SECTION 23 34 23
HVAC POWER VENTILATORS

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes the following:
   1. Centrifugal roof ventilators.
   2. In-line centrifugal fans.

1.02 SUBMITTALS

A. Product Data: Include rated capacities, furnished specialties, and accessories for each type of product indicated and include the following:

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

C. Field quality-control test reports.

D. Operation and maintenance data.

1.03 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. NEMA Compliance: Motors and electrical accessories shall comply with NEMA standards.

C. UL Standard: Power ventilators shall comply with UL 705.

PART 2 - PRODUCTS

2.01 CENTRIFUGAL ROOF VENTILATORS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Acme Engineering & Mfg. Corp.
   2. Central Blower Co.
   3. Greenheck.
   4. Loren Cook Company.

5. Penn Ventilation.

C. Description: Direct- or belt-driven centrifugal fans consisting of housing, wheel, fan shaft, bearings, motor and disconnect switch, drive assembly, curb base, and accessories.

D. Housing: Removable, **galvanized steel, mushroom-domed top**; square, one-piece, aluminum base with venturi inlet cone.
1. Hinged Subbase: Galvanized-steel hinged arrangement permitting service and maintenance.

E. Fan Wheels: Aluminum hub and wheel with backward-inclined blades.

F. Belt-Driven Drive Assembly: Resiliently mounted to housing, with the following features:
1. Fan Shaft: Turned, ground, and polished steel; keyed to wheel hub.
2. Shaft Bearings: Permanently lubricated, permanently sealed, self-aligning ball bearings.
3. Pulleys: Cast-iron, adjustable-pitch motor pulley.
4. Fan and motor isolated from exhaust airstream.

G. Accessories:
1. Disconnect Switch: Nonfusible type, with thermal-overload protection mounted **inside** fan housing, factory wired through an internal aluminum conduit.
2. Bird Screens: Removable, 1/2-inch mesh, aluminum or brass wire.
3. Dampers: Counterbalanced, parallel-blade, backdraft dampers mounted in curb base; factory set to close when fan stops.
4. Motorized Dampers: Parallel-blade dampers mounted in curb base with electric actuator; wired to close when fan stops.

H. 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: **18 inches**.
3. Pitch Mounting: Manufacture curb for roof slope.
4. Metal Liner: Galvanized steel.

2.02 IN-LINE CENTRIFUGAL FANS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Greenheck.
2. Loren Cook Company.
3. Penn Ventilation.

B. Description: In-line, **direct** or **belt**-driven centrifugal fans consisting of housing, wheel, outlet guide vanes, fan shaft, bearings, motor and disconnect switch, drive assembly, mounting brackets, and accessories.

C. Housing: Split, spun aluminum with aluminum straightening vanes, inlet and outlet flanges, and support bracket adaptable to floor, side wall, or ceiling mounting.

D. Direct-Driven Units: Motor mounted in airstream, factory wired to disconnect switch located on outside of fan housing**; with wheel, inlet cone, and motor on swing-out service door**.

E. Belt-Driven Units: Motor mounted on adjustable base, with adjustable sheaves, enclosure around belts within fan housing, and lubricating tubes from fan bearings extended to outside of fan housing.

F. Fan Wheels: Aluminum, airfoil blades welded to aluminum hub.

G. Accessories:
1. Volume-Control Damper: Manually operated with quadrant lock, located in fan outlet.
2. Companion Flanges: For inlet and outlet duct connections.
3. Fan Guards: 1/2- by 1-inch mesh of galvanized steel in removable frame. Provide guard for inlet or outlet for units not connected to ductwork.
4. Motor and Drive Cover (Belt Guard): Epoxy-coated steel.

2.03 MOTORS

A. Comply with requirements in Division 23 Section "Common Motor Requirements for HVAC Equipment."

B. Enclosure Type: Totally enclosed, fan cooled.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install power ventilators level and plumb.

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.**

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."

F. 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."

G. Install ducts adjacent to power ventilators to allow service and maintenance.

H. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

I. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.02 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:
   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. Disable automatic temperature-control operators, energize motor and adjust fan to indicated rpm, and measure and record motor voltage and amperage.
   10. Shut unit down and reconnect automatic temperature-control operators.
   11. Remove and replace malfunctioning units and retest as specified above.

B. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

END OF SECTION 23 34 23