the future of space conditioning

Tranquilair™

Displacement Ventilation Diffuser

www.frenger.co.uk
an FTF Group Company

FRENGER® systems

Contents

Tranquilair™

Introduction

Displacement ventilation is a type of indoor air ventilation system that was first used in Scandinavia in the 1970's, the system is designed to provide comfortable and efficient air distribution within the building's interior spaces.

Unlike traditional mixed-air systems that distribute air from high level, displacement ventilation delivers conditioned air at low velocities near floor level, the conditioned air gradually displaces the warmer air in the occupied zone, by taking advantage of thermal stratification, so pushing up the staler room air to high level, where it can be extracted.

This use of displacing air via natural buoyancy helps to improve indoor air quality by minimising the mixing of air layers. Since the supply air is introduced near the floor and extracted at the ceiling level, contaminants, particulates, and pollutants are effectively removed from the occupied zone.

Design Considerations

Effective design and layout are crucial for the successful implementation of displacement ventilation systems. Factors such as room layout, occupant density, supply air temperature, and diffuser placement need to be considered to ensure optimal performance.

Should you require any technical assistance for selections or project specific testing in one of Frenger's 3 number state-of-art Climatic Testing Laboratories, Frenger are ready to assist.

Applications

Displacement ventilation is commonly used in various commercial and institutional buildings such as offices, classrooms, theatres, and conference rooms and Airports.

It's particularly suitable for spaces with high ceilings and large floor areas where traditional overhead ventilation systems may be less effective.

Key Features

Frenger's Tranquilair™ displacement ventilation diffusers are designed and manufactured in the UK by Frenger and have the following key features:

- Conditioned air low velocity discharge which provides superior thermal comfort compared to traditional ventilation systems. By delivering conditioned air at low velocities near the floor, occupants experience less air movement and drafts, resulting in a more comfortable environment.
- Displacement function using low static pressures of typically between 2 and 15Pa depending upon size and required fresh air volumes, ensuring the ventilation system uses less energy for air distribution and conditioning, resulting in potential energy savings.
- Variety of displacement diffuser design options and sizes to suit a projects particular requirement, non-standard made to measure versions also available upon request.
- Easy to install with removable perforated fascia to conceal fixings.
- Finished in RAL 9016 White powder coated as standard, other colours available upon request.
- Multiple perforation patterns available, although this will be depending upon specific air discharge volume and unit size.

Floor Entry Air Connection Wall Mounted Tranquilair™ Unit

Top Entry Air Connection Free Standing Tranquilair™ Unit

Top Entry Air Connection Corner Mounted Tranquilair™ Unit

Design

The Frenger's Tranquilair™ Displacement Ventilation Diffusers are manufactured from 1mm thick Zintec steel as standard with an option to manufacture from thicker material if greater robustness is required.

Frenger can also supply colour matched duct Boxing to cover / conceal exposed ductwork connecting to the displacement diffusers.

Dimensions: Tranquilair™ **Wall Mounted Units** are available in **five widths**, as standard - 0.3m, 0.45m, 0.6m, 0.75m and 0.9m, **six depths** from as standard - 0.15m, 0.18m, 0.22m, 0.25m 0.33m and 0.4m, and with **heights from 0.32m to 1.82m in 100mm increments**.

Corner Units are available in **five widths**, as standard - 0.35m, 0.45m, 0.6m, 0.75m and 0.9m, **five depths** from as standard - 0.265m, 0.34m, 0.45m, 0.56m and 0.67m with **heights from 0.42m to 1.92m in 100mm increments**.

Free Standing Units are available in **three widths**, as standard - 0.55m, 0.75m and 0.95m with **heights from 1.22m to 1.72m in 100mm increments**.

Air Connections: Tranquilair™ wall mounted units are available with various air connection configurations with single connections available in Ø125mm, Ø160mm, Ø200mm, Ø250mm and Ø300mm and dual connections in Ø250mm and Ø300mm.

Corner units are available with various air connection configurations with single connections available in Ø125mm, Ø160mm, Ø200mm, Ø250mm, Ø300mm and Ø355mm

Free standing units are available with various air connection configurations with single connections available in Ø300mm, Ø350mm, Ø400mm, Ø450mm and Ø500mm

Tranquilair™ Displacement Ventilation Diffusers can also be supplied with top entry or floor entry air connections. See pages 8 to 13 for further details.

Surface finish: Tranquilair™ units are pre-coated White as standard (equivalent to RAL 9016, 25% gloss). Frenger also offer all RAL classic colour options to suit any architectural aesthetics (other colours available on request at additional cost). Tranquilair™ units can also be supplied with BioCote® antimicrobial coating technology to give increased protection against bacteria and mould at additional cost.

Colour Options

Colour helps to create atmosphere within a space, the Tranquilair™ units provides a unique way to integrate colour into different environments. Frenger's Tranquilair™ units are pre-coated white standard, Frenger also offer powder units powder-coated in any RAL classic colour options to suit all architectural aesthetics (other colours available on request).

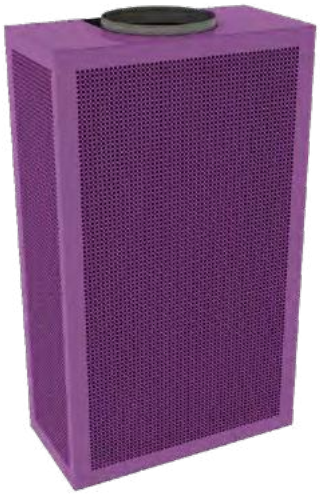
Research has been done into the effects different colours have on wellbeing and from this their suitability for different environments has been established. Blue has been found to induce calmness and improve concentration, its mental benefits make it a perfect choice for office environments, red has been shown to have more physical effects, encouraging activity, yellow is associated with creativity and is ideal for creative workspaces, neutral and cool tones are more suited for healthcare environments but depending on the purpose it can be useful to include colour such as for children's hospitals to provide stimulation.

Below are some examples of different Tranquilair™ Displacement Ventilation Diffusers, RAL Colour options. Available in RAL Classic Colour (Other colours available on request):

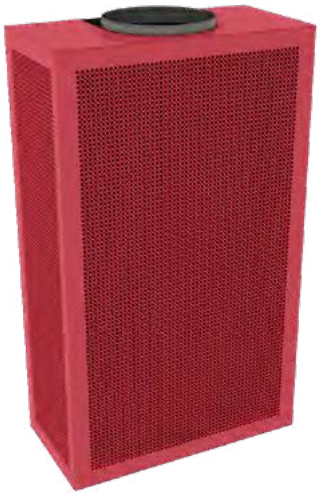
Standard Pre-Coated RAL 9016 Equivalent

Powder-Coated RAL 9004 Signal Black

Powder-Coated RAL 5012 Light Blue



Powder-Coated RAL 4008 Signal Violet



Powder-Coated RAL 3018 Strawberry Red

Powder-Coated RAL 1003 Signal Yellow

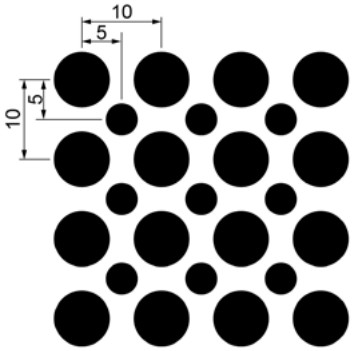
Perforation Pattern Options

Frenger's Tranquilair™ Displacement Ventilation Diffusers have perforated sections to allow air flow that is required to facilitate the gentle air flow supplied by the unit. As standard Frenger offer the 7mm and 4mm Double Dot Perforation.

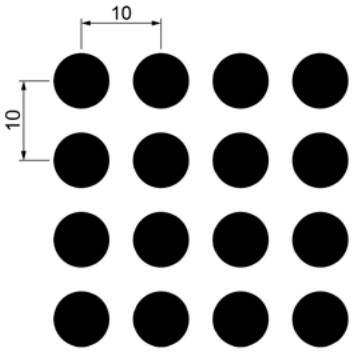
Alternative perforation patterns are available for architectural purposes, however the technical data in this brochure would not be applicable to the other perforation patterns. Seek advice from technical@frenger.co.uk.

Detailed on this page is the standard 7mm and 4mm Double Dot Perforation and the three perforations offered as optional extras for Frenger's Tranquilair™ Displacement Ventilation Diffusers:

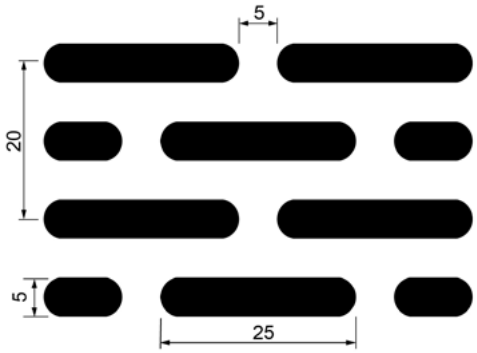
7mm and 4mm Double Dot Perforation Order Code DD



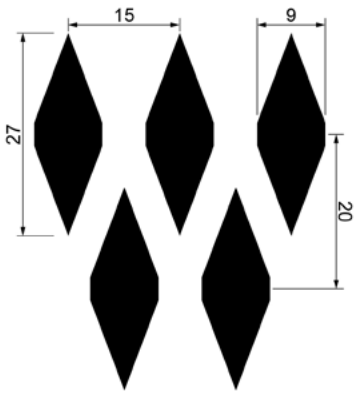
7mm Dot Perforation - Optional Perforation Order Code 7D



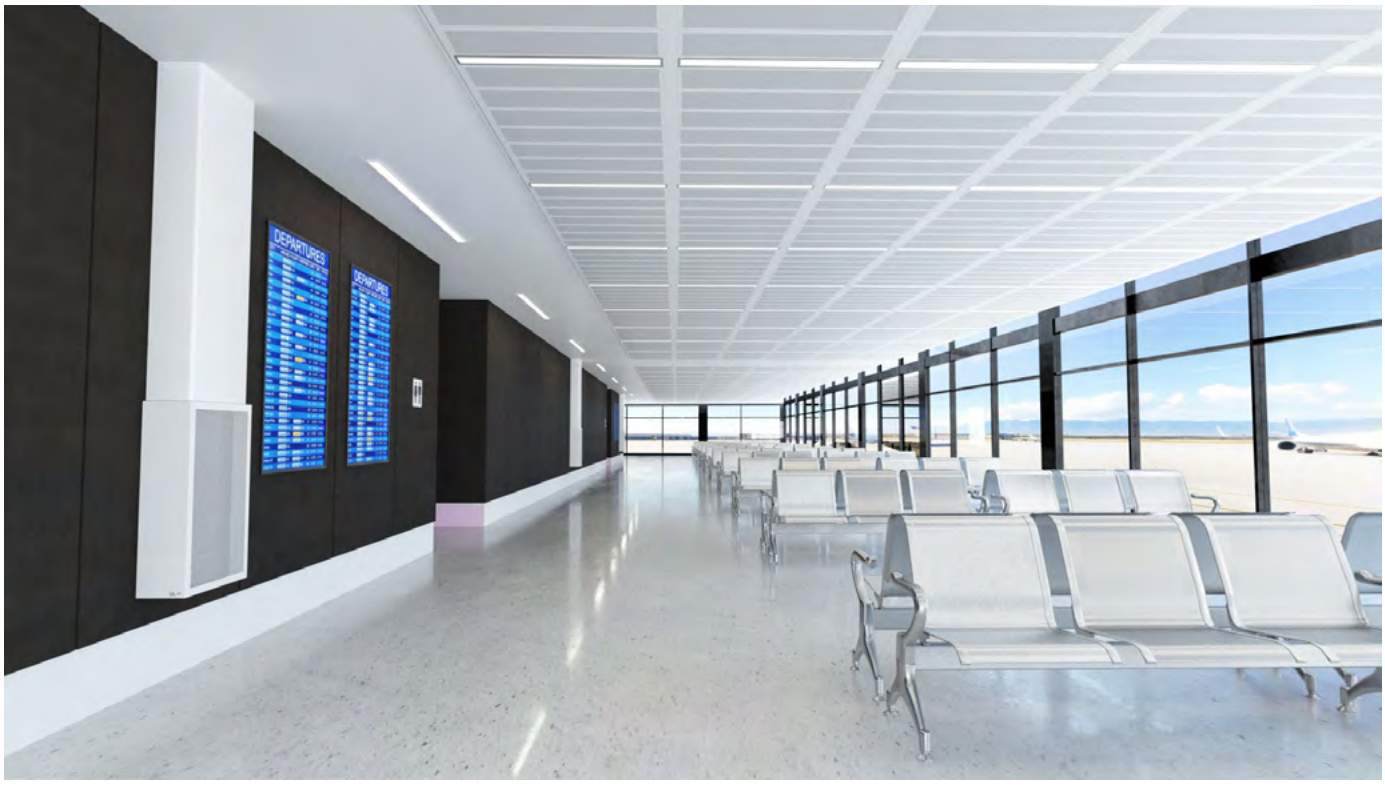
Slot Perforation - Optional Perforation Order Code 5S



Diamond Perforation - Optional Perforation Order Code DMD



Model Variants



1-Way - Wall Mounted Tranquilair™ Units at an Airport

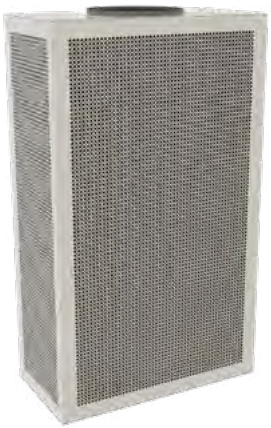
Our range of displacement ventilation diffusers is designed to suit a variety of spaces and installation needs. Each model is engineered for optimal airflow and comfort, ensuring efficient air distribution with minimal turbulence.

