**Price Perforated Supply 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. **Section includes**:
1. Perforated Supply
	1. **Related Requirements**
2. Section 01 30 00 – Administrative Requirements
3. Section 01 40 00 – Quality 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
	1. **Reference Standards**
7. All referenced standards and recommended practices in this section pertain to the most recent publication thereof, including all addenda and errata.
8. ASHRAE 55 – Standard for Thermal Environmental Conditions for Human Occupancy
9. ASHRAE 70 – Standard Method of Testing the Performance of Air Outlets and Air Inlets
10. ASTM 610 – Standard Practice for Evaluating Degree of Rusting on Painted Steel Surfaces
11. ASTM 714 – Test Method for Evaluating Degree of Blistering of Paints
12. ASTM D1308 – Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes
13. ASTM D1654 – Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
14. ASTM D4752 – Standard Practice for Measuring MEK Resistance of Ethyl Silicate (Inorganic) Zinc-Rich Primers by Solvent Rub
15. NFPA 90A – Standard for the Installation of Air-Conditioning and Ventilating Systems

**1.04 Submittals**

1. See Section 01 30 00 – Administrative Requirements for submittal procedures.
2. Product Data: Provide data indicating configuration, general assembly, and materials used in fabrication. Include catalog performance ratings that indicate airflow, and NC designation.
3. Shop Drawings: Indicate configuration, general assembly, and materials used in fabrication.
4. Project Record Documents: Record actual locations of units and control components.
5. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions (if applicable), and maintenance and repair data.
6. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
7. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

**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.

**1.07 Warranty**

1. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
2. Provide 12 month manufacturer warranty from date of shipment of diffusers.

**PART 2 – PRODUCTS**

**2.01 Manufacturer**

1. Basis of Design: Price Industries, Inc.
2. Perforated Ceiling Diffuser, Face Controller: Model PDF, APDF, PDFE, APDFE
3. Perforated Ceiling Diffusers, Curved Blades: Model PDC, APDC, PDCE, APDCE
4. Perforated Ceiling Diffusers, Neck Controller: Model PDN, APDN, PDNE, APDNE
5. Perforated Ceiling Diffusers, Modular Core: Model PDMC, APDMC
6. Perforated Ceiling Diffusers, Star Pattern: Model PDSP, APDSP, PDSPE, APDSPE
7. Fire-Rated Perforated Ceiling Diffusers: Model PDF-FR, PDN-FR, PDC-FR, PDMC-FR, PDSP-FR
8. General:
	1. The perforated face supply diffuser shall be supplied to match return air models in appearance and detail.
	2. The extended face supply diffusers shall match the extended face return diffusers for 15/16 inch tegular tile ceilings.

**2.02 Perforated Ceiling Supply Diffuser, Face Deflector**

1. Description:
	1. Furnish and install Price model [PDF], [APDF], [PDFE], or [APDFE] supply diffusers in sizes and capacities as shown by the plans and air distribution schedule.
2. Construction:
	1. The perforated diffusers shall consist of a perforated air distribution face of no less than 51 percent free area, a heavy gauge steel back pan with [round] or [square] inlet collars as noted on the plans.
	2. The perforated face construction shall be (**select one**):
		1. Steel [Models PDF and PDFE].
		2. Aluminum [Models APDF and APDFE].
	3. Air deflector modules shall be located on the back of the perforated face of the diffuser.
	4. The perforated face shall be removable from the diffuser and shall be fitted with hinges for ease of removal of the face screen for cleaning purposes and air pattern adjustment.
	5. [**PDFE and APDFE only**] The drop face diffuser shall extend 3/8 inch below the ceiling tee line to complement 15/16 inch tegular tile ceilings.
3. Performance:
	1. Air deflector modules shall allow full field adjustment of air flow pattern from one-way to four-way discharge without affecting the free area or the pressure and noise performance of the diffuser.
4. Paint Specification:
	1. Paint finish shall be (**select one**):
		1. Baked-on powder coat finish.
			1. The paint film thickness shall be a minimum of 2 mils.
			2. The finish shall have a hardness of 2H as tested in accordance with ASTM D3363.
			3. The finish shall pass an ASTM B117 Corrosive Environment Salt Spray Test for 1000 hours with no measurable creep, rusting or blistering as per ASTM D1654, D610 and D714.
			4. The finish shall pass an ASTM D870 Water Immersion test of a minimum of 500 hours with no measurable with no rusting or blistering as per ASTM D610 and D714.
			5. The finish shall have an impact resistance of 100 inch-pounds in accordance with ASTM D2794.
		2. All components shall have a custom finish in a color to match a customer supplied sample.
5. Mounting Frame:
	1. The diffuser mounting frame shall be suitable for lay-in or surface mount applications with the following frame style (**select one**):
		1. T-bar lay-in for 1 inch and 9/16 inch wide flat tee.
		2. 9/16 inch Narrow member lay-in (models PDF, APDF only).
		3. Concealed spline.
		4. Snap-in T-bar.
		5. Surface mount.
		6. 15/16 inch Tegular lay-in (models PDFE, APDFE only).
6. Options (**select all that apply**):
	1. Beaded Extended Neck:
		1. The diffuser shall be supplied with a beaded neck extended to a depth of 2-1/2 inches.
	2. Insulated Back pan (**T-bar mounting frame only**):
		1. R6 – The diffuser back pan shall be externally insulated with a molded heavy duty foil/scrim vapor barrier with an R-value of six. The insulation shall meet the requirements of UL 181 and NFPA 90A (**24 x 24 inch module size only**).
	3. Damper:
		1. The diffuser shall be supplied with a (**select one**):
			1. Steel, radial, opposed blade volume control damper (VCR7).
			2. Steel, full flow, duct mounted damper (VCR8).
			3. Steel, full flow, diffuser mounted damper (VCR8E).
			4. Steel, radial, diffuser mounted damper (VCR9).

