Price LFDCX Laminar Flow Diffuser

***Division 23 – Heating, Ventilating, and Air Conditioning***

***Section 23 37 13 – Diffusers, Registers, and Grilles***

The following specification is for a defined application. Price would be pleased to assist in developing a specification for your specific need.

**PART 1 – GENERAL**

**1.01 Section includes**:

1. Low-profile Laminar Flow Diffuser with high efficiency filter.

**1.02 Related Requirements**

1. Section 01 30 00 – Administrative Requirements
2. Section 01 40 00 – Quality Requirements
3. Section 01 60 00 – Product Requirements
4. Section 01 74 21 – Construction/Demolition Waste Management and Disposal
5. Section 01 78 00 – Closeout Submittals
6. Section 01 79 00 – Demonstration and Training
7. Section 23 31 00 – HVAC Ducts and Casings
8. Section 23 32 00 – Air Plenums and Chases

**1.03 Reference Standards**

A. ASHRAE Standard 55 – Thermal Environmental Conditions for Human Occupancy; 2013

B. ASHRAE Standard 70 – Method of Testing the Performance of Air Outlets and Air Inlets; 2006

C. ASHRAE Standard 170 – Ventilation of Health Care Facilities; 2013

D. ASTM Standard E84 – Standard Test Method for Surface Burning Characteristics of Building Materials; 2016

E. CSA Standard Z317.2-10 – Special Requirements for Heating, Ventilation, and Air-conditioning (HVAC) Systems in Health Care Facilities; 2010

F. NFPA Standard 90A – Standard for the Installation of Air-Conditioning and Ventilating Systems; 2015

G. SMACNA (SRM) – Seismic Restraint Manual Guidelines for Mechanical Systems; Sheet Metal and Air Conditioning Contractors’ National Association; 2008

H. UL Standard 723 – Standard for Test for Surface Burning Characteristics of Building Materials; 2008

**1.04 Administrative Requirements**

A. Pre-installation Meeting: Conduct a pre-installation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

B. Sequencing: Ensure that utility connections are achieved in an orderly and efficient manner.

**1.05 Submittals**

A. See Section 01 30 00 – Administrative Requirements for submittal procedures.

B. Product Data: Provide data indicating configuration, general assembly, and materials used in fabrication. Include catalog performance ratings that indicate air flow, static pressure, and NC designation.

C. Shop Drawings: Indicate configuration, general assembly, and materials used in fabrication.

D. Certificates: Certify that air capacities, pressure drops, and selection procedures meet or exceed specified requirements.

E. Manufacturer's Installation Instructions: Indicate support and hanging details, installation instructions, recommendations, and service clearances required.

F. Project Record Documents: Record actual locations of units and control components.

G. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts lists.

H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. See Section 01 60 00 - Product Requirements for additional provisions.

2. Extra Filters: Furnish one spare filter as required per component originally supplied with filters.

**1.06 Quality Assurance**

1. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum ten years of documented experience.
2. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

**1.07 Warranty**

1. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
2. Price Industries warrants that, at the time of shipment, the LFDCX will be free from defects arising from manufacturing, workmanship, or a failure to adhere to Price Industries’ published catalog specifications and specified material. If Price Industries is notified in writing of any such defect within (1) year from the date of shipment, Price Industries will, at its sole option, repair, replace, or refund the purchase price paid by the Representative for the Product. Such remedies are the exclusive remedies available under this warranty.

