



Manufacturer: MacroAir Technologies, Inc.
794 South Allen Street
San Bernardino, CA 92408-2210
Macroairfans.com

SECTION 15830 – INDUSTRIAL/COMMERCIAL CEILING FANS

MacroAir AirVolution-D 550 HVLS Fans

PART 1 GENERAL

1.1 SUMMARY

The AirVolution-D 550 High Volume, Low Speed (HVLS) fans from MacroAir create large air movement and a comfortable environment while delivering substantial cost savings. They utilize a D-Drive next-generation DC motor that eliminates the need for a gearbox, which reduces noise and moving parts. AirVolution-D also has an on-board AirBrain processor that integrates into building operating systems via gateway and automatically adapts to input voltages.

1.2 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used shall include:
 - 1. Preparation instructions and recommendations
 - 2. Storage and handling requirements and recommendations
 - 3. Power and mounting requirements
 - 4. Application Drawings: Submit plan, section, elevation and isometric views as necessary to convey the information required to detail all installation conditions for each unit specified.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: MacroAir shall provide sole source for design, engineering, manufacturing and warranty claims handling.
- B. Installer Qualifications: Any and all work outside the scope of the installation guide shall be outsourced. Factory trained installers are recommended and available upon request.

1.4 REFERENCES

- A. Underwriters Laboratories (UL 507)

1.5 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity and ventilation) within limits recommended by manufacturer for optimal results. Do not install products in environmental conditions outside MacroAir's absolute limits. The storage of all MacroAir products prior to installation will be in an "out of weather" position. Failure to maintain the integrity of the shipment is not the responsibility of MacroAir.

1.6 COORDINATION

- A. The fan shall be capable of receiving a stop command from the fire panel, an ASD (Aspirating Smoke Detection) device, or any number of smoke, flame or heat detectors.
- B. The fans shall be as follows:
 - 1. The fan shall meet the air velocity requirements of FM Global's 2.0 data sheet for ESFR sprinklers.
 - 2. If required by the local fire prevention authority or desired by the purchaser, the fan shall be wired into the building's fire suppression system so that the fan will automatically shut off within a maximum of 90 seconds after sprinklers are activated. To facilitate this automatic shut-down, the low voltage wire and relay needed to accomplish this must be supplied by the Fire Alarm installer. See Manufactures installation instructions for further details.
 - 3. Upon fire detection as described above, the fans shall coast to stop as required by NFPA guidelines.

1.7 WARRANTY

- A. MacroAir shall repair or replace warranted defective parts as follows:
 - 1. Lifetime warranty on airfoils and mounting
 - 2. 50,000-hour warranty on all other components, which include but are not limited to:
 - a. Motor
 - b. Integrated Drive
 - c. Controller/Remote
- B. At project closeout, provide to Owner or Owner's Representative an executed copy of MacroAir's standard limited warranty against manufacturing defect, outlining its terms, conditions and exclusions from coverage.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

- A. Acceptable Manufacturer: MacroAir Technologies, Inc., which is located at: 794 South Allen Street, San Bernardino, CA 92408-2210 Toll Free Tel: 866-668-3247; Tel: 909-890-2270; Web: macroairfans.com
- B. Substitutions: Not permitted
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600

2.2 MACROAIR – COMMERCIAL / INDUSTRIAL HVLS FANS

A. Performance

The fan shall be listed to applicable UL Standards and requirements by UL.