- 1-Way Air Discharge (Wall-Mounted) – Ideal for targeted airflow, this model directs air in a single direction, making it perfect for controlled ventilation in offices, classrooms, and meeting rooms.
- 3-Way Air Discharge (Wall-Mounted) – Designed for broader coverage, this model distributes air in three directions, ensuring even airflow across larger spaces such as auditoriums and open-plan offices.
- Corner-Mounted – Optimised for placement in room corners, this model maximises space efficiency while providing smooth, consistent air distribution.
- Free-Standing – A versatile solution for flexible layouts, the free-standing model offers powerful, low-velocity air distribution without the need for wall mounting.

All models are available with either top air entry or floor air entry, allowing for seamless integration into different building designs and HVAC systems. No matter the application, our displacement diffusers deliver superior air quality and comfort.

Bespoke architectural designs and use of such materials as "Stainless Steel" are available upon request.

1-Way - Wall Mounted Tranquilair™ Top Entry Unit



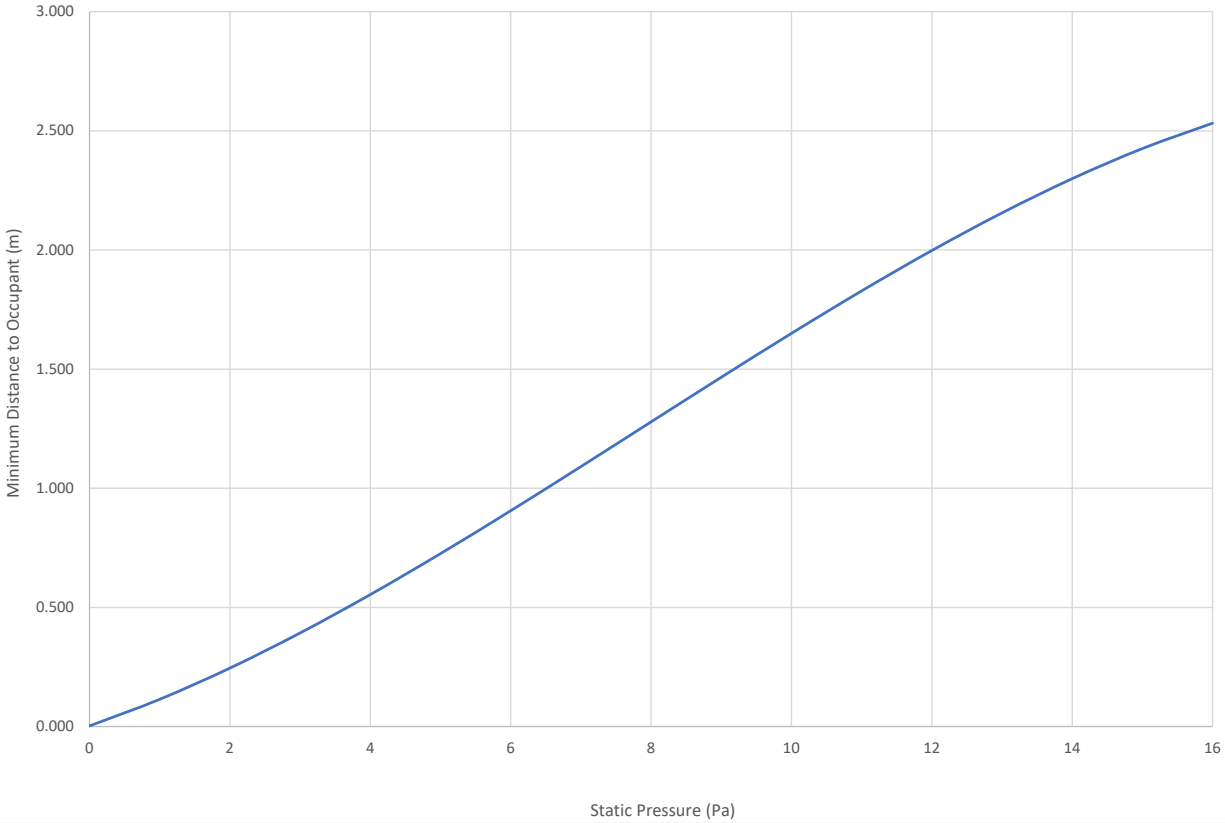
3-Way - Wall Mounted Tranquilair™ Top Entry Unit

Free Standing Tranquilair™ Top Entry Unit

Corner Mounted Tranquilair™ Top Entry Unit

Minimum Occupant Distance

Minimum Distance to Occupant Ensuring Air Velocity < 0.2m/s



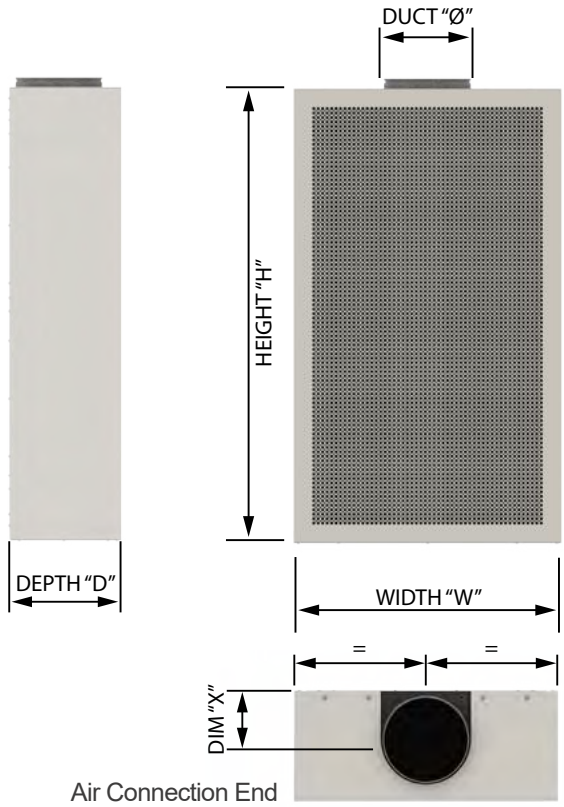
At Frenger Systems, we take Thermal Comfort very seriously. The Tranquilair™ units have undergone rigorous testing to ensure they can deliver high air volumes with the **best air distribution velocities in the industry for thermal comfort compliance.**

Through extensive research and real-world simulations, Frenger have optimised airflow distribution for thermal comfort by minimising draughts, this allows the Tranquilair™ units to be placed closer to the occupied zone than other manufacturers units on the market, creating a larger amount of usable floor space, making them the ideal choice for a variety of applications, such as offices, airports, educational facilities and healthcare buildings.

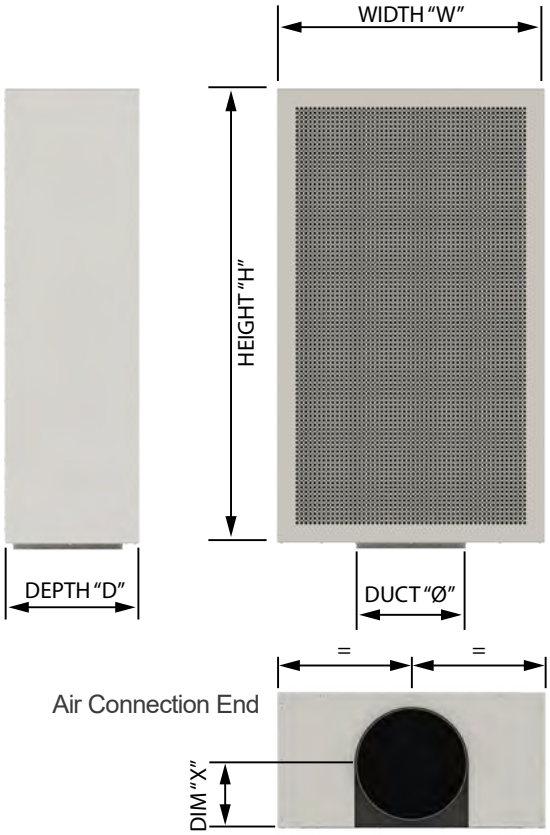
When you choose Frenger's Displacement Ventilation Diffusers, you're investing in proven performance backed by meticulous testing and innovation.

Product Dimensions - 1-Way

1-Way | Single Air Connection | Top Entry

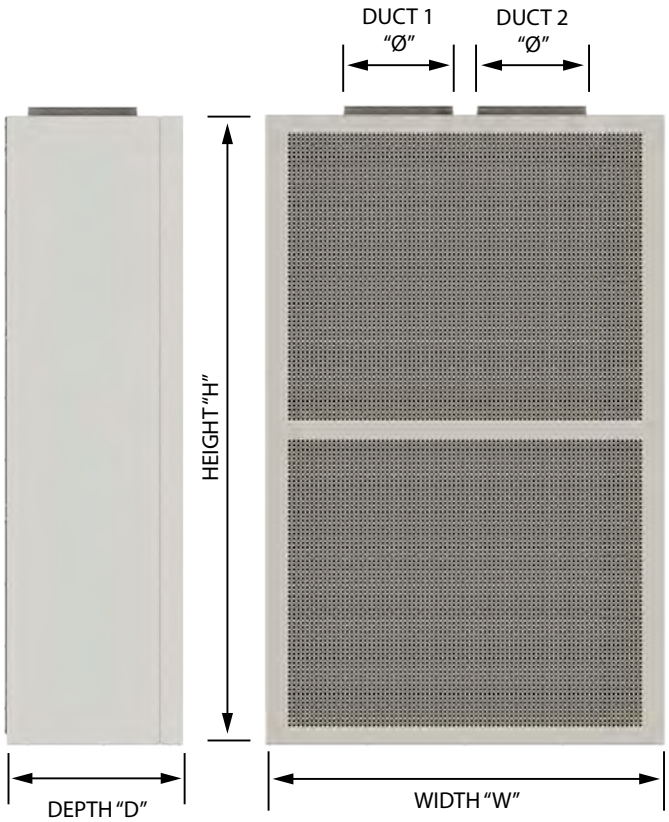


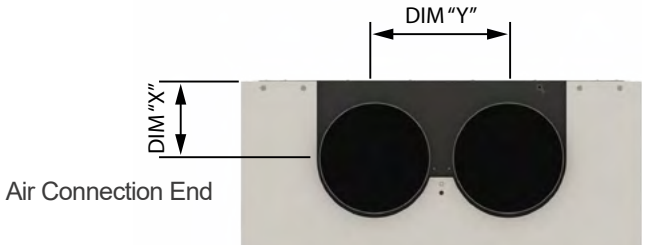
1-Way | Single Air Connection | Floor Entry