**PART 2 – PRODUCTS**

**2.01** **Low-Profile Laminar Flow Diffuser with High Efficiency Filter**

1. Basis of Design: Price Industries, Inc.
2. Low-Profile Laminar flow diffusers with high efficiency filter: Model LFDCX
3. General:
	1. The laminar flow diffusers shall be non-aspirating, unidirectional type, providing filtered air at controlled low velocity with minimal entrainment of room air to satisfy the requirements of ASHRAE Standard 170.
4. Low Profile Laminar Flow Diffusers [Price Model LFDCX]:
	1. Plenum material shall be anodized extruded aluminum.
	2. Face material shall be one of the following options:
		1. Anodized Aluminum
		2. 304 stainless steel
		3. Expanded steel
	3. Construction
		1. Plenums shall have an airtight seal preventing contaminants in the interstitial space from being drawn into the diffuser plenum and mixing with conditioned air that is being delivered to the clean space.
		2. The filter media pack shall be sealed to the anodized extruded aluminum filter frame with a fire-retardant, solid urethane sealant.
		3. A static pressure port shall be factory supplied to measure pressure drop across the filter, and to sample aerosol concentrations before the filter when testing the filter for leaks.
		4. Air shall be admitted to the top plenum chamber through an integral inlet collar, and (**select one**):
			1. Fixed distribution plate.
			2. Adjustable baffle plate.
			3. Butterfly damper with fixed distribution plate.
		5. The diffuser plenum shall feature four (4) integral hanger tabs for securing the unit to structural supports above the ceiling.
		6. The grille face shall be 65% open expanded steel.
		7. Filter media pack depth shall be [two (2) inch or four (4) inch].
		8. Filter type shall be selected from one of the following filter options based on particulate size and efficiency:
			1. High Efficiency Particulate Air (HEPA) filter shall provide 99.99% efficiency on .30 μm particulate.
			2. Ultra-Low Penetration Air (ULPA) filter shall provide 99.9995% efficiency on .12 μm particulate.
	4. Options:
		1. External Insulation
			1. The diffuser plenum shall be externally insulated with 2 inch aluminum foil-backed fiberglass insulation.
			2. Insulation shall not contain formaldehyde.
			3. Insulation and adhesive surface burning characteristics shall have a maximum flame/smoke spread of 25/50 when tested in accordance with ASTM E84. Secure insulation with adhesive. Coat edges exposed to airstream with NFPA 90A approved sealant.
			4. Insulation shall meet the requirements of ASTM-84 and UL 723.
		2. A fixed distribution plate shall be provided for application where no room side air flow adjustment is required.
		3. An adjustable distribution plate shall be provided to allow for room side fine-tune adjustment of the diffuser air flow.
		4. The volume control damper shall be provided to allow for wider adjustment of air flow from the room side.
			1. The air flow shall be room-side adjustable by turning a screw without removing the diffuser face or filter. The operator shaft shall be positively sealed against leakage.
		5. Protective Grille shall be one of the following:
			1. Expanded steel with white powder coat finish.
			2. Anodized aluminum with 40% free area perforations.
			3. Type 304 stainless steel with 40% free area perforations.
		6. Gasket shall be [white or black] ¼” EPT polyethylene butyl tape.

**PART 3 – EXECUTION**

**3.01 Examination**

 A. Verify that conditions are suitable for installation.

 B. Verify that field measurements are as shown on the drawings.

**3.02 Installation**

1. Install in accordance with manufacturer’s instructions.
2. See drawings for the size(s) and locations of laminar flow diffuser inlets.
3. Support components individually from structure in accordance with SMACNA (SRM).
4. Do not support components from ductwork.
5. Connect to ductwork in accordance with Section 203 31 00.

**3.03 Adjusting**

1. Ensure supply air to the laminar flow diffusers by performing pitot traverse of the main supply duct.
2. Balance outlets according to manufacturer’s recommendations.
3. Verify that field measurements are as shown on the drawings.

**3.04 Field Quality Control**

1. See Section 01 40 00 – Quality Requirements for additional requirements.

**3.05 Cleaning**

1. See Section 01 74 19 – Construction Waste Management and Disposal for additional requirements.

**3.06 Closeout Activities**

1. See Section 01 78 00 – Closeout Submittals for closeout documentation requirements.

See Section 01 79 00 – Demonstration and Training for additional requirements.