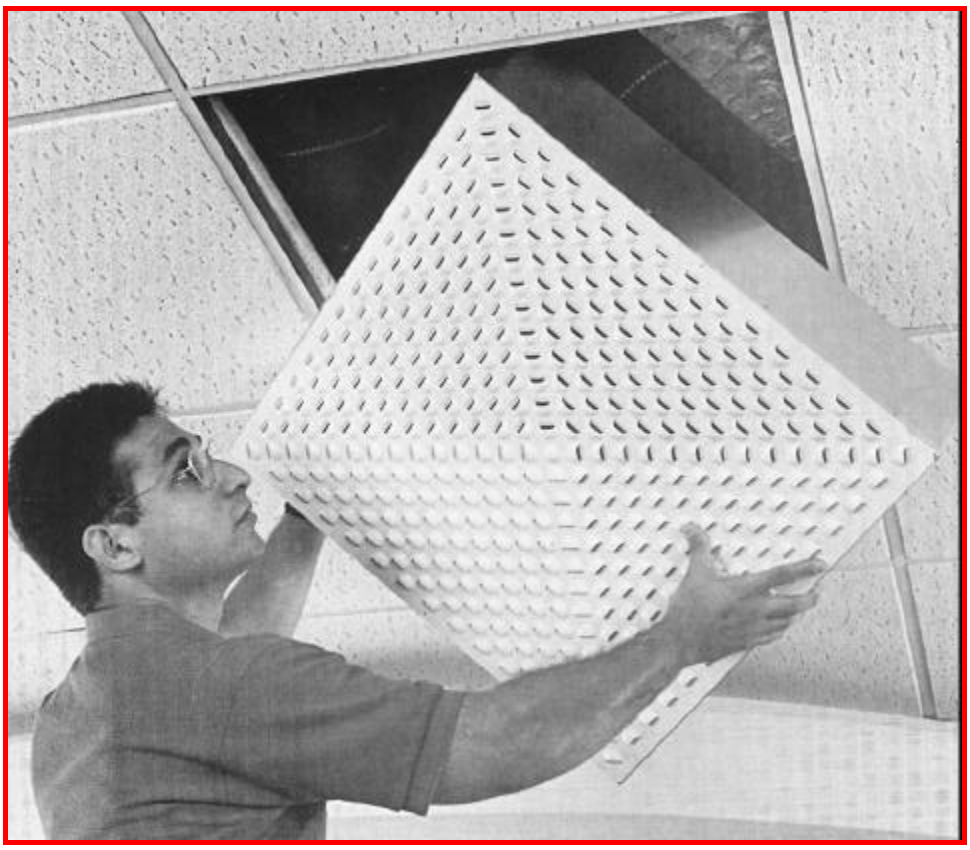

VALID AIR®

High Performance Diffusers

Specifications & Engineering Guide

WARREN TECHNOLOGY

INDOOR ENVIRONMENTAL SOLUTIONS

VALID AIR®
High Performance Diffusers

Introduction

WARREN TECHNOLOGY
TEL: 305-556-6933
FAX: 305-826-3509

New High Performance Diffuser Technology
Warren Technology has developed a new, technological breakthrough in air distribution design that will not only offer superior air distribution performance but a more high-tech, up-to-date "look" as well. By using a totally new, patented approach to diffuser design, Warren has created a new standard for air distribution performance and design. The Valid Air® high performance diffuser utilizes high velocity dimple jets to achieve air distribution performance superior to existing diffuser designs. (Performance data verified by ETL Testing Laboratories)

Conventional Air Distribution Design
Most of today's manufacturers of air diffusers have created "look alike" versions of each other's models. There may be small variations for a given style of diffuser from one manufacturer to another, but the critical dimensions that affect airflow and sound are all essentially the same. The most widely used of these conventional air outlets over the past several decades has been the "perforated diffuser" which has severe performance limitations, resulting in drafts and cold air dumping.

The Direction of the Diffuser Air Jets is Critical to Performance
In rooms with ceiling heights less than ten feet, the diffuser's air jets should be directed parallel (horizontal) to the ceiling plane in order to:
1. Prevent cold air downdrafts
2. Provide maximum throw and coverage
3. Provide maximum circulation and ventilation effectiveness

Most conventional diffusers have deflection vanes that are fixed on an angle away from the ceiling plane and therefore direct the air downward, creating cold spots, drafts and poor ventilation effectiveness. Valid Air's patented dimple air jets are directed horizontally to the ceiling to eliminate these types of problems. This feature is especially important in eliminating the problem of cold air dumping caused by conventional diffusers at reduced air flow in Variable Air Volume (VAV) systems.

The Outlet Velocity of the Diffuser Air Jets is Critical to Performance
Valid Air diffusers will prevent hot or cold spots from forming. Good room air circulation is a primarily a function of outlet velocity and is necessary for the effective removal of airborne contaminants by entraining them into the airstream to be removed by the return air filtration system. Strategically directed Valid Air high velocity dimple jets improve the effective draft temperature of a space by providing proportionate energy savings. Occupants will feel approximately 1 degree cooler for each 17 feet per minute increase in air motion.

Selection Guidelines
The two most important characteristics of a diffuser's performance are the amount of air it can deliver at a given noise level, and the amount of floor area it covers with that air quantity at a given terminal velocity. This data is combined into a single value to assist in diffuser selection: cfm/ft^2. The diffuser's "footprint" and throw-pattern are closely related to its cfm/ft^2 ratings, and may be influenced by the ceiling grid layout and the room size and shape.

For Warren's Valid Air diffusers, the inlet diameter is not as critical to proper performance as for other manufacturer's diffusers. Warren's nominal inlet velocity is about 800 feet per minute, which is lower than many other manufacturers. This reduces noise without affecting coverage-area, and results in larger diameter "nominal" inlets than competitors' models. Therefore, it is not necessary to use duct diameters as a guide to air quantity or required coverage when selecting Warren diffusers to fit into an existing design.

Instead of inlet diameter, Warren's diffuser capacity is related primarily to the face area of the diffuser, and the depth of the individual dimple jets. Six face shapes are available: 2'x2' (Square), 1'x4' (Rectangle), 2'x4' (Double), 1'x2' (Half), 6"x4' (Linear), and 6"x2' (Mini), which provide 1 - 8 ft^2 of face area. Each shape offers three dimple jet capacities: Low, Medium, or High.

Application Guidelines
The selection procedure varies slightly, depending on what stage the project has reached. It is convenient to think of this in three categories, which are: early design stage, pre-construction bid, and post-construction retrofit.

In the early stages of design, the only "known" value is the cfm/ft^2 (based on building construction and anticipated internal loads) and the ceiling grid layout, the location of interior walls is either unknown or uncertain. The designer has a free hand to select from Warren's standard diffusers and lay them out to optimize cost, comfort, and appearance.

When the complete design goes to bid, the cfm, number and general type of each diffuser has been determined, and the diffuser coverage can be determined from the layout.

In existing system upgrades, the inlet diameters may be critical, since the fittings and flex-duct is already installed. Since upgrades sometimes are accompanied by changes in internal cooling loads, the existing cfm's may not be correct. The number, size and location of diffusers may need to be changed, in which case the diameters are less important. It may be necessary to specify "non-standard" inlet diameters in some cases.

VALID AIR®
High Performance Diffusers

Suggested Specifications

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General Description

Ceiling supply diffusers shall be Valid Air High Performance Diffusers, manufactured in the USA by Warren Technology.

