

**Part 1            General**

**1.1                SECTION INCLUDES**

- .1        Packaged air handling units.

**1.2                RELATED SECTIONS**

- .1        Section 23 05 48 - Vibration Isolation.
- .2        Section 23 07 13 - Duct Insulation.
- .3        Section 23 31 00 - Duct Work.
- .4        Section 23 33 00 - Duct Work Accessories: Flexible duct connections.
- .5        Equipment Wiring: Electrical characteristics and wiring connections.

**1.3                REFERENCES**

- .1        AFBMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
- .2        AFBMA 11 - Load Ratings and Fatigue Life for Roller Bearings.
- .3        AMCA 99 - Standards Handbook.
- .4        AMCA 210 - Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
- .5        AMCA 300 - Reverberant Room Method for Sound Testing of Fans.
- .6        AMCA 301 - Method of Publishing Sound Ratings for Air Moving Devices.
- .7        AMCA 500 - Method of Testing Louvres for Ratings.
- .8        AMCA 5000 - Method of Testing Dampers for Ratings.
- .9        ARI 410 - Forced-Circulation Air-Cooling and Air-Heating Coils.
- .10        ARI 430 - Fabrication of Central Station Air Handling Units.
- .11        ARI 435 - Application of Central-Station Air-Handling Units.
- .12        ARI 610 - Central System Humidifiers for Residential Applications.
- .13        SMACNA - HVAC Duct Construction Standards - Metal and Flexible.
- .14        UL 900 - Air Filter Units.

**1.4                SUBMITTALS**

- .1        Division 01: Procedures for submittals.

- .2 Shop Drawings: Indicate assembly, unit dimensions, weight loading, required clearances, construction details, field connection details, and electrical characteristics and connection requirements.
- .3 Product Data:
  - .1 Provide literature which indicates dimensions, weights, capacities, ratings, fan performance, gauges and finishes of materials, and electrical characteristics and connection requirements.
  - .2 Provide data of filter media, filter performance data, filter assembly, and filter frames.
  - .3 Provide fan curves with specified operating point clearly plotted.
  - .4 Submit sound power level data for both fan outlet and casing radiation at rated capacity.
  - .5 Submit electrical requirements for power supply wiring including wiring diagrams for interlock and control wiring, clearly indicating factory-installed and field-installed wiring.
- .4 Manufacturer's Installation Instructions.

## **1.5 OPERATION AND MAINTENANCE DATA**

- .1 Division 01: Submittals for project closeout.
- .2 Maintenance Data: Include instructions for lubrication, filter replacement, motor and drive replacement, spare parts lists, and wiring diagrams.

## **1.6 QUALIFICATIONS**

- .1 Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years experience, who issues complete catalogue data on total product.

## **1.7 DELIVERY, STORAGE, AND HANDLING**

- .1 Division 01: Transport, handle, store, and protect products.
- .2 Accept products on site in factory-fabricated protective containers, with factory-installed shipping skids and lifting lugs. Inspect for damage.
- .3 Store in clean dry place and protect from weather and construction traffic. Handle carefully to avoid damage to components, enclosures, and finish.

## **1.8 ENVIRONMENTAL REQUIREMENTS**

- .1 Do not operate units for any purpose, temporary or permanent, until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.

## **1.9 EXTRA MATERIALS**

- .1 Division 01: Submittals for project closeout.
- .2 Provide two sets for each unit of fan belts and filters.

**Part 2 Products**

**2.1 MANUFACTURERS**

- .1 Engineered Air Product LM4/K/V
- .2 Substitutions: Refer to Division 01

**2.2 AIR HANDLING UNIT, AHU-1**

- .1 Unit Casing
  - .1 Unit casing shall be of minimum 18 (1.3mm) gauge satin coat galvanized sheet metal. All units shall be internally insulated with 1" (50mm) thick 1 1/2 lb./cu.ft. (24 kg./cu.m.) density, neoprene coated fibre glass thermal insulation. Provide hinged access doors with Camlock handles. Unit shall be finished with a grey enamel coating on unit exterior.
  - .2 **Unit size shall be as per drawings. Fan section shall be no smaller than indicated.**
  - .3 **Access doors shall be on located on two sides not front and back of unit.**
  - .4 **There shall be access to each servable component and to each side of every coil and filter.**
- .2 Fan
  - .1 Forward curved fans shall be equipped with greaseable pillow block bearings, supported on a rigid structural steel frame. Fan-motor assemblies shall be provided with vibration isolators. Fan motors shall be open drip proof, ODP type.
  - .2 **Supply fan shall be plenum type.**
- .3 Electric Coil
  - .1 Heater elements shall be installed a minimum of 12" (300mm) downstream from air filters. Insulation in heating sections shall be fibre reinforced foil faced. Heater element wiring shall terminate in a full height enclosure at one end of the heater. All internal wiring shall terminate on clearly identified terminal blocks. Heaters shall be equipped with an automatic reset disc type thermal cut-out. Heater elements shall be open type nickel-chromium construction, (60% Ni, 16% Cr, 24% Fe). Coil terminal pins shall be mechanically secured and insulated from the frame by means of non-rotating ceramic bushings. Provide SCR complete with solid state discharge air controller to maintain 65 F discharge air temperature.
- .4 Filters
  - .1 Filter sections shall be provided with adequately sized access doors to allow easy removal of filters. Filter removal shall be from one side as noted on the drawings. Maximum face velocity allowable is 500 ft/min.
  - .2 The filter modules shall be designed to slide out of the unit. Side removal 2" (50mm) filters shall slide into a formed metal track, sealing against metal spacers at each end of the track. Filters shall be rated MERV 8.
- .5 Controls

- .1 Air handling units shall be factory wired and tested, and shall be certified by C.G.A., with C.S.A. approved components. Provide a system of motor control, including all necessary terminal blocks, motor contactors, motor overload protection, grounding lugs, control transformers, auxiliary contactors and terminals for the connection of external control devices or relays.
- .2 Automatic controls shall be housed in a control panel mounted in or on the air handling unit, which will meet the C.S.A. standard of the specific installation.
- .3 Provide remote panel with unit on / off switch & light and heat on switch & light.

**Part 3 Execution**

**3.1 INSTALLATION**

- .1 Install to manufacturer's written instructions.
- .2 Install to ARI 435.
- .3 Assemble high pressure units by bolting sections together. Isolate fan section with flexible duct connections.
- .4 Install assembled unit on vibration isolators.

**END OF SECTION**