DISPLACEMENT DIFFUSER

AIRVECTOR

Rev. 0

High-Efficiency Ventilation With Enhanced Indoor Air Quality

GENERAL OVERVIEW

A Smarter Approach to Indoor Air Quality and Thermal Comfort

Displacement ventilation is an advanced air distribution strategy designed to optimize indoor air quality, thermal comfort, and energy efficiency. Unlike traditional overhead mixing systems that dilute contaminants throughout the space, displacement systems introduce low-velocity, conditioned air at floor level—directly within the occupied zone. This cooler air spreads across the floor and is naturally drawn upward by heat sources such as occupants, electronic equipment, or lighting, creating gentle thermal plumes. (see Fig. 1).

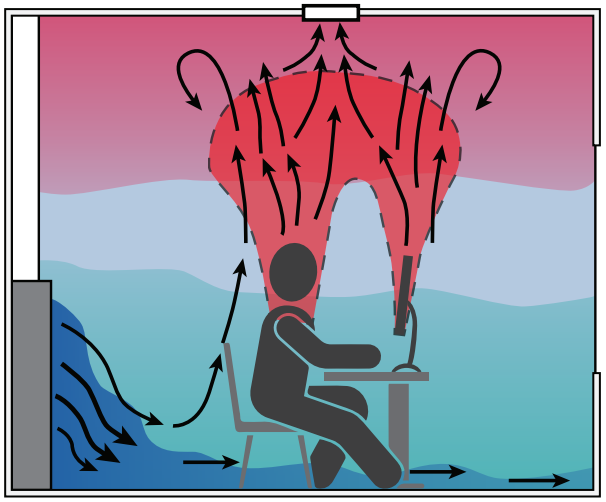

Fig. 1 - Rising air movement created near a heat source.

As the air rises, it carries excess heat, pollutants, and exhaled contaminants out of the breathing zone and toward the ceiling, where it can be exhausted. This stratified airflow pattern results in cleaner, more breathable air at occupant level, while minimizing drafts and operational noise.

Displacement systems like the DDW Series offer superior performance compared to conventional overhead mixing (MV) systems. By supplying warmer air at low velocity and leveraging thermal stratification, they reduce fan energy consumption and extend economizer operation. Recognized by ASHRAE 62.1 with a Zone Air Distribution Effectiveness (EZ) rating of 1.2, the DDW allows engineers to meet ventilation requirements with less outdoor air—improving occupant well-being, supporting LEED® certification, and increasing overall system efficiency.

Wall-mounted displacement diffusers such as the DDW are ideal for environments where floor space is limited and quiet, high-efficiency ventilation is essential—like offices, classrooms, healthcare settings, retail spaces, and auditoriums. Its perforated steel face and integrated baffle system ensure uniform airflow with minimal turbulence and whisper-quiet performance, making it a high-performance, confort ventilation solution.

DISPLACEMENT DIFFUSER

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DDW SERIES
Displacement Flow Side-Wall Diffuser

Quiet comfort & optimal air quality right at occupant level

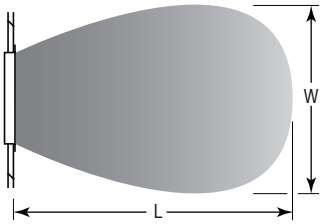
DDW

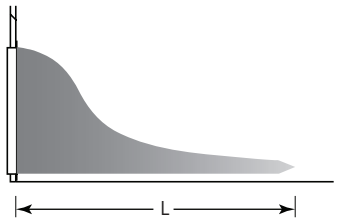
The Airvector® DDW Series is a side-wall mounted displacement diffuser engineered to deliver a steady, low-velocity airflow directly into the occupied zone. By introducing conditioned air through a perforated steel face with minimal turbulence, the DDW ensures quiet operation, improved indoor air quality, and exceptional thermal comfort. As cooler air gently spreads along the floor and rises naturally with room heat loads, it creates a clean-air "lake" effect—displacing stale air upward and out of the breathing zone.