Face
Diffuser face shall be constructed of a corrosion proof, scratch resistant, white thermoplastic plate affixed to an aluminum backplate. Diffuser shall be 2'x2' square with 8-way throw, unless otherwise noted.

Sizes
Diffuser shall be available in the following face sizes: 2'x4', 2'x2', 1'x4', 1'x2', 6"x4', and 6"x2'. The flow rates for a given dimple jet depth shall be directly proportional to the face area of the diffuser. Noise Criteria (NC) levels shall be consistent for all sizes for a given flow rate per unit face area.

Supply Jets
High induction dimple jets shall be formed into the face of the diffuser, capable of producing an airstream parallel to the ceiling at full flow throughout the entire design range. Dimple jets shall be sized to optimize room air induction and entrainment for a variety of design cfm capacities.

Throw Patterns
Dimple jets shall be arranged in a variety of patterns which result in 8-way (center of the room), 5-way (next to a sidewall), 3-way (in a corner), 2-way (opposite directions), or 1-way horizontal throws. Vertical throw (downblow) dimple jets shall be available for high heating load applications. Dual pattern models shall deliver 25% of the airflow vertically, and 75% of the airflow horizontally in each direction. Noise criteria (NC) and static pressure drop (SP) ratings shall not be affected by the throw pattern.

Plenum
Diffuser plenum shall be made from 0.030 inch thickness aluminum with side inlet on wedge shape or top inlet on square shape. Model VU shall be constructed of molded fiberglass covered on both sides with aluminum foil (R value 6), prescored for: 6, 8, 10, 12, 14, and 16 inch top inlet collars.

Optional Accessories

Insulation
Diffuser plenum shall have one-half inch thick internal insulation to reduce heat transfer and potential for condensation. Polymer foam insulation shall be used, to eliminate fibers in the airstream and to provide an effective vapor barrier. It shall meet the following standards: NFPA 90A&B, 255, 259; ASTMC518, C411, C423, C665, E84, E90, E96; UL 94HBF, 181, 723.

Mounting Frame
Standard unit shall be suitable for T-bar mounting without requiring any special brackets. Aluminum alloy frames shall be available which permit mounting in spline, plaster and sheet-rock ceilings.

Filter Rack
The diffuser plenum shall have a filter rack with hinged access door and twist latches with sufficient space for two layers of one inch thick filters.

Filters
Filters are each one inch thick and may be stacked to increase efficiency. Filter face area shall equal that of the diffuser. The filter assembly shall not reduce the capacity, diminish the throw characteristics, or increase the noise levels of the diffuser.

High Efficiency Particulate Filters
High efficiency filters shall be constructed of permanently charged rectangular polypropylene split fibers or other high efficiency media. The effective area of the media shall be at least 1.6 square feet per square foot of face area, and will not contain less than 12 pleats per foot.

Carbon filters
Odor control carbon filters shall be constructed of non-woven polyester that is impregnated with 150% carbon add-on. Filter media shall contain no less than 10.5 grams of carbon per square foot of media area. Effective media area shall not be less than 6.1 square feet per square foot of face area, and will not contain less than 12 pleats per foot.

Zeolite Filters
Odor control ammonia lock filters shall be constructed of non- woven polyester that is impregnated with 150% zeolite add-on. Filter media shall contain no less than 15 grams of zeolite per square foot of media area. Effective media area shall not be less than 6.1 square feet per square foot of face area, and will not contain less than 12 pleats per foot.

Construction Filters
Construction filters shall be constructed of polyester or synthetic fibers.

Note: For detailed specifications and performance data on filters please refer to Warren Uni•Guard™ product guide.

VALID AIR®

High Performance Diffusers

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Design and Layout Information

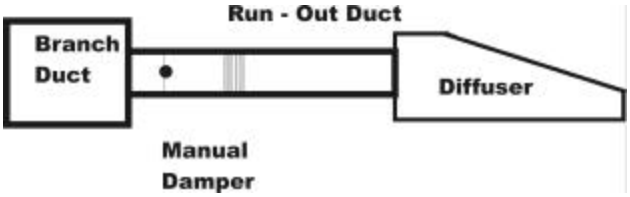
Valid air diffusers are designed to perform in a capacity range that is suitable for a one size (24"x24") standardization concept. With multiple diffusers, virtually all room sizes and design loads can be accommodated by using the standard 8-way, 24"x24" Valid Air diffuser.

Valid Air diffusers will provide proper room air circulation while avoiding objectionable downdrafts when the following recommended design layout information is used:

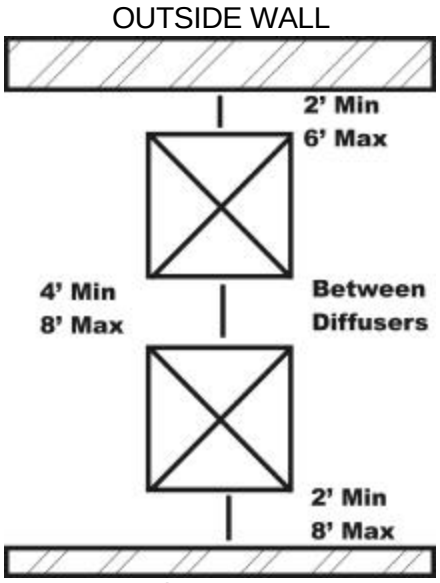
Layout Parameters

Air flow 100 – 450 CFM
Sound Criteria Maximum NC 35 (at design airflow)
CFM / ft^2 1.0 – 3.0

Recommended Installation



Recommended Layout Spacing



(2'x2' diffusers)

(Please refer to diffuser layout design examples)

Helpful hints:

1. Always locate the diffuser so that it is closest to the center of the room, or area that it serves.

2. Manual balancing dampers should be located in each run-out duct as far away as possible from the diffuser to provide air flow adjustments with minimum noise generation.

3. Return air grilles should be located diagonal from the diffuser and placed as far away as possible, in the corner of the room on either the ceiling or wall.