**2.03 Perforated Ceiling Supply Diffusers, Curved Blades**

1. Description:
	1. Furnish and install Price model [PDC] supply diffusers in sizes and capacities as shown by the plans and air distribution schedule.
2. Construction:
	1. The perforated diffuser shall consist of a perforated air distribution face of no less than 51 percent free area, and a heavy gauge steel back pan with [round] or [square] inlet collars as noted on the plans.
	2. The perforated face screen construction shall be (**select one**):
		1. Steel [Model PDC, PDCE].
		2. Aluminum [Model APDC, APDCE].
	3. Individually adjustable air deflectors shall be located in the neck of the diffuser.
	4. The perforated face shall be removable from the diffuser face and shall be fitted with quick-release spring latches for ease of removal of the face screen for cleaning purposes.
	5. [**PDCE and APDCE only**] The drop face diffuser shall extend 3/8 inch below the ceiling tee line to complement 15/16 inch tegular tile ceilings.
3. Performance:
	1. The individually adjustable curved air deflectors shall allow adjustment of the airflow pattern from a horizontal pattern to a vertical pattern without affecting the free area or the pressure and noise performance of the diffuser.
4. Paint Specification:
	1. Paint finish shall be (**select one**):
		1. Baked-on powder coat finish.
			1. The paint film thickness shall be a minimum of 2 mils.
			2. The finish shall have a hardness of 2H as tested in accordance with ASTM D3363.
			3. The finish shall pass an ASTM B117 Corrosive Environment Salt Spray Test for 1000 hours with no measurable creep, rusting or blistering as per ASTM D1654, D610 and D714.
			4. The finish shall pass an ASTM D870 Water Immersion test of a minimum of 500 hours with no measurable with no rusting or blistering as per ASTM D610 and D714.
			5. The finish shall have an impact resistance of 100 inch-pounds in accordance with ASTM D2794.
		2. All components shall have a custom finish in a color to match a customer supplied sample.
5. Mounting Frame:
	1. The diffuser mounting frame shall be suitable for lay-in or surface mount applications with the following frame style (**select one**):
		1. T-bar lay-in for 1 inch and 9/16 inch wide flat tee.
		2. 9/16 inch Narrow member lay-in (**models PDC, APDC only**).
		3. Concealed spline.
		4. Snap-in T-bar.
		5. Surface mount.
		6. 15/16 inch Tegular lay-in (**models PDCE, APDCE only**).
6. Options (**select all that apply**):
	1. Beaded Extended Neck:
		1. The diffuser shall be supplied with a beaded neck extended to a depth of 2-1/2 inches.
	2. Insulated Back pan (**T-bar mounting frame only**):
		1. R6 – The diffuser back pan shall be externally insulated with a molded heavy duty foil/scrim vapor barrier with an R-value of six. The insulation shall meet the requirements of UL 181 and NFPA 90A (**24 x 24 inch module size only**).
	3. Damper:
		1. The diffuser shall be supplied with a (**select one**):
			1. Steel, radial, opposed blade volume control damper (VCR7).
			2. Steel, full flow, duct mounted damper (VCR8).
			3. Steel, full flow, diffuser mounted damper (VCR8E).
			4. Steel, radial, diffuser mounted damper (VCR9).