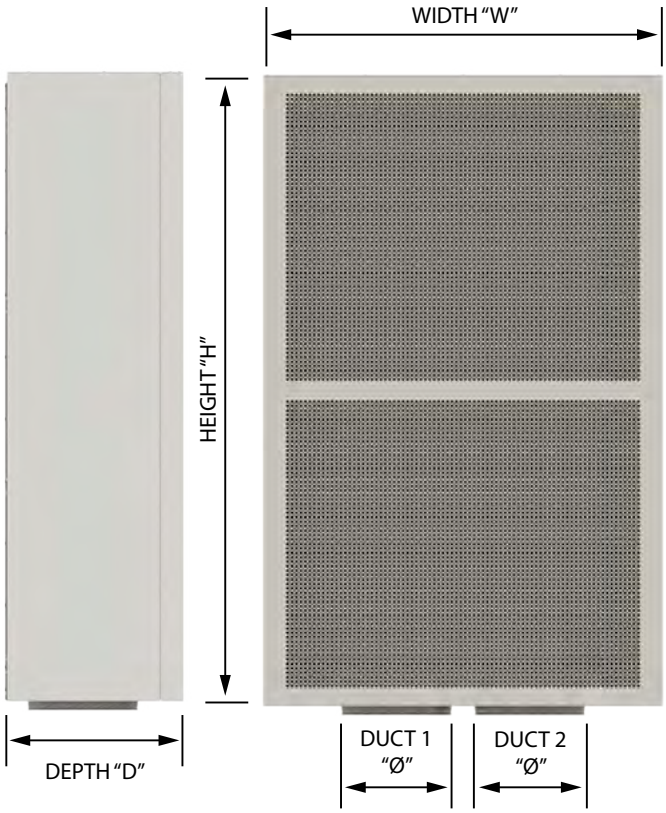
Model Ref.	Overall Product Dimensions			Air Spigot Dimensional Data				Displacement Air Volume	
	Width "W"	Height "H"	Depth "D"	Qty	Dia "Ø"	Dim "X"	Dim "Y"	Min	Max
	(mm)	(mm)	(mm)		(mm)	(mm)	(mm)	(l/s)	(l/s)
TAD-SMWD-1W-300-300-T/F	300	320	150	1X	Ø100	65	-	6	15
TAD-SMWD-1W-300-400-T/F	300	420	150	1X	Ø100	65	-	9	25
TAD-SMWD-1W-300-500-T/F	300	520	150	1X	Ø100	65	-	11	31
TAD-SMWD-1W-300-600-T/F	300	620	180	1X	Ø125	75	-	13	37
TAD-SMWD-1W-300-700-T/F	300	720	180	1X	Ø125	75	-	16	43
TAD-SMWD-1W-300-800-T/F	300	820	180	1X	Ø125	75	-	18	49
TAD-SMWD-1W-300-900-T/F	300	920	220	1X	Ø160	95	-	20	55
TAD-SMWD-1W-450-500-T/F	450	520	220	1X	Ø160	95	-	17	46
TAD-SMWD-1W-450-600-T/F	450	620	220	1X	Ø160	95	-	20	55
TAD-SMWD-1W-450-700-T/F	450	720	220	1X	Ø160	95	-	24	64
TAD-SMWD-1W-450-800-T/F	450	820	220	1X	Ø160	95	-	27	74
TAD-SMWD-1W-450-900-T/F	450	920	220	1X	Ø160	95	-	30	83
TAD-SMWD-1W-450-1000-T/F	450	1020	250	1X	Ø200	115	-	34	92
TAD-SMWD-1W-600-600-T/F	600	620	250	1X	Ø200	115	-	27	74
TAD-SMWD-1W-600-700-T/F	600	720	250	1X	Ø200	115	-	31	86
TAD-SMWD-1W-600-800-T/F	600	820	250	1X	Ø200	115	-	36	98
TAD-SMWD-1W-600-900-T/F	600	920	250	1X	Ø200	115	-	40	110
TAD-SMWD-1W-600-1000-T/F	600	1020	250	1X	Ø200	115	-	45	123
TAD-SMWD-1W-600-1100-T/F	600	1120	250	1X	Ø200	115	-	49	135
TAD-SMWD-1W-600-1200-T/F	600	1220	330	1X	Ø250	145	-	54	147
TAD-SMWD-1W-750-800-T/F	750	820	330	1X	Ø250	145	-	45	123
TAD-SMWD-1W-750-900-T/F	750	920	330	1X	Ø250	145	-	50	138
TAD-SMWD-1W-750-1000-T/F	750	1020	330	1X	Ø250	145	-	56	153
TAD-SMWD-1W-750-1100-T/F	750	1120	330	1X	Ø250	145	-	62	169
TAD-SMWD-1W-750-1200-T/F	750	1220	330	1X	Ø250	145	-	67	184
TAD-SMWD-1W-750-1300-T/F	750	1320	330	1X	Ø250	145	-	73	199
TAD-SMWD-1W-750-1400-T/F	750	1420	330	1X	Ø250	145	-	78	215
TAD-SMWD-1W-750-1500-T/F	750	1520	400	1X	Ø300	175	-	84	230
TAD-SMWD-1W-750-1600-T/F	750	1620	400	1X	Ø300	175	-	92	253
TAD-SMWD-1W-750-1700-T/F	750	1720	400	1X	Ø300	175	-	98	268
TAD-SMWD-1W-750-1800-T/F	750	1820	400	1X	Ø300	175	-	104	284
TAD-SMWD-1W-900-1100-T/F	900	1120	400	1X	Ø300	175	-	74	202
TAD-SMWD-1W-900-1200-T/F	900	1220	400	1X	Ø300	175	-	81	221
TAD-SMWD-1W-900-1300-T/F	900	1320	400	1X	Ø300	175	-	87	239
TAD-SMWD-1W-900-1400-T/F	900	1420	400	1X	Ø300	175	-	94	258
TAD-SMWD-1W-900-1500-T/F	900	1520	400	1X	Ø300	175	-	101	276

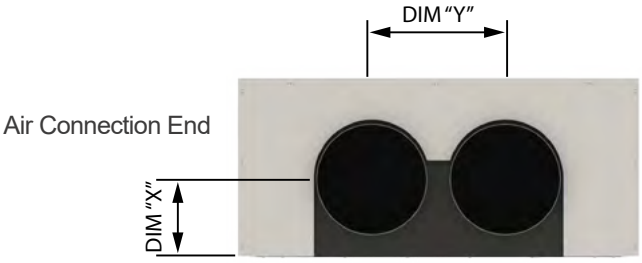
1-Way | Dual Air Connection | Top Entry





1-Way | Dual Air Connection | Floor Entry

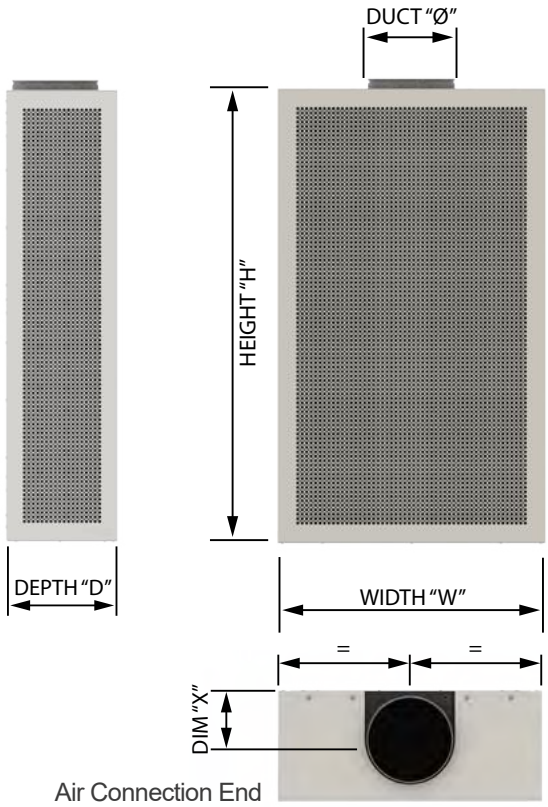




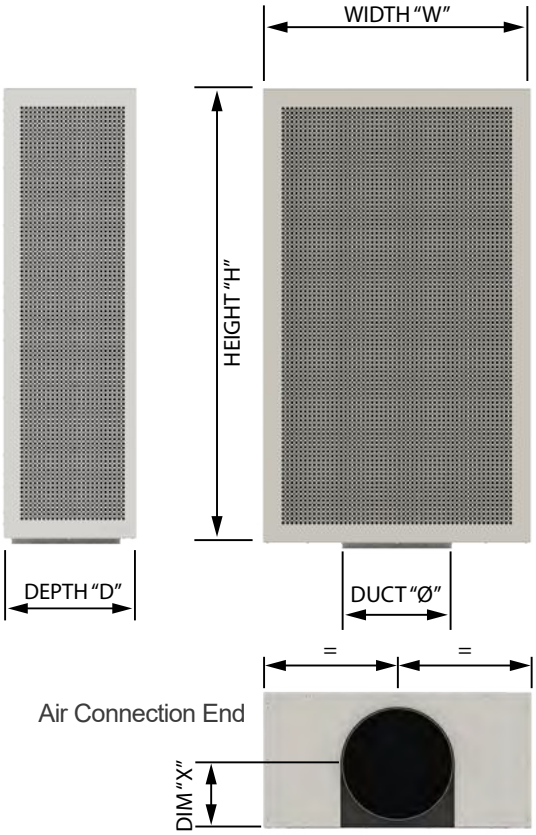
Model Ref.	Overall Product Dimensions			Air Spigot Dimensional Data				Displacement Air Volume	
	Width "W"	Height "H"	Depth "D"	Qty	Dia "Ø"	Dim "X"	Dim "Y"	Min	Max
	(mm)	(mm)	(mm)		(mm)	(mm)	(mm)	(l/s)	(l/s)
TAD-SMWD-1W-900-1600-T/F	900	1620	400	2X	Ø250	175	300	111	304
TAD-SMWD-1W-900-1700-T/F	900	1720	400	2X	Ø250	175	300	118	322
TAD-SMWD-1W-900-1800-T/F	900	1820	400	2X	Ø250	175	300	124	341