VALID AIR®

High Performance Diffusers

Performance Chart
For All Valid Air Models

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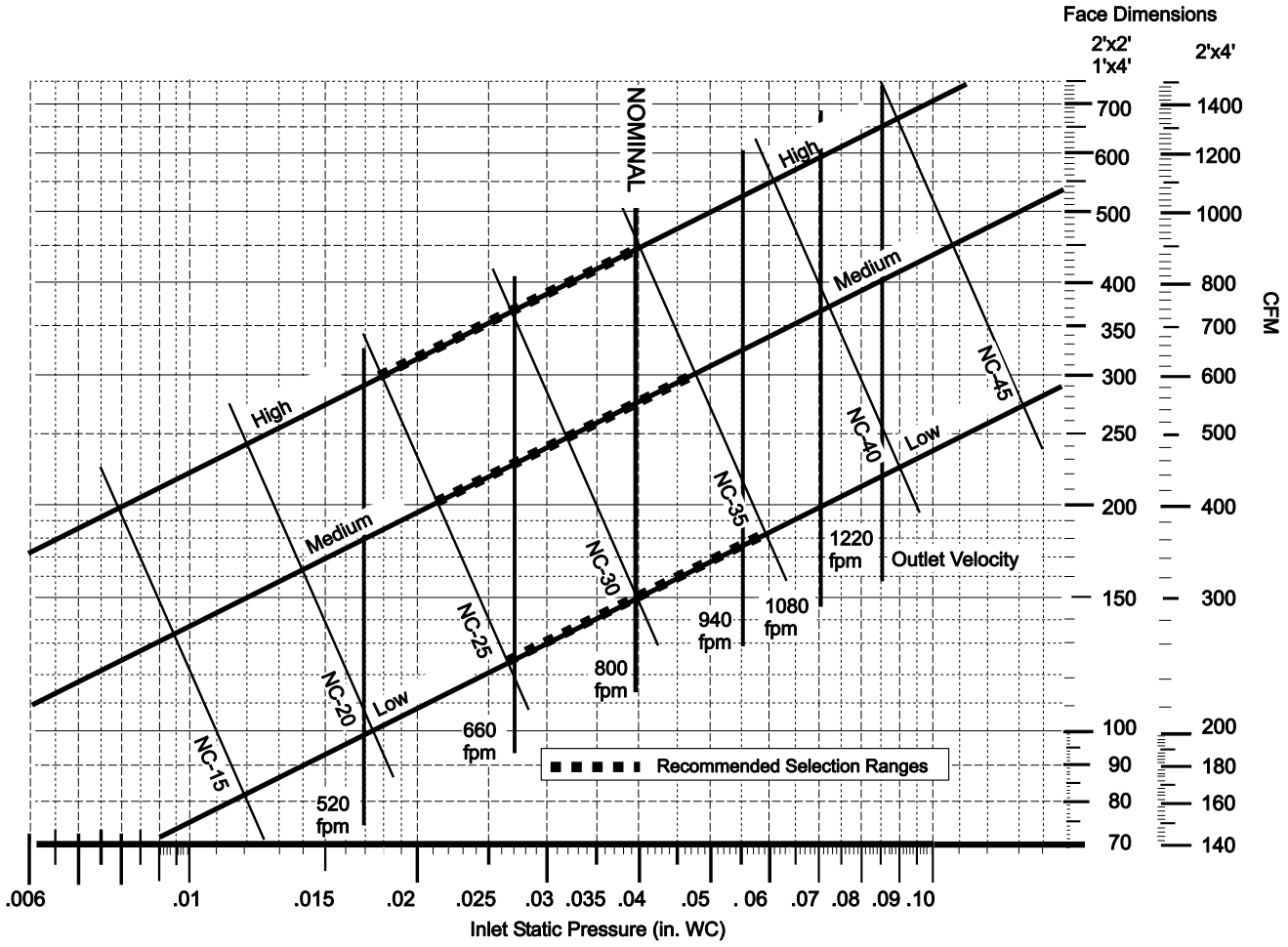

Notes

Capacity Selection Procedure:

Select units between 520 and 940 fpm outlet velocity. Stay below NC-35 for noise sensitive applications. Higher outlet velocities improve induction and entrainment of room air.

1. For a given air flow in CFM, select the dimple capacity (High, Medium or Low) noting the corresponding inlet static pressure, Noise Criteria (NC), and outlet velocity. Select the highest velocity, to provide room circulation, without exceeding the desired noise criteria (NC) level.
2. All data is based on standard inlet diameters. Non-standard diameters may affect this data.

Use larger face area (or two diffusers) if noise levels are too high, or smaller face area for cases below NC-20 (to improve air motion).

Nominal Inlet Diameters;

Capacity	2'x2' 1'x4'	2'x4' only
High	10"	14"
Medium	8"	12"
Low	6"	10"

Examples:

Given Size	CFM	Capacity	Dimple Velocity	Outlet NC	Room Circulation
2'x2'	200	Medium	580	25	Fair
2'x2'	200	Low	1080	37	Best

VALID AIR®

High Performance Diffusers

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Product Order Code

Model VU *(Universal)* 2' x 2'

Determine the product code by filling out the empty code letter on the right. Use this product in the product order form

V-AIR	SHAPE	INLET	THROW	CAPAC	DIA		RACK	FILTERS	INSUL	PLENUM	T-BAR
V	U					-	N	N	N		

Basic Features

Inlet Location

T = Top Inlet (dome plenum)
F = Faceplate (no plenum)
- **Q** = Custom Inlet (define)

Throw Pattern

8 = 8-way
5 = 5-way
- **3** = 3-way
- **2** = 2-way
- **1** = 1-way
- **V** = Vertical
- **Q** = Custom Pattern (define)

Capacity

		Nominal Inlet Size	*CFM NC-35*
L	= Low	6"	180
M	= Medium	8"	300
H	= High	10"	450

Inlet Diameter

Note: Inlet Diameter manual balancing damper available consult factory

N = No Inlet Collar (dome only)
X = No Plenum (faceplate only)
6 = 6" Round Inlet Collar
8 = 8" Round Inlet Collar
0 = 10" Round Inlet Collar
2 = 12" Round Inlet Collar
4 = 14" Round Inlet Collar
S = 16" Round Inlet Collar
- **Q** = Custom Inlet (define)

- ***Special items may require longer lead times.***

Options

Filter Rack

N = None (for filtration units see models VW, VS, and VD)

Filters

N = None (for filtration units see models VW, VS, and VD)

Insulation

N = None (available on all other models)

Plenum

N = Standard Prescored Plenum
U = Unassembled (for shipping)
X = No Plenum (faceplate only)
- **Q** = Custom Plenum (define)

T-Bar Dimensions

N = Standard U.S.
- **M** = Metric (600 x 600 mm)
- **Q** = Custom Dimensions (define)

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High Performance Diffusers

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Product Order Code

Model VS *(Square)* 2' x 2'

Determine the product code by filling out the empty code letter on the right. Use this product in the product order form

V-AIR	SHAPE	INLET	THROW	CAPAC	DIA		RACK	FILTERS	INSUL	PLENUM	T-BAR
V	S					-					

Basic Features

Inlet Location

T = Top Inlet (dome plenum)
- **Q** = Custom Inlet (define)

Throw Pattern

8 = 8-way
5 = 5-way
- **3** = 3-way
- **2** = 2-way
- **1** = 1-way
- **V** = Vertical
- **Q** = Custom Pattern (define)

Capacity

			Nominal Inlet Size	*CFM NC-35*
L	=	Low	6"	180
M	=	Medium	8"	300
H	=	High	10"	450

Inlet Diameter

Note: Inlet Diameter manual balancing damper available consult factory

6 = 6" Round Inlet Collar
- **7** = 7" Round Inlet Collar

8 = 8" Round Inlet Collar
- **9** = 9" Round Inlet Collar

0 = 10" Round Inlet Collar
- **2** = 12" Round Inlet Collar
- **Q** = Custom Inlet (define)

- ***Special items may require longer lead times.***

Options

Filter Rack

Maximum of two 1" filters

N = None
R = Filter Rack
- **Q** = Custom Rack (define)

Filters

Requires Filter Rack Option form section above. Filters specified here ship inside unit (see accessory page for replacement /spare filters.)

