Section 23 34 00

HVAC Fans

Part 1 General

1. 1.1 Summary
	1. Section Includes
		1. The ceiling-mounted circulation fan is the model scheduled with the capacities indicated. The fan shall be furnished with mounting hardware, a remote control, and SenseME™ Technology as manufactured by Big Ass Fans.
	2. Summary of Work
		1. Installation of the fan, wireless network, 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. Installation services are available through Big Ass Fans. Consult the appropriate installation scope of work for information on the available installation options, overview of customer and installer responsibilities, and details on installation site requirements.
2. 1.2 Related Sections
	1. 21 00 00 Fire Suppression
	2. 23 00 00 Heating, Ventilating, and Air Conditioning (HVAC)
	3. 26 00 00 Electrical
3. 1.3 References
	1. Canadian Standards Association (CSA)
	2. International Organization for Standardization (ISO)
	3. National Electrical Code (NEC)
	4. National Fire Protection Association (NFPA)
	5. Underwriters Laboratories (UL)
	6. Nationally Recognized Testing Laboratory (NRTL)
	7. European Conformity (CE)
	8. UK Conformity Assessed (UKCA)
4. 1.4 Submittals
	1. Shop Drawings: Drawings detailing product dimensions, weight, and attachment methods
	2. Product Data: Specification sheets on the ceiling-mounted fan, specifying electrical and installation requirements, features and benefits, and controller information
	3. Revit Files: Files provided for architectural design
	4. Product Documentation: The manufacturer shall furnish a copy of all installation, operation, and maintenance instructions for the fan.
	5. Schedule
5. 1.5 Quality assurance
	1. Certifications
		1. Safety
			1. The fan assembly, as a system, shall be Nationally Recognized Testing Laboratory (NRTL)-certified and built pursuant to the guidelines set forth by UL standard 507 and CSA standards 22.2 No. 60335-1 and 22.2 No. 113.
			2. The fan assembly, as a system, shall be CE- and UKCA-compliant.
			3. The fan motor shall be NRTL-certified and built pursuant to the following standards.
				1. Canada

CSA C22.2 No. 100. Standard for Safety for Motors and Generators.

CSA C22.2 No. 77. Standard for Safety for Motors with Inherent Overheating Protection.

* + - * 1. United States

UL 1004-1. Standard for Safety for Rotating Electrical Machines - Part 1 General Requirements.

UL 1004-3. Standard for Safety for Thermally Protected Motors.

UL 1004-7. Standard for Safety for Electronically Protected Motors.

* 1. Manufacturer Qualifications
		1. The fan and any accessories shall be supplied by Big Ass Fans, which has a minimum of twenty (20) years of product experience.
		2. ISO 9001-compliant
1. 1.6 Delivery, storage, and handling
	1. Deliver product in original, undamaged packaging with identification labels intact. The fan shall be new, free from defects, and factory tested.
	2. The fan and its components must be stored in a safe, dry location until installation.
2. 1.7 Warranty
	1. The manufacturer shall replace any products or components defective in material or workmanship, free of charge to the customer (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:

**Product Period of Coverage**

Indoor Fans 5 years

Damp-Rated Fans 3 years

†Labor to repair the defect will be provided free of charge at the Big Ass Fans service center for defects arising during the Warranty Period.

††See the complete warranty for more details.

