauge aluminum material that has been stiffened by use of multiple components to form a cross section that forms a rectangle to afford maximum rigidity. Seals shall be dual durometer vinyl material of multiple leaf design to ensure minimal leakage. Damper shafts shall pass through trouble-free nylon bearings and be connected to the damper blade using multiple fasteners that utilize vibration resistant components for maximum trouble-free life.

K. Agency Listings

1. All units shall be listed by NRTL (Nationally Recognized Testing Laboratory) such as ETL. All units shall have certified performance under applicable ARI program(s) for unit ventilators. The manufacturer shall furnish proof of such certification prior to final approval of the product.

L. Coils

1. Hot water coils shall be constructed of mechanically expanded copper tubing, minimum wall .016”, inside aluminum fins, minimum thickness .045”. The coil performance shall be maximized by incorporation of a waffle design of the fin surface. Coils shall be pressure tested at no less than 500 p.s.i.g. at the factory to ensure they are leak tight.

2. DX coils (VRF Type) shall be furnished with a thermo expansion valve sized to accommodate the condensing unit selected to meet the load. Coils shall be pressure tested at no less than 500 p.s.i.g. at the factory to ensure they are leak tight.

M. Filters

1. The units shall be furnished with throwaway filters. This filter shall be placed in the airstream such that all outdoor and/or return air passes through a single filter. Separate filtration of the outdoor air and return air are not acceptable.

2. Two (2) sets of spare throwaway filters are to be furnished by the manufacturer.

N. Intake Louver/Grille

1. Intake louver shall be in the quantity and size shown on the Drawings and Specifications. Vertical blade aluminum louver shall be constructed with double-break, aluminum blades for mounting in panel wall or masonry wall applications. The louver frame shall be heavy gauge aluminum 2-1/4” deep in direction of airflow and have weepholes along face of bottom edge. A 1/2“ square mesh screen shall be provided on the interior side of louver. Louver shall be aluminum with an oven baked powder paint finish, color as selected by Architect. A four-sided flange shall be provided around perimeter of intake of same material and finish as louver.

2. A decorative lattice grille shall be furnished on the exterior face of the wall intake louver. Grille shall be fabricated of 12 gauge aluminum and have the same finish as the wall intake louver. Grille shall be so designed to not block the weepholes in the wall louver. The vertical grille web shall exactly match the turned back edge of the vertical blade to minimize blockage of free area of wall intake louver.

O. Temperature Controls

1. The unit ventilator shall have field installed DDC controls provided by ATC Sub-Contractor.

P. Night Set Back Relay

1. A unit mounted relay shall be furnished that can be used by the controls Contractor to signal the unit to go to occupied/unoccupied mode from a remote source. The relay furnished shall be capable of either 24VA (DC) or 115 VAC coil operation. The contacts shall be SPDT for maximum flexibility.

PART 3 - EXECUTION

3.1 INSPECTION

A. Inspect equipment space locations before beginning installation. Verify that the space is correct for entry and access. Do not proceed with installation of the equipment until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's instructions and recommendations for installation of equipment, accessories and components.

B. All heating, ventilating and air conditioning equipment shall be carefully designed, constructed and installed so as to prevent any objectionable noise or vibration reaching any part of the building outside of the mechanical equipment room. Care shall also be taken to prevent transmission of noise or odor through ductwork into other spaces. The Contractor shall be required to rectify or replace at his own expense, any equipment not complying with the foregoing requirements.

3.3 CLEANING

A. Clean interior and exterior surfaces promptly after installation of equipment and components. Take care to avoid damage to protective coatings and finishes. Remove excess sealants, lubrication, dirt and other foreign substances.

END OF SECTION 230230