N = None
H = 1" High Efficiency Filters
I = Two 1"High Efficiency Filter
- **G** = 1" High Efficiency Filters + 1" Carbon
- **F** = 1" High Efficiency Filters + 1" Zeolite
- **Y** = 1" High Efficiency Filters + 1" Construction
- **C** = 1" Carbon (general odors)
- **Z** = 1" Zeolite (ammonia)
- **L** = 1" Construction
- **A** = 1" Construction + 1" Carbon
- **E** = 1" Construction + 1" Zeolite
- **B** = 1" Zeolite + 1" Carbon

Insulation

Not available with Rack or Filter options

N = None
- **F** = Internal Polymer Foam Insulation
- **Q** = Custom Insulation (define)

Plenum

N = Standard Aluminum Plenum
- **F** = Internal Polymer Foam Insulation
- **Q** = Custom Plenum (define)

T-Bar Dimensions

N = Standard U.S.
- **M** = Metric (600 x 600 mm)
- **Q** = Custom Dimensions (define)

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Product Order Code

Model VW *(Wedge)* 2' x 2'

Determine the product code by filling out the empty code letter on the right. Use this product in the product order form

V-AIR	SHAPE	INLET	THROW	CAPAC	DIA		RACK	FILTERS	INSUL	PLENUM	T-BAR
V	W					-					

Basic Features

Inlet Location

S = Standard Front Inlet (wedge plenum)
- **B** = Back Inlet
- **Q** = Custom Inlet (define)

Throw Pattern

8 = 8-way
5 = 5-way
- **3** = 3-way
- **2** = 2-way
- **1** = 1-way
- **V** = Vertical
- **Q** = Custom Pattern (define)

Capacity

			Nominal Inlet Size	*CFM NC-35*
L	=	Low	6"	180
M	=	Medium	8"	300
H	=	High	10"	450

Inlet Diameter

Note: Inlet Diameter manual balancing damper available consult factory

6 = 6" Round Inlet Collar
- **7** = 7" Oval Inlet Collar

8 = 8" Oval Inlet Collar
- **9** = 9" Oval Inlet Collar

0 = 10" Oval Inlet Collar
2 = 12" Oval Inlet Collar
- **Q** = Custom Inlet (define)

- ***Special items may require longer lead times.***

Options

Filter Rack

Maximum of two 1" filters

N = None
R = Filter Rack
- **Q** = Custom Rack (define)

Filters

Requires Filter Rack Option form section above. Filters specified here ship inside unit (see accessory page for replacement /spare filters.)

N = None
H = 1" High Efficiency Filters
I = Two 1"High Efficiency Filter
- **G** = 1" High Efficiency Filters + 1" Carbon
- **F** = 1" High Efficiency Filters + 1" Zeolite
- **Y** = 1" High Efficiency Filters + 1" Construction
- **C** = 1" Carbon (general odors)
- **Z** = 1" Zeolite (ammonia)
- **L** = 1" Construction
- **A** = 1" Construction + 1" Carbon
- **E** = 1" Construction + 1" Zeolite
- **B** = 1" Zeolite + 1" Carbon

Insulation

Not available with Rack or Filter options

N = None
- **F** = Internal Polymer Foam Insulation
- **Q** = Custom Insulation (define)

Plenum

N = Standard Aluminum Plenum
- **Q** = Custom Plenum (define)

T-Bar Dimensions

N = Standard U.S.
- **M** = Metric (600 x 600 mm)
- **Q** = Custom Dimensions (define)

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Accessory Order Code

Replacement Filters

Model Code	Nominal Dimension	Description
FSH	24”x24”x1”	High Efficiency Particulate Filter
FSC	24”x24”x1”	Carbon Filter
FSZ	24”x24”x1”	Zeolite Filter
FSL	24”x24”x1”	Construction Filter

Note: 24”x48” requires two filters per 1 inch thick layer.

Mounting Frames

Model Code	Nominal Dimension	Description
M22	24”x24”	Mounting Frame
M14	12”x48”	Mounting Frame
M24	24”x48”	Mounting Frame
M64	6”x48”	Mounting Frame
M12	12”x24”	Mounting Frame
M62	6”x24”	Mounting Frame

Note: Use for ceiling without a T-bar grid.

Duct Branch Manual Balancing Dampers

Model Code	Nominal Dimension	Description
A	6”	Manual balancing damper for duct board connection
B	8”	Manual balancing damper for duct board connection
C	10”	Manual balancing damper for duct board connection
D	12”	Manual balancing damper for duct board connection
W	6”	Manual balancing damper for metal duct connections
X	8”	Manual balancing damper for metal duct connections
Y	10”	Manual balancing damper for metal duct connections
Z	12”	Manual balancing damper for metal duct connections

Note: Accessories on this form will be shipped in different containers than Valid Air Diffusers ordered at the same time. Filters are to be shipped inside the diffusers, they must be ordered on the Valid Air Product Order Form.

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High Performance Diffusers

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Performance Data

Model VU, VS and VW 2' x 2'

						NOMINAL		
Entrainment Ratios			23:1	31:1	38:1	**44:1**	50:1	55:1
Inlet Static Pressure (in. WC)			0.01	0.02	0.03	**0.04**	0.05	0.06
High Capacity 10" Inlet		CFM	235	320	390	**450**	505	550
		NC	18	26	31	**35**	38	40
	THROW (ft)	8-way	5-8-14	8-11-17	10-14-20	11-16-21	13-18-23	15-20-25
		5-way	6-9-15	8-12-18	11-15-21	12-17-22	14-19-24	16-21-26
		3-way	7-10-16	10-14-20	13-18-23	15-20-25	17-22-28	19-24-30
		2-way	9-12-18	12-17-22	15-21-26	18-23-28	20-25-31	22-28-33
		1-way	12-17-22	17-22-27	21-26-31	24-29-34	27-32-37	31-35-40
		Vertical*	@ 0.04"	@ 0.05"	@ 0.07"	@ 0.09"	@ 0.11"	@ 0.12"
Medium Capacity 8" Inlet		CFM	140	195	240	**275**	310	340
		NC	16	24	29	**33**	36	38
	THROW (ft)	8-way	4-6-10	6-8-12	7-10-14	8-12-16	9-13-17	11-14-18
		5-way	4-6-11	6-9-13	8-11-15	9-12-16	10-14-18	11-15-19
		3-way	5-8-12	7-10-15	9-13-17	11-15-19	12-16-20	14-18-22
		2-way	6-9-13	9-12-16	11-15-19	13-17-21	15-18-22	16-20-24
		1-way	9-12-16	12-16-20	15-19-23	18-21-25	20-23-27	22-26-29
		Vertical*	@ 0.03"	@ 0.04"	@ 0.06"	@ 0.07"	@ 0.08"	@ 0.10"
Low Capacity 6" Inlet		CFM	75	105	130	**150**	170	185
		NC	13	21	26	**30**	33	35
	THROW (ft)	8-way	3-5-8	4-6-10	6-8-11	7-9-12	7-10-13	8-11-14
		5-way	4-5-8	5-7-10	6-9-12	7-10-13	8-11-14	9-12-15
		3-way	4-6-10	6-8-12	7-10-13	9-12-15	10-13-16	11-14-17
		2-way	5-7-11	7-10-13	9-12-15	10-13-16	12-15-18	13-16-19
		1-way	7-10-13	10-13-16	12-15-18	14-17-20	16-19-21	18-20-23
		Vertical*	@ 0.02"	@ 0.03"	@ 0.04"	@ 0.04"	@ 0.05"	@ 0.06"

Percentage of air flow in each direction:	**8-way**	**5-way**	**3-way**	**2-way**	**1-way**	**Vertical**
Left	22%	12%	34%	50%	-	-
Right	22%	12%	-	50%	-	-
Diagonal	12%	54%	32%	-	-	-
Down	-	-	-	-	-	100%
Front	22%	22%	34%	-	100%	-
Back	22%	-	-	-	-	-

NOTES:

1. Entrainment ratios were calculated at the 50 fpm throw distance using ETL certified laboratory measurements and equations referenced in the 1997 ASHRAE Handbook of Fundamentals.
2. Inlet Static Pressure (in. WC) values show the pressure required at the diffuser's inlet to deliver the listed CFM. Non-standard inlet location may affect performance.
3. Noise criteria (NC) values are based on a conservative room effect of 10 dB in all octaves (125 Hz through 4000 Hz).
4. Throws represent the longest centerline distance (in feet) that isothermal air travels from the diffusers edge, at or above a given velocity. Throws are representative averages of all directions, for 150, 100 and 50 fpm velocities. All values are within 12" of the ceiling. The main airstream remains above that level for typical supply air temperatures.