Part 2 Product

1. 2.1 Manufacturer
	1. 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. 2.2 Big Ass Fans Haiku®
	1. Complete Unit
		1. Regulatory Requirements: The entire fan assembly shall be NRTL-certified and built pursuant to the construction guidelines set forth by UL standard 507 and CSA standards 22.2 No. 60335-1 and 22.2 No. 113. Damp-rated fans shall be suitable for use in damp locations when installed in a GFCI protected branch circuit.
		2. Quality: The fan shall display good workmanship in all aspects of its construction. Field balancing of the airfoils shall not be necessary.
		3. Colors: Airfoil colors may be selected by the architect or owner as described in 2.2.C, “Airfoils.”
		4. Optional Accessories
			1. An LED downlight that attaches to the bottom of the fan may be selected at the time of order.
			2. Indoor Universal Mount fans: The Chromatic Uplight™ may be selected at the time of order.
			3. Universal Mount fans: A 0–10 V module may be selected at the time of order. The module shall enable the fan to be integrated with a home or building automation system or a 3rd party
			0–10 V dimmer using an industry-standard protocol.
	2. Mounting System
		1. Low Profile Mount
			1. The Low Profile Mount shall be suitable for flat ceilings with heights ranging from 8 to 10 ft (2.4 to 3 m).
			2. The fan shall be equipped with a mounting plate, rubber bumpers, mounting brackets, a compact, low-profile motor hub assembly, and mounting hardware.
			3. The fan shall be available with a diameter of 52 in. (132 cm) or 60 in. (152 cm).
		2. Universal Mount
			1. The Universal Mount shall be suitable for flat or sloped ceilings with heights ranging from 9 to ≥14 ft (2.7 to ≥4.3 m).
			2. The fan shall be equipped with a mounting bracket, canopy, mounting ball and wedge, downrod, wiring cover, motor hub, and mounting hardware.
			3. A 12-in. (305-mm), 20-in. (508-mm), or 32-in. (813-mm) downrod shall be selected at the time of order. A 7-in. (178-mm), 48-in. (1219-mm), or 60-in. (1524-mm) downrod shall be available for purchase as a separate optional accessory.
				1. The 7-in. (178-mm) downrod shall not be available for 84-in. (213-cm) fans.
			4. The fan shall be available with a diameter of 52 in. (132 cm), 60 in. (152 cm), or 84 in. (213 cm).
	3. Airfoils
		1. The fan shall be equipped with three airfoils spanning a total diameter of 52 in. (132 cm), 60 in. (152 cm), or 84 in. (213 cm), as specified by the architect or owner.
		2. Indoor Fans
			* 1. The airfoils shall be made of bamboo or aircraft-grade aluminum, as specified by the architect or owner.
				2. Bamboo airfoils shall be available in caramel (light brown) or cocoa (dark brown), as specified by the architect or owner. The airfoils shall be suitable for indoor spaces only.
				3. Aluminum airfoils shall be available in black, white, satin nickel, oil-rubbed bronze, brushed aluminum, or driftwood, as specified by the architect or owner.
		3. Damp-Rated Fans
			* 1. The airfoils shall be made of aircraft-grade aluminum.
				2. The airfoils shall be available in caramel wood grain, cocoa wood grain, black, white, satin nickel, oil-rubbed bronze, brushed aluminum, or driftwood, as specified by the architect or owner.
	4. Motor
		1. The fan shall have an electronically commutated motor (ECM) rated for 100–240 VAC, single-phase.
		2. The motor shall draw 2.3–46.6 watts depending on the speed at which the fan is operated and if a light is installed.
		3. The fan shall be designed for continuous operation in ambient temperatures of 32–104°F (0–40°C) and a humidity range of 20–90% (non-condensing).
		4. The fan’s motor unit and motor unit trim shall be available in a black, white, satin nickel, or oil-rubbed bronze finish, as specified by the architect or owner.
	5. 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 1.5 mm in diameter and fabricated of aircraft steel.
		2. Field construction of safety cables is not permitted.
	6. SenseME™ Technology
		1. The fan shall be equipped with SenseME Technology for smart automation and shall be able to wirelessly connect to local Ethernet networks or host a network. The fan’s Bluetooth® capability shall permit over-the-air firmware updates.
		2. SenseME Technology control features shall be managed by users via the Big Ass Fans mobile app. The Big Ass Fans mobile app shall be supported by Android™ and iOS® mobile devices.
		3. Big Ass Fans Mobile App Control Modes
			1. Fan Eco. Activate Fan Eco to fully leverage the energy savings from the world's most efficient ceiling fan.
			2. Auto Mode
				1. Motion Sensor. The fan and light automatically turn on and off depending on whether motion is detected in the room.
				2. Temperature and Humidity Sensor. The sensor located in the Bluetooth remote control monitors room temperature and humidity in order to automatically adjust the fan speed to achieve the user’s ideal thermal comfort level.
				3. Learning. The fan automatically learns the user’s ideal temperature based on observing their manual adjustments to fan speed.
			3. Scheduling. Sets precise schedules for fan and light control modes.
			4. Whoosh® Mode. Silently varies fan speed to mimic cooling natural breezes.
			5. Sleep Mode. Responds to changing conditions to provide customized comfort all night long.
			6. Rooms. Enables users to group multiple fans in the same space for synchronized operation. Users shall be able to use the Big Ass Fans mobile app to automate fan and light functions or adjust settings manually.
			7. Manual Speed Control. Speed settings range from 0 (Off) to 7 (High).
			8. Manual Light Control. The optional Chromatic Uplight and LED downlight shall have adjustable brightness and On and Off settings, as well as the ability to be controlled by the motion sensor and scheduling features. The mobile app shall also provide control of the Chromatic Uplight’s Night Light mode and optional UV-C Clean mode. For fans with the LED downlight, see 2.2.H, “LED Downlight.” For fans with the Chromatic Uplight, see 2.2.I, “Chromatic Uplight.”
			9. Amazon Alexa Integration. Enables the use of Amazon Alexa to control the fan and light(s).
			10. Google Assistant Integration. Enables the use of Google Assistant to control the fan and light(s).
		4. Big Ass Fans Account. Allows for integrated controls between fans and smart thermostats located on the same Wi-Fi network.
		5. Display and sound
			1. Changes to fan settings shall be confirmed with auditory feedback (a beep) and/or visual indication of the active setting.
			2. The fan mode indicators shall be located on the bottom of the fan and shall be visible from the ﬂoor.
			3. Users shall have the ability to turn off the indicators and auditory feedback.
	7. Remote Control
		1. The fan shall be equipped with a compact Bluetooth remote control that allows intuitive operation of the fan speed and light brightness in the following modes:
			1. Fan speeds 0 (Off) through 7 (High)
			2. Auto Mode
			3. Light brightness 0–100%
		2. The remote shall control both the fan and light(s). Light brightness shall be increased or decreased by pressing the Up or Down Light button on the remote, and the light(s) shall be turned on or off by pressing the Light On/Off button.
		3. Each operating mode shall be indicated by a pattern on the fan mode indicators, which shall be located on the bottom of the fan and shall be visible from the floor.
		4. The remote shall be 1.5 in. wide x 5.7 in. tall x 0.8 in. thick (39 mm wide x 146 mm tall x 20 mm thick) and shall operate on a CR 2450 3 V lithium battery (included).
	8. LED Downlight (Optional)
		1. The fan shall be equipped with an LED downlight, as specified by the architect or owner.
		2. The LED downlight kit shall include an LED light module with a diffused clear or smoky lens.
		3. The LED downlight shall use a twist lock mechanism to attach to the bottom of the fan for downward-directed lighting.
		4. The LED downlight shall allow the user to adjust the color temperature to 2700 K or 4000 K.
		5. The LED downlight shall have a standard lumen option of 1,770 lumens and shall be capable of dimming down to 1%.
	9. Chromatic Uplight (Optional, Indoor Universal Mount fans)
		1. The fan shall be equipped with the Chromatic Uplight, as specified by the architect or owner.
		2. The Chromatic Uplight shall be compatible with Indoor Universal Mount fans.
		3. The Chromatic Uplight shall be installed on top of the fan motor hub for upward-directed lighting.
		4. The Chromatic Uplight kit shall include an LED light module that shall secure to the fan downrod with two set screws.
		5. The Chromatic Uplight shall allow the user to adjust the color temperature to 2700 K, 4000 K, or RGB color changing and shall have night light functionality. The user shall be able to change the RGB color setting to red, orange, yellow, green, blue, purple, or pink.
		6. The Chromatic Uplight shall have a standard lumen option of 1,845 lumens (2700 K setting) or 1,984 lumens (4000 K setting) and shall be capable of dimming down to 1%.
		7. As an upgrade, the Chromatic Uplight shall also include UV-C LEDs, as specified by the architect or owner. The UV-C LEDs shall emit UV-C light while the fan is spinning.
		8. For safety, the optional UV-C LEDs shall only be able to be turned on while the fan is spinning.
	10. 0–10 V Module (Optional, Universal Mount fans)
		1. The fan shall be equipped with a 0–10 V module, as specified by the architect or owner.
		2. The module shall be compatible with Universal Mount fans.
		3. The module shall be installed in the fan’s mounting bracket.
		4. The module shall provide independent control of fan speed and light intensity and shall support daisy chaining for one or up to 10 fans.
		5. The module shall be compatible with any 0–10 V sinking/sourcing dimmer and with most home or building automation systems.

