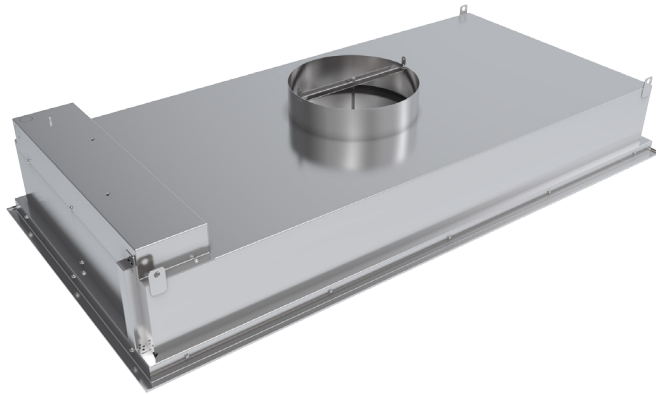




5100 shown with LED light option.



INTRODUCTION

The Krueger 5100 series of diffusers are the next generation low velocity, non-aspirating, unidirectional flow diffusers for critical environments. Designed to comply with industry standard ASHRAE 170, the 5100 series is commonly used in operating rooms as the primary diffuser array providing a clean piston of air over the patient during surgical procedures.

The 5100 series creates a low velocity, evenly distributed, downward moving “piston” of conditioned air. Unidirectional flow minimizes air induction, reducing the opportunity for air borne pathogens to be re-entrained and pollute the clean discharge air. Installed over the operating table in a hospital operating room, these diffusers help protect the patient from contaminated room secondary air. The only appreciable amount of room air entrainment occurs at the boundaries of the moving air mass, outside the confines of the operating table. As a result, the patient is effectively isolated from residual room air.

The advantages of laminar flow technology provide similar benefits in other clean room applications, such as research laboratories, animal laboratories, food processing plants, pharmaceutical laboratories and protective environment rooms.

