



**MonsterFans**  
by Schwank

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# MonsterFans Style Series

**SECTION 23 34 00**  
**HVLS FANS**

**\*\* NOTE TO SPECIFIER \*\*** MonsterFans Style Series HVLS Fans by Schwank; HVLS Fans. This section is based on the products of MonsterFans Style Series HVLS Fans by Schwank, which is located at:  
5285 Bradco Blvd.,  
Mississauga, ON L4W 2A6  
Tel.: 1-877-446-3727 | Local: 706-554-6191  
csr@schwankgroup.com  
schwankgroup.com/monsterfans

## **PART 1 GENERAL**

### 1.1 SECTION INCLUDES

A. High volume low speed fans.

### 1.2 RELATED SECTIONS

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

A. Section 26 05 00 - Common Work Results for Electrical.

### 1.3 REFERENCES

**\*\* NOTE TO SPECIFIER \*\*** Delete references from the list below that are not actually required by the text of the edited section.

A. American National Standards Institute/Air Movement and Control Association [ANSI/AMCA]: Standard 230 - Laboratory Methods of Testing Air Circulating Fans for Rating.

B. National Fire Protection Association [NFPA]: 13 - National Fire Code for Sprinklers.

### 1.4 SYSTEM DESCRIPTION

A. General: Fans shall be designed to circulate and/or de-stratify the air envelope. The fans shall be strategically placed to maximize the efficiency of the space. Each fan shall be designed to move the maximum amount of air within a given space while consuming minimal electrical power.

B. Design:

1. Each fan shall be complete with five injection molded polyurethane filled blades including proprietary MonsterFans Style Series Blade Technology featuring variable angles of attack up to 23 degrees and 1 – 2 integrated air fences depending on fan diameter.

2. Blades shall be mated and weight matched within a tolerance of 0.48 oz [13.61 g] for balance and stabilization. Guy wires shall not be required for further stabilization.
3. Blades and Hub to be painted using automotive grade paint and techniques with a clear coat finish – six standard colors shall be available. Client shall have the option to apply custom colors and a minimum of 100 water dip applied custom finishes.
4. LED light shall be integrated into the hub. LED light shall supply a minimum of 1920 lumens and have dimming capabilities and shall include 20 range settings.

C. Performance:

1. All fan control electronics shall be located within in a water resistant housing affixed and integrated above the motor, mounted vertically and affixed to a heat sink for heat dissipation of on board electronics.
2. LED Driver shall be located in a water resistant housing affixed and integrated above the motor, mounted vertically and affixed to a heat sink for heat dissipation of on board electronics.
3. Each fan shall be controlled by a digital remote keypad connected via supplied CAT5 cabling – 100 feet [30 meters].
4. Each fan control shall be touchpad with backlit LED digital readout and include on/off, forward/reverse control of fan functionality and on/off, dimming control of integrated LED light.
5. Optional fan control shall be touchscreen and capable of controlling up to 65 fans. It shall include grouping from 1:1 to 65:1 ratio, remote diagnostics, CAT5 connectivity and optional Bac-Net communication for BAS integration,.
6. Main Power Supply for Motor: 104-277V 1Ph, 50 / 60Hz and shall have auto identifying power supply capabilities.

D. Each fan shall be capable of receiving a stop command from the fire panel, or any number of smoke, flame or heat detectors.

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 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.

#### 1.5 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.

B. 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.

#### 1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Providing sole source for design, engineering, manufacturing and warranty claims handling.

B. Installer Qualifications: Trained by manufacturer.

**\*\* NOTE TO SPECIFIER \*\*** Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Install fan in area designated by Architect.
2. Do not proceed with remaining work until workmanship is approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

#### 1.7 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to starting work of this section.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.

B. Handling: Handle materials to avoid damage.

#### 1.9 PROJECT CONDITIONS

A. 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 recommended limits.

#### 1.10 SEQUENCING

A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

#### 1.11 WARRANTY

A. Manufacturer shall provide material and labor warranty for manufacturer and operation for the following warranty periods from date of substantial completion. Warranty duration is as follows:

1. Airfoil shaped Blade	Lifetime Warranty
2. Aluminum alloy Hub	Lifetime Warranty
3. Motor	3-year Limited Warranty
4. VFD control panel	3-year Limited Warranty
5. Labor	1-year Limited Warranty [pre-approved]
6. Custom fan wraps/paint	1-year Limited Warranty

## **PART 2 PRODUCTS**

### 2.1 MANUFACTURERS

A. Acceptable Manufacturer: MonsterFans Style Series HVLS Fans by Schwank, which is located at: 5285 Bradco Blvd., Mississauga, ON L4W 2A6

Tel.: 1-877-446-3727

csr@schwankgroup.com

www.schwankgroup.com/monsterfans

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

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

### 2.2 FAN CONSTRUCTION

A. Hub: Steel - precision drilled to firmly support the blades and provide a safe connection to the Motor. As a fail-safe a 3/32 inch [2.4 mm] stainless steel braided cable shall be looped through the hub and extend up through the motor, extension tube and mount to be looped around the structural mounting point securing the entire fan assembly to the structure.

B. Blades: Each fan shall be complete with five injection molded blades filled with polypropylene. Each blade shall include proprietary MonsterFans Style Series Blade Technology featuring variable angles of attack up to 23 degrees and 1 – 2 integrated air fences depending on fan diameter. Each blade shall be affixed to the hub by means of four ¼ x 5/8 [6.35 x 15.875 mm] Serrated Flange Head Cap Screws that are each tightened to 20 ft lbs [27.1 j] to provide a tight connection for a rotationally balanced blades and hub.

C. Housing: Rounded plastic covers outfitted with rubber seals creating IP54 rating shall house the onboard fan control electronics and separately the LED driver. An aluminum heat sink shall be affixed around the 2 inch [50.8 mm] round steel extension tube and serve as the mounting point for the electronics, LED driver and covers.

D. Motor: The fan shall utilize a high efficiency Transverse Flux Brushless DC Motor [the motor]. specifically designed for low speed high torque applications made of rigid and lightweight AISI 383 [ADC12] aluminium alloy, keeping the motor assembly under 15 lbs [6.8 kgs]. The motor shall have short circuit, earth fault, phase loss, over voltage, under voltage, motor stalling, over temperature, motor overload and communication loss protection measures.

E. Controller: Each fan shall be provided with one low voltage key pad control for remote operation. Each control shall be forward/reverse compatible with infinite speed settings 0-100%. Each controller shall control the LED Light for dimming and on/off functionality. Final location of key pad controller is to be within full view and within 100 feet [30 meters] of the fan.

F. Fan Mount: Each fan shall have a 360 degree adjustable mounting system allowing for slopes of 0-18.5° designed to prevent vibration and movement while supporting total fan weight. Each fan shall have a fail-safe cable fabricated from 3/32 inch [2.4 mm] stainless steel shall extend through the mount, mounting system and motor hub assembly to be affixed to the building structure. Each fan shall be packaged with mounting hardware to mount to: Glu-Lam, Purlin, Open Web Steel Truss, and Wood Truss roof structures.

G. Extension Tubes: Each fan shall be provided with an integrated 2 inch [50.8mm] round steel extension tube creating total length including mount, extension tube, motor, hub, hub cover and LED light face of 31 inches [789 mm]. To achieve the required clearance custom length extension tubes shall be available for specification.

**\*\* NOTE TO SPECIFIER \*\*** Extension tube lengths can be ordered in 1" increments. Custom lengths must be noted at order to accommodate lengthened communication/electrical harness and safety cable.

**\*\* NOTE TO SPECIFIER \*\*** Recommended Fan Spacing [Fan spacing based on facility and contributing factors to optimize fan performance]: 20 feet to 40 feet [6 m to 12 m]. Delete if not required for project.

### 2.3 - 10'0" [3.0 m] FAN

A. HVLS Fan Model: MonsterFans Style Series [10 ft] supplied by Schwank.

B. Performance Specifications:

1. Fan Size: 10 feet [3.0 m].
2. Power Consumption: 264W.
3. Amps at 120 Volts: 2.2A.
4. Speed: 120 rpm.
5. Air Flow: 45,000 cfm [21,238 l/s] [76,455 m<sup>3</sup>/h].
6. Max Effective Cooling Diameter [Maximum effective diameter is where horizontal air speed at 1.2 m [3.9 feet] above floor drops below 0.2 m/s [0.7 fps] in an empty room]: 100 feet [32.4 m].
7. Max Effective De-stratify Diameter [Maximum effective diameter is where horizontal air speed at 1.2 m [3.9 feet] above floor drops below 0.2 m/s [0.7 fps] in an empty room]: 70 feet [22.7 m].
8. Weight: 85 lbs [38.5 kgs].
9. Noise Level 8 feet [2.4 m] below wing tip: 39 dBA.

**\*\* NOTE TO SPECIFIER \*\* Recommended Fan Spacing [Fan spacing based on facility and contributing factors to optimize fan performance]: 18 feet to 36 feet [5.5 m to 11 m]. Delete if not required for project.**

#### 2.4 - 9'0" [2.7 m] FAN

A. HVLS Fan Model: MonsterFans Style Series [9 ft] supplied by Schwank.

B. Performance Specifications:

1. Fan Size: 9 feet [2.7 m].
2. Power Consumption: 264W.
3. Amps at 120 Volts: 2.2A.
4. Speed: 120 rpm.
5. Air Flow: 39,000 cfm [18,405 l/s] [66,261 m<sup>3</sup>/h].
6. Max Effective Cooling Diameter [Maximum effective diameter is where horizontal air speed at 1.2 m [3.9 feet] above floor drops below 0.2 m/s [0.7 fps] in an empty room]: 90 feet [27.4 m].
7. Max Effective De-stratify Diameter [Maximum effective diameter is where horizontal air speed at 1.2 m [3.9 feet] above floor drops below 0.2 m/s [0.7 fps] in an empty room]: 63 feet [19.8 m].
8. Weight: 85 lbs [38.5 kgs].
9. Noise Level 8 feet [2.4 m] below wing tip: 39 dBA.

**\*\* NOTE TO SPECIFIER \*\* Recommended Fan Spacing [Fan spacing based on facility and contributing factors to optimize fan performance]: 16 feet to 32 feet [5 m to 10 m]. Delete if not required for project.**

#### 2.5 - 8'0" [2.4 m] FAN

A. HVLS Fan Model: MonsterFans Style Series [8 ft] supplied by Schwank.

B. Performance Specifications:

1. Fan Size: 8 feet [2.4 m].
2. Power Consumption: 264W.
3. Amps at 120 Volts: 2.2A.



4. Speed: 120 rpm.
5. Air Flow: 35,000 cfm [16,518 l/s] [59,465 m<sup>3</sup>/h].
6. Max Effective Cooling Diameter [Maximum effective diameter is where horizontal air speed at 1.2 m [3.9 feet] above floor drops below 0.2 m/s [0.7 fps] in an empty room]: 80 feet [24.4 m].
7. Max Effective De-stratify Diameter [Maximum effective diameter is where horizontal air speed at 1.2 m [3.9 feet] above floor drops below 0.2 m/s [0.7 fps] in an empty room]: 56 feet [17.1 m].
8. Weight: 85 lbs [38.5 kgs].
9. Noise Level 8 feet [2.4 m] below wing tip: 39 dBA.

**\*\* NOTE TO SPECIFIER \*\* Recommended Fan Spacing [Fan spacing based on facility and contributing factors to optimize fan performance]: 16 feet to 32 feet [5 m to 10 m]. Delete if not required for project.**

#### 2.6 - 7'0" [2.1 m] FAN

A. HVLS Fan Model: MonsterFans Style Series [7 ft] supplied by Schwank.

B. Performance Specifications:

1. Fan Size: 7 feet [2.1 m].
2. Power Consumption: 264W.
3. Amps at 120 Volts: 2.2A.
4. Speed: 120 rpm.
5. Air Flow: 27,000 cfm [12,743 l/s] [45,873 m<sup>3</sup>/h].
6. Max Effective Cooling Diameter [Maximum effective diameter is where horizontal air speed at 1.2 m [3.9 feet] above floor drops below 0.2 m/s [0.7 fps] in an empty room]: 80 feet [24.4 m].
7. Max Effective De-stratify Diameter [Maximum effective diameter is where horizontal air speed at 1.2 m [3.9 feet] above floor drops below 0.2 m/s [0.7 fps] in an empty room]: 56 feet [17.1 m].
8. Weight: 85 lbs [38.5 kgs].
9. Noise Level 8 feet [2.4 m] below wing tip: 39 dBA.

## **PART 3 EXECUTION**

### 3.1 EXAMINATION

A. Do not begin installation until supporting structure and interior work have been properly completed.

B. 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.

C. 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.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### 3.3 INSTALLATION

A. Installer:

1. Installation services shall install fans. Installation includes full mechanical installation of the fan. Electrically, full connection of the low voltage key pad controller within 100 feet [30 m] of final fan location is included. Additional installation includes connection of Fire Alarm Tie In at Fan Location Only. Coordinate connection to flow switch or alarm panel with the electrical contractor.

2. Where factory trained installation services are not available, install fans in accordance with manufacturer's instructions and local regulations.

B. Install fans in accordance with NFPA 13.

C. Mounting Method: Fans shall be mounted to the building structure using the OWSJ [Open Web, Steel Joist] method. Fans shall be mounted from the bottom chord of the existing or new structure using included OWSJ Mounting Bracket..

1. Based on site conditions, acceptable alternate mounting methods include I-beam mounting, Z-purlin mount with brackets and beam; and wood/glu-lam beam mounting.

D. HVLS Fan Clearance Requirements:

1. Minimum 12 inches [305 mm] above blades to underside of roof deck/ceiling.
2. Minimum 12 inches [305 mm] from fan blade's leading edge to obstruction above or below fan.
3. Minimum 8 inches [203 mm] from end of blade to fan obstruction.
4. Fan shall be installed at a minimum of 120 inches [3050 mm] above finished floor.

E. Safety Cable: 3/32 inch [2.4 mm] integrated stainless steel safety cable shall be connected to main building structure securing entire fan assembly to the structure.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION