SECTION 23 74 33

FACTORY FABRICATED PACKAGED HEATING AND COOLING MAKE-UP AIR UNITS SPECIFICATIONS

TAG: Untempered Fan

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes modular rooftop filtered make-up air fan(s), designed to deliver fresh outside makeup air for installations requiring frequent air changes. Units are designed for indoor or outdoor applications and are available in vertical or horizontal discharge configurations.

1.2 SUBMITTALS

A. The manufacturer assumes no liability for the use or results of use of this document. This specification is to be reviewed by the engineer to confirm requirements of the project and building codes are met.

B. As the manufacturer continues product development, it reserves the right to change design and specifications without notice.

1.3 QUALITY ASSURANCE

A. ETL-Listed to listed and conforms to UL705 and CSA Std. C22.2.

B. Miami-Dade Certification - NOA-2 Supply

1.4 WARRANTY

A. All units are provided with the following 2-year standard warranty. Optional extended warranty available.

B. This warranty shall not apply if:

1. The equipment is not installed by a qualified installer per the manufacturer's installation instructions shipped with the product.
2. The equipment is not installed in accordance with Federal, State, and Local codes and regulations.
3. The equipment is misused, neglected, or not maintained per the manufacturer's maintenance instructions.
4. The equipment is not operated within its published capacity.
5. The invoice is not paid within the terms of the sales agreement.

C. The manufacturer shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 2-year warranty period, upon examination by the manufacturer, such part will be repaired or replaced by the manufacturer at no charge. The buyer shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without manufacturer's prior authorization, and all returned equipment shall be shipped by the buyer, freight prepaid to a destination determined by the manufacturer.

PART 2 - PRODUCTS

2.1 GENERAL ASSEMBLY

A. Unit(s) shall be factory assembled, tested and shipped as a complete packaged assembly, for indoor or outdoor mounting, consisting of the following specifications, deliver all capacities scheduled, and conform to design indicated herein. Alternate layouts or dimensional changes will not be accepted.

2.2 CABINET

A. Unit(s) shall be constructed of minimum 20-gauge G-90 galvanized steel riveted together via structural pop-rivets. All metal shall be CNC bent for precise assembly.

1. Base Construction: The base shall be constructed of galvanized steel for improved rigidity. Base shall be structurally reinforced to accommodate the blower assembly.
2. Rigging Provisions: The unit shall have a structural base constructed of minimum 14-gauge G-90 galvanized steel, and include lifting points on all four sides.
3. Roof Construction: Roof shall be pitched to allow for proper drainage.
4. Exterior Wall Construction: All exterior walls shall consist of insulated galvanized steel construction.
5. Service Access Doors: All door jambs shall be gasketed around their perimeter. Doors may be mounted via spring actuated, stainless steel hinges with stainless steel rivets, and self-compressing stainless steel pad lockable latches or through removable sliding panels.
6. Each compartment shall have removable access panels to allow for ease of service and maintainability. Electrical cabinet doors shall be outfitted with schematic and/or manual pouches formed into the door, along with wiring diagram attached to the indoor of the door from the factory.

B. Entire interior and exterior casing shall be constructed of minimum 20-gauge G-90 galvanized steel with no painting, and shall have undergone a salt spray corrosion test as per ASTM B 117.

C. An observation port shall be located on the exterior of the unit for observation of the main flame and pilot flame. All controls, gas valves, modulating controls and electrical components shall be mounted within the burner vestibule. The burner vestibule shall be an integral part of the unit and not extend outside the exterior casing of the unit and not exposed to the main air stream.

D. Entire unit shall be Miami-Dade wind rated up to ±130psf per TAS 201, 202 & 203.

2.3 SUPPLY AIR BLOWER AND MOTOR

A. All supply fans shall be direct drive.

B. The blower assembly shall consist of a centrifugal backward inclined, non- overloading wheel secured directly to a heavy-duty, ball bearing type motor via two set screws. The motor and wheel assembly shall be mounted to a heavy gauge galvanized steel frame. The motor shall be controlled by a variable frequency drive, allowing for variable airflow without the need of belts and pulleys.

C. Blower Motor: Motor shall be a premium efficiency motor available as:

1. Open Drip Proof (ODP) motor driven by a Variable Frequency Drive.
2. Totally Enclosed Fan Cooled (TEFC) motor driven by a Variable Frequency Drive.
3. Electronically Commutated Motor (ECM).
4. Explosion Proof.

D. Fans to be selected at or near efficiency peak. Check fan curves provided with job.

E. Blower and motor assembly shall be dynamically balanced. The entire blower and motor assembly shall be mounted on rubber vibration isolators. Wheels balanced as per AMCA 204-96; Balance Quality and Vibration Levels for fans.

2.4 SHAFTS AND BEARINGS

A. Shafts shall be precision ground and polished. Heavy duty, pre-lubricated bearings designed for, and individually tested, specifically for use in air handling applications.

2.5 AIRFLOW CONFIGURATIONS

A. Unit shall be configurable for up (vertical) discharge through unit.

B. Unit shall be configurable for down (vertical) discharge through unit.

C. Unit shall be configurable for side (horizontal) discharge through the cabinet.

D. Unit intake airflow configuration shall be through use of a fresh/outdoor damper.

1. Damper: Manufacturer shall provide and install on unit, when possible, a two-position, motor-operated damper with internal end switch to energize the blower-starter circuit. Blades shall be a maximum of 6" wide 16-gauge G-90 galvanized steel and shall be made to guarantee the absence of noticeable vibration at design air velocities. Damper blades are to be mounted on friction-free synthetic bearings. Damper edges shall have PVC coated polyester fabric mechanically locked into blade edge. Jamb seals used are flexible metal, compression type. Damper shall exceed AMCA Class 1A standard for low leakage. Damper assembly shall be a single assembly, and outfitted with an integral bird screen and louver/gutter system to divert any drainage through the base of the unit – intake air hood not required.
2. Actuator: A single direct drive damper actuator shall be used with spring return to ensure that the outdoor air section opens when not powered.
3. Discharge Diffuser Selections: 180° Side Discharge, Three-way down diffusion, Four-way down diffusion, or 45° down diffusion.