**2.04 Perforated Ceiling Supply Diffusers, Neck Controller**

1. Description:
	1. Furnish and install Price model [PDN], [APDN], [PDNE], or [APDNE] supply diffusers in sizes and capacities as shown by the plans and air distribution schedule.
2. Construction:
	1. The perforated diffusers shall consist of a perforated air distribution face of no less than 51 percent free area, and a heavy gauge steel back pan with [round] or [square] inlet collars as noted on the plans.
	2. The perforated face construction shall be (**select one**):
		1. Steel [Models PDN and PDNE].
		2. Aluminum [Models APDN and APDNE].
	3. Curved blade air deflector modules shall be located in the neck of the diffuser.
	4. The perforated face shall be removable from the diffuser face and shall be fitted with hinges for ease of removal of the face screen for cleaning purposes.
	5. [**PDNE and APDNE only**] The drop face diffuser shall extend 3/8 inch below the ceiling tee line to complement 15/16 inch tegular tile ceilings
3. Performance:
	1. The air deflector modules shall allow full field adjustment of airflow pattern from one way to four way discharge without affecting the free area or the pressure and noise performance of the diffuser.
4. Paint Specification:
	1. Paint finish shall be (**select one**):
		1. Baked-on powder coat finish.
			1. The paint film thickness shall be a minimum of 2 mils.
			2. The finish shall have a hardness of 2H as tested in accordance with ASTM D3363.
			3. The finish shall pass an ASTM B117 Corrosive Environment Salt Spray Test for 1000 hours with no measurable creep, rusting or blistering as per ASTM D1654, D610 and D714.
			4. The finish shall pass an ASTM D870 Water Immersion test of a minimum of 500 hours with no measurable with no rusting or blistering as per ASTM D610 and D714.
			5. The finish shall have an impact resistance of 100 inch-pounds in accordance with ASTM D2794.
		2. All components shall have a custom finish in a color to match a customer supplied sample.
5. Mounting Frame:
	1. The diffuser mounting frame shall be suitable for lay-in or surface mount applications with the following frame style (**select one**):
		1. T-bar lay-in for 1 inch and 9/16 inch wide flat tee.
		2. Narrow member lay-in.
		3. Concealed spline.
		4. Snap-in T-bar.
		5. Surface mount.
		6. Tegular lay-in (**models PDNE, APDNE only**).
6. Options (**select all that apply**):
	1. Beaded Extended Neck:
		1. The diffuser shall be supplied with a beaded neck extended to a depth of 2-1/2 inches.
	2. Insulated Back pan (**T-bar mounting frame only**):
		1. AFI –The diffuser back pan shall be externally insulated with ½ inch fiberglass with foil/scrim vapor barrier which meets the requirements of UL 181 and NFPA 90A.
		2. R6 – The diffuser back pan shall be externally insulated with a molded heavy duty foil/scrim vapor barrier with an R-value of six. The insulation shall meet the requirements of UL 181 and NFPA 90A (**24 x 24 inch module size only**).
	3. Damper:
		1. The diffuser shall be supplied with a (select one):
			1. Steel, radial, opposed blade volume control damper (VCR7).
			2. Steel, full flow, duct mounted damper (VCR8).
			3. Steel, full flow, diffuser mounted damper (VCR8E).
			4. Steel, radial, diffuser mounted damper (VCR9).

