SECTION 23 34 00

INDUSTRIAL/COMMERCIAL CEILING FANS

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\*\* NOTE TO SPECIFIER \*\* Rite-Hite; high volume, low speed ceiling fans, industrial fans, commercial fans.
This section is based on the products of Rite-Hite, which is located at:
8900 N. Arbon Dr.
Milwaukee, WI 53223
Toll Free Tel: 888-214-0882
Tel: 414-355-2600
Fax: 414-355-9248
Email: [request info (info@ritehite.com)](http://admin.arcat.com/users.pl?action=UserEmail&company=RiteHite&coid=35200&rep=&fax=414-355-9248&message=RE:%20Spec%20Question%20(15830rhc):%20%20&mf=)
Web: <https://www.ritehite.com/en/am>
 [ [Click Here](http://www.arcat.com/arcatcos/cos35/arc35200.html) ] for additional information.
RITE-HITE Corporation, headquartered in Milwaukee, Wisconsin USA is a world-wide leader in the development, manufacture, and sale of HVLS (high volume, low speed) industrial ceiling fan that helps make your employees more comfortable and productive, while also helping you drive down your energy costs.

1. GENERAL
	1. SECTION INCLUDES
		1. High volume, low speed (HVLS) ceiling fans.
	2. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 26 00 00 - Electrical.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete the reference listed below if not actually required by the text of the edited section.

* + 1. National Fire Protection Association (NFPA) 13 - National Fire Code for Sprinklers.
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
		2. Product Data: Manufacturer's data sheets on each product to be used, including:
			1. Preparation instructions and recommendations.
			2. Storage and handling requirements and recommendations.
			3. Installation methods.
	2. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Providing sole source for design, engineering, manufacturing and warranty claims handling.
		2. Installer Qualifications: Trained by manufacturer.
	3. DELIVERY, STORAGE, AND HANDLING
		1. Store products in manufacturer's unopened packaging until ready for installation.
		2. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
	4. PROJECT CONDITIONS
		1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
	5. COORDINATION
		1. The fan shall be capable of receiving a stop command from the fire panel, a VESDA, or any number of smoke, flame or heat detectors.
		2. The fans shall be as follows:
			1. The fan shall meet the requirements of NFPA 13 (National Fire Code for Sprinklers) in regards to blocking obstructions below sprinkler heads.
			2. The fan shall meet the air velocity requirements of FM Global's 2.0 data sheet for ESFR sprinklers.
			3. If required by the local fire prevention authority, the fans shall be tied into the building's fire suppression system so that the fans shut off as soon as a fire is detected. The fan's control box shall include a variable frequency drive that facilitates this. The low voltage wire and relay needed to accomplish this shall be supplied by the Fire Alarm installer.
			4. When the fan is shut off upon fire detection as described above, the fans shall come to a complete stop in less than 45 seconds.
	6. WARRANTY
		1. Warranty: 3-year parts and 3-year labor. 10-year structural. Lifetime on workmanship of blades and hub. 1-year money-back customer satisfaction guarantee.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: Rite-Hite, which is located at: 8900 N. Arbon Dr.; Milwaukee, WI 53223; Toll Free Tel: 888-214-0882; Tel: 414-355-2600; Fax: 414-355-9248; Email: [request info (info@ritehite.com)](http://admin.arcat.com/users.pl?action=UserEmail&company=RiteHite&coid=35200&rep=&fax=414-355-9248&message=RE:%20Spec%20Question%20(15830rhc):%20%20&mf=); Web: <https://www.ritehite.com/en/am>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.
	1. HVLS CEILING FANS

\*\* NOTE TO SPECIFIER \*\* Designed for smaller spaces where aesthetics are important. With standard polished blades or painted blades to blend into your environment, the Rave provides a customized style with performance. Delete if not required.

* + 1. Product: Revolution 25 Series HVLS Fan as manufactured by Rite-Hite.

\*\* NOTE TO SPECIFIER \*\* Delete diameter not required for project.