2.6 VARIABLE AIR VOLUME

A. Separate 120V Wiring Package (Required and used only for DCV or Prewire with VFD) - Three Phase Only

B. VAV Package w/ Manual Control for Non Tempered Units (VFD Included)

C. VAV Package w/ Static Pressure Control for Non Tempered Units (VFD Included)

D. VAV Package w/Preset or Reference Speeds for Non Tempered Units (VFD Included)

2.7 INTAKE

A. Possible configurations include: No Intake, Evap Cooler, V-Bank, Intake Hood, Screened Intake, and Trunkline.

B. Optional purchase: Extra set of intake filters.

2.8 CURB (Selectable options)

A. Full Perimeter Curb

B. Paint Option: Not Painted, Enamel, Epoxy

C. Insulated

D. Burglar Bars

E. Welded Bottom Corners

F. 16 Gauge

G. MPU Clips

2.9 COOLING SYSTEM (Optional)

A. Cooling coil section shall be field bolted directly to discharge of blower section. Coil section to be designed to fit onto common curb with main unit.

B. Base of coil section to be constructed same as main unit with double pitch stainless steel drain pan for coil.

C. Casing and roof to be 20-gauge G-90 galvanized construction. Inside of section to be fully insulated with foil back insulation.

D. DX module to meet scheduled requirements.

E. Evaporative cooler module to meet scheduled requirements.

F. Chilled water module to meet scheduled requirements.

2.10 MIXING BOXES

A. Mixing box to meet scheduled requirements.

2.11 REFRIGERATION KIT AND OPTIONS

A. Locking Cap.

B. Refrigeration Kit 410A.

C. Ship condenser loose.

2.12 HEATING SYSTEM (Optional)

A. Heating coil section shall be field bolted directly to unit section. Coil section to be designed to fit onto common curb with main unit.

B. Casing and roof to be 20-gauge G-90 galvanized construction. Inside of section to be fully insulated with foil back insulation.

C. Steam heating module to meet scheduled requirements.

D. Hot water heating module to meet scheduled requirements.

2.13 CONDENSING UNIT (Optional)

A. Condensing unit to be sized per fan.

2.14 FILTERS

A. Provide filters as part of unit. All filters shall be furnished and installed to meet the

performance requirements set forth in the schedule and as specified under another section of this work.

B. The filters shall be (2") thick, aluminum mesh coated with super-filter adhesive, aluminum mesh with polyester foam or pleated throw away.

C. Aluminum-mesh filters shall have aluminum frames with media to be layers of slit and expanded aluminum, varying in pattern to obtain maximum depth loading.

D. Washable 2" filters shall be enclosed in two-piece, die-cut frame with diagonal supports. Frame shall be constructed of heavy-duty beverage board. Filter media is supported on the air leaving side by a metal grid.

E. All filters shall be installed on tracks for easy removal from the unit.

F. Shall be either insulated or non-insulated constructed of G-90 galvanized steel with filters supported by internal slides and with removable access panels.

G. Unit shall have an optional adjustable pressure differential sensor for the filter bank to alert in the event of a clogged filter.

2.15 ELECTRICAL

A. All controls shall be pre-wired and housed in an insulated electrical cabinet within the unit to protect against risk of condensation.

B. All units shall be provided with single point electrical connection.

C. Unit shall be provided with a door safety switch that de-energizes the supply fan when the door is opened.

D. The electrical cabinet shall be outfitted with the following:

1. LED electrical cabinet service light with automatic activation upon door switch.
2. Color wiring schematics, laminated to the interior wall of the cabinet doors.
3. Factory mounted disconnect with unit bottom knockouts.
4. A LED backlit, LCD Human-Machine Interface (HMI) shall be mounted within the unit’s control cabinet to allow for all setpoints configuration and refrigeration system monitoring at the unit.
5. Up to 4 additional space mounted HMIs available. Additional HMIs shall allow forfull programming capabilities and are outfitted with integral temperature and humidity sensors. Additional HMIs shall be capable of being individually averaged for space temperature/humidity readings. All HMIs shall be wired using standard CAT5/6 cables.

2.16 OPTIONS

A. Coil Ecoating

B. Gravity Dampers

C. Indoor Hanging Cradle

D. Painted Coatings

E. 6 Pole 40 Amp Rotary Motor Disconnect

F. Convenience Outlet

G. Cooling Thermostat

H. Extended Power Drop

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine all areas and conditions under which packaged units are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.2 INSTALLATION

A. Install units in accordance with manufacturer's instructions, drawings, written specifications, manufacturer’s installation manual and all applicable building codes.

3.3 CONNECTIONS

A. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate the general arrangement of piping, fittings, and specialties. Install piping to allow service and maintenance.

B. Duct installation requirements are specified in other Division 23 Sections. Drawings indicate the general arrangement of ducts.

C. Electrical connections conform to applicable requirements in Division 26 Sections.

3.4 SYSTEM START-UP

A. System start-up is performed by a factory-trained Service Technician.