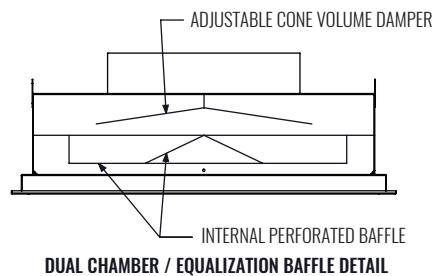
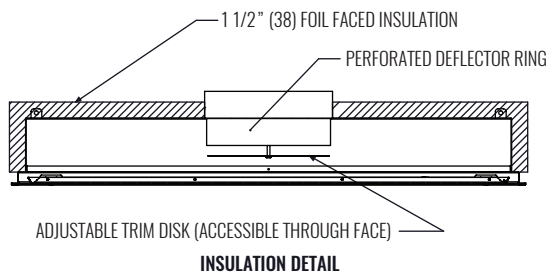
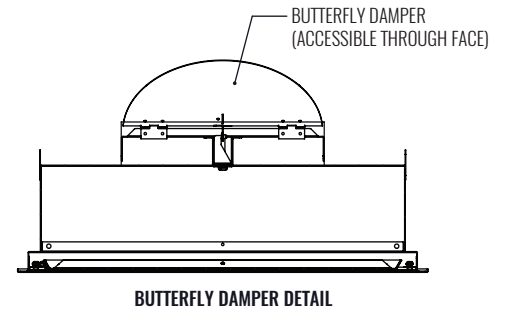
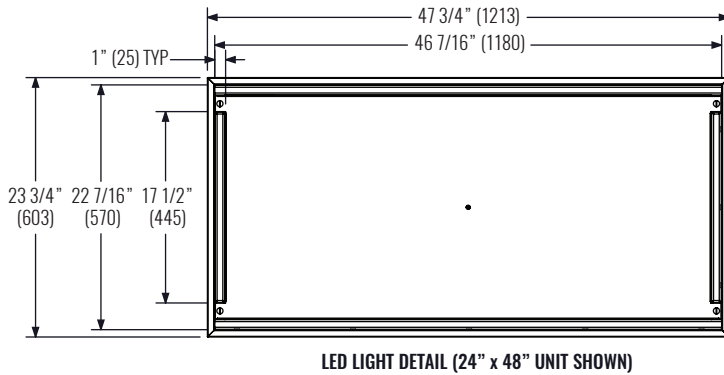
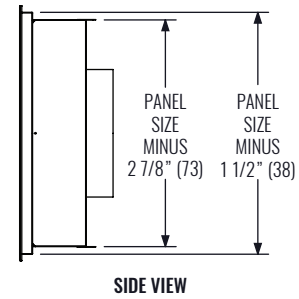
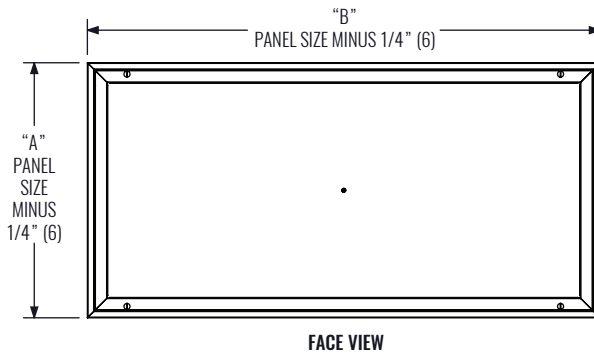
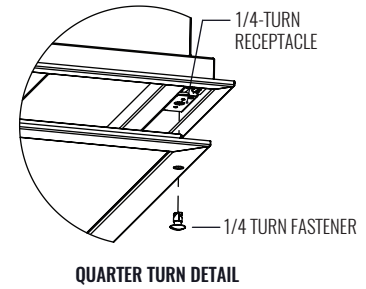
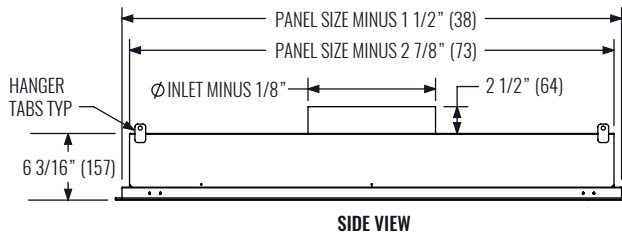
MODEL

5100 - Laminar Flow Panel; Aluminum and Stainless Steel Construction

FEATURES

- Low velocity, non-aspirating
- Fully welded plenum body and diffuser face
- Quick opening (1/4 turn) fasteners permit complete removal of the face
- Built-in, face accessible, adjustable trim disk for even air distribution and field balancing
- Safety cables (2) prevent accidental dropping of face
- 13% free area perforated face is standard, larger free area perforated faces are available for larger capacity units
- Frame Styles: Surface mount (F22) and lay-in T-bar (F23) for 1.00” and 1.50” tee widths
- Integral earthquake hanger tabs
- Optional integral LED lights
- Standard finish depends on ordered options; optional finish is Antimicrobial White

5100 | DIMENSIONAL DATA



PANEL SIZE	A	B
12" x 24"	11 3/4" (298)	23 3/4" (603)
12" x 48"	11 3/4" (298)	47 3/4" (1213)
12" x 60"	11 3/4" (298)	59 3/4" (1518)
12" x 72"	11 3/4" (298)	71 3/4" (1822)
24" x 24"	23 3/4" (603)	23 3/4" (603)
24" x 36"	23 3/4" (603)	35 3/4" (908)
24" x 48"	23 3/4" (603)	47 3/4" (1213)
24" x 60"	23 3/4" (603)	59 3/4" (1518)
24" x 72"	23 3/4" (603)	71 3/4" (1822)
36" x 48"	35 3/4" (908)	47 3/4" (1213)
36" x 60"	35 3/4" (908)	59 3/4" (1518)

NOTES: Dimensions in parentheses are millimeters.