* + - 1. Diameter: 6 feet (1830 mm).
			2. Diameter: 8 feet (2440 mm).
			3. Diameter: 10 feet (3050 mm).
			4. Diameter: 12 feet (3660 mm).
			5. Number of Blades: 3.
			6. Area Coverage: Up to 17,500 sq. ft (1625 sq. m); 75 feet (15 m) from the fan's center in all directions.
			7. Blade Material: Aluminum.

\*\* NOTE TO SPECIFIER \*\* Delete blade finish not required for project.

* + - 1. Blade Finish: Mill finish.
			2. Blade Finish: RAL K5 custom color. Refer to Interior Finish Schedule.

\*\* NOTE TO SPECIFIER \*\* Delete motor frame finish not required for project.

* + - 1. Motor: Direct Drive 25Nm
			2. Watts: 100-700

\*\* NOTE TO SPECIFIER \*\* Delete electrical requirement not required for project.

* + - 1. Electrical Requirements: 100-120VAC single phase 50/60 Hz..
			2. Electrical Requirements: 200-240VAC single phase 50/60 Hz.
			3. Electrical Requirements: 200-240VAC three phase 50/60 Hz.
			4. Electrical Requirements: 277VAC single phase 50/60 Hz.
			5. Amps: 2.7A at 230V.
			6. Decibels: 38 to 42 dBA depending on fan speed.
			7. Air Speed: Up to 3.9 mph (1.8 m/s) at full speed.

\*\* NOTE TO SPECIFIER \*\* Delete option for controls not required for project.

* + - 1. Controls: Variable speed, wireless touchscreen
			2. Controls: Fan-Commander 2.0. Controls up to 24 fans independently.
			3. Mounting Heights: 10 feet to 30 feet (3050 mm to 9150 mm) from finished floor to bottom of blade.

\*\* NOTE TO SPECIFIER \*\* Delete weights not required based on diameter required.

* + - 1. Weight: 75 lb (34 kg)
			2. UL Listed to 507 Standard.
			3. Torque: 19 ft-lb (25Nm)
		1. Product: Revolution 75 Series HVLS Fan as manufactured by Rite-Hite.

\*\* NOTE TO SPECIFIER \*\* Delete diameter not required for project.

* + - 1. Diameter: 8 feet (2440 mm).
			2. Diameter: 12 feet (3660 mm).
			3. Diameter: 16 feet (4880 mm).
			4. Diameter: 20 feet (6100 mm).
			5. Diameter: 24 feet (7320 mm).
			6. Number of Blades: 3.
			7. Area Coverage: Up to 22,000 sq. ft (2044 sq. m); 85 feet (26 m) from the fan's center in all directions.
			8. Blade Material: Aluminum.

\*\* NOTE TO SPECIFIER \*\* Delete blade finish not required for project.

* + - 1. Blade Finish: Mill finish.
			2. Blade Finish: RAL K5 custom color. Refer to Interior Finish Schedule.

\*\* NOTE TO SPECIFIER \*\* Delete motor frame finish not required for project.

* + - 1. Motor: Direct Drive 75Nm.
			2. Watts: 100-1700.

\*\* NOTE TO SPECIFIER \*\* Delete electrical requirement not required for project.

* + - 1. Electrical Requirements: 200-240VAC single phase 50/60 Hz.
			2. Electrical Requirements: 200-240VAC three phase 50/60 Hz.
			3. Electrical Requirements: 277VAC single phase 50/60 Hz.
			4. Electrical Requirements: 400-480VAC three phase 50/60 Hz.
			5. Amps: 3.5A at 460V.
			6. Decibels: 38 to 42 dBA depending on fan speed.
			7. Air Speed: Up to 5.3 mph (2.3 m/s) at full speed.

\*\* NOTE TO SPECIFIER \*\* Delete option for controls not required for project.