Product Dimensions - 3-Way

3-Way | Single Air Connection | Top Entry



3-Way | Single Air Connection | Floor Entry



Model Ref.	Overall Product Dimensions			Air Spigot Dimensional Data				Displacement Air Volume	
	Width "W"	Height "H"	Depth "D"	Qty	Dia "Ø"	Dim "X"	Dim "Y"	Min	Max
	(mm)	(mm)	(mm)		(mm)	(mm)	(mm)	(l/s)	(l/s)
TAD-SMWD-3W-300-300-T/F	300	320	180	1X	Ø125	75	-	8	23
TAD-SMWD-3W-300-400-T/F	300	420	180	1X	Ø125	75	-	13	37
TAD-SMWD-3W-300-500-T/F	300	520	180	1X	Ø125	75	-	17	46
TAD-SMWD-3W-300-600-T/F	300	620	180	1X	Ø125	75	-	20	55
TAD-SMWD-3W-300-700-T/F	300	720	220	1X	Ø160	95	-	24	64
TAD-SMWD-3W-300-800-T/F	300	820	220	1X	Ø160	95	-	27	74
TAD-SMWD-3W-300-900-T/F	300	920	220	1X	Ø160	95	-	30	83
TAD-SMWD-3W-450-500-T/F	450	520	220	1X	Ø160	95	-	28	77
TAD-SMWD-3W-450-600-T/F	450	620	220	1X	Ø160	95	-	34	92
TAD-SMWD-3W-450-700-T/F	450	720	250	1X	Ø200	115	-	39	107
TAD-SMWD-3W-450-800-T/F	450	820	250	1X	Ø200	115	-	45	123
TAD-SMWD-3W-450-900-T/F	450	920	250	1X	Ø200	115	-	50	138
TAD-SMWD-3W-450-1000-T/F	450	1020	250	1X	Ø200	115	-	56	153
TAD-SMWD-3W-600-600-T/F	600	620	250	1X	Ø200	115	-	40	110
TAD-SMWD-3W-600-700-T/F	600	720	250	1X	Ø200	115	-	47	129
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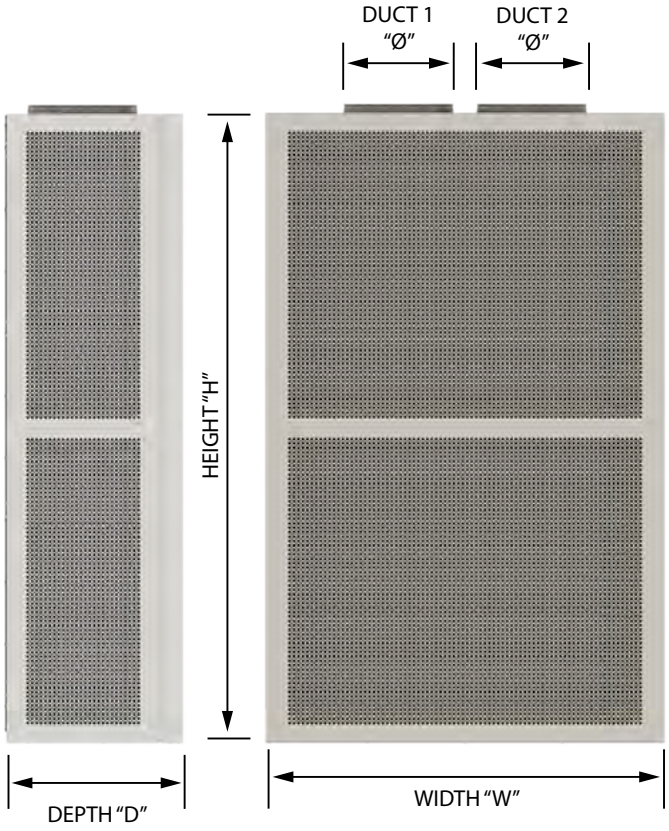
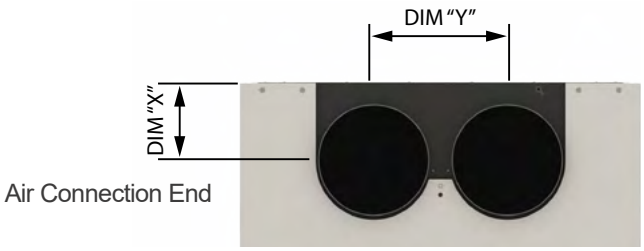
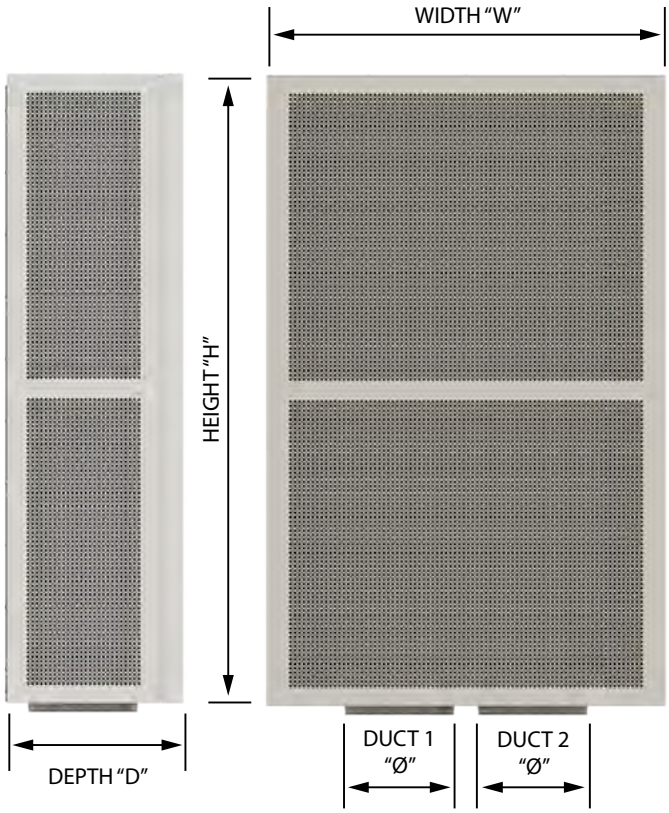
TAD-SMWD-3W-600-1000-T/F	600	1020	300	1X	Ø250	140	-	67	184
TAD-SMWD-3W-600-1100-T/F	600	1120	300	1X	Ø250	140	-	74	202
TAD-SMWD-3W-600-1200-T/F	600	1220	300	1X	Ø250	140	-	81	221
TAD-SMWD-3W-750-800-T/F	750	820	400	1X	Ø300	165	-	72	196
TAD-SMWD-3W-750-900-T/F	750	920	400	1X	Ø300	165	-	81	221
TAD-SMWD-3W-750-1000-T/F	750	1020	400	1X	Ø300	165	-	90	245
TAD-SMWD-3W-750-1100-T/F	750	1120	400	1X	Ø300	165	-	99	270
TAD-SMWD-3W-750-1200-T/F	750	1220	400	1X	Ø300	165	-	108	295
TAD-SMWD-3W-750-1300-T/F	750	1320	400	1X	Ø300	165	-	117	319

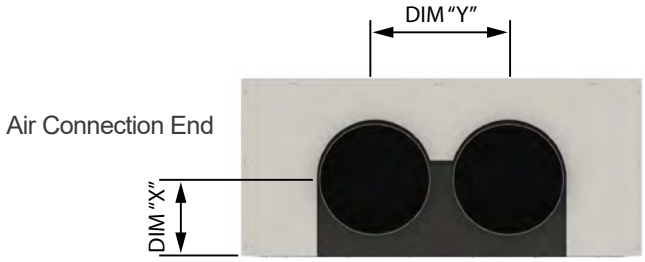
3-Way | Dual Air Connection | Top Entry





3-Way | Dual Air Connection | Floor Entry

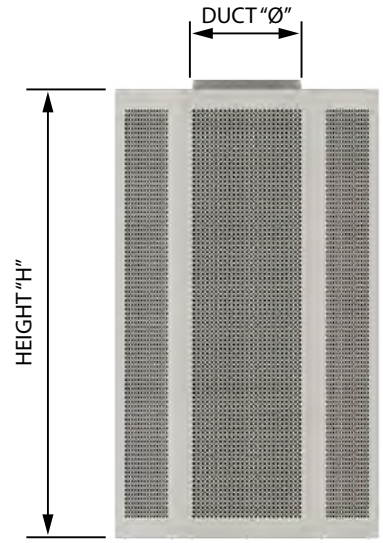


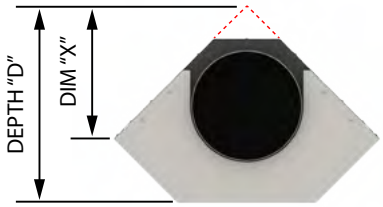


Model Ref.	Overall Product Dimensions			Air Spigot Dimensional Data				Displacement Air Volume	
	Width "W"	Height "H"	Depth "D"	Qty	Dia "Ø"	Dim "X"	Dim "Y"	Min	Max
	(mm)	(mm)	(mm)		(mm)	(mm)	(mm)	(l/s)	(l/s)
TAD-SMWD-3W-750-1400-T/F	750	1420	400	2X	Ø250	175	300	125	344
TAD-SMWD-3W-750-1500-T/F	750	1520	400	2X	Ø250	175	300	134	368
TAD-SMWD-3W-750-1600-T/F	750	1620	400	2X	Ø250	175	300	148	405
TAD-SMWD-3W-750-1700-T/F	750	1720	400	2X	Ø250	175	300	157	430
TAD-SMWD-3W-750-1800-T/F	750	1820	400	2X	Ø250	175	300	166	454
TAD-SMWD-3W-900-1100-T/F	900	1120	400	2X	Ø250	175	300	123	337
TAD-SMWD-3W-900-1200-T/F	900	1220	400	2X	Ø250	175	300	134	368
TAD-SMWD-3W-900-1300-T/F	900	1320	400	2X	Ø250	175	300	146	399
TAD-SMWD-3W-900-1400-T/F	900	1420	400	2X	Ø250	175	300	157	430
TAD-SMWD-3W-900-1500-T/F	900	1520	450	2X	Ø300	200	330	185	506
TAD-SMWD-3W-900-1600-T/F	900	1620	450	2X	Ø300	200	330	203	557
TAD-SMWD-3W-900-1700-T/F	900	1720	450	2X	Ø300	200	330	216	591
TAD-SMWD-3W-900-1800-T/F	900	1820	450	2X	Ø300	200	330	228	624

Product Dimensions - Corner

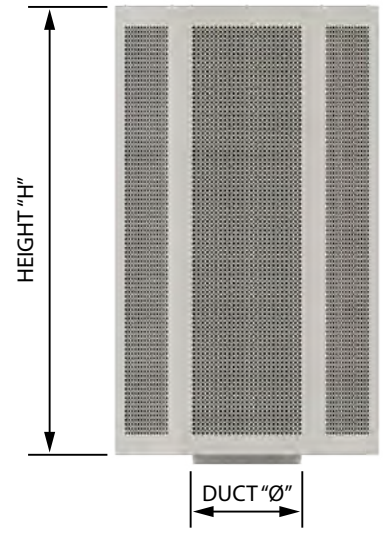
Corner | Single Air Connection | Top Entry

