



atmosphere is everything

SECTION 23 24 33.13

AIR CURTAINS

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Air curtains for pedestrian entrances.
- B. Air curtains for vehicular entrances.
- C. Air curtains for clean room entrances.

1.2 RELATED SECTIONS

- A. Section 05 50 00 – Metal Fabrications: Concealed steel support members.
- B. Section 06 10 00 – Rough Carpentry.
- C. Section 05 41 00 – Structural Metal Studs.
- D. Section 07 62 00 – Sheet metal flashing.
- E. Section 07 92 00 – Joint Sealants.
- F. Section 08 10 00 – Metal Doors and Frames.
- G. Section 08 33 00 – Overhead Coiling Doors.
- H. Section 08 42 00 – Entrance Doors.
- I. Section 26 05 00 – Equipment Wiring: Connections to building power distribution.

1.3 REFERENCES

- A. ASTM A240 / A240M -10 – Standard Specification for Chromium and Chromium.
- B. ASTM A879 / A879M -06 – Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Application Requiring Designation of the Coating Mass on Each Surface.
- C. ASTM A653 / A653M -09a – Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- D. UL 507 – UL Standard for Safety Electric Fans – Intertek Testing Services Listed for US and Canada.
- E. UL508A – Standard for Industrial Control Panels
- F. CEC – Approved Elec heating Coils
- G. Electrical components UL/CUL listed.
- H. NEC – National Electric Code.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- 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.
- C. Shop Drawings: Include plans, elevations, sections, and details, indicating dimensions, tolerances, materials, fasteners, hardware, finish, piping, electrical wiring diagrams, options, and accessories.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6.25 inches (160 mm) square, representing actual product, color, and patterns.
- F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- G. Operation and Maintenance Manual: Submit manufacturer's operation and maintenance manual, including operation, maintenance, adjustment, and cleaning instructions, trouble shooting guide, parts list, and electrical wiring diagrams.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum ten years documented experience producing the products specified in this Section
- B. Installer Qualifications: Minimum five years documented experience installing products specified in this Section

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store in a dry, heated storage area until installation of products.
- C. Protect materials and finish from damage during handling and installation.

1.7 SEQUENCING

- A. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.
- B. Coordinate the installation of wiring and control switches for air curtains with the openings and the hardware provided for such openings.
- C. Install after doors, walls, ceilings, and other adjacent surfaces are finished and painted.

1.8 WARRANTY

- A. Standard one-year limited parts warranty for units against defects in workmanship and material.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Acceptable Manufacturer: Mars Air Systems, LLC; 14716 South Broadway St., Gardena, CA 90248. Tel: (310) 532-1555 or (800) 421-1266. Fax: (310) 324-3030. Email: info@marsair.com. Web: www.marsair.com.
- B. Delete one of the following two paragraphs: coordinate with requirements of Division 1 section on product options and substitutions.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 33 00.

2.2 AIR CURTAIN ASSEMBLIES

- A. Motor Fan Assembly: Design for easy removal, assembly, repair, and maintenance.
 - 1. Motor: Totally enclosed air over (TEAO) cooled motor with sealed lifetime pre-lubricated ball bearings, motor starter and thermal overload protection.
 - a. Wired for single speed operation.
 - b. Provide wash down type motors, NEC IP-54 for the locations indicated.
 - c. Provide explosion proof type motors, NEC Class 1, Division 1, Group D for the locations indicated.
 - d. Electrical Characteristics: 115V AC, single phase; 5.1 Amp full load per motor/fan.
 - e. Electrical Characteristics: 208/230V AC, single phase; 2.5 Amp full load per motor/fan.
 - f. Meets NEC. ETL Listed to conform to UL 507 (US) and CSA22.2 (Canada) Standards (air curtain only)
 - 2. Fans: Forward curved centrifugal type, double width, and double inlet design, directly driven to an electric motor.
 - a. Provide resilient isolation dampening mountings between motor frame and motor mounting pan.
 - b. Factory balanced blower wheel assembly statically and dynamically.
- B. Housing: Self-contained one-piece type with sufficient strength for mounting from pre-punched mounting holes at both ends to adjacent walls or ceiling without intermediate support.
 - 1. Size:
 - a. Unheated: 21 3/8 inches deep by 10-5/8 inches high (including discharge nozzle) by width of unit.
 - 2. Mounting:
 - a. Unheated Inside Mount.
 - b. Mount Location Indicated.
 - 3. Material:
 - a. Provide 18- and 20-gauge electro or hot dipped galvanized steel sheet housing conforming to ASTM A 879 and/or ASTM A 653.
 - b. Provide type 304 stainless steel housing with brushed finish. ASTM A 240/A 240M.
 - 4. Air Inlet Grille
 - 5. HEPA filtration, 12" HEPAC section with disposable MERV 8 pre-filters
 - 6. Discharge: Provide integral discharge nozzle specified.
 - 7. Finish and Color: Provide with, no VOC, corrosion resistant polyurethane powder coated finish for sheet metal housings.
 - a. Obsidian Black.
 - b. Pearl White.
 - c. Titanium Silver.
 - d. Stainless Steel.
- C. Environmental Air Curtains: Models for Heights to 8 feet (3656 mm) for Environmental Separation and Temperature Control
 - 1. Discharge Nozzle: Wedge-shaped discharge outlet nozzle with adjustable air foil vanes with a plus/minus 40-degree sweep front to back.