5100

Performance Data



5100 | 13% FREE AREA | PERFORMANCE DATA

8" INLET	AIRFLOW (CFM)	100	120	140	160	180	200	220	240	260	280	300
48" x 12" Module	Total Pressure	0.03	0.043	0.058	0.076	0.096	0.119	0.144	0.172	0.201	0.233	0.268
	NC	-	17	19	22	25	27	29	31	34	35	37
60" x 12" Module	Total Pressure	0.028	0.04	0.055	0.072	0.091	0.112	0.136	0.161	0.189	0.22	0.252
	NC	-	16	18	21	24	25	28	30	33	34	36
72" x 12" Module	Total Pressure	0.026	0.037	0.05	0.066	0.083	0.103	0.125	0.148	0.174	0.202	0.232
	NC	-	16	18	21	23	26	27	30	32	33	35

8" INLET	AIRFLOW (CFM)	100	120	140	160	180	200	220	240	260	280	300
24" x 24" Module	Total Pressure	0.03	0.043	0.058	0.076	0.096	0.119	0.144	0.172	0.201	0.233	0.268
	NC	-	17	19	22	25	27	29	31	34	35	37
36" x 24" Module	Total Pressure	0.026	0.037	0.05	0.066	0.083	0.103	0.125	0.148	0.174	0.202	0.232
	NC	-	15	18	21	24	26	28	30	33	34	36
48" x 24" Module	Total Pressure	0.023	0.034	0.046	0.06	0.075	0.093	0.113	0.134	0.158	0.183	0.21
	NC	-	-	17	20	23	25	27	30	32	33	35

10" INLET	AIRFLOW (CFM)	160	180	200	220	240	260	280	300	320	340	360
48" x 24" Module	Total Pressure	0.022	0.028	0.035	0.042	0.05	0.059	0.069	0.079	0.09	0.113	0.14
	NC	-	15	18	19	22	25	27	29	31	33	35
60" x 24" Module	Total Pressure	0.021	0.027	0.033	0.04	0.048	0.056	0.065	0.074	0.084	0.107	0.132
	NC	-	-	17	19	22	24	27	29	31	33	35
72" x 24" Module	Total Pressure	0.021	0.027	0.033	0.036	0.043	0.05	0.058	0.066	0.076	0.096	0.118
	NC	-	-	17	19	22	24	27	29	31	32	34

12" INLET	AIRFLOW (CFM)	230	260	290	315	345	375	400	430	460	490	520
48" x 24" Module	Total Pressure	0.036	0.046	0.057	0.068	0.081	0.096	0.109	0.126	0.144	0.163	0.184
	NC	15	18	21	22	25	28	30	32	35	3	42
60" x 24" Module	Total Pressure	0.031	0.04	0.049	0.058	0.07	0.083	0.094	0.108	0.124	0.141	0.159
	NC	15	18	21	22	25	28	30	32	35	38	42
72" x 24" Module	Total Pressure	0.028	0.036	0.045	0.053	0.063	0.075	0.085	0.099	0.113	0.128	0.144
	NC	14	17	20	21	24	27	29	31	34	37	41

NOTES: Data was derived from tests conducted in accordance with ANSI/ASHRAE Standard 70-1991. Noise Criteria (NC) is based on 10 dB room absorption, re 10⁻¹² Watts, damper fully open. Blank (-) indicates a NC of less than 15.

5100 | 23% FREE AREA | PERFORMANCE DATA

8" INLET	AIRFLOW (CFM)	200	240	280	320	360	400
24" x 24" Module	Total Pressure	0.08	0.11	0.16	0.2	0.26	0.32
	NC	16	21	27	29	33	37

10" INLET	AIRFLOW (CFM)	200	240	280	320	360	400
24" x 24" Module	Total Pressure	0.04	0.06	0.08	0.1	0.13	0.16
	NC	-	-	19	21	25	29
24" x 48" Module	AIRFLOW (CFM)	400	480	560	640	720	800
	Total Pressure	0.09	0.13	0.18	0.24	0.3	0.37
	NC	26	31	37	39	43	47