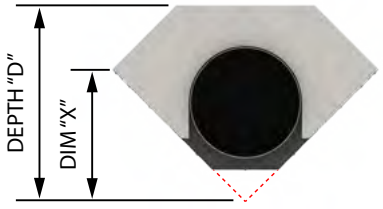




Air Connection End

Corner | Single Air Connection | Floor Entry



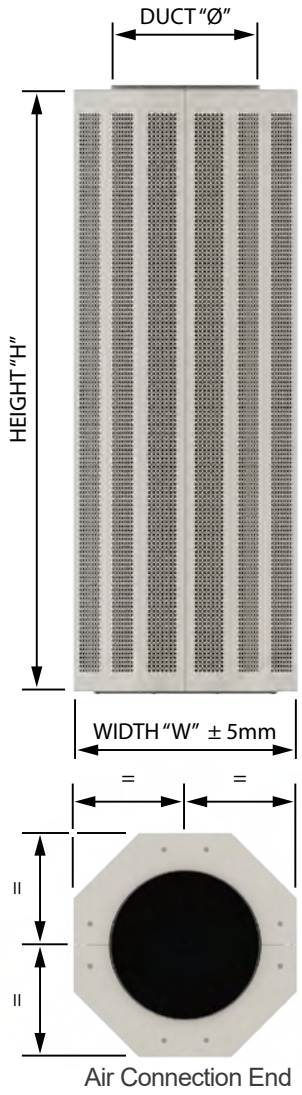


Air Connection End

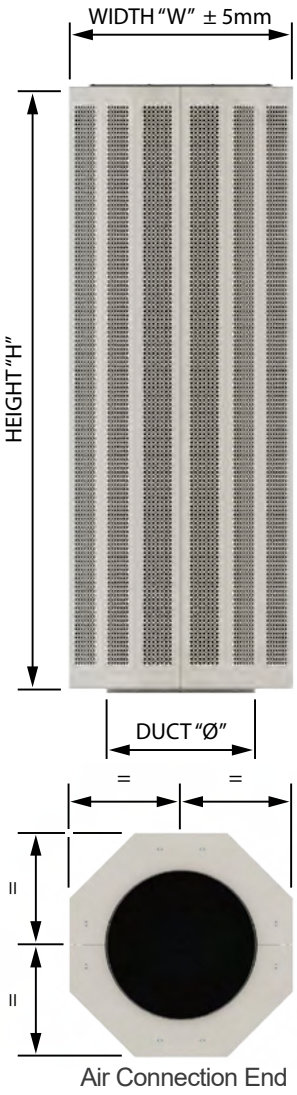
Model Ref.	Overall Product Dimensions			Air Spigot Dimensional Data			Displacement Air Volume	
	Width "W"	Height "H"	Depth "D"	Qty	Dia "Ø"	Dim "X"	Min	Max
	(mm)	(mm)	(mm)		(mm)	(mm)	(l/s)	(l/s)
TAD-CMWD-C-350-400-T/F	350	420	265	1X	Ø125	120	9	25
TAD-CMWD-C-350-500-T/F	350	520	265	1X	Ø125	120	11	31
TAD-CMWD-C-350-600-T/F	350	620	265	1X	Ø125	120	13	37
TAD-CMWD-C-350-700-T/F	350	720	265	1X	Ø125	120	16	43
TAD-CMWD-C-350-800-T/F	350	820	265	1X	Ø160	140	18	49
TAD-CMWD-C-350-900-T/F	350	920	265	1X	Ø160	140	20	55
TAD-CMWD-C-350-1000-T/F	350	1020	265	1X	Ø160	140	22	61
TAD-CMWD-C-450-500-T/F	450	520	340	1X	Ø160	160	20	54
TAD-CMWD-C-450-600-T/F	450	620	340	1X	Ø160	160	24	64
TAD-CMWD-C-450-700-T/F	450	720	340	1X	Ø160	160	27	75
TAD-CMWD-C-450-800-T/F	450	820	340	1X	Ø200	180	31	86
TAD-CMWD-C-450-900-T/F	450	920	340	1X	Ø200	180	35	97
TAD-CMWD-C-450-1000-T/F	450	1020	340	1X	Ø200	180	39	107
TAD-CMWD-C-600-600-T/F	600	620	450	1X	Ø200	200	27	74
TAD-CMWD-C-600-700-T/F	600	720	450	1X	Ø200	200	31	86
TAD-CMWD-C-600-800-T/F	600	820	450	1X	Ø200	200	36	98
TAD-CMWD-C-600-900-T/F	600	920	450	1X	Ø200	200	40	110
TAD-CMWD-C-600-1000-T/F	600	1020	450	1X	Ø250	225	45	123
TAD-CMWD-C-600-1100-T/F	600	1120	450	1X	Ø250	225	49	135
TAD-CMWD-C-600-1200-T/F	600	1220	450	1X	Ø250	225	54	147
TAD-CMWD-C-750-800-T/F	750	820	560	1X	Ø250	260	49	135
TAD-CMWD-C-750-900-T/F	750	920	560	1X	Ø250	260	55	152
TAD-CMWD-C-750-1000-T/F	750	1020	560	1X	Ø250	260	62	169
TAD-CMWD-C-750-1100-T/F	750	1120	560	1X	Ø300	285	68	186
TAD-CMWD-C-750-1200-T/F	750	1220	560	1X	Ø300	285	74	202
TAD-CMWD-C-750-1300-T/F	750	1320	560	1X	Ø300	285	80	219
TAD-CMWD-C-750-1400-T/F	750	1420	560	1X	Ø300	285	86	236
TAD-CMWD-C-750-1500-T/F	750	1520	560	1X	Ø300	285	92	253
TAD-CMWD-C-750-1600-T/F	750	1620	560	1X	Ø300	285	102	278
TAD-CMWD-C-750-1700-T/F	750	1720	560	1X	Ø300	285	108	295
TAD-CMWD-C-750-1800-T/F	750	1820	560	1X	Ø300	285	114	312
TAD-CMWD-C-900-1200-T/F	900	1220	670	1X	Ø300	290	101	276
TAD-CMWD-C-900-1300-T/F	900	1320	670	1X	Ø300	290	109	299
TAD-CMWD-C-900-1400-T/F	900	1420	670	1X	Ø355	315	118	322
TAD-CMWD-C-900-1500-T/F	900	1520	670	1X	Ø355	315	126	345
TAD-CMWD-C-900-1600-T/F	900	1620	670	1X	Ø355	315	139	380
TAD-CMWD-C-900-1700-T/F	900	1720	670	1X	Ø355	315	147	403
TAD-CMWD-C-900-1800-T/F	900	1820	670	1X	Ø355	315	155	426
TAD-CMWD-C-900-1900-T/F	900	1920	670	1X	Ø355	315	164	449

Product Dimensions - Free Standing

360° | Single Air Connection | Top Entry



360° | Single Air Connection | Floor Entry

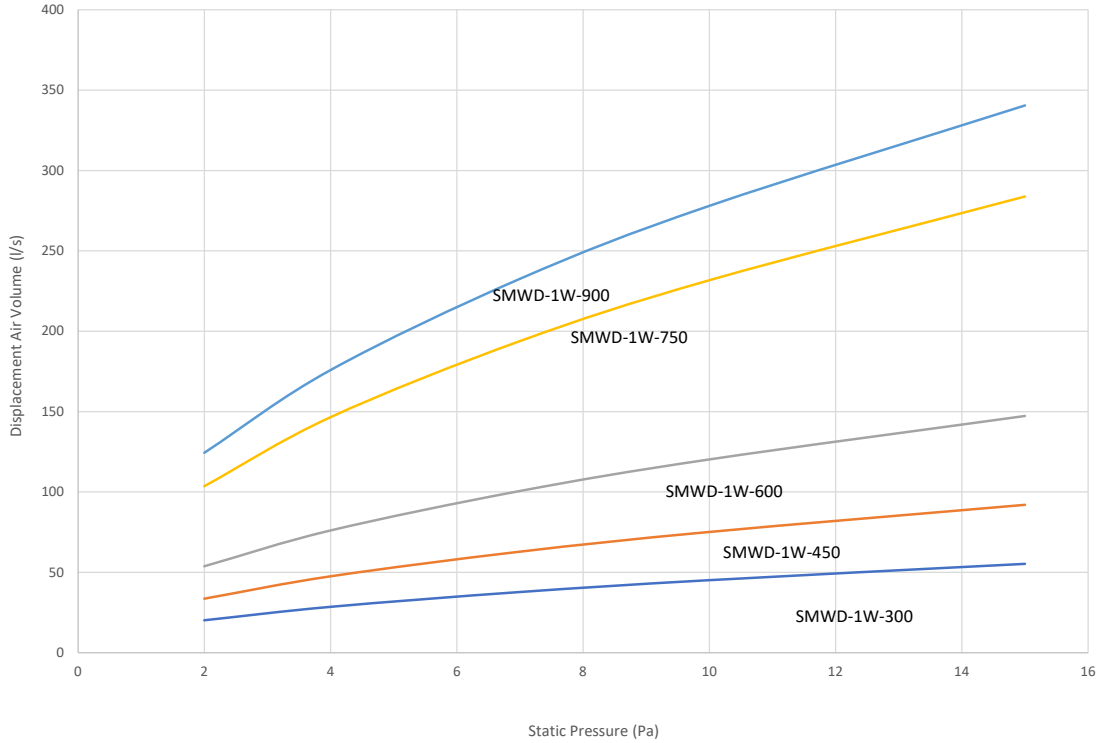


Model Ref.	Overall Product Dimensions		Air Spigot Dimensional Data		Displacement Air Volume	
	Width "W"	Height "H"	Qty	Dia "Ø"	Min	Max
	(mm)	(mm)		(mm)	(l/s)	(l/s)
TAD-FS-550-1200-T/F	550	1220	1X	Ø300	108	295
TAD-FS-550-1300-T/F	550	1320	1X	Ø300	117	319
TAD-FS-550-1400-T/F	550	1420	1X	Ø350	125	344
TAD-FS-550-1500-T/F	550	1520	1X	Ø350	134	368
TAD-FS-550-1600-T/F	550	1620	1X	Ø350	148	405
TAD-FS-550-1700-T/F	550	1720	1X	Ø350	157	430
TAD-FS-750-1200-T/F	750	1220	1X	Ø400	175	479
TAD-FS-750-1300-T/F	750	1320	1X	Ø400	188	515
TAD-FS-750-1400-T/F	750	1420	1X	Ø400	202	552
TAD-FS-750-1500-T/F	750	1520	1X	Ø450	222	607
TAD-FS-750-1600-T/F	750	1620	1X	Ø450	235	644
TAD-FS-750-1700-T/F	750	1720	1X	Ø450	242	663
TAD-FS-950-1200-T/F	950	1220	1X	Ø450	242	663
TAD-FS-950-1300-T/F	950	1320	1X	Ø450	262	718
TAD-FS-950-1400-T/F	950	1420	1X	Ø500	282	773
TAD-FS-950-1500-T/F	950	1520	1X	Ø500	302	828
TAD-FS-950-1600-T/F	950	1620	1X	Ø500	333	911
TAD-FS-950-1700-T/F	950	1720	1X	Ø500	353	966

Air Discharge Sizing - 1-Way

Model Ref.	Air Discharge Volume @ Static Differential Pressure (dP)									
	dP = 2Pa		dP = 4Pa		dP = 7Pa		dP = 10Pa		dP = 15Pa	
	(l/s)	(m3/h)	(l/s)	(m3/h)	(l/s)	(m3/h)	(l/s)	(m3/h)	(l/s)	(m3/h)
TAD-SMWD-1W-300-300-T/F	6	20	8	29	10	38	13	45	15	55
TAD-SMWD-1W-300-400-T/F	9	32	13	46	17	60	20	72	25	88
TAD-SMWD-1W-300-500-T/F	11	40	16	57	21	75	25	90	31	110
TAD-SMWD-1W-300-600-T/F	13	48	19	68	25	91	30	108	37	133
TAD-SMWD-1W-300-700-T/F	16	56	22	80	29	106	35	126	43	155
TAD-SMWD-1W-300-800-T/F	18	65	25	91	34	121	40	144	49	177
TAD-SMWD-1W-300-900-T/F	20	73	29	103	38	136	45	162	55	199
TAD-SMWD-1W-450-500-T/F	17	60	24	86	31	113	38	135	46	166
TAD-SMWD-1W-450-600-T/F	20	73	29	103	38	136	45	162	55	199
TAD-SMWD-1W-450-700-T/F	24	85	33	120	44	158	53	189	64	232
TAD-SMWD-1W-450-800-T/F	27	97	38	137	50	181	60	216	74	265
TAD-SMWD-1W-450-900-T/F	30	109	43	154	57	204	68	243	83	298
TAD-SMWD-1W-450-1000-T/F	34	121	48	171	63	226	75	271	92	331
TAD-SMWD-1W-600-600-T/F	27	97	38	137	50	181	60	216	74	265
TAD-SMWD-1W-600-700-T/F	31	113	44	160	59	211	70	252	86	309
TAD-SMWD-1W-600-800-T/F	36	129	51	183	67	241	80	289	98	353
TAD-SMWD-1W-600-900-T/F	40	145	57	205	75	272	90	325	110	398
TAD-SMWD-1W-600-1000-T/F	45	161	63	228	84	302	100	361	123	442
TAD-SMWD-1W-600-1100-T/F	49	177	70	251	92	332	110	397	135	486
TAD-SMWD-1W-600-1200-T/F	54	194	76	274	101	362	120	433	147	530
TAD-SMWD-1W-750-800-T/F	45	161	63	228	84	302	100	361	123	442
TAD-SMWD-1W-750-900-T/F	50	181	71	257	94	340	113	406	138	497
TAD-SMWD-1W-750-1000-T/F	56	202	79	285	105	377	125	451	153	552
TAD-SMWD-1W-750-1100-T/F	62	222	87	314	115	415	138	496	169	607
TAD-SMWD-1W-750-1200-T/F	67	242	95	342	126	453	150	541	184	663
TAD-SMWD-1W-750-1300-T/F	73	262	103	371	136	490	163	586	199	718
TAD-SMWD-1W-750-1400-T/F	78	282	111	399	147	528	175	631	215	773
TAD-SMWD-1W-750-1500-T/F	84	302	119	428	157	566	188	676	230	828
TAD-SMWD-1W-750-1600-T/F	92	333	131	471	173	622	207	744	253	911
TAD-SMWD-1W-750-1700-T/F	98	353	139	499	183	660	219	789	268	966
TAD-SMWD-1W-750-1800-T/F	104	373	147	528	194	698	232	834	284	1022
TAD-SMWD-1W-900-1100-T/F	74	266	105	376	138	498	165	595	202	729
TAD-SMWD-1W-900-1200-T/F	81	290	114	411	151	543	180	649	221	795
TAD-SMWD-1W-900-1300-T/F	87	315	124	445	163	588	195	703	239	861
TAD-SMWD-1W-900-1400-T/F	94	339	133	479	176	634	210	757	258	928
TAD-SMWD-1W-900-1500-T/F	101	363	143	513	189	679	225	812	276	994
TAD-SMWD-1W-900-1600-T/F	111	399	157	565	207	747	248	893	304	1093
TAD-SMWD-1W-900-1700-T/F	118	423	166	599	220	792	263	947	322	1160
TAD-SMWD-1W-900-1800-T/F	124	448	176	633	233	837	278	1001	341	1226