* + - 1. Controls: Variable speed, wireless touchscreen
			2. Controls: Fan-Commander 2.0. Controls up to 24 fans independently.
			3. Mounting Heights: 10 feet to 80 feet (3050 mm to 24,300 mm) from finished floor to bottom of blade.

\*\* NOTE TO SPECIFIER \*\* Delete weights not required based on diameter required.

* + - 1. Weight: 250 lb (114 kg)
			2. UL Listed to 507 Standard.
			3. Torque: 55 ft-lb (75Nm)

\*\* NOTE TO SPECIFIER \*\* The Revolution fan is an HVLS (high volume, low speed) industrial ceiling fan that helps make your employees more comfortable and productive, while also helping you drive down your energy costs.

* + 1. Product: Revolution HVLS Fan as manufactured by Rite-Hite.

\*\* NOTE TO SPECIFIER \*\* Delete diameter not required for project.

* + - 1. Diameter: 8 feet (2440 mm).
			2. Diameter: 12 feet (3660 mm).
			3. Diameter: 16 feet (4880 mm).
			4. Diameter: 20 feet (6100 mm).
			5. Diameter: 24 feet (7320 mm).
			6. Number of Blades: 4.
			7. Blade Material: Aluminum.

\*\* NOTE TO SPECIFIER \*\* Delete blade finish not required for project.

* + - 1. Blade Finish: Mill-finish.
			2. Blade Finish: Custom color. Refer to Interior Finish Schedule.
			3. Blade Finish: Custom logo. Refer to Interior Finish Schedule.
			4. Area Coverage: Up to 22,000 sq. ft (2044 sq. m); 85 feet (26 m) from the fan's center in all directions.
			5. Motor: 2.0 HP (1.5 KW)

\*\* NOTE TO SPECIFIER \*\* Delete electrical requirement not required for project.

* + - 1. Electrical Requirements: 230VAC single phase 50/60 Hz.
			2. Electrical Requirements: 230VAC three phase 60 Hz.
			3. Electrical Requirements: 400VAC three phase 50 Hz.
			4. Electrical Requirements: 460VAC three phase 60 Hz.
			5. Electrical Requirements: 575VAC three phase 60 Hz.
			6. Amps: 2.8 at 460VAC.
			7. Decibels: 40 to 63 dBA depending on fan speed (measured 20 feet (6096 mm) below and 20 feet (6100 mm) from the fan's center).
			8. Air Speed: Up to 7 mph (3.0 m/s) at full speed.
			9. Controls: Variable speed. on/off.
			10. Controls: Fan-Commander. Controls up to 18 fans independently.
			11. Mounting Heights: 10 feet (3048 mm) to 80 feet (24400 mm) from finished floor to bottom of blade.

\*\* NOTE TO SPECIFIER \*\* Delete weights not required based on diameter required.

* + - 1. Fan Weight: 268 lb (122 kg) - Diameter: 8 feet (2440 mm).
			2. Fan Weight: 276 lb (126 kg) - Diameter: 12 feet (3660 mm).
			3. Fan Weight: 284 lb (129 kg) - Diameter: 16 feet (4880 mm).
			4. Fan Weight: 292 lb (133 kg) - Diameter: 20 feet (6100 mm).
			5. Fan Weight: 300 lb. (136 kg) - Diameter: 24 feet (7320 mm).
			6. UL Listed to 507 Standard.
	1. HVLS FAN CONSTRUCTION
		1. Construction: Revolution (4-blade)
			1. The motor and universal steel bracketing shall be enclosed with a motor cover. The gear reducer shall be an inline helical gear reducer or equivalent hardened to 58- 62 Rockwell C. The gear reducer shall be precision finished for low noise and long service life with double lip seals to keep oil in and contaminant out, and be lubricated for life. The gear reducer shall have a standard backlash of less than 20 arc minutes and be equipped with a steel shaft of 1.25 inches (32 mm) diameter.
			2. Each fan shall incorporate a three-way motor-to-hub safety connection for added safety.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Fan shall have formed aluminum blades that shall have contour and twist for maximum air movement. Each blade shall be connected to the hub of the fan by means of 1- 24 mm x 100 mm threaded bolt that is tightened to 200-ft.-Ibs. to provide a rotationally balanced blade and hub. The hub of the Fan shall be extruded precision-milled aluminum. The hub shall incorporate a safety ring attached to each blade arm that will support the hub and blades in case of a motor shaft failure.
			2. Fan shall be supported by cables that wrap around joist and mounting brackets and with four stabilization cables.
			3. The controls shall consist of a power disconnect switch, power on/off switch and a touchpad to control the speed of the fan. Each control box shall be UL listed to U.S. and Canadian Safety Standards NEMA 4X control box. Each fan controller will include a factory programmed Solid-State Frequency Drive (VFD) to provide a soft-start for the fan as well as infinite speed control capability for the fan. Each control box shall have Touch-Safe internal components, including in-line fusing and a line reactor for three-phase power.