* 5. Vertical throw values for terminal velocities of 150,100 and 50 fpm for isothermal applications are shown. The Inlet Static Pressure (ISP) required to obtain the tabulated CFM is shown (higher than for horizontal patterns).

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High Performance Diffusers

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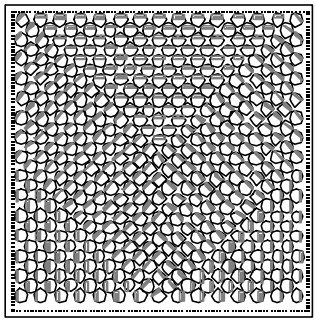
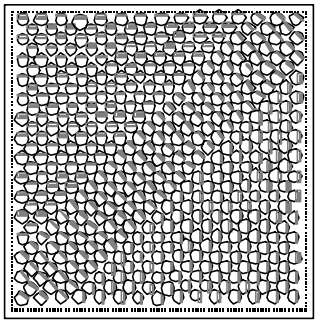
Dimensions

Model VU *(Universal)* 2' x 2'

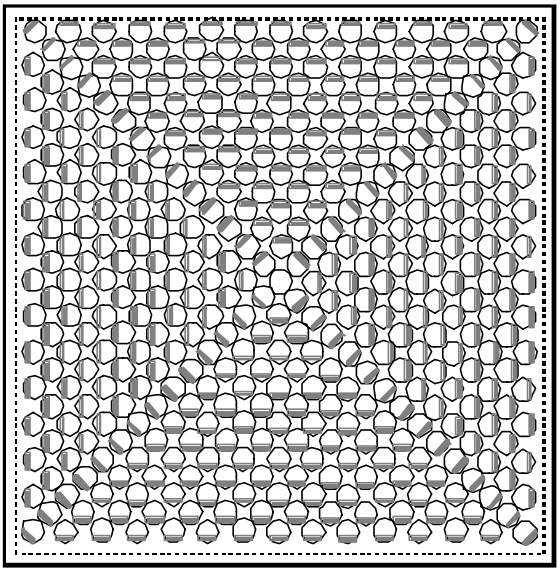
Five-Way Pattern



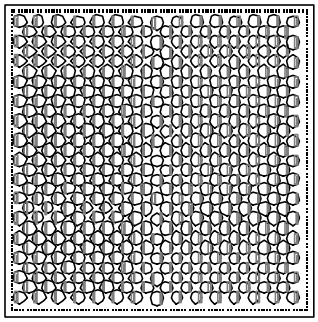
Three-Way Pattern



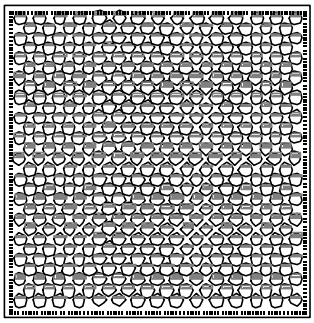
Eight-Way Pattern



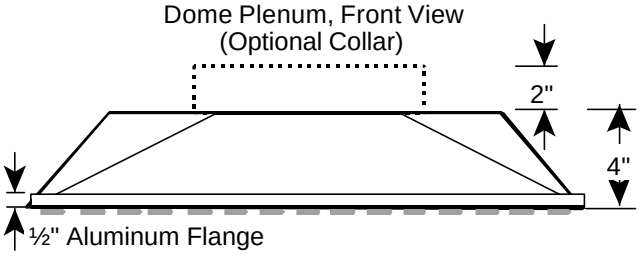
Two-Way Pattern



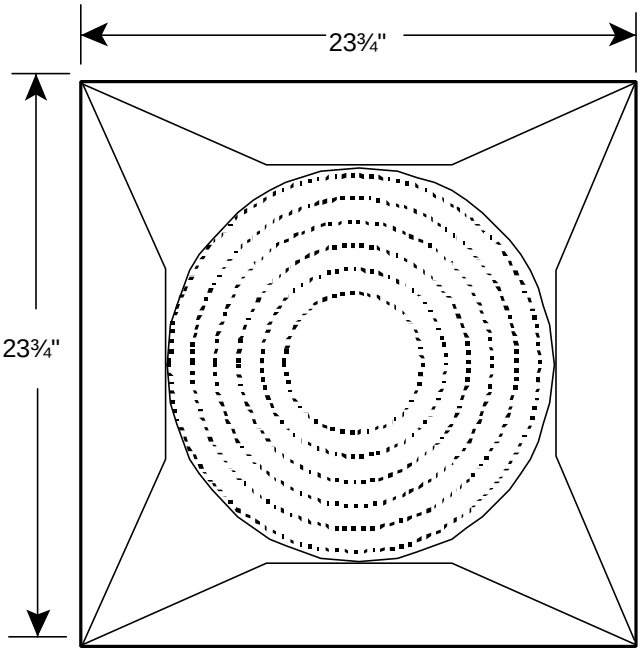
One-Way Pattern



Dome Plenum, Front View
(Optional Collar)



Dome Plenum, Top View



NOTES:

1. Face dimensions shown are for 2' grid T-bar ceilings. For Metric 600 mm grid T-bar, face dimensions are 594 x 594 mm.
2. Plenum constructed of molded fiberglass covered on both sides with aluminum foil.
3. Inlet shown is Nominal for High capacity (10" round). Plenum is pre-scored for: 6, 8, 10, 12, 14, and 16 inch top inlet collars.

VALID AIR®

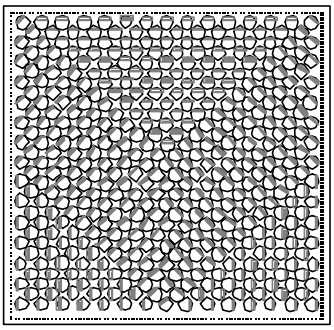
High Performance Diffusers

WARREN TECHNOLOGY
TEL: 305-556-6933
FAX: 305-826-3509

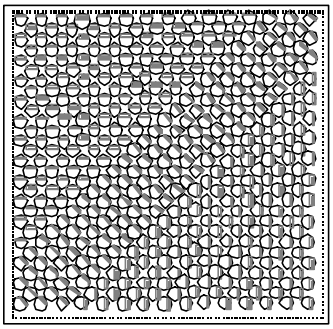
Dimensions

Model VS *(Square)* 2' x 2'