Model #	Diameter	Horsepower	Hanging Weight	RPM	Power Usage	Forward Displacement**	Reverse Displacement**	Industry Spacing***	Max Affected Area****	Max dBA*****
MA08XL5506	8 ft [2.44 m]	1.05 HP	128 lbs [58.2 kg]	1-220 RPM	730 W	53,000 CFM [1,490 CMM]	29,000 CFM [820 CMM]	60 ft [18.3 m]	4,000 ft ² [372 m ²]	61
MA10XL5506	10 ft [3.05 m]	1.05 HP	137 lbs [62.2 kg]	1-170 RPM	850 W	84,000 CFM [2,380 CMM]	49,000 CFM [1,400 CMM]	65 ft [19.8 m]	6,600 ft ² [613 m ²]	59
MA12XL5506	12 ft [3.66 m]	1.05 HP	146 lbs [66.2 kg]	1-137 RPM	920 W	106,000 CFM [3,010 CMM]	76,000 CFM [2,140 CMM]	70 ft [21.3 m]	8,800 ft ² [818 m ²]	60
MA14XL5506	14 ft [4.27 m]	1.05 HP	155 lbs [70.2 kg]	1-110 RPM	890 W	132,000 CFM [3,730 CMM]	86,000 CFM [2,440 CMM]	80 ft [24.4 m]	11,000 ft ² [1,022 m ²]	56
MA16XL5506	16 ft [4.88 m]	1.05 HP	164 lbs [74.2 kg]	1-90 RPM	1070 W	158,000 CFM [4,490 CMM]	114,000 CFM [3,240 CMM]	90 ft [27.4 m]	13,000 ft ² [1,208 m ²]	53
MA18XL5506	18 ft [5.49 m]	1.05 HP	172 lbs [78.2 kg]	1-74 RPM	900 W	181,000 CFM [5,130 CMM]	127,000 CFM [3,580 CMM]	95 ft [29 m]	15,000 ft ² [1,394 m ²]	53

*Data will be added when additional testing and/or information is ready

**Calculation based on AMCA 230-99 equation

***Delivers 2.8-4.2 ft/s [0.86-1.27 m/s] of average air speed in the occupied space. This relates to perceived cooling or set point change of 4.9-6.1 F [2.7-4.3 C]. Consult our online AirViz tool for more details

****Delivers 2.7-3.8 ft/s [0.82-1.16 m/s] of average air speed in the occupied space. This relates to a perceived cooling or set point change of 4.8-5.8 F [2.6-3.2 C]. Consult our online AirViz tool for more details.

*****Sound testing taken with the sensor 5 ft above the ground and 20 ft from the center of the fan with the fan running full speed and mounted at 20 ft high.

B. Airfoils

The fan shall be equipped with six (6) NASA developed XL airfoils. The airfoils shall consist of anodized 6061 T4 precision extruded aluminum and be of the MacroAir XL design, with fan diameters ranging from 8 to 18 feet in two (2) foot increment. The airfoils shall be connected to six (6) individual aluminum 6005 T6 struts by means of two (2) 5/16-24 x 2-inch grade 5 hex bolts, two (2) 5/16-inch flat washers and two (2) 5/16-inch nylon lock nuts per airfoil.

1. Number of Airfoils: 6
2. Airfoil Material: 6061 T4 Extruded Aluminum
3. Airfoil Finish: Anodized
4. Option Airfoil Finish: Custom powder coated colors per Drylac RAL color chart

C. Motor

The fan shall be equipped with a Transverse Flux brushless DC motor designed for low speed high torque applications. The motor shall be driven sensorlessly to eliminate the possibility of sensor or encoder failure.

1. Motor Type: Sensor-less Transverse Flux brushless DC Motor
2. Continuous Torque: 52 lbf (70 Nm)
3. Pole Count: 96
4. IP Rating: 65
5. Insulation Class: K (200 C)
6. Motor Finish and Color: Black Electrophoretic Paint
7. Motor Housing: AISI 383 (ADC12)
8. Studs: AISI 4137 Grade 9 (JIS SCM435)

D. Integrated Drive

1. Electrical Requirements (Low Voltage)
 - a. 104-277 VAC single (1) phase 50/60 Hz, or
 - b. 181-255 VAC three (3) phase 50/60 Hz
2. Electrical Requirements (High Voltage)
 - a. 241-294 VAC one (1) phase 50/60 Hz, or
 - b. 342-636 VAC three (3) phase 50/60Hz.
3. Environment
 - a. Operation: -10°C to 60°C
 - b. Humidity: 0-95% non-condensing
 - c. Cooling: Centrifugal cooling through blades
4. Operating Frequency: 20-50 KHz
5. Firmware Updates: Via RJ45 (Remote) connector
6. Dynamic acceleration and deceleration
7. Modbus 485 (19.2 8-N-1)
8. BACnet and LonWorks options available

9. Network touch-screen option available with:

- a. Live fault code monitor
- b. Live fan speed monitor
- c. Impact and solvent resistant
- d. IP65 rated

E. Mounting

The fan mounting system shall be equipped with hardware, no less than SAE grade 5 for safe installation. The fan shall be equipped with a stress relieving swivel (SRS) mount. The fan mount shall encompass multiple mounting options for I-beam, Purlin and Glulam applications (specified upon order).

- 1. Standard Mount: SRS I-beam clamp with 3' drop
- 2. Optional Mounting Hardware: Glulam Mounting Brackets
- 3. Optional Mounting Hardware: UMH with Guy Wires
- 4. Mounting Drops: Extensions available in two (2) to ten (10) foot lengths in one (1) foot increments (custom sizes available)
- 5. Mounting and Extension Material: Steel, Aluminum
- 6. Mount Finish: Black Anodized

F. Hub/Motor Housing

The fan shall be equipped with an aluminum motor housing with pressed in steel studs to securely accept six (6) removable, black anodized, 6005 T6 aluminum beam struts. The struts shall be designed with airfoil guides to ensure precision alignment.

- 1. Material: T6 Cast Aluminum
- 2. Airfoil Strut Material: 6005 T6 Aluminum
- 3. Airfoil Strut Finish: Black Anodized
- 4. Hardware: Twelve (12) 5/16-24 x 1-3/4 inch Grade-8 pressed in studs
- 5. Hardware: Twelve (12) 5/16-inch flat washers (SAE)
- 6. Hardware: Twelve (12) 5/16-inch nylon lock nuts

G. Safety System

The fan shall include one-piece airfoil retainer links to prevent airfoil separation from the motor housing and a 3/16" safety cable attached to the lowest point of the fan. Each fan shall be E-stop compatible for fire and building automated systems (BAS).

1. Safety Cable Material: 3/16" x 7 x 19 Braided Steel
2. Safety Cable Finish: Galvanized
3. Airfoil Retainer Link Material: 10 Gauge A36 Steel
4. Airfoil Retainer Link Finish: Black Zinc

PART 3 EXECUTION

3.1 PREPARATION

- A. Check accuracy of dimensions indicated for openings to receive fans.
- B. Check location and availability of utility services to ensure proper voltage and installation preparation.
- C. Coordinate location and installation of the HVLS Fans.
- D. Ensure building structural members are sufficient to support the weight and operation of the fan. Consult professional engineer or registered architect as required.

3.2 INSTALLATION

- A. Install units per manufacturer's written instructions.
- B. Fan airfoil height to be a minimum of 10 feet from the floor in accordance with MacroAir's recommendations.
- C. All safety and support features must be installed. These include any guy wires and safety cables as well as airfoil retainer locking features.
- D. Adjust unit as required for proper operation in accordance with manufacturer's installation instructions.
- E. Securely anchor units.
- F. Ensure that operating parts turn freely prior to initial startup.

- G. Repair or replace damaged parts, dents, buckles, abrasions or other damage affecting appearance or serviceability, as acceptable to Architect.

3.3 PROTECTION

- A. Protect finished Work until date of Substantial Completion.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

3.4 CLEANING

- A. Clean Work per Section 01 74 00.
- B. Clean and inspect fans per manufacturer's instructions.
- C. Remove temporary protective cover at date of Substantial Completion.

END OF SECTION