

SECTION 23 34 00 HVAC FANS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. The fan is the model scheduled with the capacities indicated, designed specifically for efficient directional cooling in tight industrial applications. The fan shall be furnished with standard mounting hardware and variable speed control to provide cooling and destratification.
- B. Summary of Work
 - 1. Installation of the fan, miscellaneous or structural metal work (if required), field electrical wiring, cable, conduit, fuses and disconnect switches, other than those addressed in the installation scope of work, shall be provided by others. Factory installation services are available through Big Ass Fans. Consult the appropriate installation scope of work for information on the available factory installation options, overview of customer and installer responsibilities, and details on installation site requirements.

1.2 RELATED SECTIONS

- A. 21 00 00 Fire Suppression
- B. 23 00 00 Heating, Ventilating, and Air Conditioning (HVAC)
- C. 26 00 00 Electrical

1.3 REFERENCES

- A. National Fire Protection Association (NFPA)
- B. Underwriters Laboratories (UL)
- C. Canadian Standards Association (CSA)
- D. International Organization for Standardization (ISO)
- E. National Electrical Manufacturers Association (NEMA)
- F. National Electrical Code (NEC)

1.4 SUBMITTALS

- A. Shop Drawings: Drawings detailing product dimensions, weight, and attachment methods.
- B. Product Data: Specification sheets on the fan, specifying electrical and installation requirements, features and benefits, and controller information.
- C. Revit Files: Files provided for architectural design.
- D. Installation Guide: The manufacturer shall furnish a copy of all operating and maintenance instructions for the fan. All data is subject to change without notice.
- E. Schedule

1.5 QUALITY ASSURANCE

- A. Certifications
 - 1. The fan assembly, as a system, shall be Intertek/ETL certified and built pursuant to the guidelines set forth by UL standard 507 and CSA standard 22.2 No. 113.
- B. Manufacturer Qualifications
 - 1. The fan and any accessories shall be supplied by Big Ass Fans, which has a minimum of ten (10) years of product experience.
 - 2. ISO 9001-certified

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver product in original, undamaged packaging with identification labels intact. The fan shall be new, free from defects, and factory tested.
- B. The fan and its components must be stored in a safe, dry location until installation.

1.7 WARRANTY

- A. The manufacturer shall replace any products or components defective in material or workmanship for the customer free of charge (including transportation charges within the USA, FOB Lexington, KY), pursuant to the complete terms and conditions of the Big Ass Fans Warranty in accordance to the following schedule:

Main Fan Unit	5 years
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+ All reasonable costs of repair or replacement will be paid or reimbursed provided customer obtains pre-approval.

++ See the complete warranty for more details.

PART 2 PRODUCT

2.1 MANUFACTURER

- A. Delta T LLC, dba Big Ass Fans, PO Box 11307, Lexington, Kentucky 40575.
Phone (877) 244-3267. Fax (859) 233-0139. Website: www.bigassfans.com

2.2 HIGH VOLUME, LOW SPEED FANS – BIG ASS FANS PIVOT 2.0

- A. Complete Unit
1. Regulatory Requirements: The entire fan assembly shall be Intertek/ETL-certified and built pursuant to the construction guidelines set forth by UL standard 507 and CSA standard 22.2. No. 113.
 2. Sustainability Characteristics: The fan shall be designed specifically for efficient directional cooling in tight industrial applications. The fan components shall be designed specifically for high volume, low speed fans to ensure lower operational noise. Sound levels from the fan operating at maximum speed measured in a laboratory setting shall not exceed 63.5 dBA. Actual results of sound measurements in the field may vary due to sound reflective surfaces and environmental conditions.
 3. Good workmanship shall be evident in all aspects of construction. Field balancing of the airfoils shall not be necessary.
- B. Controls
1. The fan controller shall be incorporated into the fan assembly and housed in an enclosure independent of the motor to prevent overheating or electrical interference. The fan controller shall be factory programmed to minimize starting and braking torques and shall be equipped with a simple diagnostic program and an LED light to identify and relay faults in the system.
- C. Airfoil System
1. The fan shall be equipped with six (6) high volume, low speed airfoils of precision extruded, anodized aluminum alloy. The airfoils shall be of the high-performance Mini-Elipto design. The airfoils shall be connected to the hub and interlocked with six (6) stainless steel retainers and two (2) sets of stainless steel bolts and lock washers per airfoil.
 2. The fan shall be equipped with six (6) plug-style airfoil tips designed to redirect outward airflow into directional airflow. The airfoil tips shall be molded of high-strength polymer and shall be attached at the tip of each airfoil with a stainless steel screw. The standard color of the airfoil tips shall be Safety Yellow.
- D. Motor
1. The fan motor shall be a permanent magnet brushless motor rated for continuous operation at maximum speed with the capability of modulating the fan speed from 0–100% without the use of a gearbox or other mechanical means of control. The motor shall operate from any voltage ranging from 110–125 VAC or 200–240 VAC, single phase, and 50/60 Hz, without requiring adapters or customer selection. The motor shall be a non-ventilated, heat sink design with the capability of continuous operation in -4°F to 131°F (-20°C to 55°C) ambient condition. The standard color of the motor unit shall be Safety Yellow.
 2. The average power consumption of the motor at max speed shall be 460.5 Watts.
- E. Hub
1. The fan hub shall be constructed of zinc-plated steel for high strength and durability. The hub shall be precision machined to achieve a well-balanced and solid rotating assembly.
- F. Mounting System