12" INLET	AIRFLOW (CFM)	200	240	280	320	360	400
24" x 24" Module	Total Pressure	0.03	0.05	0.06	0.08	0.11	0.13
	NC	-	-	-	-	18	22
24" x 48" Module	AIRFLOW (CFM)	400	480	560	640	720	800
	Total Pressure	0.05	0.07	0.1	0.13	0.16	0.2
	NC	20	25	31	33	37	41
24" x 60" Module	AIRFLOW (CFM)	500	600	700	800	900	1000
	Total Pressure	0.07	0.09	0.13	0.17	0.21	0.26
	NC	25	30	36	38	42	45

14" INLET	AIRFLOW (CFM)	400	480	560	640	720	800
24" x 48" Module	Total Pressure	0.03	0.05	0.06	0.08	0.11	0.13
	NC	-	19	25	27	31	35
24" x 60" Module	AIRFLOW (CFM)	500	600	700	800	900	1000
	Total Pressure	0.04	0.06	0.08	0.1	0.13	0.16
	NC	19	24	30	32	36	40

16" INLET	AIRFLOW (CFM)	500	600	700	800	900	1000
24" x 60" Module	Total Pressure	0.03	0.04	0.05	0.06	0.08	0.1
	NC	-	18	24	26	30	34

NOTES: Data was derived from tests conducted in accordance with ANSI/ASHRAE Standard 70-2006. Noise Criteria (NC) is based on 10 dB room absorption, re 10⁻¹² Watts, damper fully open. Blank (-) indicates a NC of less than 15.

5100 | SUGGESTED SPECIFICATION & CONFIGURATION

SECTION 233713 – DIFFUSERS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division ** Specifications Sections, apply to this section

1.2 SUMMARY

- A. Sections Includes:
1. Laminar Flow Diffuser

1.3 CODES AND STANDARDS

1. IEST-RP-CC006, Institute of Environmental Sciences Recommended Practices for Testing Clean Rooms
2. ASHRAE Standard 70, Method of Testing the Performance of Air Outlets and Air Inlets, 2006
3. ASHRAE Standard 170, Ventilation of Health Care Facilities, 2017
4. ASTM Standard E84, Standard Test Method for Surface Burning Characteristics of Building Materials, 2016

1.4 SUBMITTALS

- A. Product Data: For each type of produce indicated, include the following:
1. Data Sheet: Indicate materials of construction, finish and mounting details and performance data including throw vertical and horizontal, static pressure, sound ratings.
 2. Source quality-control reports.

