
SECTION 23 37 00
AIR OUTLETS AND INLETS**PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. See Grilles, Registers & Diffuser Schedule on drawings for Basis of Design Manufacturers and Model Numbers. Provide Basis of Design grilles, registers and diffusers or approved equal.
- B. Rectangular Plaque Face Ceiling Diffusers.
- C. Round ceiling diffusers.
- D. Supply/Return/Exhaust Grilles and Diffusers - Maximum Security.
- E. Supply Grille.
- F. Supply Registers.
- G. Registers/Grilles.
 - 1. Ceiling-mounted, exhaust and return register/grilles.
 - 2. Wall-mounted, supply register/grilles.
 - 3. Wall-mounted, exhaust and return register/grilles.
- H. Duct-mounted supply and return registers/louvers.
- I. Louvers:
- J. Roof Hoods.
- K. Gravity Ventilators.

1.2 RELATED REQUIREMENTS

- A. Section 09 91 23 - Interior Painting: Painting of ducts visible behind outlets and inlets.

1.3 REFERENCE STANDARDS

- A. AHRI 880 (I-P) - Performance Rating of Air Terminals 2017.
- B. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating 2012 (Reapproved 2015).
- C. AMCA 511 - Certified Ratings Program Product Rating Manual for Air Control Devices 2021.
- D. AMCA 550 - Test Method for High Velocity Wind Driven Rain Resistant Louvers 2022.
- E. ASHRAE Std 130 - Laboratory Methods of Testing Air Terminal Units 2016.
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023.
- G. SMACNA (ASMM) - Architectural Sheet Metal Manual 2012.

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Listed manufacturers and series are for reference only and do not promote any single product. Series are provided for reference, and should not be used as an ordering model number. Accessories and options may be custom components purchased separately.
- C. Product Data: Provide data for equipment required for this project. Provide manufacturer's most current catalog data sheet for equipment indicating rough-in size, finish, and accessories. Manufacturer's data sheets on each item of equipment and device, shall be clearly marked up to identify the items, accessories and options to be used on the project.
 - 1. Review outlets and inlets as to size, finish, and type of mounting prior to submission.
 - 2. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.
 - 3. Grilles, Registers and Diffusers (23 37 00 - 001 - A)

- 4. Louvers (23 37 00 - 003 - A)
- 5. Roof Hoods (23 37 00 - 002 - A)
- D. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
 - 1. Submit under Operation and Maintenance Data books
 - 2. Grilles, Registers and Diffusers.
 - 3. Roof Hoods.

1.5 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide 3 year warranty, including parts, materials and labor for defective parts, for the following:
 - 1. Include in Closeout Submittals Book.
 - 2. Grilles, Registers and Diffusers.
 - 3. Roof Hoods.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Price Industries.
- B. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 ROUND CEILING DIFFUSERS

- A. Manufacturers:
 - 1. Price.
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Type: Round, adjustable pattern, stamped or spun, multi-core diffuser to discharge air in 360 degree pattern, with sectorizing baffles where indicated. Diffuser collar shall project not more than 1 inch above ceiling. In plaster ceilings, provide plaster ring and ceiling plaque.
- C. Fabrication: Steel with baked enamel finish.
- D. Accessories: Radial opposed blade damper and multi-louvered equalizing grid with damper adjustable from diffuser face.

2.3 RECTANGULAR PLAQUE FACE CEILING DIFFUSERS

- A. For outside air and supply air systems.
- B. Type: Provide square plaque faced diffuser to discharge air in four way pattern.
- C. Connections: As scheduled on drawings.
- D. Frame: Provide surface mount, inverted T-bar, and spline type. In plaster ceilings, provide plaster frame and ceiling frame.
- E. Fabrication: Steel with baked enamel finish.
- F. Accessories: Provide radial opposed blade volume control damper; removable core with damper adjustable from diffuser face.
- G. Manufacturers:
 - 1. Price Industries.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.4 MAXIMUM SECURITY GRILLES AND DIFFUSERS

- A. For supply, return, transfer and exhaust air systems in maximum security spaces.
- B. Grille Type: 3/16" steel, perforated face of grille with 3/16" round holes, and integral wall sleeve.
- C. Diffuser Type: Risk resistant, four way, 12 gage face.
- D. Frame: 2 inch margin with concealed mounting and gasket.
- E. Construction: Made of steel with factory enamel finish.
- F. Rear sleeve and angle frame.
- G. Manufacturers:
 - 1. Price Industries.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.5 MAXIMUM SECURITY RISK RESISTANT SUPPLY / EXHAUST GRILLE

2.6 SUPPLY / EXHAUST GRILLE

- A. Type: Streamlined and individually adjustable curved blades to discharge air along face of grille, two-way deflection.
- B. Frame: 1-1/4 inch margin with concealed mounting and gasket.
- C. Construction: Made of aluminum extrusions with factory enamel finish.
- D. Manufacturers:
 - 1. Price Industries.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.7 SUPPLY REGISTERS

- A. Frame: 1-1/4 inch margin with countersunk screw mounting and gasket.
- B. Construction: Made of aluminum extrusions with factory enamel finish.
- C. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.
- D. Manufacturers:
 - 1. Price Industries.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.8 CEILING EXHAUST AND RETURN REGISTERS/GRILLES

- A. Manufacturers:
 - 1. Price.
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Frame: 1-1/4 inch margin with concealed mounting.
- C. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face where not individually connected to exhaust fans.

2.9 WALL SUPPLY REGISTERS/GRILLES

- A. Manufacturers:
 - 1. Price.
- B. Frame: 1-1/4 inch margin with concealed mounting and gasket.
- C. Damper: Integral, gang-operated opposed blade type with removable key operator, operable from face.

2.10 SUPPLY REGISTERS

- A. For outside air and supply air systems.
- B. Type: Streamlined blades with 0 degree deflection, 3/4" blade spacing, and front blades parallel to the long dimension with two-way deflection.
- C. Frame: 1-1/4 inch margin with countersunk screw mounting and gasket.
- D. Fabrication: Aluminum extrusions with factory clear lacquer finish.
- E. Color: To be selected by Architect from manufacturer's standard range.
- F. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.
- G. Manufacturers:
 - 1. Titus; Model 300FL.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.11 EXHAUST/RETURN/TRANSFER REGISTERS

- A. For exhaust, return and transfer air systems.
- B. Type: Streamlined blades with 0 degree deflection, 3/4" blade spacing, and front blades parallel to the long dimension with two-way deflection.
- C. Frame: 1-1/4 inch margin with countersunk screw mounting and gasket.
- D. Fabrication: Aluminum extrusions with factory clear lacquer finish.
- E. Color: To be selected by Architect from manufacturer's standard range.
- F. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.
- G. Manufacturers:
 - 1. Titus; Model 350FL.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.12 LOUVERS

- A. Manufacturers:
 - 1. Ruskin Company; _____: www.ruskin.com/#sle.
 - 2. Greenheck
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Type: 4 inch deep frame with blades on 45 degree slope with center baffle and return bend, heavy channel frame, 1/2 inch square mesh screen over intake or exhaust end.
- C. Fabrication: 12 gauge, 0.1046 inch (2.66 mm) thick extruded aluminum thick galvanized steel welded assembly, with factory prime coat finish.
- D. Color: To be selected by Architect from manufacturer's standard range.

2.13 ROOF HOODS

- A. Fabricate of galvanized steel, minimum 16 gauge, 0.0598 inch base and 20 gauge, 0.0359 inch hood, or aluminum, minimum 16 gauge, 0.0598 inch base and 18 gauge, 0.0598 inch hood; suitably reinforced; with removable hood; birdscreen with 1/2 inch square mesh for exhaust and 3/4 inch for intake, and factory prime coat finish.
- B. Manufacturers:
 - 1. Greenheck; Model FGI / FGR.
 - 2. Loren Cook Company.
 - 3. Substitutions: See Section 01 6000 - Product Requirements.

2.14 GRAVITY VENTILATORS

- A. Hood Intake and Relief Gravity Ventilator:
 - 1. Manufacturers:
 - a. Greenheck Fan Corporation.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
 - 2. General:
 - a. Low silhouette for intake applications with natural gravity or negative pressure system(s).
 - b. Performance ratings and factory testing to be in accordance with AMCA 511 and AMCA 550.
 - c. Suitable for non-ducted applications.
 - d. Equipment to bear permanently affixed manufacturer's nameplate listing model and serial number.
 - 3. Hood and Base:
 - a. Material: Aluminum.
 - b. Hood Construction: Precision formed, arched panels with interlocking seams.
 - c. Vertical End Panels: Fully locked into hood end panels.
 - d. Curb Cap: Pre-punched mounting holes for installation.
 - 4. Birdscreen:
 - a. Fabricate in accordance with ASTM B221 (ASTM B221M).
 - b. Construction: 1/2 inch Aluminum mesh.
 - c. Horizontally mounted across hood intake area.
 - 5. Hood Support: Galvanized steel construction and fastened so hood can be removed completely from the base or hinged open.
 - 6. Options/Accessories:
 - a. Roof Curbs:
 - 1) Pitched Roofs: Welded, straight side curb with flashing flange and wood nailer.
 - 2) Material: Aluminum.
 - 3) Insulation Thickness: 1 inch.
 - b. Curb Seal: Rubber seal between fan and roof curb.
 - c. Dampers:
 - 1) Type: Gravity.
 - 2) Factory designed to prevent outside air from entering back into building when fan is off.
 - 3) Balanced for minimal resistance to flow.
 - 4) Galvanized frames with pre-punched mounting holes.
 - d. Hood Insulation or Coating: Provide 1/2 inch fiberglass insulation lining or anti-condensate coating to prevent condensation and reduce sound levels.

PART 3 EXECUTION**3.1 INTERFACE WITH WORK OF OTHER SECTIONS**

- A. Confirm rough-in and framing of walls and partitions with supports for equipment and accessories.

3.2 EXAMINATION

- A. Verify that surfaces are suitable for installation. Provide accessory items based on assembly item is mounted to.
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- B. Verify that field measurements are as shown on the drawings.
- C. Examine areas to receive products for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

- A. Install in accordance with the following:
 - 1. Federal, state and local codes.
 - 2. Manufacturer's instructions.
- B. Comply with SMACNA (ASMM) for flashing/counter-flashing of roof penetrations and supports for roof curbs and roof mounted equipment.
- C. Install equipment level and plumb.
- D. Secure grilles, registers and diffusers independent of ceiling assemblies.
- E. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.
- F. Install grilles, registers and diffusers to ductwork with air tight connection.
- G. Provide balancing dampers on duct take-off to diffusers, and grilles and registers, despite whether dampers are specified as part of the diffuser, or grille and register assembly.
- H. Paint ductwork visible behind air outlets and inlets matte black. Refer to Section 09 90 00 - Painting.

END OF SECTION 23 37 00