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

SECTION 15830 – INDUSTRIAL/COMMERCIAL CEILING FANS

MacroAir by Blue Giant AirVolution HVLS Fans

PART 1 GENERAL

1.1 SUMMARY

The AirVolution-D 780 High Volume, Low Speed (HVLS) fans from MacroAir by Blue Giant create large air movement and a comfortable environment while delivering substantial cost savings. They utilize a D-Drive next-generation DC motor that delivers 50% greater continuous horsepower than traditional HVLS fans and eliminates the need for a gearbox which reduces noise and moving parts. AirVolution-D 780 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.

C. 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 by Blue Giant 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 by Blue Giant's absolute limits.

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 fan shall include a Variable Frequency Drive (VFD) within the control panel. The low voltage wire and relay needed to accomplish this must be supplied by the Fire Alarm installer.
   3. Upon fire detection as described above, the fans shall coast to stop as required by NFPA guidelines.

1.7 WARRANTY

A. MacroAir by Blue Giant shall repair or replace warranted defective parts as follows:
   1. Lifetime warranty on airfoils and mounting.
   2. Twelve-year service life prorated limited 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 by Blue Giant's standard limited warranty against manufacturing defect, outlining its terms, conditions and exclusions from coverage.

PART 2 PRODUCTS

2.1 APROVED MANUFACTURERS

A. Acceptable Manufacturer: MacroAir by Blue Giant 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 BY BLUE GIANT – COMMERCIAL / INDUSTRIAL HVLS FANS

A. Performance

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

Fan Model	Dia.	HP	Hanging Weight	RPM	Power Usage (kW)	Forward Displacement **	Reverse Displacement **	Industry Spacing ***	Max. Affected Area****	Max dBA *****
MA20XL7806	20ft	2.1 / 1.566kW	189lbs / 85.7kgs	75	1.18	250,000 CFM (7,070 CMM)	187,000 CFM (5,300 CMM)	105ft (30m)	20,000 ft² (1,858m²)	54.8
MA24XL7806	24ft	2.1 / 1.566kW	213lbs / 96.6kgs	64	1.55	346,000 CFM (9,870 CMM)	256,000 CFM (7,250 CMM)	115ft (35.1m)	22,000 ft² (2,044m²)	54.5

* 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 or 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.
****** Add 70 lbs / 31.8 Kg for a guard

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 by Blue Giant XL design, with fan diameters ranging from 8 to 18 feet in two (2) foot increments and one (1) 24-foot diameter fan. 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. Optional 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: 125 lbf (170 Nm).
3. Pole Count: 96.
4. IP Rating: 66.
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. 181-255 VAC three (3) phase 50/60 Hz.
2. Electrical Requirements (High Voltage)
    a) 241-294 VAC one (1) phase 50/60 Hz. 342-636 VAC three (3) phase 50/60Hz.
3. Environment
    a) Operation: -10ºC to 60ºC.
    b) Humidity: 0-95% non-condensing
    c) Cooling: Centrifugal cooling through blades
4. Operating Frequency: 20-50KHz
5. Firmware Updates: Via RJ45 (remote) connector
6. Lockable disconnect switch
7. Dynamic acceleration and deceleration
8. Modbus 485 (19.2 8-N-1)
9. BACnet and LonWorks options available
10. Network touch-screen options available with:
    a) Live energy consumption monitor
    b) Live fault code monitor
    c) Live fan speed monitor
    d) Impact and solvent-resistant

e) 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 reliving 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 3.5’ drop.
2. Optional Mounting Hardware: Glulam Mounting Brackets.
3. Mounting Drops: Extensions available in two (2) to ten (10) foot lengths in (1) foot increments (custom sizes available).
4. Mounting and Extension Material: Steel, Aluminum.
5. 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 and enable airfoils to be inverted for full CFM output in either reverse or forward operation.

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. Included in the safety system shall be fuses and a disconnect to prevent fire or misuse. 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 OSHA guidelines.

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