

SECTION 233400 - HVAC FANS

PART 1 - GENERAL

1.01 BUY AMERICAN REQUIREMENTS

- A. Provide certificates to show that all products meet the following requirements.
 - 1. American Iron and Steel (AIS)
 - 2. Build America, Buy America Act
- B. See Supplementary Conditions for details.

1.02 SUMMARY

- A. Section Includes:
 - 1. Fans, propeller - sidewall mounted.

1.03 ACTION SUBMITTALS

- A. Product Data:
 - 1. For each type of product.
 - a. Construction details, material descriptions, dimensions of individual components and profiles, and finishes for fans.
 - b. Rated capacities, furnished specialties, and accessories for each fan.
 - c. Fans:
 - 1) Certified fan performance curves with system operating conditions indicated.
 - 2) Certified fan sound-power ratings.
 - 3) Fan construction and accessories.
 - 4) Motor ratings and electrical characteristics, plus motor and electrical accessories.
 - 5) Fan speed controllers.
 - d. Material thickness and finishes, including color charts.
 - e. Dampers, including housings, linkages, and operators.

1.04 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fans and ventilators, include the following:
 - 1. Operation in normal and emergency modes.
 - 2. Operation and maintenance manuals.

PART 2 - PRODUCTS

2.01 SIDEWALL PROPELLER EXHAUST FAN, EF-1

- A. Manufacturers: Greenheck.
- B. Construction:
 - 1. Impeller: Fabricated steel or cast aluminum propellor with hubs, statically and dynamically balanced, keyed and locked to shaft, directly connected to motor.
 - 2. Frame: One piece, galvanized steel drive frame, mounting flanges and supports.
 - 3. Direct driven motor in the airstream.
 - 4. Disconnect Switch: Factory wired, non-fusible, in housing for thermal overload protected motor, and wall mounted multiple speed switch.
- C. Accessories:
 - 1. Back-draft Damper: Multiple blade with offset hinge pin, blades linked.
 - 2. Insulated Control Damper: Multiple blade with offset hinge pin, blades linked, line voltage motor drive, power open, spring return.
 - 3. Safety Screens: Expanded galvanized metal over inlet, motor, and drive; to comply with OSHA regulations.
 - 4. Hood: Weather shield, to exclude rain and snow.
- D. Motors
 - 1. Comply with NEMA designation, temperature rating, service factor, and efficiency requirements for motors.
 - 2. 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.
 - 3. Provide controls power supply and transformer as necessary for fully functioning system.

2.02 BELT DRIVE SIDEWALL PROPELLER FAN, VF-1

- A. Manufacturers: Greenheck, Loren Cook.
- B. Source Limitations: Obtain sidewall-mounted propeller fans from single manufacturer.
- C. Construction:
 - 1. Impeller: Fabricated steel or cast aluminum propellor with hubs, statically and dynamically balanced, keyed and locked to shaft, directly connected to motor.
 - 2. Frame: One piece, galvanized steel drive frame, mounting flanges and supports.
 - 3. Direct driven motor in the airstream.
 - 4. Disconnect Switch: Factory wired, non-fusible, in housing for thermal overload protected motor, and wall mounted multiple speed switch.
- D. Accessories:
 - 1. Insulated Control Damper: Multiple blade with offset hinge pin, blades linked, line voltage motor drive, power open, spring return.
 - 2. Safety Screens: Expanded galvanized metal over inlet, motor, and drive; to comply with OSHA regulations.
 - 3. Hood: Weather shield, to exclude rain and snow.

- E. Motors
 - 1. Comply with NEMA designation, temperature rating, service factor, and efficiency requirements for motors.
 - 2. 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.
- F. Provide controls power supply and transformer as necessary for fully functioning system

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

- A. Install fans level and plumb.
- B. Disassemble and reassemble units, as required for moving to the final location, in accordance with manufacturer's written instructions.
- C. Lift and support units with manufacturer's designated lifting or supporting points.
- D. Equipment Mounting:
 - 1. Unit Support: Install fans level on structural curbs. **Coordinate wall penetrations and flashing with wall construction. Secure units to structural support with anchor bolts.**
- E. Install units with adequate clearances for service and maintenance.
- F. Label fans in accordance with requirements specified in Section 230553 "Identification for HVAC Piping and Equipment."

3.02 ELECTRICAL CONNECTIONS

- A. Connect wiring in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- B. Ground equipment in accordance with Section 260526 "Grounding and Bonding for Electrical Systems."
- C. Install electrical devices furnished by manufacturer, but not factory mounted, in accordance with NFPA 70 and NECA 1.
- D. Install nameplate for each electrical connection, indicating electrical equipment designation and circuit number feeding connection.
 - 1. Nameplate is to be laminated acrylic or melamine plastic signs, as specified in Section 260553 "Identification for Electrical Systems."
 - 2. Nameplate is to be laminated acrylic or melamine plastic signs with a black background and engraved white letters at least 1/2 inch high.

3.03 CONTROL CONNECTIONS

- A. Install control and electrical power wiring to field-mounted control devices.
- B. Connect wiring in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

3.04 ADJUSTING

- A. Adjust damper linkages for proper damper operation.
- B. Lubricate bearings.

3.05 CLEANING

- A. After completing system installation and testing, adjusting, and balancing and after completing startup service, clean fans internally to remove foreign material and construction dirt and dust.

3.06 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
 - 1. Fan Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 - 2. Test and adjust controls and safeties.
 - 3. Fans and components will be considered defective if they do not pass tests and inspections.
 - 4. Prepare test and inspection reports.

3.07 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain HVAC fans.

END OF SECTION