

**SECTION 23 34 23
HVAC POWER VENTILATORS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Roof exhausters
- B. Wall exhausters
- C. Cabinet exhaust fans
- D. Ceiling exhaust fans
- E. In-line exhaust or supply fans

1.2 REFERENCES

- A. AMCA 99 - Standards Handbook
- B. AMCA 210 - Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating
- C. AMCA 300 – Reverberant Room Method for Sound Testing of Fans
- D. AMCA 301 - Method of Calculating Fan Sound Ratings from Laboratory Test Data
- E. SMACNA - HVAC Duct Construction Standard

1.3 QUALITY ASSURANCE

- A. Performance Ratings: Conform to AMCA 210 and bear the AMCA Certified Rating Seal
- B. Sound Ratings: tested to AMCA 300 and 301, and bear AMCA Certified Sound Rating Seal
- C. Fabrication: Conform to AMCA 99

1.4 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01 33 00.
- B. Provide product data on wall and roof exhausters, and ceiling and cabinet fans.
- C. Provide fan curves with specified operating point clearly plotted.
- D. Submit sound power levels for both fan inlet and outlet at rated capacity.
- E. Submit manufacturer's installation instructions under provisions of Section 01 33 00.

1.5 COMMISSIONING

- A. Commissioning of a system or systems specified in this section is part of the construction process.
- B. Documentation and testing of these systems, as well as training of the Owner's operation and maintenance personnel, is required in cooperation with the Owner's Representative and the Commissioning Authority.
- C. Project Closeout is dependent on successful completion of all commissioning procedures, documentation, and issue closure. Refer to Section 01 77 00 - Contract Closeout, for substantial completion details.
- D. Refer to Section 01 91 00, Commissioning, for detailed commissioning requirements

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Greenheck
- B. Penn Ventilators
- C. Jenn Aire
- D. Broan
- E. Loren Cook
- F. ACME
- G. Twin City Fans & Blowers

2.2 ROOF EXHAUSTERS

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- A. Centrifugal or Axial Fan Unit: V-belt or direct driven, with spun aluminum housing; resilient mounted motor; ½" mesh, 16 gage aluminum bird screen; square base to suit roof curb with continuous curb gaskets; secured with corrosion resistant bolts and screws.
- B. Roof Curb: minimum 12" high on any side measured from finished roof, self-flashing with continuously welded seams, built-in cant strip, insulation and curb bottom, interior baffle with acoustic insulation, curb bottom, and factory installed door-nailer strip, see 23 05 29 2.5 for additional information on curbs.
- C. Disconnect Switch: Factory wired, non-fusible, in housing for thermal overload protected motor, wall-mounted type.
- D. Backdraft Damper: Gravity activated, aluminum multiple blade construction, felt edged with nylon bearings.
- E. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts, and keyed; variable and adjustable pitch motor sheave selected to achieve the required rpm with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

2.3 WALL EXHAUSTERS

- A. Centrifugal or Axial Fan Unit: V-belt or direct driven, with spun aluminum housing; resiliently mounted motor; ½" mesh, 16 gage aluminum bird screen secured with stainless steel bolts and screws.
- B. Disconnect Switch: Factory wired, non-fusible, in housing for thermal overload protected motor, wall-mounted type.
- C. Backdraft Damper: Gravity activated, aluminum multiple blade construction, felt edged with nylon bearings.
- D. Sheaves: For V-belt drives, provide cast iron or steel, dynamically balanced, bored to fit, keyed shafts, with self-aligning pre-lubricated ball bearings; variable and adjustable pitch motor sheaves selected to achieve the required RPM with sheaves set at mid-position.

2.4 CABINET AND CEILING EXHAUST FANS

- A. Centrifugal Fan Unit: V-belt or direct driven, with galvanized steel housing lined with ½"-inch acoustic insulation, resilient mounted motor, gravity backdraft damper in discharge.
- B. Disconnect Switch: Factory wired, non-fusible, in housing for thermal overload protected motor.
- C. Grille shall be molded white plastic or aluminum with baked white enamel finish.
- D. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts, and keyed; variable and adjustable pitch motor sheaves selected to achieve the required rpm with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

2.5 IN-LINE EXHAUST OR SUPPLY FANS

- A. Fan shall be complete factory assembled unit and shall include housing, centrifugal fan wheel, adjustable V-belt drive, motor, disconnect switch and vibration isolation.
- B. Housing shall be heavy gauge, galvanized steel, with square duct mounting collars; 90° intake to discharge configuration is allowed.
- C. Wheel shall be centrifugal backward inclined constructed of aluminum, with matched wheel and inlet cones.
- D. Motors shall be high efficiency, heavy-duty ball bearing type, mounted out of the air stream.
- E. Mount the fan shaft in permanently sealed and lubricated pillow block ball bearings.
- F. Each unit shall be equipped with the following accessories:
 - 1. Self-acting adjustable back-draft damper
 - 2. Hanging neoprene vibration isolators
 - 3. Insulated housing and motor cover (only for outdoor ventilation air fans)

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4. Motor cover/belt drive OSHA guard
5. Disconnect device
6. Fans shall be AMCA Certified and for both sound and air performance.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Secure roof exhausters with lag screws to roof curb.

3.2 SCHEDULE

- A. Provide equipment schedule on drawings to include the following data:

Manufacturer

Model

Fan Type

Hood/Housing

Capacity

SP inch WG

Drive

Motor hp

Sound (Sones)

Sound Power

1st Octave

2nd Octave

3rd Octave

4th Octave

5th Octave

6th Octave

7th Octave

8th Octave

Accessories

3.3 FUNCTIONAL PERFORMANCE TESTING

- A. System Functional Performance Testing is part of the Commissioning Process.
 1. The Contractor shall perform the Functional Performance Testing and the Commissioning Authority shall witness and document the test.
 2. Refer to Section 01 91 00, Commissioning, for functional performance tests and commissioning requirements.
- B. Systems Readiness Checklists shall be completed and submitted for each piece of equipment included in this section.
- C. Perform the functional performance testing of HVAC pumps as part of the Chilled Water System Functional Performance testing.

3.4 DEMONSTRATION AND TRAINING

- A. Training of the Owner's operation and maintenance personnel is required in cooperation with the Owner's Representative.
 1. Provide competent, factory authorized personnel to provide instruction to operation and maintenance personnel concerning the location, operation, and troubleshooting of the installed systems.

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2. Schedule the instruction in coordination with the Owner's Representative after submission and approval of formal training plans.
 3. Refer to Section 01 91 00, Commissioning, for further contractor training requirements.
- B. Provide demonstration and training for the following equipment covered by this section:
1. Roof Exhausters
 2. Wall Exhausters
 3. Cabinet and Ceiling Exhaust Fans
 4. In-Line Exhaust or Supply Fans

END OF SECTION