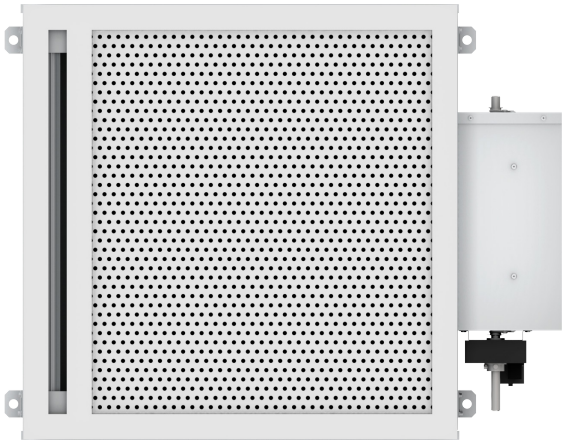
INTRODUCTION

Krueger's AFH displacement diffuser is intended to be mounted in a suspended ceiling installation or in applications requiring both cooling and heating. The diffuser is designed to produce a vertical low velocity displacement air pattern when supplying cool air or an adjustable high velocity pattern when supplying heated air. The diffuser switches from cooling to heating mode or vice versa with an electric actuator. When the AFH is in cooling mode, it discharges air evenly across the perforated face with minimal turbulence or induction of room air. The cool air falls slowly to the floor and gradually fills the space. When the AFH is in heating mode, it discharges air parallel to the face, towards the perimeter, with a high velocity jet.

The superior air quality and low noise levels make the AFH suitable for offices, classrooms, or any application where air quality demands are high, or where there may be minimal floor space and a requirement for both cooling and overhead heating must be met.



AFH, featuring a 1-slot configuration.

MODEL

AFH - Flat-Faced, Flush Mount, Lay-in T-bar, Low-Velocity, Supply Unit

FEATURES

- 20 gage front panel.
- Dual plenum chambers allow heating/cooling changeover.
- Heating supplied by 1" Designflo® (DFL) linear slot diffuser with adjustable pattern controllers (available in 1-slot or 2-slot configurations).

PANEL SIZES

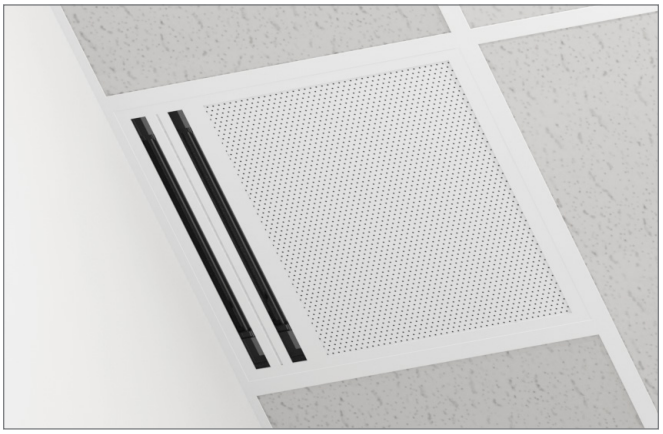
- 24" x 24" or 48" x 24"

OPTIONS

- Plenum Insulation
- Electric Actuator
- Inlet Airflow Sensor

FINISHES

- Standard is #44 British White.
- Custom colors available.



AFH installed view, featuring a 2-slot configuration.

AFH

Displacement Ventilation | Ceiling Mounted, Heating & Cooling Changeover

KRUEGER

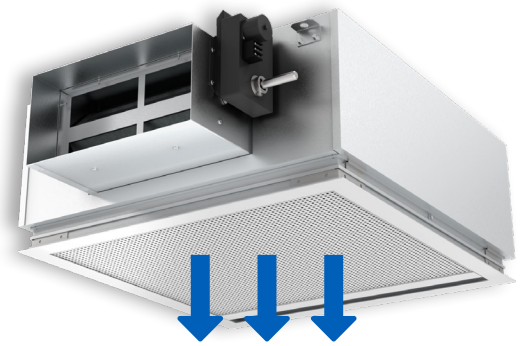
APPLICATION

FUNCTION

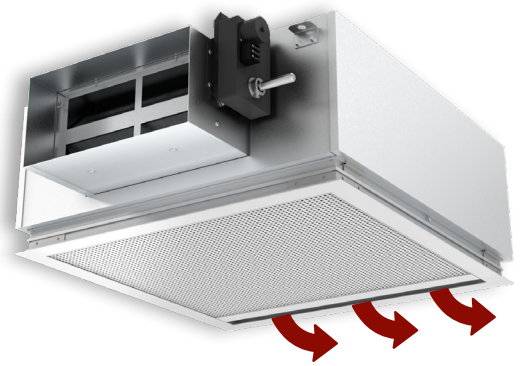
In cooling mode, low velocity air is discharged into the space through the perforated face, normally at a slightly lower temperature than setpoint. In heating mode, higher velocity air is discharged into the space through the linear slot diffusers, either one direction or two, normally at slightly higher temperatures than setpoint.

