

## SECTION 23 34 00 HVAC Fans

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes
  - 1. The ceiling-mounted circulation fan is the model scheduled with the capacities indicated. 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. Technischer Überwachungsverein (TUV)
- B. National Fire Protection Agency (NFPA)
- C. Underwriters Laboratory (UL)
- D. Canadian Standards Association (CSA)
- E. National Electric Code (NEC)
- F. International Organization for Standardization (ISO)

#### 1.4 SUBMITTALS

- A. Shop Drawings: Drawings detailing product dimensions, weight, and attachment methods
- B. Part 2 Product Data: Specification sheets on the ceiling-mounted 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 information is subject to change without notice.
- E. Schedule

#### 1.5 QUALITY ASSURANCE

- A. Certifications
  - 1. The fan assembly, as a system, shall be TUV-certified and built pursuant to the guidelines set forth by UL standard 507 and CSA standard 22.2 No. 113.
  - 2. The fan shall be compliant with NFPA 13—Standard for the Installation of Sprinkler Systems, NFPA 72—National Fire Alarm and Signaling Code, and NFPA 70-2011—NEC.
  - 3. Controllers shall comply with NEC and UL standards and shall be labeled where required by code.
- B. Manufacturer Qualifications
  - 1. The fan and any accessories shall be supplied by Big Ass Fans that has a minimum of ten (10) years of product experience.
  - 2. ISO 9001-certified

3. The manufacturer shall not be listed on the Air Movement and Control Association International Inc. (AMCA) Certified Ratings Program (CRP) Non-Licensed Products report in the previous 36 months.

**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 shall be stored in a safe, dry location until installation.

**1.7 WARRANTY**

- A. The Warranty Period for surfaces with enhanced finishes (painted, anodized, etc.) on Essence shall be limited to one year. 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 Non-Prorated Warranty in accordance to the following schedule:

Item	Period of Coverage
Hub and airfoils	Lifetime (Parts) <sup>†</sup>
Motor, drive, and controller	10 years <sup>**</sup>
Labor	1 year <sup>**</sup>
Enhanced finishes <sup>***</sup>	1 year <sup>***</sup>

<sup>†</sup> "Lifetime" means a period ending seven (7) years after Big Ass Fans discontinues manufacturing the product, as such period is defined by Big Ass Fans, but in no event shall this period be less than 10 years from the date that the Warranty Period commences, as defined above.

<sup>\*\*</sup> The 10-Year Warranty Period and 1-Year Labor apply to non-residential installations only, and requires purchased installation by a factory-approved, Big Ass Fans certified installer and the submission of installation documentation by such installer. A 5-Year Warranty Period will apply for proper installations by any other state qualified or licensed electrical contractor. The Warranty is void in its entirety if the product is installed by personnel other than a state qualified or licensed contractor.

<sup>\*\*\*</sup> The 1-year enhanced finishes warranty applies to outdoor installations only.

**PART 2 PRODUCT**

**2.1 MANUFACTURER**

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

**2.2 HIGH VOLUME, LOW SPEED FANS – BIG ASS FANS ESSENCE**

- A. Complete Unit
  1. Regulatory Requirements: The entire fan assembly shall be TUV-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 to move an effective amount of air for cooling and destratification of conditioned commercial applications over an extended life. 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 40 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 eight (8) high volume, low speed airfoils of precision extruded, anodized aluminum alloy. Each airfoil shall be of the high-performance Mini-Elipto design. The airfoils shall be connected to the hub and interlocked with eight (8) stainless steel retainers and two (2) sets of stainless steel bolts and lock washers per airfoil.
  2. The fan shall be equipped with eight (8) upswept winglets designed to redirect outward airflow downward, thereby enhancing efficiency. The winglets 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 winglets shall be silver or black.
  3. As an option, the fan shall be equipped with eight (8) plug-style airfoil tips, molded of high strength polymer, in place of the eight (8) upswept winglets. The airfoil tips shall be attached at the tip of each airfoil with a stainless steel screw. The standard color of the airfoil tips shall be black.
- 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 100–120 VAC or 200–240 VAC, single phase, and 50/60Hz, 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 white with silver trim or silver with black trim.
  2. The motor shall be rated at one of the following:
    - a. 8-ft fan average power @ max speed = 475 Watts
    - b. 10-ft fan average power @ max speed = 425 Watts
    - c. 12-ft fan average power @ max speed = 350 Watts
    - d. 14-ft fan average power @ max speed = 300 Watts
- E. Mounting System
1. The fan mounting system shall be designed for quick and secure installation from a variety of structural supports. All components in the mounting system shall be of formed metal design using low-carbon steel no less than 3/16" (0.5 cm) thick and containing no critical welds. The mounting system shall be powder coated for appearance and resistance to corrosion. All mounting bolts shall be metric stainless steel or equivalent. No mounting hardware substitutions, including cast aluminum, are acceptable.
  2. The fan extension tube shall be a round, extruded aluminum tube. The extension tube shall include a chrome plate with forward and reverse controls and a fan status indicator light that is visible from the floor.
- F. 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.
- G. Safety Cable
1. The fan shall be equipped with a safety cable that provides an additional means of securing the fan assembly to the building structure. The safety cable shall be Ø3/16" (0.5 cm) diameter and fabricated out of 7 x 19 stranded galvanized steel, pre-loaded and tested to 3,200 lbf (13,345 N).
  2. Field construction of safety cables is not permitted.
- H. Wall Control
1. Wired (standard). The fan shall be equipped with a low-voltage wired remote wall control providing control of all fan functions. The wall control shall be capable of mounting to a standard electrical box or directly to a wall surface. 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. Communication with the fan drive and controller shall be by a standard, commercially available CAT5 (or higher) Ethernet cable that is field installed and provided by the installer.
  2. Wireless (optional). As an option, the fan shall be equipped with an optional radio frequency (RF) remote wall control in place of the wired wall control. The wall control shall provide control of all fan functions. The wall control shall be capable of mounting to a standard electrical box with an owner-supplied wall plate and shall include a capacitive touch display for controlling the fan's power and speed. Communication with the fan drive and controller shall be wireless.
- I. Fire Control Panel Integration

1. Includes a 10–30 VDC pilot relay for seamless fire control panel integration. The pilot relay can be wired Normally Open or Normally Closed in the field.
- J. Guy Wires
1. Guy wires shall be included for installations with extension tubes 4 ft (1.2 m) or longer to limit the potential for lateral movement.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Fan location shall have a typical bar joist or existing I-beam structure 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. Airfoils shall be at least 10 ft (3 m) above the floor.
  2. Installation area shall be free of obstructions such as lights, cables, sprinklers, or other building structures with the airfoils at least 2 ft (0.61 m) clear of all obstructions.
  3. The structure the fan is attached to shall be capable of supporting a torque load of up to 40 ft·lb (54 N·m) of torque.
- C. The fan shall not be located where it shall 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 3.2 Installation Manual.
- D. The fan is suitable for use in wet locations when installed on a GFCI protected branch circuit.
- E. In buildings equipped with sprinklers, including ESFR sprinklers, fan installation shall comply with all of the following:
  1. The maximum fan diameter shall be 24 ft (7.3 m).
  2. The HVLS fan shall be centered approximately between four adjacent sprinklers.
  3. The vertical clearance from the HVLS fan to the sprinkler deflector shall be a minimum of 3 ft (0.9 m).
  4. All HVLS fans shall be interlocked to shut down immediately upon receiving a waterflow signal from the alarm system in accordance with the requirements of NFPA 72—National Fire Alarm and Signaling Code.

END OF SECTION