**2.05 Perforated Ceiling Supply Diffusers, Modular Core**

1. Description:
	1. Furnish and install Price model [PDMC], [APDMC] supply diffusers in sizes and capacities as shown by the plans and air distribution schedule.
2. Construction:
	1. The perforated diffusers shall consist of louvered pattern control modules, and a perforated air distribution face of no less than 51 percent free area, a heavy gauge steel back pan with [round] or [square] inlet collars as noted on the plans.
	2. The perforated face construction shall be (**select one**):
		1. Steel [Model PDMC].
		2. Aluminum [Model APDMC].
	3. The diffuser core shall consist of fixed louver directional modules located in the neck of the diffuser. The modules shall be easily field adjustable from the diffuser face without the use of any tools or mechanical device.
	4. The perforated face and modules shall be easily removable to allow for access to the diffuser interior.
3. Performance:
	1. Air deflector modules shall allow full field adjustment of airflow pattern from one-way, two-way, two way corner, three-way, and four-way horizontal pattern without affecting the free area or the pressure and noise performance of the diffuser.
4. Paint Specification:
	1. Paint finish shall be (**select one**):
		1. Baked-on powder coat finish.
			1. The paint film thickness shall be a minimum of 2 mils.
			2. The finish shall have a hardness of 2H as tested in accordance with ASTM D3363.
			3. The finish shall pass an ASTM B117 Corrosive Environment Salt Spray Test for 1000 hours with no measurable creep, rusting or blistering as per ASTM D1654, D610 and D714.
			4. The finish shall pass an ASTM D870 Water Immersion test of a minimum of 500 hours with no measurable with no rusting or blistering as per ASTM D610 and D714.
			5. The finish shall have an impact resistance of 100 inch-pounds in accordance with ASTM D2794.
		2. All components shall have a custom finish in a color to match a customer supplied sample.
5. Mounting Frame:
	1. The diffuser mounting frame shall be suitable for lay-in or surface mount applications with the following frame style (**select one**):
		1. T-bar lay-in for 1 inch and 9/16 inch wide flat tee.
		2. Narrow member lay-in.
		3. Concealed spline.
		4. Snap-in T-bar.
		5. Surface mount.
6. Options (**select all that apply**):
	1. Beaded Extended Neck:
		1. The diffuser shall be supplied with a beaded neck extended to a depth of 2-1/2 inches.
	2. Insulated Back pan (**T-bar mounting frame only**):
		1. AFI –The diffuser back pan shall be externally insulated with ½ inch fiberglass with foil/scrim vapor barrier which meets the requirements of UL 181 and NFPA 90A.
		2. R6 – The diffuser back pan shall be externally insulated with a molded heavy duty foil/scrim vapor barrier with an R-value of six. The insulation shall meet the requirements of UL 181 and NFPA 90A (**24 x 24 inch module size only**).
	3. Damper:
7. The diffuser shall be supplied with a (**select one**):
8. Steel, radial, opposed blade volume control damper (VCR7).
9. Steel, full flow, duct mounted damper (VCR8).
10. Steel, full flow, diffuser mounted damper (VCR8E).
11. Steel, radial, diffuser mounted damper (VCR9).

**2.06 Perforated Ceiling Supply Diffusers, Star Pattern**

1. Description:
	1. Furnish and install Price model [PDSP], [APDSP], [PDSPE], or [APDSPE] supply diffusers in sizes and capacities as shown by the plans and air distribution schedule.
2. Construction:
	1. The perforated diffusers shall consist of a perforated air distribution face of no less than 51 percent free area, and a heavy gauge steel back pan with [round] or [square] inlet collars as noted on the plans.
	2. The perforated face construction shall be (**select one**):
		1. Steel [Models PDSP and PDSPE].
		2. Aluminum [Models APDSP and APDSPE].
	3. Air deflector modules shall be located in the neck of the diffuser.
	4. The perforated face shall be removable from the diffuser face and shall be fitted with hinges for ease of removal of the face screen for cleaning purposes. The deflector assembly shall include a center opening to allow for access to an optional damper.
	5. [**PDSPE and APDSPE only**] The drop face diffuser shall extend 3/8 inch below the ceiling tee line to complement 15/16 inch tegular tile ceilings
3. Performance:
	1. Air deflector modules shall be factory set for four-way side throw or four-way diagonal throw. The diffuser air pattern shall be field adjustable by rotating the deflector assembly. A vertical pattern shall also be achieved by turning the deflector blades.
4. Paint Specification:
	1. Paint finish shall be (**select one**):
		1. Baked-on powder coat finish.
			1. The paint film thickness shall be a minimum of 2 mils.
			2. The finish shall have a hardness of 2H as tested in accordance with ASTM D3363.
			3. The finish shall pass an ASTM B117 Corrosive Environment Salt Spray Test for 1000 hours with no measurable creep, rusting or blistering as per ASTM D1654, D610 and D714.
			4. The finish shall pass an ASTM D870 Water Immersion test of a minimum of 500 hours with no measurable with no rusting or blistering as per ASTM D610 and D714.
			5. The finish shall have an impact resistance of 100 inch-pounds in accordance with ASTM D2794.
		2. All components shall have a custom finish in a color to match a customer supplied sample.
5. Mounting Frame:
	1. The diffuser mounting frame shall be suitable for lay-in or surface mount applications with the following frame style (**select one**):
		1. 9/16 inch wide T-bar with drop frame.
		2. Concealed spline.
		3. 15/16 inch wide flat T-bar.
		4. Snap-in T-bar.
		5. 9/16 wide tegular T-bar.
		6. Clip-on Recessed Spline.
		7. Surface mount.
6. Options (**select all that apply**):
	1. Beaded Extended Neck:
		1. The diffuser shall be supplied with a beaded neck extended to a depth of 2-1/2 inches.
	2. Insulated Back pan (**T-bar mounting frame only**):
		1. AFI –The diffuser back pan shall be externally insulated with ½ inch fiberglass with foil/scrim vapor barrier which meets the requirements of UL 181 and NFPA 90A.
		2. R6 – The diffuser back pan shall be externally insulated with a molded heavy duty foil/scrim vapor barrier with an R-value of six. The insulation shall meet the requirements of UL 181 and NFPA 90A (**24 x 24 inch module size only**).
	3. Damper:
7. The diffuser shall be supplied with a (**select one**):
8. Steel, radial, opposed blade volume control damper (VCR7).
9. Steel, full flow, duct mounted damper (VCR8).
10. Steel, full flow, diffuser mounted damper (VCR8E).
11. Steel, radial, diffuser mounted damper (VCR9).