Cool supply air flows at floor level and gradually pervades through the occupied space before rising due to the convection of warm surfaces. Warm supply air flows downward along cold windows, tempering the air as it moves into the occupied space.

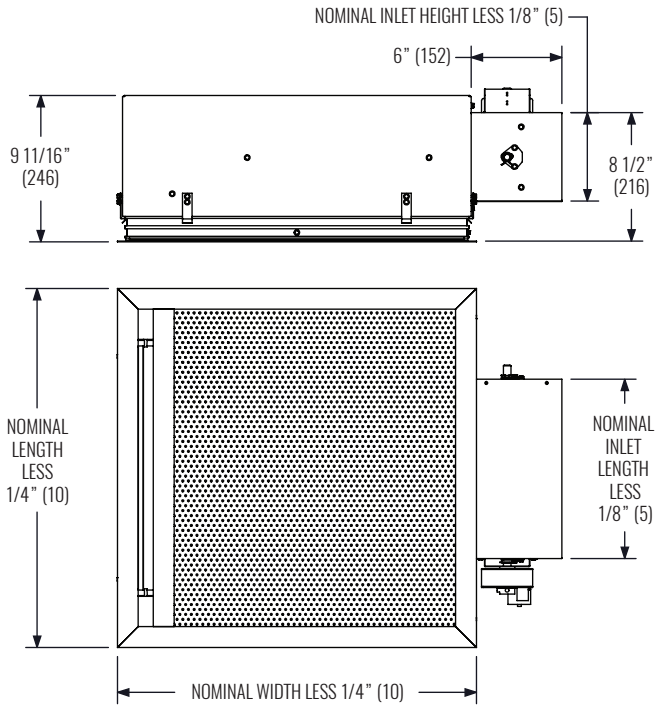
AFH IN COOLING MODE



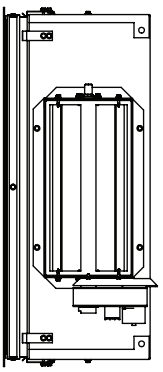
AFH IN HEATING MODE



DIMENSIONAL DATA



INLET SIZES		
PANEL SIZE	DUCT SIZE	DEPTH
24" x 24"	6" x 6"	6"
	12" x 6"	
	18" x 6"	
48" x 24"	24" x 6"	6"
	30" x 6"	
	36" x 6"	



PERFORMANCE DATA

COOLING													
UNIT SIZE	IP DATA						NC	METRIC DATA					
	AIR FLOW	Pt	VELOCITY @ 6' BELOW PANEL					AIR FLOW	Pt	VELOCITY @ 6' BELOW PANEL			
			5° FΔT	10° FΔT	15° FΔT	20° FΔT				3° CΔT	6° CΔT	8° CΔT	11° CΔT
	CFM	"WG	FPM	FPM	FPM	FPM		L/s/sm	Pa	m/s	m/s	m/s	m/s
24"x24" 12"x6" INLET	30	0.020	21	26	32	37	-	153	5.0	0.11	0.13	0.16	0.19
	60	0.030	37	42	47	58	-	307	7.5	0.19	0.21	0.24	0.29
	91	0.060	53	63	74	84	11	460	14.9	0.27	0.32	0.37	0.43
	121	0.110	68	84	100	110	18	614	27.4	0.35	0.43	0.51	0.56
24"x48" 24"x6" INLET	67	0.010	27	32	37	43	-	340	2.5	0.14	0.16	0.19	0.22
	134	0.020	43	53	64	69	9	680	5.0	0.22	0.27	0.33	0.35
	201	0.060	64	80	96	107	19	1019	14.9	0.33	0.41	0.49	0.54
	268	0.100	85	107	n/a	n/a	28	1359	24.9	0.43	0.54	-	-

HEATING																
SLOT WIDTH	NO. OF SLOTS	IP DATA				NC	METRIC DATA				OCTAVE BAND, dB					
		AIR FLOW	PRESSURE Ps	1-WAY THROW	2-WAY THROW		AIR FLOW	PRESSURE Ps	1-WAY THROW	2-WAY THROW						
		CFM	"WG	ft	ft		L/s/sm	Pa	m	m	2	3	4	5	6	7
1"	1	10	0.010	1-2-6	1-1-4	-	16	1.0	0.4-0.8-2.5	0.3-0.6-1.8	15	-	-	-	-	-
		25	0.050	5-7-14	3-5-10	-	39	6.0	2.1-3.1-5.8	1.5-2.2-4.1	30	29	18	-	-	-
		55	0.230	11-14-20	7-10-14	23	85	29.2	4.5-6.1-8.6	3.2-4.3-6.1	44	48	39	33	24	14
		70	0.380	13-16-23	9-11-16	29	109	47.3	5.6-6.9-9.7	4.0-4.9-6.9	48	54	45	40	31	19
		85	0.560	14-18-25	10-12-18	35	132	69.7	6.2-7.6-10.7	4.4-5.4-7.6	51	58	50	46	37	24