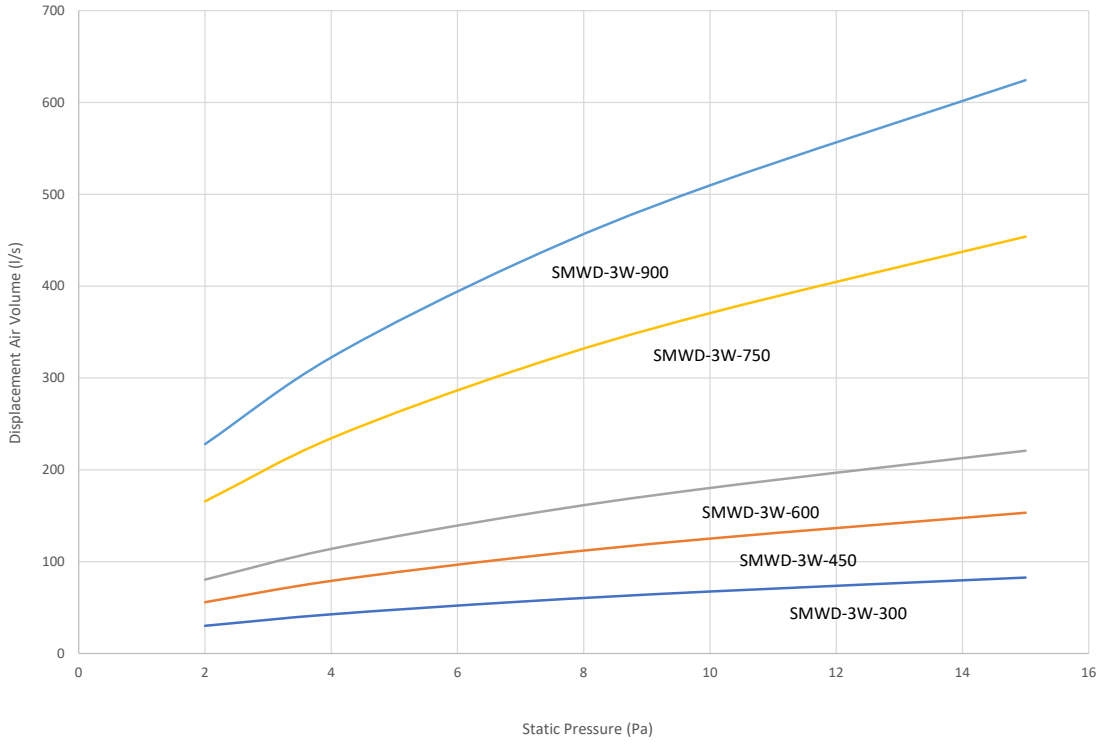
Air Volume Range - 1-Way



Air Discharge Sizing - 3-Way

Model Ref.	Air Discharge Volume @ Static Differential Pressure (dP)									
	dP = 2Pa		dP = 4Pa		dP = 7Pa		dP = 10Pa		dP = 15Pa	
	(l/s)	(m3/h)	(l/s)	(m3/h)	(l/s)	(m3/h)	(l/s)	(m3/h)	(l/s)	(m3/h)
TAD-SMWD-3W-300-300-T/F	8	30	12	43	16	57	19	68	23	83
TAD-SMWD-3W-300-400-T/F	13	48	19	68	25	91	30	108	37	133
TAD-SMWD-3W-300-500-T/F	17	60	24	86	31	113	38	135	46	166
TAD-SMWD-3W-300-600-T/F	20	73	29	103	38	136	45	162	55	199
TAD-SMWD-3W-300-700-T/F	24	85	33	120	44	158	53	189	64	232
TAD-SMWD-3W-300-800-T/F	27	97	38	137	50	181	60	216	74	265
TAD-SMWD-3W-300-900-T/F	30	109	43	154	57	204	68	243	83	298
TAD-SMWD-3W-450-500-T/F	28	101	40	143	52	189	63	225	77	276
TAD-SMWD-3W-450-600-T/F	34	121	48	171	63	226	75	271	92	331
TAD-SMWD-3W-450-700-T/F	39	141	55	200	73	264	88	316	107	387
TAD-SMWD-3W-450-800-T/F	45	161	63	228	84	302	100	361	123	442
TAD-SMWD-3W-450-900-T/F	50	181	71	257	94	340	113	406	138	497
TAD-SMWD-3W-450-1000-T/F	56	202	79	285	105	377	125	451	153	552
TAD-SMWD-3W-600-600-T/F	40	145	57	205	75	272	90	325	110	398
TAD-SMWD-3W-600-700-T/F	47	169	67	240	88	317	105	379	129	464
TAD-SMWD-3W-600-800-T/F	54	194	76	274	101	362	120	433	147	530
TAD-SMWD-3W-600-900-T/F	60	218	86	308	113	407	135	487	166	596
TAD-SMWD-3W-600-1000-T/F	67	242	95	342	126	453	150	541	184	663
TAD-SMWD-3W-600-1100-T/F	74	266	105	376	138	498	165	595	202	729
TAD-SMWD-3W-600-1200-T/F	81	290	114	411	151	543	180	649	221	795
TAD-SMWD-3W-750-800-T/F	72	258	101	365	134	483	160	577	196	707
TAD-SMWD-3W-750-900-T/F	81	290	114	411	151	543	180	649	221	795
TAD-SMWD-3W-750-1000-T/F	90	323	127	456	168	604	200	721	245	884
TAD-SMWD-3W-750-1100-T/F	99	355	139	502	184	664	220	794	270	972
TAD-SMWD-3W-750-1200-T/F	108	387	152	548	201	724	240	866	295	1060
TAD-SMWD-3W-750-1300-T/F	117	419	165	593	218	785	261	938	319	1149
TAD-SMWD-3W-750-1400-T/F	125	452	177	639	235	845	281	1010	344	1237
TAD-SMWD-3W-750-1500-T/F	134	484	190	684	251	905	301	1082	368	1325
TAD-SMWD-3W-750-1600-T/F	148	532	209	753	277	996	331	1190	405	1458
TAD-SMWD-3W-750-1700-T/F	157	565	222	798	293	1056	351	1262	430	1546
TAD-SMWD-3W-750-1800-T/F	166	597	234	844	310	1117	371	1335	454	1635
TAD-SMWD-3W-900-1100-T/F	123	444	174	627	231	830	276	992	337	1215
TAD-SMWD-3W-900-1200-T/F	134	484	190	684	251	905	301	1082	368	1325
TAD-SMWD-3W-900-1300-T/F	146	524	206	741	272	981	326	1172	399	1436
TAD-SMWD-3W-900-1400-T/F	157	565	222	798	293	1056	351	1262	430	1546
TAD-SMWD-3W-900-1500-T/F	185	665	261	941	346	1245	413	1488	506	1822
TAD-SMWD-3W-900-1600-T/F	203	732	288	1035	380	1369	455	1637	557	2005
TAD-SMWD-3W-900-1700-T/F	216	776	305	1098	403	1452	482	1736	591	2126
TAD-SMWD-3W-900-1800-T/F	228	821	322	1161	426	1535	510	1835	624	2248