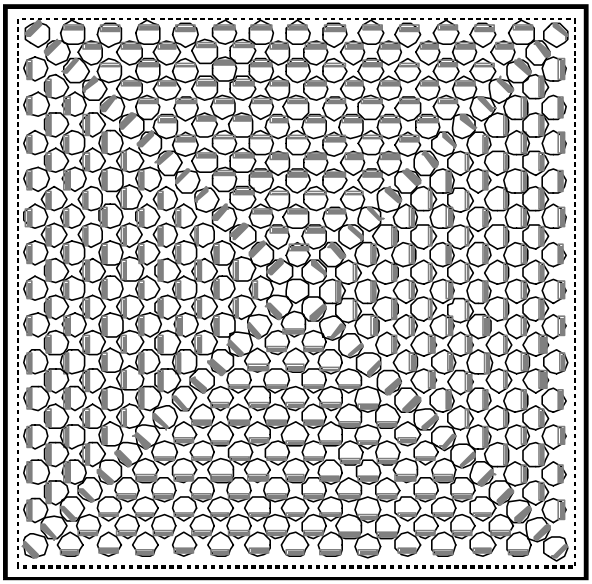
Five-Way Pattern



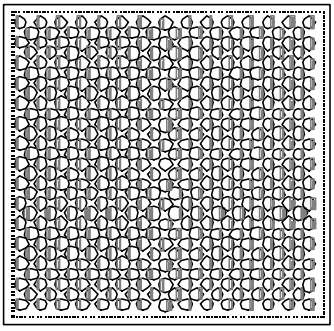
Three-Way Pattern



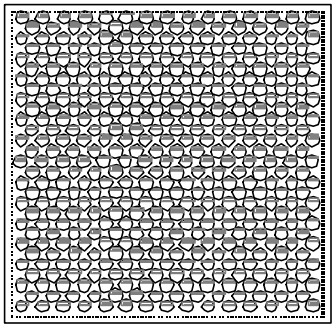
Eight-Way Pattern



Two-Way Pattern



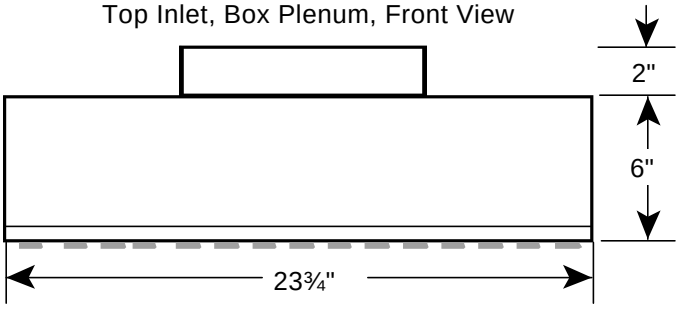
One-Way Pattern



NOTES:

1. Face dimensions shown are for 2' grid T-bar ceilings. For Metric 600 mm grid T-bar, face dimensions are 594 x 594 mm.
2. Top inlet only.

Top Inlet, Box Plenum, Front View



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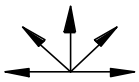
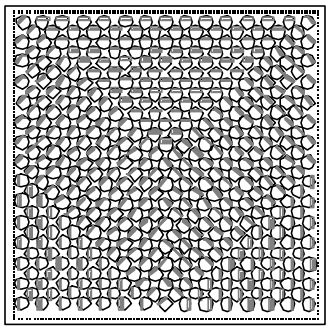
WARREN TECHNOLOGY
TEL: 305-556-6933
FAX: 305-826-3509

Dimensions

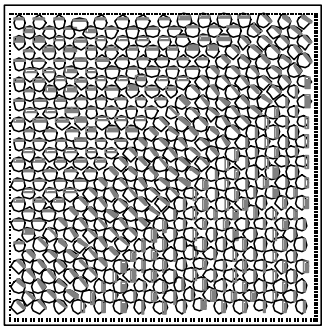
Model VS *(Square)* 2' x 2' with Filter Rack

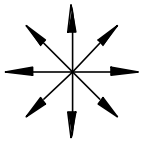


Five-Way Pattern

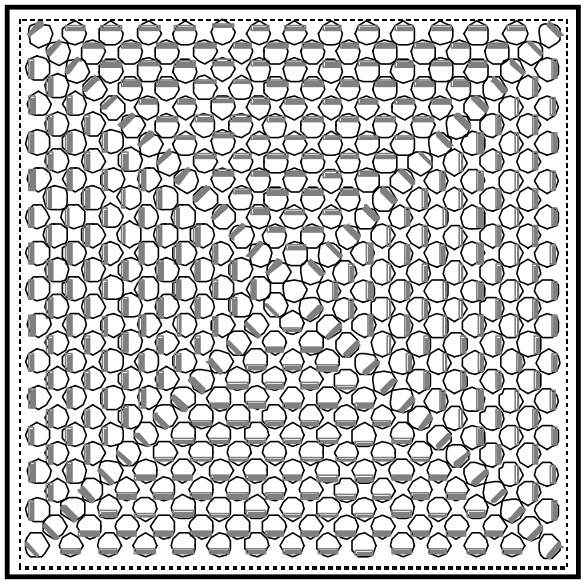


Three-Way Pattern

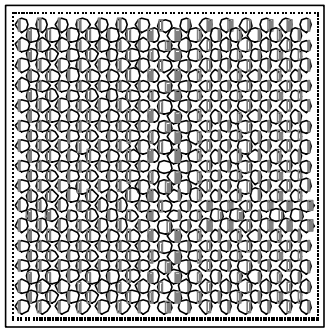




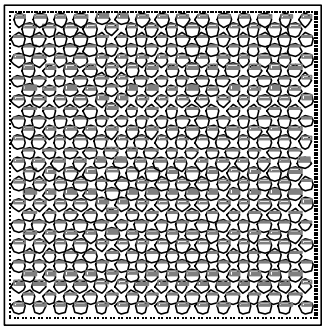
Eight-Way Pattern



Two-Way Pattern



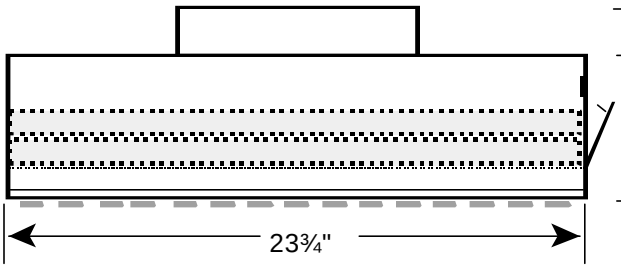
One-Way Pattern



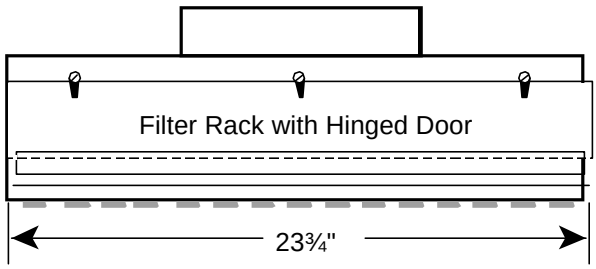
NOTES:

1. Face dimensions shown are for 2' grid T-bar ceilings. For Metric 600 mm grid T-bar, face dimensions are 594 x 594 mm.
2. High Efficiency, Carbon, Zeolite, and Construction Filters are available.
3. Top inlet only.