\*\* NOTE TO SPECIFIER \*\* Delete options not required.

* + - 1. Fan-Commander - independently control up to 18 fans from one location.
				1. Ethernet option - Allows fans to be controlled from a computer on an existing network.
				2. Relay option - Allows fan speed or operation to be changed by other external devices based on inputs (such as time, temperature, humidity, wind speed, etc.).
		1. Construction: Revolution 25 and Revolution 75 (3-blade)
			1. The motor shall be a sensorless permanent magnet direct drive motor. It will have double tapered roller bearings for higher load capability and long life. Designed to operate up to 50C (122F) ambient.
			2. Fan shall have formed aluminum blades that shall have contour and twist for maximum air movement. Each blade shall be connected to the hub of the fan by means of 1- 24 mm x 100 mm threaded bolt that is tightened to 200-ft.-Ibs. to provide a rotationally balanced blade and hub. The hub of the Fan shall be extruded precision-milled aluminum.
			3. Blades shall have resilient bushing mounts to reduce stress transferred to hub structure.
			4. Fan shall be supported by integral 1/4" cables that wrap around joist and mounting brackets and with four stabilization cables.
			5. Fan-Commander 2.0 (for Revolution 25 and Revolution 75)
				1. Each fan controller will include a factory programmed Solid-State Frequency Drive (VFD) to provide a soft-start for the fan as well as infinite speed control capability for the fan. Each control box shall have Touch-Safe internal components, including in-line fusing for three-phase power
				2. Impact detection stops fan if an object blocks the blade path.
				3. Standard 7 inch touch screen interface
				4. Controls 1 to 24 fans
				5. 7 day schedule
				6. Automatic speed control based on ambient temperature
				7. Remote diagnostic monitoring for all fans
				8. Standard mesh networking between fans and controller
				9. Powerful 900 MHz- 250mW radios communicate through walls and internal obstructions in industrial facilities.
				10. Self-forming and self-healing wireless mesh network topology dynamically determines the best network path
				11. Simple radio network configuration requires no specialized knowledge of RF networking.
				12. No RS485 or Ethernet wiring required between fans
				13. Standard Ethernet Connectivity
				14. Connection to Building Management Systems (BMS) via BACnet IP
				15. Control from PC or mobile devices (through LAN access point)
				16. Fire system enable allows shutdown during an emergency.
				17. Optional wireless discrete I/O module for interface into Building Management Systems (BMS).
1. EXECUTION
	1. EXAMINATION
		1. Do not begin installation until supporting structure and interior work have been properly completed.
		2. Installation of miscellaneous or structural support, if required, electrical wire and wiring, conduit, fuses, and disconnect switches other than those included within the control box shall be specified in other sections.
		3. Installer shall examine the substrate and conditions under which the Fan is to be installed and notify the Architect and Contractor in writing of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.
		4. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
	2. INSTALLATION
		1. Manufacturer's representative shall install the industrial fan in accordance with manufacturer's recommendations
	3. PROTECTION
		1. Protect installed products until completion of project.
		2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION