

SECTION 23 34 39 - High-Volume, Low-Speed Propeller Fans

SPECIFICATIONS

TAG: High-Volume Low-Speed Fans, CA-HVLS

PART 1 - GENERAL

1.1 SUMMARY

- A. HVLS fan shall have 3 blades or 6 blades designed to efficiently move air.
- B. Fan frame shall be structural steel and blades should be aluminum with high impact end caps.
- C. Creates an evaporative cooling effect when running in forward mode, can de-stratify uneven temperatures in tall buildings when running in reverse mode.

1.2 SUBMITTALS

- A. The manufacturer assumes no liability for the use or results of use of this document. This specification is to be reviewed by the engineer to confirm requirements of the project and building codes are met.
- B. As the manufacturer continues product development, it reserves the right to change design and specifications without notice.

1.3 QUALITY ASSURANCE

- A. All models shall be ETL listed and comply with safety standards UL507 (Electric Fans) and CSA Std. C22.2, No 113.

1.4 Warranty

- A. All units shall be provided with the following warranties:
 - 1. 5-Year Limited Warranty – Electrical and Mechanical Components
 - 2. 7-Year Warranty (Factory Installation) – Electrical and Mechanical Components
 - 3. Lifetime Warranty (Factory Installation) – Blades, Hub, and Frame
- B. This warranty shall not apply if:
 - 1. The equipment is not installed by a qualified installer per this installation guide; this guide should be kept with the equipment once installation is complete.
 - 2. The equipment is not installed in accordance with Federal, State, Local codes and regulations.
 - 3. The equipment design or sizing is not approved per MANUFACTURER'S specifications.
 - 4. The equipment is misused, neglected, or not maintained per the

MANUFACTURER'S maintenance instructions.

5. The equipment is not operated within its published capacity.
 6. The equipment is substituted or connected with parts not manufactured per Original Equipment Manufacturer.
 7. The invoice is not paid within the terms of the sales agreement.
- C. The manufacturer shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the warranty period, upon examination by the manufacturer, such part will be repaired or replaced by manufacturer at no charge. The buyer shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without manufacturer's prior authorization and all returned equipment shall be shipped by the buyer, freight prepaid to a destination determined by the manufacturer.
- D. What this warranty does not cover, any defects or damage caused by:
1. Objects that encounter the fan causing damage.
 2. Objects that become tangled with the fan (e.g., power cords, extension cords, air hoses, chains, etc.).
 3. Parts and/or components damaged from neglect, accident, abuse, misuse, misapplication, or incorrect installation.
 4. Repair or alteration not authorized in writing by the MANUFACTURER.
 5. Improper testing, operation, maintenance, adjustment, or modification of any kind not authorized in writing by MANUFACTURER personnel.
 6. Use of the product under other than normal operating conditions or in a manner inconsistent with the product's label or instructions.
 7. Failure to properly store the product before installation.
 8. Shipping and delivery of the product through the shipping carrier.

PART 2 - PRODUCTS

2.1. GENERAL

- A. HVLS fans are engineered to move air in a large area while constantly creating an expansive comfort zone.

2.2. PRODUCT

- A. 8 ft Fan Diameter
1. Motor Power: 1 HP
 2. Weight: 240 lbs
 3. Decibels: 57 dB
- B. 10 ft Fan Diameter