Top Inlet, Box Plenum, Front View



Top Inlet, Box Plenum, Side View



VALID AIR®

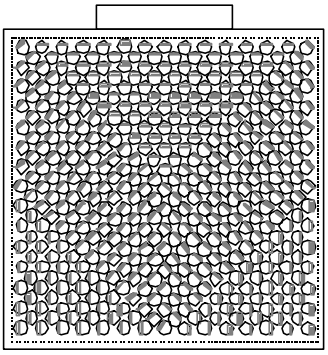
High Performance Diffusers

WARREN TECHNOLOGY
TEL: 305-556-6933
FAX: 305-826-3509

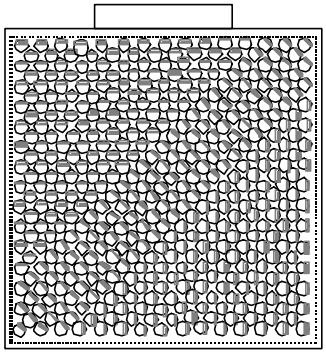
Dimensions

Model VW *(Wedge)* 2' x 2'

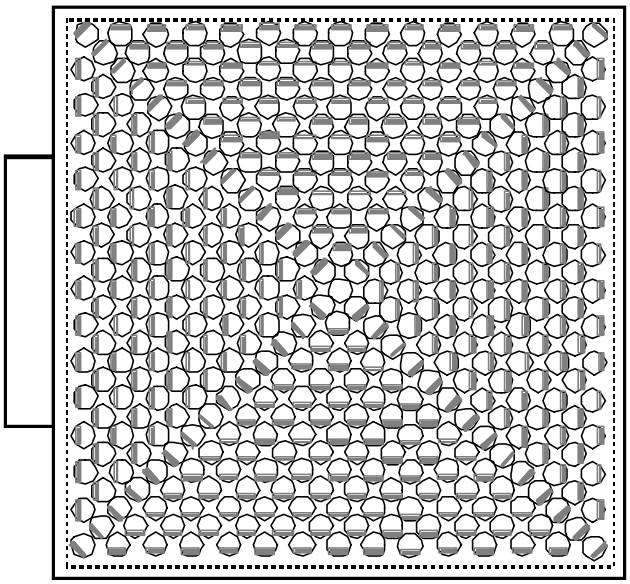
Five-Way Pattern



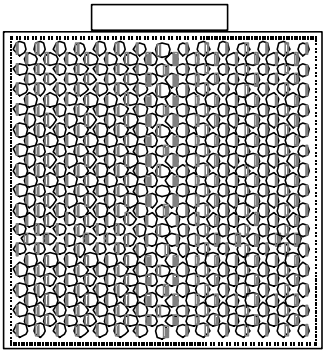
Three-Way Pattern



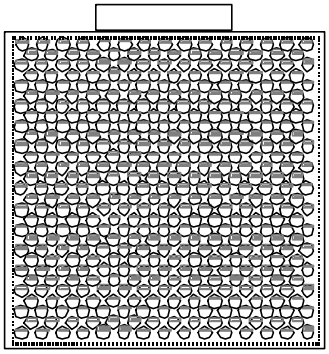
Eight-Way Pattern



Two-Way Pattern



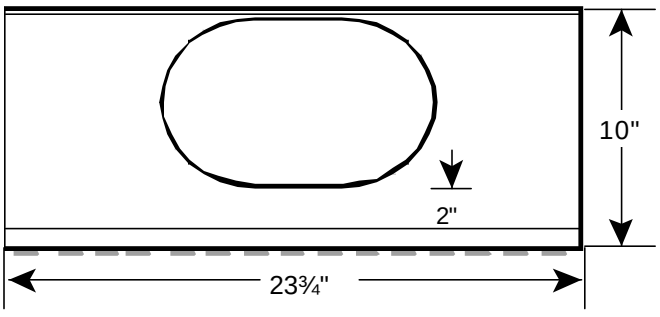
One-Way Pattern



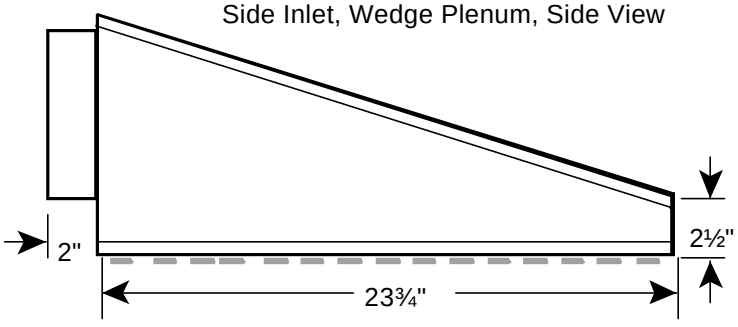
NOTES:

1. Face dimensions shown are for 2' grid T-bar ceilings. For Metric 600 mm grid T-bar, face dimensions are 594 x 594 mm.
2. Inlet shown is Nominal for High capacity (10" round or oval). Standard flex duct fits oval inlets (no transition).
3. Side inlets are shown in standard location (versus the pattern).

Side Inlet, Wedge Plenum, Front View



Side Inlet, Wedge Plenum, Side View



VALID AIR®

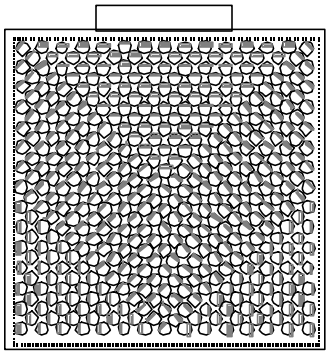
High Performance Diffusers

WARREN TECHNOLOGY
TEL: 305-556-6933
FAX: 305-826-3509

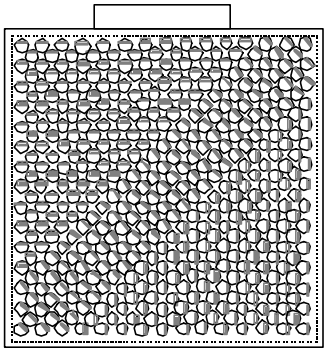
Dimensions

Model VW *(Wedge)* 2' x 2' with Filter Rack

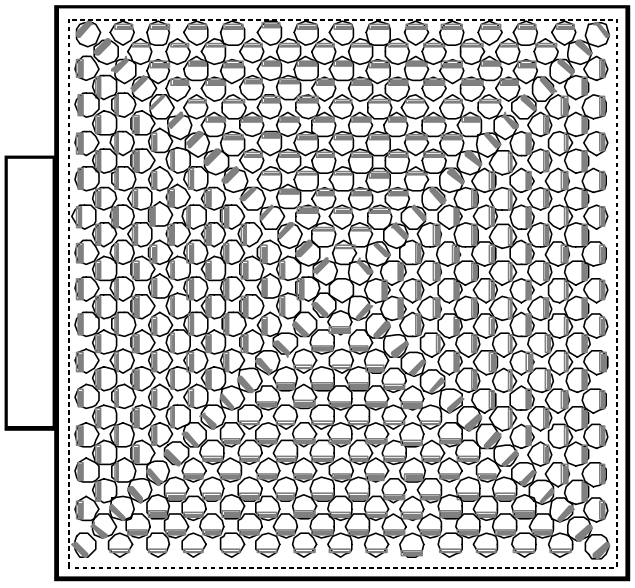
Five-Way Pattern



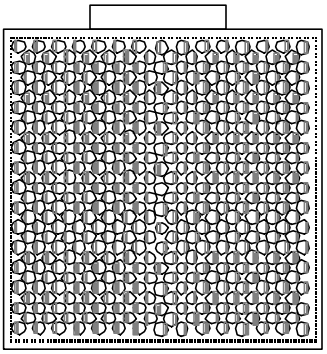
Three-Way Pattern



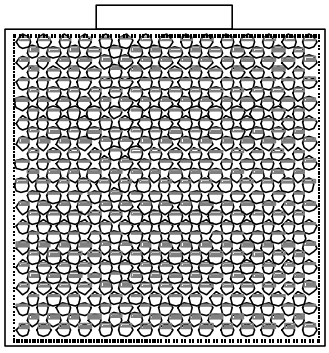
Eight-Way Pattern



Two-Way Pattern



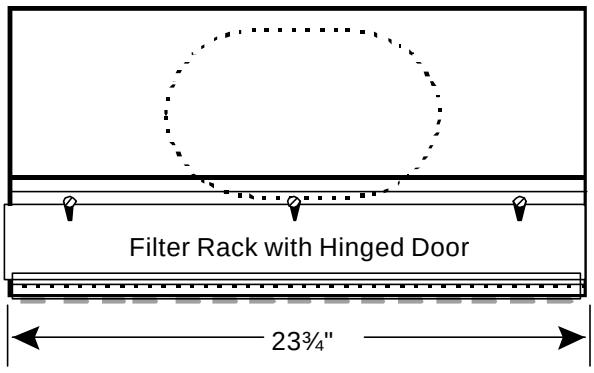
One-Way Pattern



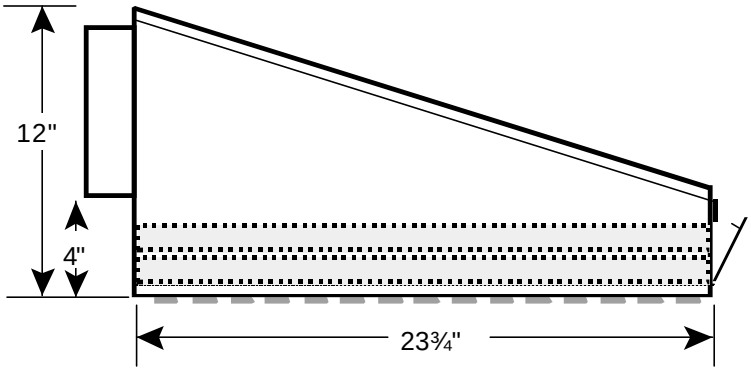
NOTES:

1. Face dimensions shown are for 2' grid T-bar ceilings. For Metric 600 mm grid T-bar, face dimensions are 594 x 594 mm.
2. High Efficiency, Carbon, Zeolite, and Construction Filters are available.
3. Inlet shown is Nominal for High capacity (10" round or oval). Standard flex duct fits oval inlets (no transition).
4. Side inlets are shown in standard location (versus the pattern).

Side Inlet, Wedge Plenum, Rear View



Side Inlet, Wedge Plenum, Side View



WARREN TECHNOLOGY
PRODUCTS & SYSTEMS

Warren Technology designs, develops, and manufactures quality products for the heating, ventilation and air-conditioning industry.

Our mission is to provide indoor environmental solutions that enhance personal comfort, improve indoor air quality, and increase energy savings.

Advanced computer-aided design and integrated flexible manufacturing systems developed during the past 35 years enable Warren to respond rapidly to changing customer requirements.

Warren's Uni•VAV® Individual Room Comfort System provides individual temperature control for buildings with almost any type of forced air HVAC system.

Air handling systems for any building, large or small, may be upgraded to achieve greater energy efficiency while providing for the individual temperature needs of each occupant.

The Uni•VAV®, and UNI•GUARD™ systems are designed to improve individual comfort control, productivity and indoor air quality.

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- Individual Zone Control
- Energy-Saving Diversification
- System Design Flexibility

Leopard Intellivent®
Personal VAV Diffusers
- Individual Temperature Control
- Easy to Install and Relocate

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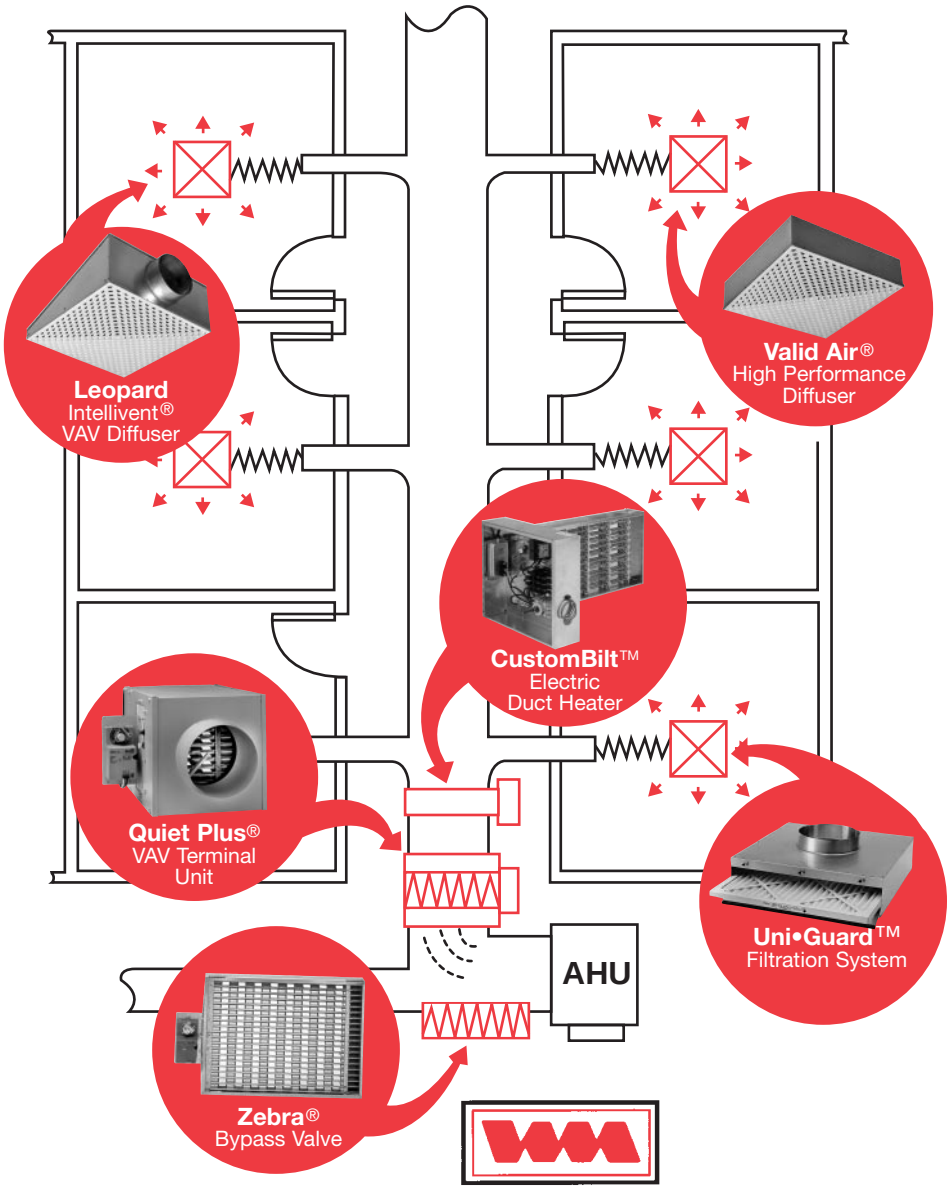
High Performance Diffusers
- Increased Air Circulation
- Draft-Free, Dump-Proof Air Flow

Custombuilt™
Electric Duct Heaters
- Safety Tested, Economical

Quiet Plus®
VAV Terminal Units
- Ultra Quiet Operation
- Precise Control

Zebra®
Precision Air Valves
- Laminar Air Flow
- Low Noise Levels

UNI•GUARD™
Individual Room Filtration System
- Improved IAQ



WARREN
TECHNOLOGY

INDOOR ENVIRONMENTAL SOLUTIONS

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