NOTES: Throw is based on isothermal air at 150, 100, and 50 (0.75, 0.5, and 0.25 m/s) FPM terminal velocities. Two way, one slot throw is split throw. Throw and sound based on a 2ft. length. Pressures are for diffuser section only. Plenums will add some noise and pressure drop. NC values are based on Octave Band 2 - 7 sound power levels minus a room absorption of 10dB. Dash in space denotes a NC or dB value of less than 10. Data was obtained from tests conducted in accordance with ANSI / ASHRAE Standard 70-1991.

AFH

Displacement Ventilation | Ceiling Mounted, Heating & Cooling Changeover

KRUEGER

ENGINEERING SPECIFICATION & CONFIGURATION

AFH
Furnish and install Krueger model series AFH (LxW) with the sizes and capacities indicated on the plans and air outlet schedule.

PERFORMANCE DURING COOLING MODE
Air shall be delivered to the space at low noise levels and low velocities that are even across the diffuser face, in all ducting configurations and without the use of nozzles. Diffuser Manufacturer shall provide sound and pressure drop data derived from tests in accordance with ASHRAE Standard 70-2006.

PERFORMANCE DURING HEATING MODE
The diffuser shall be capable of delivering air to the space in either a vertical or horizontal heating pattern. Performance data for Throw at 150 fpm, 100 fpm, 50 fpm (0.76 m/s, 0.51 m/s, 0.25m/s) shall be provided by manufacturer.

CONSTRUCTION
The diffuser shall be constructed with two separate plenums, one for heating operation and one for cooling operation. The cooling section of the heat-cool lay-in displacement diffuser, model AFH, shall be constructed with an equalization baffle behind the operative diffuser faces for uniform, low velocity, distribution of supply air. Both the equalization baffle and faces shall be securely retained in the diffuser frames. The diffuser frames shall be constructed of heavy wall extruded aluminum and shall be welded to ensure rigidity. There shall be no visible fasteners on the front or side panels. The operative face shall be constructed of painted 20 gauge perforated steel. The internal baffling elements shall be constructed of aluminum. The plenum may be galvanized steel. The paint shall be enamel based. Epoxies and their derivatives are unacceptable. Visible non-metallic components are unacceptable.

The linear slot diffuser for the heating section shall utilize heavy wall extruded aluminum air deflector frames. The linear shall be available in 1-slot or 2-slot configurations. The extruded aluminum air pattern controllers shall be fully adjustable, allowing movement from side to side to create various air pattern configurations and shall be fully adjustable to allow shut-off without adding any blank-off devices.

MOUNTING/FASTENING
The diffuser shall integrate into standard lay-in T-bar ceilings and shall have no visible fasteners.

ACTUATOR: ELECTRIC
The diffuser shall use a 24 VAC modulating actuator controlling a damper allowing two separate air flow paths. The actuator shall close the heating section when in cooling mode and close the cooling section while in heating mode. The actuator shall remain accessible from the outside of the diffuser for servicing.

1. **MODEL: (XXX)**
   AFH - Flat-Faced, Flush Mount, Lay-in T-bar, Low-Velocity Supply Unit
2. **PANEL SIZE: (XXxXX)**
   24x24
   48x24
3. **INLET: (XX) ***
   12 - 12" x 6"
   24 - 24" x 6"
4. **FRAME STYLE: (XXX)**
   F22 - Surface Mount **
   F23 - Lay-in T-bar
5. **NUMBER OF SLOTS: (X)**
   1 - 1-slot
   2 - 2-slots
6. **SLOT LOCATION: (XX)**
   24 - Locate on short side of unit.
   48 - Locate on long side of unit. ***
7. **ACTUATOR: (XX)**
   00 - None
   01 - Johnson Controls M9104
   02 - Siemens GDE131
8. **INSULATION: (X)**
   0 - None
   W - 1/2" External Foil Faced Insulation
9. **ACCESSORIES: (XX)**
   00 - None
   P1 - Inlet Airflow Sensor, Inlet Size 12
   P2 - Inlet Airflow Sensor, Inlet Size 24
10. **FINISH: (XX)**
    44 - British White
    07 - Custom

* Inlet size 24 is not available on panel size 24x24. The inlet is always opposite of slot location.
** Frame style F22 includes a separate plaster frame (model 5HCF23), shipped loose for field installation.
*** Slot location 48 is only available with the 24x48 panel size.

SAMPLE CONFIGURATION: AFH - 24x24 - 12 - F23 - 1 - 24 - 01 - W - 00 - 44