

SECTION 23 37 10 - DIFFUSERS, REGISTERS, AND GRILLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes ceiling and wall mounted diffusers, registers, grilles and accessories.

1.3 DEFINITIONS

- A. Diffuser: Circular, square, or rectangular air distribution outlet, generally located in the ceiling and comprised of deflecting members discharging supply air in various directions and planes and arranged to promote mixing of primary air with secondary room air.
- B. Grille: A louvered or perforated covering for an opening in an air passage, which can be located in a sidewall, ceiling, or floor.
- C. Register: A combination grille and damper assembly over an air opening.

1.4 SUBMITTALS

- A. Submit manufacturer's technical product data for all air outlets. For each model indicated, include the following:
  - 1. Data Sheet: For each type of air outlet and inlet, and accessory furnished; indicate construction, finish, and mounting details.
  - 2. Schedule of diffusers, registers, and grilles indicating drawing designation, room location, quantity, model number, size, and accessories furnished. The schedule shall also indicate static-pressure drop, and noise criteria ratings (NC) for each air outlet and inlet. A generic catalog sheet indicating pressure drop and NC ratings is not acceptable.

1.5 QUALITY ASSURANCE

- A. Install diffusers, registers, and grilles according to NFPA 90A, "Standard for the Installation of Air-Conditioning and Ventilating Systems.
- B. Source Limitations: Obtain diffusers, grilles and registers through one source from a single manufacturer, regularly engaged in production of the equipment.

## PART 2 - PRODUCTS

### 2.1 LOUVERED FACE CEILING AIR DIFFUSERS

- A. General: Provide louvered face ceiling air diffusers where shown; of size, shape, capacity and type indicated; constructed of materials and components as indicated, and as required for complete installation. Provide diffusers manufactured by Titus. Subject to review, diffusers meeting the full requirements of the specifications and manufactured by one of the following will be considered:
  - 1. Krueger
  - 2. Price Industries.
  - 3. Nailor.
  - 4. Anemostat.
  - 5. Metalaire.
- B. Ceiling diffusers shall have a fixed or adjustable horizontal discharge pattern. The inner louver assembly shall be flush with the outer frame with a 1, 2, 3 or 4-way directional pattern. Individual louvers shall have a horizontal lip to create a ceiling pattern at reduced air flows. The inner core must be easily removable.
- C. Ceiling Compatibility: Provide louvered diffusers with border styles that are compatible with adjacent ceiling systems. Refer to general construction drawings and specifications for types of ceiling systems which will contain each type of ceiling air diffuser.
- D. Types: The model numbers and manufacturers indicated on the diffuser schedule set the standard for the products to be used. Provide louvered diffusers of type as scheduled and with accessories as required.
- E. Provide each diffuser in the manufacturer's standard white electro-coated finish unless otherwise indicated on the drawings.
- F. Diffusers shall be provided with the same style and characteristics as provided with the basis of design product named on the drawings.

### 2.2 REGISTERS AND GRILLES

- A. General: Provide registers and grilles where shown; of size, shape, capacity and type indicated; constructed of materials and components as indicated, and as required for complete installation. Provide opposed blade damper on all registers. Provide registers and grilles manufactured by Titus. Subject to review, registers and grilles meeting the full requirements of the specifications and manufactured by one of the following will be considered:
  - 1. Krueger
  - 2. Price Industries.
  - 3. Nailor.
  - 4. Anemostat.
  - 5. Metalaire.
- B. Performance: Provide registers and grilles that have, as minimum, temperature and velocity traverses, throw and drop, and noise criteria ratings for each size device as listed in manufacturer's current data.
- C. Structural Integrity: floor registers and grilles are required to meet the structural requirements indicated in the International Mechanical Code Chapter 6: 603.18.1.

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- D. Compatibility: Provide registers and grilles with border styles indicated and that are compatible with adjacent wall or ceiling systems, and that are specifically manufactured to fit into construction with accurate fit and adequate support. Refer to general construction drawings and specifications for types of construction which will contain each type of register and grille.
- E. Types: The model numbers and manufacturers indicated on the drawing schedules set the standard for the product(s) to be provided. Provide registers and grilles of type as scheduled, with accessories as required to match the basis of design product named on the drawing.
- F. Provide each register and/or grille in manufacturer's standard white electro-coated finish. Refer to equipment schedules for grilles/registers that require a custom color. When required, the Architect will select the custom colors.

2.3 SLOT DIFFUSERS

- A. General: Provide linear type slot diffusers; of size, shape, capacity and type indicated; constructed of materials and components as indicated, and as required for complete installation. Provide slot diffusers manufactured by Titus. Subject to review, diffusers meeting the full requirements of the specifications and manufactured by one of the following will be considered:
  - 1. Krueger
  - 2. Price Industries.
  - 3. Nailor.
  - 4. Anemostat.
  - 5. Metalaire.
- B. The units shall be fabricated of extruded aluminum. Diffusers shall be provided with separate adjustable pattern deflectors capable of providing a 180-degree pattern adjustment for each slot.
- C. When required, provide mounting frames and margins suitable for the intended installation. Where continuous diffuser lengths are required, separate sections shall butt with a hairline joint and interlocking splines shall be provided by the diffuser manufacturer. Provide mitered corners, where indicated on the drawings. In locations where the diffusers are to be installed as part of the ceiling grid, provide units that are compatible with the specific type of ceiling grid.
- D. Units are to be furnished in manufacturer's standard white enamel finish or with an etched satin anodized finish. Finish to be selected by the Architect during the submittal phase. Refer to equipment schedules for slot diffusers that require custom colors. When required, the Architect will select the custom colors.
- E. Provide a distribution plenum for each slot diffuser. Each plenum to be constructed of galvanized steel and furnished with an inlet damper and internal or external insulation.
- F. The model numbers and manufacturers indicated on the schedules set the standard for the products to be used. Provide outlets of type as scheduled and with accessories as required.
- G. Slot diffusers shall be provided with the same style and characteristics as provided with the basis of design product named on the drawings.

2.4 DRUM LOUVER REGISTERS

- A. General: Except as otherwise indicated, provide drum louvers, where shown of the size, shape, capacity and type indicated and constructed of heavy gauge aluminum. Provide drum louvers manufactured by

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Titus. Subject to review, drum louvers meeting the full requirements of the specifications and manufactured by one of the following will be considered:

1. Krueger
  2. Price Industries.
  3. Nailor.
  4. Anemostat.
  5. Metalaire.
- B. Drum louvers to have a single bank of adjustable vanes to provide direction control of the air stream. Vanes to be fabricated of aluminum and shall be adjustable to reduce the maximum throw of the louver. Provide a barrel capable of rotating 30-degrees above and below the center line of the louver.
- C. Provide an integral damper fabricated of aluminum blades in a rigid aluminum frame. The damper shall be an opposed blade type and adjustable from the face of the outlet.
- D. Provide each drum louver in either a satin anodized or standard white finish as selected by the Architect. Refer to equipment schedules for drum louvers that require custom colors. When required, the Architect will select the custom colors.
- E. Drum louvers shall be provided with the same style and characteristics as provided with the basis of design product named on the drawings.

2.5 LOUVERED RETURN AIR GRILLES

- A. Provide nominal 2" deep extruded aluminum return louvered grille(s) where shown, of the size, shape, capacity and model type indicated. Grilles to be Pottorff model EFY-245 or equal.
- B. Provide louver frame type, mullion or flange to suit the requirements of the installation.
- C. Louver Finish: Refer to drawing schedules for finishes required for each louver. Provide louver units with one of the following finishes, as noted on the drawings:
1. If the drawings indicate a "Primer" finish provide a factory applied baked enamel primer.
  2. If the drawings indicate a "Standard" color provide a factory applied baked enamel color, selected by the Architect from the manufacturer's standard color chart.
  3. If the drawings indicate a "Custom Color" provide a factory applied baked enamel in a custom color as selected by the Architect.

2.6 VARIABLE AIR FLOW DIFFUSERS

- A. Thermally powered variable air volume diffusers shall be manufactured Titus. Each diffuser shall be a complete VAV terminal and thermostat.
- B. Each diffuser shall be thermally powered to infinitely vary the supply of air into the space, in either heating or cooling mode, by means of regulating a variable aperture damper. Supply air from the variable geometry diffusers will discharged horizontally in a 360° pattern and will maintain constant air movement in the space throughout the range of volume variation from 100% down to 25%. The diffusers shall vary the supply air volume to provide both heating and cooling. The diffusers shall be thermally powered. The room temperature settings for heating and cooling shall be separately adjustable in the field by separately adjusting each of the two room thermostats. One room temperature sensing thermostat shall sense room temperature and vary the supply air when cooling. The other room temperature sensing thermostat shall sense room temperature and vary the supply air when heating.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install diffusers, registers, and grilles level and plumb.
- B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practicable. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.
- C. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.
- D. Variable Air Flow Diffusers: Provide all equipment, controls, wiring and accessories for a complete and functional system where variable flow diffusers are indicated. This contractor shall provide all labor to install power and control wiring as necessary.
- E. Provide any fasteners (screws, tamper proof screws, etc.) that are required by the manufacturer for installation.

3.3 ADJUSTING

- A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

3.4 CLEANING

- A. After installation of diffusers, registers, and grilles, inspect exposed finish. Clean exposed surfaces to remove burrs, dirt, and smudges. Replace diffusers, registers, and grilles that have damaged finishes.

END OF SECTION 23 37 10