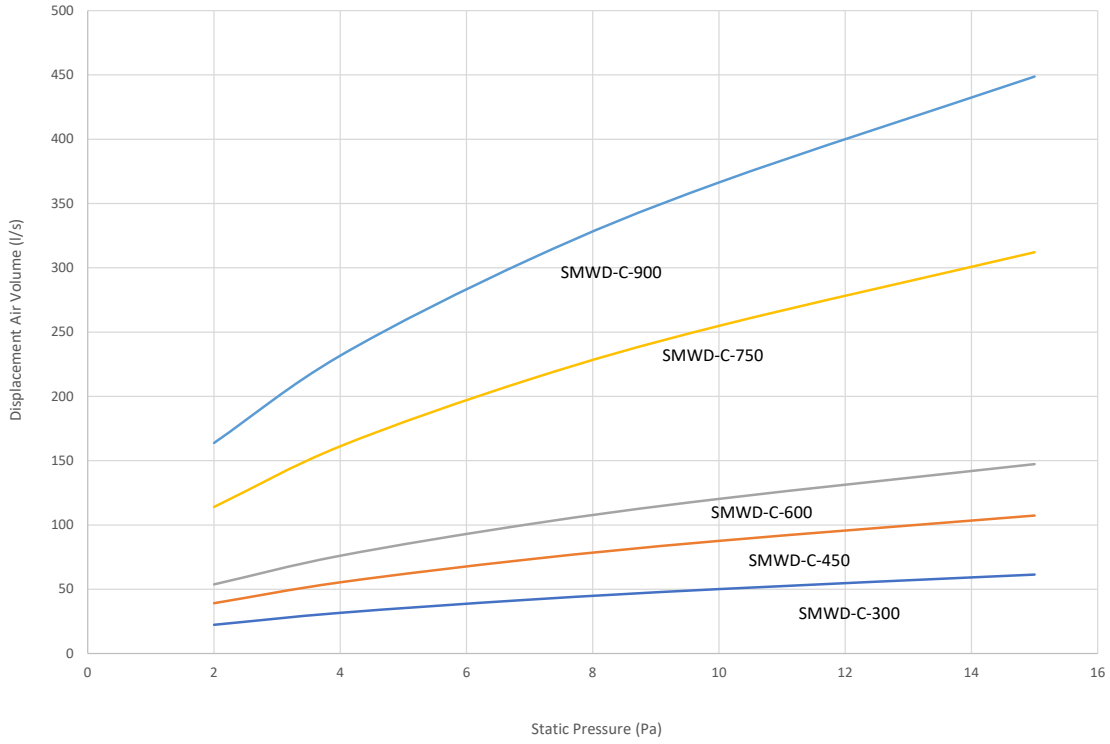
Air Volume Range - 3-Way



Air Discharge Sizing - Corner

Model Ref.	Air Discharge Volume @ Static Differential Pressure (dP)									
	dP = 2Pa		dP = 4Pa		dP = 7Pa		dP = 10Pa		dP = 15Pa	
	(l/s)	(m3/h)	(l/s)	(m3/h)	(l/s)	(m3/h)	(l/s)	(m3/h)	(l/s)	(m3/h)
TAD-CMWD-C-350-400-T/F	9	32	13	46	17	60	20	72	25	88
TAD-CMWD-C-350-500-T/F	11	40	16	57	21	75	25	90	31	110
TAD-CMWD-C-350-600-T/F	13	48	19	68	25	91	30	108	37	133
TAD-CMWD-C-350-700-T/F	16	56	22	80	29	106	35	126	43	155
TAD-CMWD-C-350-800-T/F	18	65	25	91	34	121	40	144	49	177
TAD-CMWD-C-350-900-T/F	20	73	29	103	38	136	45	162	55	199
TAD-CMWD-C-350-1000-T/F	22	81	32	114	42	151	50	180	61	221
TAD-CMWD-C-450-500-T/F	20	71	28	100	37	132	44	158	54	193
TAD-CMWD-C-450-600-T/F	24	85	33	120	44	158	53	189	64	232
TAD-CMWD-C-450-700-T/F	27	99	39	140	51	185	61	221	75	271
TAD-CMWD-C-450-800-T/F	31	113	44	160	59	211	70	252	86	309
TAD-CMWD-C-450-900-T/F	35	127	50	180	66	238	79	284	97	348
TAD-CMWD-C-450-1000-T/F	39	141	55	200	73	264	88	316	107	387
TAD-CMWD-C-600-600-T/F	27	97	38	137	50	181	60	216	74	265
TAD-CMWD-C-600-700-T/F	31	113	44	160	59	211	70	252	86	309
TAD-CMWD-C-600-800-T/F	36	129	51	183	67	241	80	289	98	353
TAD-CMWD-C-600-900-T/F	40	145	57	205	75	272	90	325	110	398
TAD-CMWD-C-600-1000-T/F	45	161	63	228	84	302	100	361	123	442
TAD-CMWD-C-600-1100-T/F	49	177	70	251	92	332	110	397	135	486
TAD-CMWD-C-600-1200-T/F	54	194	76	274	101	362	120	433	147	530
TAD-CMWD-C-750-800-T/F	49	177	70	251	92	332	110	397	135	486
TAD-CMWD-C-750-900-T/F	55	200	78	282	104	373	124	446	152	547
TAD-CMWD-C-750-1000-T/F	62	222	87	314	115	415	138	496	169	607
TAD-CMWD-C-750-1100-T/F	68	244	96	345	127	456	152	546	186	668
TAD-CMWD-C-750-1200-T/F	74	266	105	376	138	498	165	595	202	729
TAD-CMWD-C-750-1300-T/F	80	288	113	408	150	539	179	645	219	790
TAD-CMWD-C-750-1400-T/F	86	311	122	439	161	581	193	694	236	850
TAD-CMWD-C-750-1500-T/F	92	333	131	471	173	622	207	744	253	911
TAD-CMWD-C-750-1600-T/F	102	366	144	518	190	685	227	818	278	1002
TAD-CMWD-C-750-1700-T/F	108	388	152	549	202	726	241	868	295	1063
TAD-CMWD-C-750-1800-T/F	114	410	161	580	213	768	255	918	312	1124
TAD-CMWD-C-900-1200-T/F	101	363	143	513	189	679	225	812	276	994
TAD-CMWD-C-900-1300-T/F	109	393	154	556	204	736	244	879	299	1077
TAD-CMWD-C-900-1400-T/F	118	423	166	599	220	792	263	947	322	1160
TAD-CMWD-C-900-1500-T/F	126	454	178	642	236	849	282	1014	345	1242
TAD-CMWD-C-900-1600-T/F	139	499	196	706	259	934	310	1116	380	1367
TAD-CMWD-C-900-1700-T/F	147	529	208	749	275	990	329	1184	403	1450
TAD-CMWD-C-900-1800-T/F	155	560	220	791	291	1047	348	1251	426	1532
TAD-CMWD-C-900-1900-T/F	164	590	232	834	307	1103	366	1319	449	1615

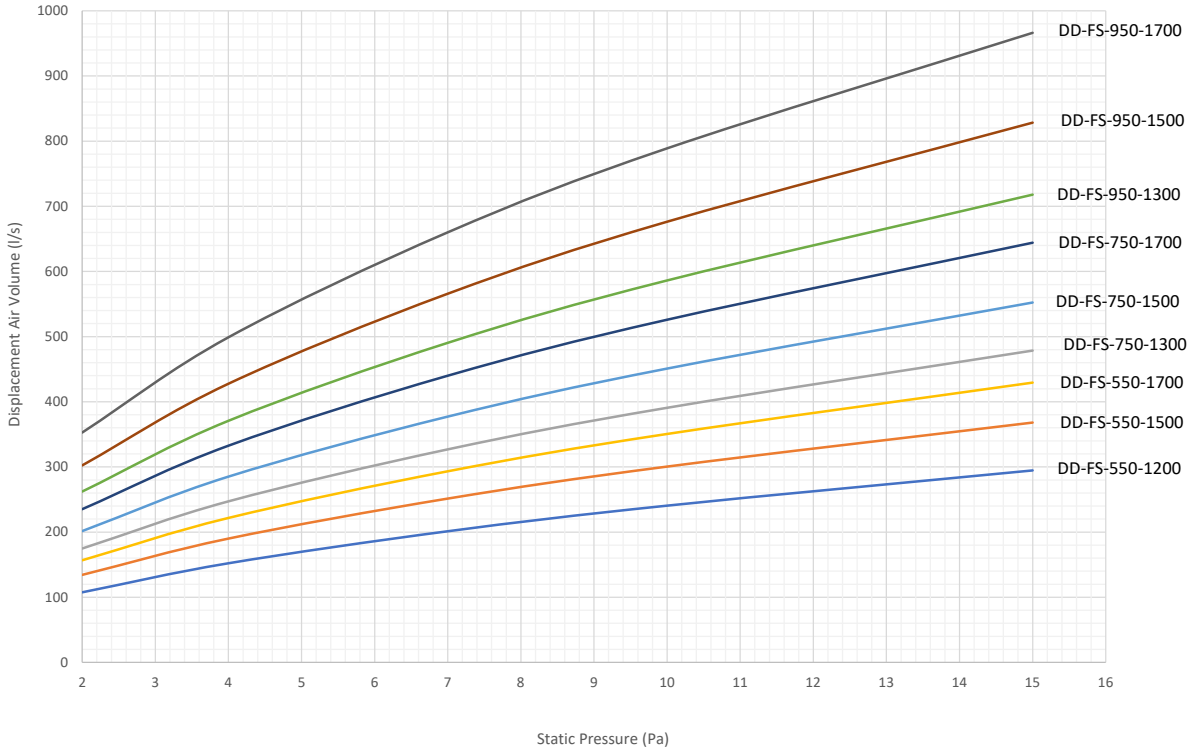
Air Volume Range - Corner



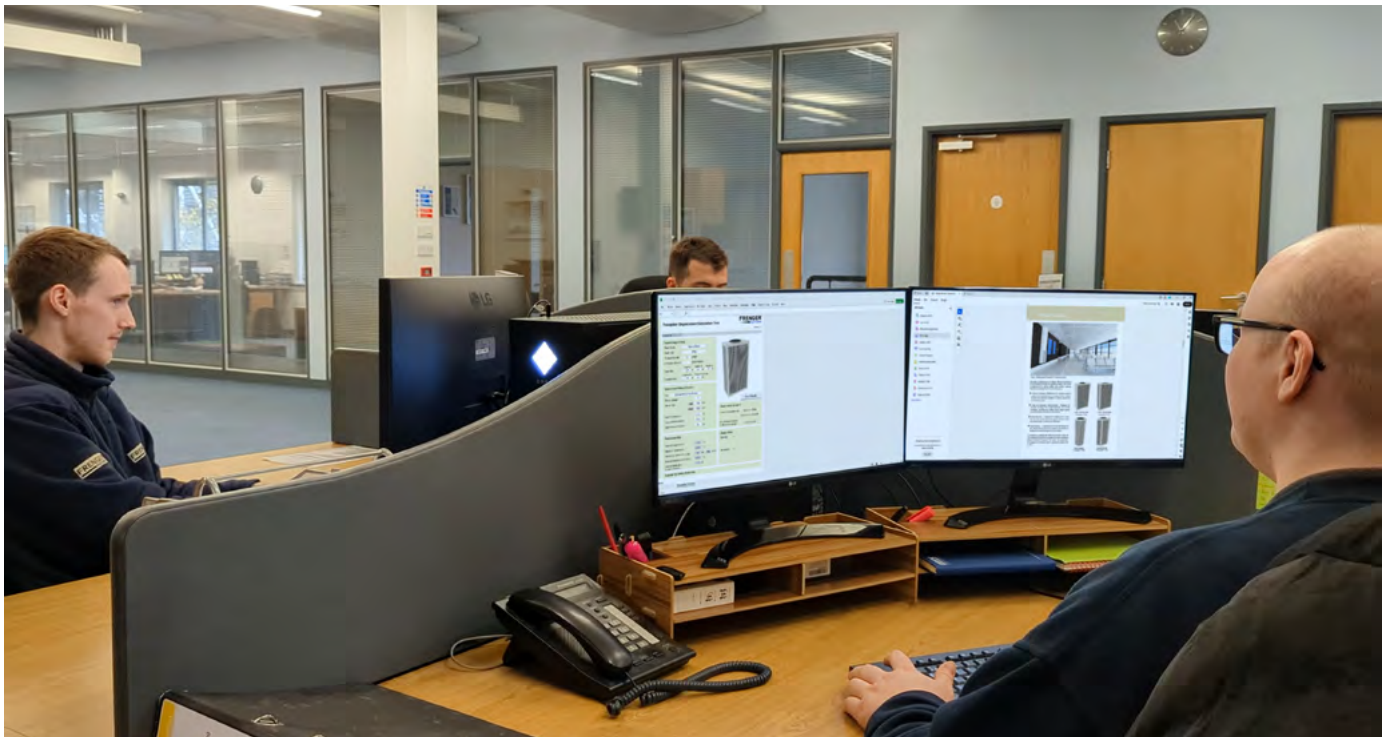
Air Discharge Sizing - Free Standing

Model Ref.	Air Discharge Volume @ Static Differential Pressure (dP)									
	dP = 2Pa		dP = 4Pa		dP = 7Pa		dP = 10Pa		dP = 15Pa	
	(l/s)	(m3/h)	(l/s)	(m3/h)	(l/s)	(m3/h)	(l/s)	(m3/h)	(l/s)	(m3/h)
TAD-FS-550-1200-T/F	108	387	152	548	201	724	240	866	295	1060
TAD-FS-550-1300-T/F	117	419	165	593	218	785	261	938	319	1149
TAD-FS-550-1400-T/F	125	452	177	639	235	845	281	1010	344	1237
TAD-FS-550-1500-T/F	134	484	190	684	251	905	301	1082	368	1325
TAD-FS-550-1600-T/F	148	532	209	753	277	996	331	1190	405	1458
TAD-FS-550-1700-T/F	157	565	222	798	293	1056	351	1262	430	1546
TAD-FS-750-1200-T/F	161	581	228	821	302	1086	361	1299	442	1590
TAD-FS-750-1300-T/F	175	629	247	890	327	1177	391	1407	479	1723
TAD-FS-750-1400-T/F	188	678	266	958	352	1268	421	1515	515	1855
TAD-FS-750-1500-T/F	202	726	285	1027	377	1358	451	1623	552	1988
TAD-FS-750-1600-T/F	222	798	314	1129	415	1494	496	1786	607	2187
TAD-FS-750-1700-T/F	235	847	333	1198	440	1584	526	1894	644	2319
TAD-FS-950-1200-T/F	242	871	342	1232	453	1630	541	1948	663	2386
TAD-FS-950-1300-T/F	262	944	371	1335	490	1765	586	2110	718	2584
TAD-FS-950-1400-T/F	282	1016	399	1437	528	1901	631	2272	773	2783
TAD-FS-950-1500-T/F	302	1089	428	1540	566	2037	676	2435	828	2982
TAD-FS-950-1600-T/F	333	1198	471	1694	622	2241	744	2678	911	3280
TAD-FS-950-1700-T/F	353	1270	499	1797	660	2377	789	2841	966	3479

Air Volume Range - Free Standing



Calculation Software



Frenger's calculation programme for Tranquilair™ is extremely user friendly.

The calculation programme allows you to select the room and occupancy specifications to offer guidance (in the "Room Check" section) on the ventilation requirements in the "Spatial Design Criteria" section.

Diffuser type can be changed in the drop down menu in the "Displacement Diffuser Selection" section, this can be set as either "Wall Mounted [1-Way Throw]", "Wall Mounted [3-Way Throw]", "Corner Mounted [3-Way Throw]" and "Free-Standing [360º Throw]". Diffuser Quantity & Size along with Room Temperature Supply Air Temperature and Static Pressure can also be selected.

In the "Performance Data" section is automatically calculated based on selection in the calculator.

Finally, the "Design Check" should read "Ok" in green, or detail some warning in red.

Calculation programs for Tranquilair™ are available upon request.

Contact our technical department or complete an application request from www.frenger.co.uk from the relevant link on our home page.

Product Ordering Codes

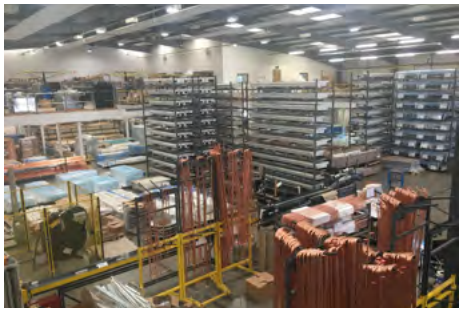
1. Diffuser Model	2. Diffuser Type	3. Air Throw	4. Nominal Width (mm)	5. Nominal Height (mm)	6. Air Entry
TAD - Tranquilair Diffuser	**SMWD** - Surface Mounted Wall Diffuser	**1W** - 1-Way Throw			**T** - Top
	CMWD - Corner Mounted Wall Diffuser	**3W** - 3-Way Throw			**F** - Floor
	FS - Free Standing				

Example: TAD - SMWD - 1W - 300 - 600 - T

1 2 3 4 5 6

Bespoke Manufacturing

Frenger has the manufacturing capability required to deliver the most complex of bespoke solutions. Facilities include the latest full CNC machine centers, together with a dedicated powder-coat paint plant to paint all of the components of the products and project specific in-house testing laboratories.