1. Motor Power: 1 HP
2. Weight: 260 lbs
3. Decibels: 58 dB

C. 12 ft Fan Diameter

1. Motor Power: 1 HP
2. Weight: 280 lbs
3. Decibels: 59 dB

D. 14 ft Fan Diameter

1. Motor Power: 1.5 HP
2. Weight: 322 lbs
3. Decibels: 59 dB

E. 16 ft Fan Diameter

1. Motor Power: 1.5 HP
2. Weight: 342 lbs
3. Decibels: 59.8 dB

F. 18 ft Fan Diameter

1. Motor Power: 2 HP
2. Weight: 378 lbs
3. Decibels: 59.5 dB

G. 20 ft Fan Diameter

1. Motor Power: 2 HP
2. Weight: 398 lbs
3. Decibels: 60 dB

H. 22 ft Fan Diameter

1. Motor Power: 2 HP
2. Weight: 417 lbs

3. Decibels: 58 dB
- I. 24 ft Fan Diameter
 1. Motor Power: 2 HP
 2. Weight: 437 lbs
 3. Decibels: 58.5 dB
- J. Voltage (3 Phase): 230/460V or 575V
- K. Voltage (1 Phase): 120V (up to 1.5 HP)/208-230V
- L. Freq: 50/60 Hz
- M. IP Rating: 55
- N. Number of Blade: 6
- O. Blade Material: Aluminum
- P. Directional: Forward/Reverse

2.3. CONSTRUCTION

- A. Fan Unit
 1. Fan frame shall be powder coated or galvanized steel.
 2. Fan hub shall be 5052-H32 cast aluminum alloy.
 3. Standard mount shall be a universal I-Beam clamp with swivel.
 4. Standard mount shall be available in 1, 2, or 4 Ft. lengths.
 5. Optional steel extensions shall be available in 2, 4, 6, or 8 Ft. lengths.
 6. Fan shall be supported by cables that wrap around joist and mounting brackets and with stabilization cables
- B. Blades
 1. Blades shall be 6063-T5 extruded aluminum.
 2. Blade end caps shall be high impact polystyrene.
- C. Gear Motor
 1. Motor shall be Helical Incline Reducing Type
 2. Gear ratio shall be such that blades max rpm is within safety range of blades

3. Bottom of gearbox shall be sealed.
4. Gearbox shall be a "Unicase" housing with no split housings with gaskets.
5. Gearbox shall Autovent to allow gearbox to breathe and not damage seals.
6. There shall be a lip seal on the motor shaft.

D. Electrical

1. Control panels shall be listed by ETL (UL 508A)
2. The control enclosure shall be NEMA 1 rated. The control enclosure may be constructed of stainless steel or painted steel.
3. Variable Frequency Drives (VFDs) shall be provided for fans as required. The Control Panel shall modulate the VFDs between a minimum setpoint and a maximum setpoint on demand. The temperature sensor input(s) to the digital thermostat controller shall be the speed reference signal.
4. The VFD speed range of operation shall be from 0% to 100% for the system, with the actual minimum speed set as required to meet minimum ventilation and fan requirements.
5. The system shall have integral timers to turn the fans off after an adjustable amount of run time. Digital timers shall also have the ability to change the system from manual mode of operation to automatic mode of operation.
6. A digital thermostat controller shall allow for external BMS fan control via Dry Contact. The controller shall operate each fan at a specific speed during the BMS mode.
7. The LCD Interface shall display all system faults and VFD operating parameters. Faults included shall be, high temp, low temp, missing sensor, broken sensor, fan over amperage condition. The fault shall be displayed as text and also include an audible alarm with a mute button. Multiple displays shall be capable of being used with the system. Each fan shall be able to be controlled and monitored through each display. An additional "Manager's Display" shall be capable of controlling and monitoring the system from a remote location.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Installer shall examine the substrate and conditions under which the Fan is to be installed.
- B. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

3.2 APPLICATION

- A. Suited for warehouses, schools, dining areas, gymnasiums, and other applications to efficiently distribute air.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions, drawings, written specifications, manufacturer's installation manual and all applicable building codes.

3.4 SAFETY COMPONENTS

- A. There shall be a safety ring locking the hub assembly to the motor shaft.
- B. Safety cables shall be included and shall be 3/16" stainless steel.
- C. Guy wires shall be included and shall be 1/8" stainless steel.
- D. Safety clips shall be 713 cast aluminum alloy.

3.5 SYSTEM START-UP

- A. System start-up is performed by a factory-trained Service Technician