**2.07 Fire-Rated Perforated Ceiling Supply Diffusers**

1. Description:
	1. Furnish and install Price model [PDF-FR], [PDN-FR], [PDC-FR], [PDMC-FR], [PDSP-FR] fire-rated perforated diffusers in the sizes and capacities as shown by the plans and air distribution schedule.
	2. Diffusers shall be Fire-Rated Assemblies listed in the UL, Underwriters Laboratories Fire Resistance Directory and in the ULC, Underwriters Laboratories of Canada Equipment and Materials Directory.
	3. Diffusers shall meet UL time versus temperature test criteria and NFPA 90A requirements.
	4. This design is intended for use in an exposed grid suspended ceiling (T-bar Lay-in) with up to a three-hour rating and must be installed in accordance with the installation instructions.
2. Construction:
	1. The perforated diffusers shall consist of a perforated air distribution face of no less than 51 percent free area, and a heavy gauge steel back pan with [round] or [square] inlet collars as noted on the plans.
	2. The diffuser construction shall be steel.
	3. **Select appropriate model**:
		1. Model PDF-FR:
			1. The perforated face shall have adjustable air deflector modules shall be located on the back of the perforated face of the diffuser.
			2. The perforated face shall be removable from the diffuser face and shall be fitted with quick-release spring latches for ease of removal of the face screen.
		2. Model PDN-FR:
			1. The perforated diffuser shall have adjustable pattern controllers located in the neck of the diffuser.
			2. The perforated face shall be removable from the diffuser face and shall be fitted with quick-release spring latches for ease of removal of the face screen.
		3. Model PDC-FR:
			1. The perforated face shall have individually adjustable curved air deflectors located in the neck of the diffuser.
			2. The perforated face shall be removable from the diffuser face and shall be fitted with quick-release spring latches for ease of removal of the face screen.
		4. Model PDMC-FR:
			1. The perforated face shall have fixed air deflectors located in the neck of the diffuser.
			2. The perforated face shall be removable from the diffuser face and shall be fitted with hinges for ease of removal of the face screen.
		5. Model PDSP-FR:
			1. The perforated face shall have individually adjustable curved air deflectors located in the neck of the diffuser.
			2. The perforated face shall be removable from the diffuser face and shall be fitted with hinges for ease of removal of the face screen.
3. Mounting Frame:
	1. The diffuser mounting frame shall be suitable for 15/16 inch T-bar lay-in applications.
4. Damper:
	1. The diffuser shall be supplied with a galvanized steel, [non-adjustable] or [adjustable], fire-rated ceiling radiation damper.
5. Thermal Blanket:
	1. The diffuser shall be externally wrapped with a non-asbestos thermal blanket.
6. Paint Specification:
	1. Paint finish shall be (**select one**):
		1. Baked-on powder coat finish.
			1. The paint film thickness shall be a minimum of 2 mils.
			2. The finish shall have a hardness of 2H as tested in accordance with ASTM D3363.
			3. The finish shall pass an ASTM B117 Corrosive Environment Salt Spray Test for 1000 hours with no measurable creep, rusting or blistering as per ASTM D1654, D610 and D714.
			4. The finish shall pass an ASTM D870 Water Immersion test of a minimum of 500 hours with no measurable with no rusting or blistering as per ASTM D610 and D714.
			5. The finish shall have an impact resistance of 100 inch-pounds in accordance with ASTM D2794.
		2. All components shall have a custom finish in a color to match a customer supplied sample.
7. Options (**select all that apply**):
	1. Volume Control:
8. The diffuser shall be supplied with a steel volume control damper that is room side adjustable for balancing.
	1. Fusible Link:
9. The diffuser shall be supplied with a fusible link rated for (**select one**):
	* + 1. 165 degrees Fahrenheit.
			2. 212 degrees Fahrenheit.

**PART 3 – EXECUTION**

**3.01 Examination**

1. Verify that conditions are suitable for installation.
2. 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 diffusers.

**3.03 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.
2. See Section 01 79 00 – Demonstration and Training for additional requirements.