

SECTION 233423 - HVAC POWER VENTILATORS

PART 1 - GENERAL

1.1 STIPULATIONS

- A. The specifications sections “General Conditions of the Construction Contract”, “Special Conditions”, and “Division 1 – General Requirements” form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 SUMMARY

- A. Section Includes:
 - 1. Upblast Centrifugal ventilators.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Wiring Diagrams: For power, signal, and control wiring.
 - 3. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.
- C. Operation and maintenance data.
- D. Steel Certifications.

1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- B. AMCA Compliance: Fans shall have AMCA-Certified performance ratings and shall bear the AMCA-Certified Ratings Seal.

PART 2 - PRODUCTS

2.1 UPBLAST CENTRIFUGAL VENTILATORS (EF-x)

Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Acme Engineering & Manufacturing Corporation.
 2. Broan-NuTone LLC; NuTone Inc.
 3. Carnes Company.
 4. Hartzell Fan Incorporated.
 5. JencoFan.
 6. Loren Cook Company.
 7. PennBarry.
 8. Or Approved Equal.
- B. Housing: Removable, spun-aluminum, dome top and outlet baffle; aluminum base with venturi inlet cone.
1. Provide spun-aluminum discharge baffle to direct discharge air upward, with rain and snow drains and grease collector.
 2. Hinged Subbase: Galvanized-steel hinged arrangement permitting service and maintenance.
- C. Fan Wheels:
1. Aluminum hub and wheel with backward-inclined blades.
- D. Accessories:
1. Disconnect Switch: Non-fusible type, with thermal-overload protection mounted inside or outside fan housing per schedule, factory wired through an internal aluminum conduit.
 2. Bird Screens: Removable, 1/2-inch mesh, aluminum or brass wire.
 3. Dampers:
 - a. Counterbalanced, parallel-blade, back draft dampers mounted in curb base; factory set to close when fan stops.
- E. Roof Curbs: Galvanized steel; mitered and welded corners; 1-1/2-inch- thick, rigid, fiberglass insulation adhered to inside walls; and 1-1/2-inch wood nailer. Size as required to suit roof opening and fan base.
1. Configuration: Built-in raised cant and mounting flange.
 2. Overall Height: 16 inches
 3. Sound Curb: Curb with sound-absorbing insulation.
 4. Pitch Mounting: Manufacture curb for roof slope.
 5. Metal Liner: Galvanized steel.
- F. Capacities and Characteristics: See Drawing Schedule for Capacities and Characteristics

2.2 LOCAL EXHAUST VENTILATOR (LEV-1)

Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or equal:

- A. Fan Wheels:
 - 1. Aluminum wheel with radial blades.
- B. Accessories:
 - 1. Disconnect Switch: Non-fusible type, with thermal-overload protection mounted inside or outside fan housing per schedule, factory wired through an internal aluminum conduit.
 - 2. Fume Arm: Basis of Design IAP Model FA-0814-H, 8in 14ft at 0.7”@1050 cfm; stainless steel arm. 20” diameter hoods with light kit and spark protector.
 - 3. Fan: FAN-DM-0808-3HP-3P 3HP 460V, 3PHASE
 - 4. Filter: FAN-EPA-08 Filter assembly housing
- C. Capacities and Characteristics: See Drawing Schedule for Capacities and Characteristics.

2.3 LOCAL EXHAUST VENTILATOR (LEV-2)

Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or equal:

- A. Description:
 - 1. Disconnect Switch: Non-fusible type, with thermal-overload protection mounted inside or outside fan housing per schedule, factory wired through an internal aluminum conduit.
 - 2. Fume Arm: Basis of Design Sentry Air Systems model SS-010-HFA. 12’ heavy duty stainless steel extractor arm .
 - 3. Carbon steel cabinet
 - 4. Filter: HEPA filter
 - 5. Variable speed controller
 - 6. Magnehelic gauge
 - 7. Outlet plenum.
- B. Capacities and Characteristics: See Drawing Schedule for Capacities and Characteristics.

2.4 TABLE TOP SPRAY BOOTH

Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings M-tek model MT-OF 3or equal:

- A. Discharge:
 - 1. 8" Dia. 9 Ft. Exhaust Duct Kit, 2 plain duct pieces, ring connector to fan, rain guards, counter flashing and vertical damper capFan Wheels:
- B. Booth Construction

1. 18 ga. Zinc galvanized steel panels, companion flanged and pre-punched at 6" on center with 1/4" nuts and bolts
2. Forward curve direct drive exhaust blower - .2" sp at 1150 cfm
3. 1/3 hp, 1 phase 115V/ 60 hz motor.
4. Manometer kit
5. 2 exhaust filters with 4 exhaust filter grids
6. Hardware set
7. UL approved
8. Powder coated inside and out.
9. Prefab electrical control kit
10. Observation window on entry doors
11. 8" diameter 9 ft exhaust duct kit, 2 plain duct pieces, ring connector to fan, fan guards, counter flashing and vertical damper cap.
12. Interlock combo kit
13. Fire suppression system

2.5 MOTORS

- A. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Division 23 Section "Common Motor Requirements for HVAC Equipment."
 1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
 2. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in Division 26 Sections.
- B. Enclosure Type: Totally enclosed, fan cooled.

2.6 SOURCE QUALITY CONTROL

- A. Certify sound-power level ratings according to AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Factory test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Label fans with the AMCA-Certified Ratings Seal.
- B. Certify fan performance ratings, including flow rate, pressure, power, air density, speed of rotation, and efficiency by factory tests according to AMCA 210, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating." Label fans with the AMCA-Certified Ratings Seal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Secure roof-mounted fans to roof curbs with cadmium-plated hardware.

- B. Ceiling Units: Suspend units from structure; use steel wire or metal straps.
- C. Support suspended units from structure using threaded steel rods and elastomeric hangers having a static deflection of 1 inch.
- D. Install units with clearances for service and maintenance.
- E. Label units according to requirements specified in Division 23 Section "Identification for HVAC Piping and Equipment."

3.2 CONNECTIONS

- A. Duct installation and connection requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors. Flexible connectors are specified in Division 23 Section "Air Duct Accessories."
- B. Install ducts adjacent to power ventilators to allow service and maintenance.
- C. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- D. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- B. Tests and Inspections:
 - 1. Verify that shipping, blocking, and bracing are removed.
 - 2. Verify that unit is secure on mountings and supporting devices and that connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
 - 3. Verify that cleaning and adjusting are complete.
 - 4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.
 - 5. Adjust belt tension.
 - 6. Adjust damper linkages for proper damper operation.
 - 7. Verify lubrication for bearings and other moving parts.
 - 8. Verify that manual and automatic volume control and fire and smoke dampers in connected ductwork systems are in fully open position.
 - 9. Remove and replace malfunctioning units and retest as specified above.

- C. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Prepare test and inspection reports.

3.4 ADJUSTING

- A. Adjust damper linkages for proper damper operation.
- B. Adjust belt tension.
- C. Replace fan and motor pulleys as required to achieve design airflow.
- D. Lubricate bearings.

END OF SECTION 233423