PART 2 - PRODUCTS

2.1 DIFFUSERS

- A. Laminar Flow Diffuser
1. Manufacturers: Subject to compliance with requirements and performance listed in section 2.2 Source Quality Control, products by one of following manufacturer is acceptable
 - a. Krueger (Basis of Design)
 - b. Titus
 - c. Tuttle & Bailey
 2. Diffuser shall be Group E Non-Aspirating Diffuser per ASHRAE Standard 170-2017.
 3. Diffuser plenum shall be constructed of a single sheet of {0.40" thick aluminum / 20 gauge 304 stainless steel} and welded at all seams and corners. Plenum shall be attached to the mounting frame without mechanical fasteners; mechanical fasteners that penetrate the plenum shall not be acceptable. Inlet collar shall be sealed to the top of the plenum.
 - a. Option: All exterior seams are to be continuously welded.
 4. Diffusers shall be supplied with static pressure port to allow measurement of pressure drop across the face of the diffuser.
 5. The face of the diffuser shall be {13 / 23 / 33} percent free area perforated {0.40" thick aluminum / 20 gauge 304 stainless steel}. The face shall be secured in place by quarter-turn fasteners for quick removal and sanitizing. Differs shall be provided with two PVC coated stainless steel safety cables for ease of installation/removal and to prevent accidental dropping and of the diffuser face.
 6. **(Optional)** A butterfly damper shall be located in the inlet collar of the diffuser. Damper shall be operated by a Phillips head operator accessible through perforated face of diffuser.
 7. **(Optional)** Diffusers shall be supplied with 1 ½" foil-faced external insulation. Insulation shall have a flamespread index of 0-25 and a smoke developed index of 0-50 (25/50 rating) when tested in accordance with ASTM E84.
 8. Finish: shall be one of the following:
 - a. #44 White
 - i. The finish shall be a powder coat paint, baked at 425°F.
 - ii. The paint thickness shall be 2.0 – 3.0 mils, gloss at 60° per ASTM D523-89 of 60 – 70%
 - iii. The paint shall have a pencil hardness per ASTM D3363-92A of H – 2H,
 - iv. The paint shall have crosshatch adhesion per ASTM D3359-83 of 5B
 - v. The paint must pass a salt spray test per ASTM B117-9048 of 1000 hours,
 - vi. The paint must pass a humidity test per ASTM D2247-92 of 1000 hours
 - vii. The paint must pass a conical mandrel per ASTM D522 of 1/8" conical bend, no cracking shown.
 - b. #4A Antimicrobial White
 - i. The finish shall be a powder coat paint, baked at 425°F.
 - ii. The paint thickness shall be 2.0 – 3.0 mils, gloss at 60° per ASTM D523-89 of 60 – 70%
 - iii. The paint shall have a pencil hardness per ASTM D3363-92A of H – 2H,
 - iv. The paint shall have crosshatch adhesion per ASTM D3359-83 of 5B
 - v. The paint must pass a salt spray test per ASTM B117-9048 of 1000 hours,
 - vi. The paint must pass a humidity test per ASTM D2247-92 of 1000 hours
 - vii. The paint must pass a conical mandrel per ASTM D522 of 1/8" conical bend, no cracking shown.
 - c. Aluminum with mill finish
 - d. Stainless Steel with mill finish

SUGGESTED SPECIFICATION & CONFIGURATION (Continued)

2.2 SOURCE QUALITY CONTROL

- A. The manufacturer shall provide published performance data rated for the laminar flow diffuser
 - 1. The diffuser shall be tested in accordance with ANSI/ASHRAE Standard 70-2006
 - 2. Throw values are at isothermal conditions

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 level and plumb.
- B. Verify diffuser air patterns are as indicated on drawings during installation.
- C. Ceiling-Mounted Outlets: Drawings indicate general arrangement of ducts, fittings and accessories. Air Outlet and 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 practical. Where architectural features or other items conflict with installation, notify Engineer for determination of final location.
- D. Install diffusers with airtight connections to ducts and to allow service and maintenance of dampers, air extractors and fire dampers.

3.3 ADJUSTING

- A. After installation, verify diffusers air patterns is as indicated on drawings, or as directed before starting air balance.

END OF SECTION 233713

1. SERIES: (XXXX)*

5100 - Laminar flow diffuser

2. PATTERN: (XX)

03 - Aluminum pan and face
 04 - Aluminum face and stainless steel pan
 05 - Stainless steel pan and face

3. ROUND NECK SIZE: (XX)

06", 08", 10", 12", 14", 16", 18"

4. FRAME: (XXX)

F22 - Surface Mount
 F23 - Lay-in 1" T-Bar

5. PANEL: (XXxXX)

12"x24"	12"x48"	12"x60"	12"x72"
24"x24"	24"x36"	24"x48"	24"x60"
24"x72"	36"x48"	36"x60"	

6. PERFORATED FACE: (XX)

13 - 13% free area
 23 - 23% free area
 33 - 33% free area

7. INSULATION: (X)

0 - None
 I - External 1.5" insulation
 R - External molded R6 insulation
 C - Internal fiber free insulation

8. ACCESSORIES: (XX)

00 - Default trim disc
 BD - Butterfly damper
 WI - Welded inlet
 LE - LED lights **
 PA - Dual chamber Pat-A match ***

9. FINISH: (XX)

01 - Mill
 10 - Alumican
 44 - British white
 4A - British white (antimicrobial)

* Unit includes four safety cables on each panel.

** Only available for 24"x24", 24"x36", and 24"x48" panel sizes.

*** Accessory not available with BD damper.