Project Specific Testing Facility

The 3 number state-of-the-art Climatic Testing Laboratories at Frenger's technical facility in Derby (UK) have internal dimensions of 6.3m (L) x 5.7m (W) x 3.3m (H) high and includes a thermal wall so that both internal and perimeter zones can be simulated. Project specific testing validates product / solution performance (outputs) and resultant Room Comfort Conditions for compliance category grading in accordance with BS EN ISO 7730. All of Frenger's chilled beams have also been independently tested and certified by Eurovent in terms of product performance (output), as Eurovent can not test for thermal comfort; hence the need for Frenger's own laboratories.

Project Specific Testing

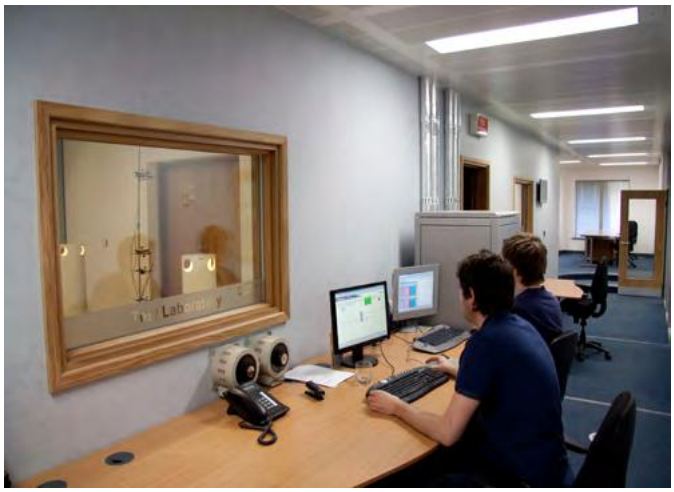
Project specific mock-up testing is a valuable tool which allows the Client to fully assess the proposed system and determine the resulting room occupancy Thermal Comfort conditions. The physical modelling is achieved by installing a full scale representation of a building zone complete with internal & external heat gains (Lighting, Small Power, Occupancy & Solar Gains).

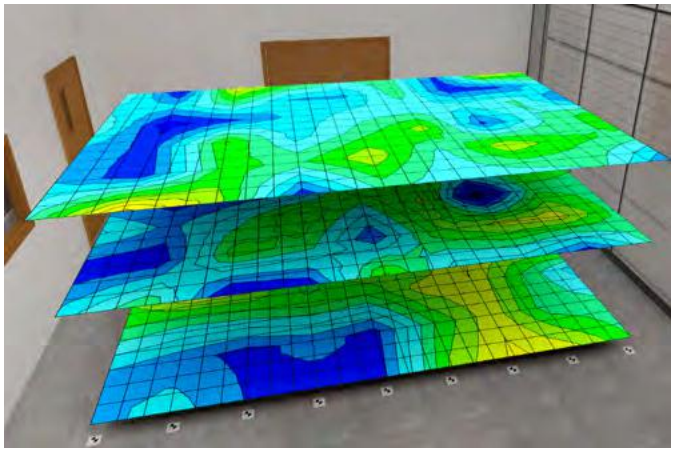
The installed mock-up enables the client to verify the following:

- Product performance under project specific conditions.
- Spatial air temperature distribution.
- Spatial air velocities.
- Experience thermal comfort.
- Project specific aesthetics.
- Experience lighting levels (where relevant).
- Investigate the specific design and allow the system to be optimised.

The project-specific installation and test is normally conducted to verify:

- Product capacity under design conditions.
- Comfort levels - air temperature distribution.
  - thermal stratification.
  - draft risk.
  - radiant temperature analysis.
- Smoke test video illustrating air movement.
- Live Thermal Imaging





Photometric Testing Facility

The in-house Photometric test laboratories at Frenger are used to evaluate the performance of luminaires. To measure the performance, it is necessary to obtain values of light intensity distribution from the luminaire. These light intensity distributions are used to mathematically model the lighting distribution envelope of a particular luminaire. This distribution along with the luminaires efficacy allows for the generation of a digital distribution that is the basis of the usual industry standard electronic file format. In order to assess the efficacy of the luminaire it is a requirement to compare the performance of the luminaire against either a calibrated light source for absolute output or against the “bare” light source for a relative performance ratio.

The industry uses both methods. Generally absolute lumen outputs are used for solid state lighting sources and relative lighting output ratios (LOR) are used for the more traditional sources. Where the LOR method is chosen then published Lamp manufacturer’s data is used to calculate actual lighting levels in a scheme and for LED light source the integration chamber is used to measure LED luminance efficacy.

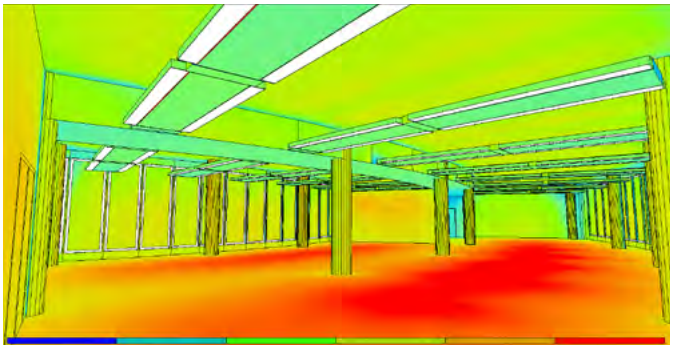
The intensity distribution is obtained by the use of a Goniophotometer to measure the intensity of light emitted from the surface of the fitting at pre-determined angles. The light intensity is measured using either a photometer with a corrective spectral response filter to match the CIE standard observer curves or our spectrometer for LED sources.

Luminaire outputs are measured using our integrating sphere for smaller luminaires or our large integrator room for large fittings and Multi Service Chilled Beams. For both methods we can use traceable calibrated radiant flux standards for absolute comparisons.

All tests use appropriate equipment to measure and control the characteristics of the luminaire and include air temperature measurements, luminaire supply voltage, luminaire current and power. Thermal characteristics of luminaire components can be recorded during the testing process as required.

A full test report is compiled and supplied in “locked” PDF format. Data is collected and correlated using applicable software and is presented electronically to suit, usually in Eulumdat, CIBSE TM14 or IESN standard file format.

Frenger conduct photometric tests in accordance with CIE 127:2007 and BS EN 13032-1 and sound engineering practice as applicable. During the course of these tests suitable temperature measurements of parts of LED’s can be recorded. These recorded and plotted temperature distributions can be used to provide feedback and help optimise the light output of solid state light source based luminaires which are often found to be sensitive to junction temperatures.



Acoustic Testing Facility

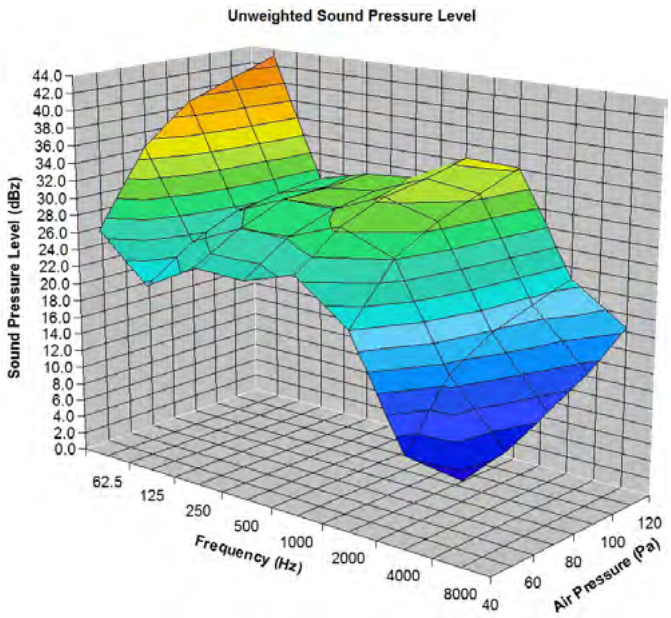
The Acoustic Test Room at Frenger is a hemi-anechoic chamber which utilises sound absorbing acoustic foam material in the shape of wedges to provide an echo free zone for acoustic measurements; the height of the acoustic foam wedge has a direct relationship with the maximum absorption frequency, hence Frenger had the acoustic wedges specifically designed to optimise the sound absorption at the peak frequency normally found with our active chilled beam products.

The use of acoustic absorbing material within the test room provides the simulation of a quiet open space without “reflections” which helps to ensure sound measurements from the sound source are accurate, in addition the acoustic material also helps reduce external noise entering the test room meaning that relatively low levels of sound can be accurately measured.

The acoustic facilities allow Frenger to provide express in-house sound evaluation so that all products, even project specific designs can be quickly and easily assessed and optimised.

To ensure accuracy, Frenger only use Class 1 measurement equipment which allows sound level measurements to be taken at 11 different ⅓ octave bands between 16 Hz to 16 kHz, with A, C and Z (un-weighted) simultaneous weightings.

In addition to the above, Frenger also send their new products to specialist third party Acoustic Testing. The results of which are very close and within measurement tolerances to that of Frenger’s in-house measurement of sound.



Industry Associations

Always mindful of its place within the HEVAC industry, Frenger Systems pride themselves on broad range of trade associations and accreditations. With a clear service, product and environmental ethos across everything they do, Frenger is focused on meeting and consistently surpassing the expectations of its customers. Frenger invest heavily in achieving industry recognised accreditations and as part of ongoing commitment to their customers and continually assess the level of services they provide. Opening up their company to these independent organisations allows Frenger to continually improve their customer service and satisfaction.

As an engaged member of the HEVAC industry, Frenger are actively asked to participate in industry specific discussions and studies. With this in mind Frenger are proud to have achieved and be linked with the following associations:

BSI EN ISO 9001:2015

Frenger Systems are registered by BSI for operating a Quality Management System which complies with the requirements of BS EN 9001:2015.

Eurovent

Frenger Systems participate in the EC (Eurovent Certified) programme. To check ongoing Validity of Certificate: www.eurovent-certification.com or www.certiflash.com Certiflash.

Chilled Beam and Ceiling Association

The Chilled Beam and Ceiling Association has been formed by leading companies within the construction industry. The objective of the Association is to promote the use of Chilled Beams and Chilled Ceilings, and encourage best practice in their development and application.

HEVAC Member

HEVAC is the heating and ventilating contractors association. As a HEVAC member Frenger Systems are subject to regular, third party inspection and assessment to ensure their technical and commercial competence.

Federation of Environment Trade Association

The Federation of Environment Trade Association (FETA), of which Frenger Systems is a member of, is the recognised UK body which represents the interests of manufacturers, suppliers, installers and contractors within the heat pump, controls, ventilating, refrigeration & air conditioning industry.

UK Trade & Investment

Frenger Systems are members of both the UK TI (the former Department of Trade and Industry) as well as the Chamber of Commerce for Export Documentation.

Certified CIBSE CPD

Frenger Systems is a CIBSE approved “Continued Professional Development” (CPD) provider. Frenger offers 1 hour lunch time CPD presentations regarding “Chilled Beam Technology” or "Radiant Heating Technology" CPD presentations are usually provided by webinar with live technical advisors. Alternatively half or full day Chilled Beam Technology or Radiant Heating Technology training is available at Frenger’s UK Technical Academy in a dedicated training theatre with fully operational BMS system with various different Chilled Beam and Chilled Ceiling solutions and both water driven and electric radiant heating solutions.

Booking of a CPD Presentation can be requested on Frenger’s home page, under the drop down menu headed “Company”, then “CPD Booking”. Alternatively email sales@frenger.co.uk.

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