1. The fan mounting system shall be designed for quick and secure installation on a variety of structural supports. The fan shall be capable of mounting to a bar joist or I-beam roof structure or to a vertical column.
 2. All components of the mounting system shall be of ASTM A-36 steel, welded construction, at least $\varnothing 3/16''$ (5 mm) thick, and powder coated for appearance and corrosion resistance. No mounting hardware or parts substitutions, including cast aluminum, are acceptable.
 3. All mounting bolts shall be SAE Grade 8 or equivalent.
 4. The design of the upper mount for ceiling-mounted fans shall provide two axes of rotation. This design shall allow for adjustments to be made after the mount is installed to the mounting structure to ensure the fan will hang level from the structure and can adjust its center of gravity when pivoted.
 5. The design of the column mounting bracket shall feature 21 positioning holes to allow horizontal fan adjustment.
 6. A pivot joint and pivoting lower yoke shall be included for column-mounted fans and shall be optional for ceiling-mounted fans.
 - a. The pivot joint and pivoting lower yoke shall feature nine (9) positioning holes to allow fan adjustment in all directions.
 - b. If an application does not require that the fan pivot, the pivot joint and pivoting lower yoke may be excluded for ceiling-mounted fans, reducing the minimum hanging distance below the roof.
- G. Safety Cables
1. The fan shall be equipped with multiple safety cables that provide additional means of securing the fan assembly to the building structure.
 - a. Ceiling-mounted fans shall be equipped with an upper safety cable pre-attached to the top of the extension tube. The safety cable shall be wrapped around the building structure and secured with a shackle.
 - b. Column-mounted fans shall be equipped with an upper safety cable that is secured from the column to the lower yoke.
 - c. All fans shall be equipped with a lower safety cable that is wrapped around the motor shaft and secured to the bottom of the extension tube.
 2. The safety cables shall be $\varnothing 1/4''$ (6 mm) in diameter and fabricated out of 7 × 19 stranded galvanized steel. The end loops shall be secured with swaged Nicopress® sleeves, pre-loaded and tested to 3,200 lbf (13,345 N).
 3. Field construction of safety cables is not permitted.
- H. Wall Control
1. The fan shall be equipped with a low-voltage wired remote wall control providing control of all fan functions.
 2. The wall control shall be capable of mounting to a standard electrical box or directly to a wall surface.
 3. The wall control shall include a rotary-style dial for controlling the fan's power and speed and an LED light to identify and relay faults in the system.
 4. Communication with the fan drive and controller shall be by a standard, commercially available CAT-5 (or higher) Ethernet cable that is field installed and provided by the installer.
- I. Cage
1. The fan shall be equipped with a rugged and easy to assemble cage.
 2. The cage shall be of welded wire construction, plated for corrosion resistance.
 3. The cage shall be attached directly to the motor unit.
 4. The cage shall not be intended for personal protection.
- J. Fire Control Panel Integration: An optional 10–30 VDC pilot relay shall be available for seamless fire control panel integration. The pilot relay can be wired Normally Open or Normally Closed in the field. The relay shall be included only if ordered.
- K. Guy Wires: Guy wires shall be included to limit the potential for lateral movement.

PART 3 EXECUTION

3.1 PREPARATION

- A. Fan location shall have a typical bar joist structure, existing I-beam structure, or vertical column from which to mount the fan. Additional mounting options may be available.

- B. Mounting structure shall be able to support weight and operational torque of fan. Consult structural engineer if necessary.
- C. Fan location shall be free from obstacles such as lights, cables, or other building components.
- D. Check fan location for proper electrical requirements. Consult installation guide for appropriate circuit requirements.
- E. Each fan requires dedicated branch circuit protection.

3.2 INSTALLATION

- A. The fan shall be installed by a factory-certified installer according to the manufacturer's Installation Guide, which includes acceptable structural dimensions and proper sizing and placement of angle irons for bar joist applications. Big Ass Fans recommends consulting a structural engineer for installation methods outside the manufacturer's recommendation and a certification, in the form of a stamped print or letter, submitted prior to installation.
- B. Minimum Distances
 - 1. For ceiling installations, the airfoils shall be at least 10 ft (3 m) above the floor.
 - 2. For column installations, the bottom of the column mount shall be located at least 13 ft (4 m) from the floor so that the lowest point of the fan is at least 10 ft (3 m) from the floor.
 - 3. For column installations, the column shall be located at least 4" (102 mm) away from a wall.
 - 4. Installation area shall be free of obstructions such as lights, cables, sprinklers, or other building structures with the airfoils at least 2 ft (610 mm) clear of all obstructions.
- C. The fan shall not be located where it will be continuously subjected to wind gusts or in close proximity to the outputs of HVAC systems or radiant heaters. Additional details are in the Big Ass Fans Installation Manual.

END OF SECTION