Part 3 Execution

1. 3.1 Preparation
	1. The fan location must have an appropriate ceiling-mounted outlet box marked, “Acceptable for Fan Support.” If there is not an appropriate outlet box already installed at the location, one must be installed on a ceiling joist or beam and be properly wired. Additional mounting options may be available. Consult the installation guide for additional details.
	2. The fan location must be free from obstacles such as lights, cables, or other building components.
	3. Check the fan location for proper electrical requirements. Consult the installation guide for appropriate circuit requirements.
2. 3.2 Installation
	1. Install the fan according to the manufacturer’s installation guide, which includes acceptable mounting methods.
	2. Required Distances
		1. For 52-inch (132-cm) and 60-inch (152-cm) fans, the airfoils must be at least 7 ft (2.1 m) above the floor.
		2. For 84-inch (213-cm) fans, the airfoils must be at least 8 ft (2.4 m) above the floor.
		3. The airfoils must have at least 2 ft (0.6 m) clearance from all obstructions.
		4. The fan must be within a 30 ft (9.1 m) radius of where the mobile digital device will be used for control. (Line-of-sight obstructions may create a smaller maximum range.)
		5. The fan shall not be located where it will be subjected to rain or continuous wind gusts, or in close proximity to the outputs of HVAC systems or radiant heaters. Consult the installation guide for additional details.
	3. Install and set up the Big Ass Fans mobile app according to the manufacturer’s instructions.

End of Section