2. Air Velocity at Nozzle:
 - a. STD236-1: 36 Inch (915 mm) Wide Units: 2206 feet/min (11.2 m/s) single 1/2HP motor/fan assembly.
 - b. STD242-1: 42 Inch (1065 mm) Wide Units: 1945 feet/min (9.9 m/s) single 1/2HP motor/fan assembly.
 - c. STD248-1: 48 Inch (1220 mm) Wide Units: 1730 feet/min (8.8 m/s) single 1/2HP motor/fan assembly.
 - d. STD260-2: 60 Inch (1524 mm) Wide Units: 2592 feet/min (13.2 m/s) single 1/2HP motor/fan assembly.
 - e. STD272-2: 72 Inch (1830 mm) Wide Units: 2206 feet/min (11.2 m/s) two 1/2HP motor/fan assemblies.
3. Air Speed at Floor: Minimum of 300 fpm (1.53 m/s) at 3 feet (914 mm) from the floor.
4. Air Inlet Grille and Filters:
 - a. Location: Front.
 - b. Speed: 2550 cu ft/min (1200 L/s), minimum, per motor/fan assembly.
5. Sound Pressure Level At 10 feet (3 m) From Nozzle:
 - a. Single Motor/Fan Units: 66 dBA.
 - b. Two Motor/Fan Units: 68 dBA.

2.3 COMPONENTS

- A. Door-Activated Limit switch(s): Provide, field installed magnetic door switch to control air curtain(s) as follows; Automatic on/off control, activates air curtain to full speed when door is opened and turns to low speed when door is closed.
 1. Type: Magnetic reed switch and actuator for swing and sliding doors. Industrial floor mounted or surface mounted switches for roll up doors
- B. Optional Digital Programmable Controller:
 1. Fully programmable controller
 2. Pre-set and fully customizable programs
 3. Wireless WiFi control via field supplied smartphone, tablet or computer
 4. Time delay (Passive & Adaptive)
 5. Factory Integrated temperature control sensors. No external thermostat required.
 6. Summer-Winter modes
 7. 24/7 timer
 8. Maintenance schedule alerts
 9. Status display showing date, time, temperature and air curtain mode
 10. Multi-unit control capability
 11. English (IP) or Metric (SI) display readings
 12. Password protected
 13. Auto Lock display
 14. Emergency shut-off button
 15. High temperature lock from fan failure
 16. Low voltage control signal for door activation
 17. Integrated BMS controls
 18. VFD compatible with 0-10VDC output
 19. Optional BACnet option

- 20. Optional adaptive fan speed control and heat control based on existing field conditions. Field mounted outdoor temperature sensors required.
- C. Provide mounting hardware as required for the opening.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that required utilities are in correct location and are of correct capacities for specified products.
- B. Verify openings to receive air curtains are plumb, level, square, accurately aligned, correctly located, and in tolerance.
- C. Examine surfaces to receive air curtains. If surface preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 INSTALLATION

- A. Install air curtains in accordance with approved shop drawings and manufacturer's printed installation instructions.
- B. Install air curtains plumb, level, square, true to line, and weathertight, without warp or rack.
- C. Anchor air curtains securely in place to supports.
- D. Coordinate with sheet metal flashing as specified in Section 07 62 00.
- E. Install joint sealants as specified in Section 07 92 00.
- F. Coordinate with electrical power as specified in Section 26 05 00.
- G. Install door limit switches and adjust for correct operation.
- H. Provide connection to piped services and utilities as specified in Section 22 10 00 and 23 21 00.

3.3 FIELD QUALITY CONTROL

- A. Adjust air curtains to function properly.
- B. Adjust air foil vanes located within the discharge nozzle as required for prevailing conditions at each opening.

- C. Check heated air curtain performance on a calm day by measuring air temperature 6 inches off the floor. Optimal reading is halfway between the temperature inside and outside the building.

3.4 CLEANING

- A. Clean air curtains promptly after installation in accordance with manufacturer's instructions.
- B. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- C. Remove and replace damaged components that cannot be successfully repaired as determined by Architect.
- D. Replace Pre-Filter periodically to extend the life of HEPA filter

3.5 PROTECTION

- A. Protect materials and finish from damage until substantial completion.

3.6 SCHEDULES

- A. Refer to Air Curtain Schedule appended to this section.

END OF SECTION