Thanks to its perforated steel face and internal baffle system, the DDW ensures uniform airflow distribution while maintaining whisper-quiet performance. It's ideal for applications where floor space is limited and air quality is critical—such as classrooms, offices, healthcare environments, theaters, or retail spaces.

Engineered for surface mounting, the DDW blends seamlessly into wall designs, offering a modern, unobtrusive appearance.

AIR PATTERNS





GENERAL FEATURES

- **Low Velocity Air Delivery:** Ensures thermal comfort without drafts.
- **Perforated Front Panel:** Steel face with powder-coated finish for durability and clean aesthetics.
- **Surface Mounted:** Easy wall installation preserves floor space.
- **Quiet Operation:** Designed for low sound levels in sensitive environments.
- **Directional Displacement:** One-way horizontal discharge near the floor for natural vertical airflow.
- **Integrated Air Distribution Baffle:** Promotes uniform flow across the diffuser face.

All dimensions in inches

Displacement Flow Side-Wall Diffusers
DDW

Size W x H	Inlet Size	Face Velocity (fpm)	CFM / ft	Total Pressure	Ps	NC
14 x 24	2.5 x 12	20	41	-	-	-
		30	64	-	-	-
		40	86	0.01	-	-
		50	115	0.02	0.01	-
14 x 30	2.5 x 12	20	52	-	-	-
		30	80	0.01	-	-
		40	108	0.02	0.01	-
		50	141	0.03	0.02	-
14 x 36	2.5 x 12	20	70	-	-	-
		30	105	0.01	-	-
		40	142	0.02	0.01	-
		50	172	0.04	0.02	-
14 x 48	2.5 x 12	20	87	-	-	-
		30	142	0.02	0.01	-
		40	180	0.04	0.02	-
		50	234	0.06	0.03	16
22 x 24	2.5 x 18	20	64	-	-	-
		30	101	0.01	-	-
		40	128	0.02	0.01	-
		50	168	0.04	0.02	-
22 x 30	2.5 x 18	20	106	-	-	-
		30	133	0.02	-	-
		40	178	0.04	0.02	-
		50	226	0.06	0.03	16
22 x 36	2.5 x 18	20	101	0.01	-	-
		30	162	0.03	0.01	-
		40	206	0.05	0.02	-
		50	265	0.08	0.03	20
22 x 48	2.5 x 18	20	149	0.02	-	-
		30	208	0.04	0.02	-
		40	290	0.08	0.03	21
		50	364	0.13	0.05	28
24 x 30	2.5 x 18	20	89	-	-	-
		30	142	0.02	0.01	-
		40	182	0.04	0.02	-
		50	222	0.06	0.03	17
24 x 36	2.5 x 18	20	110	0.01	-	-
		30	170	0.03	0.01	-
		40	224	0.05	0.02	-
		50	281	0.08	0.04	22
24 x 48	2.5 x 20	20	154	0.02	-	-
		30	226	0.04	0.01	-
		40	298	0.07	0.03	22
		50	367	0.11	0.04	29

SYMBOLS
Ps Static Pressure in inches of water
NC Noise Criteria based on 10 db room absorption
Total Pressure in water gauge

- ΔT is the difference between the room air temperature 3½ ft above the floor and the temperature of the supply air.
- Data based on test results according to ASHRAE Standard 70-2023 Performance of Air Outlets and Inlets.
- "Proximity to outlet" refers to the minimum distance between a diffuser and an occupant needed to achieve the specified DR value.
- Being closer than this distance results in a higher DR than what's listed.
- Draft Rating estimates the percentage of people likely to feel discomfort from drafts. A DR below 20 complies with ASHRAE Standard 55-2004.
- A dash "–" means the DR remains below the threshold at all measured distances from the diffuser.
- DR values are based on an occupant density of 25 people per 1000 ft², the ASHRAE 62.1-2004 default for classrooms (ages 5–8).
- The "Adjacent zone" is the distance from the diffuser face where the air velocity drops to 50 fpm, measured 1 inch above the floor.