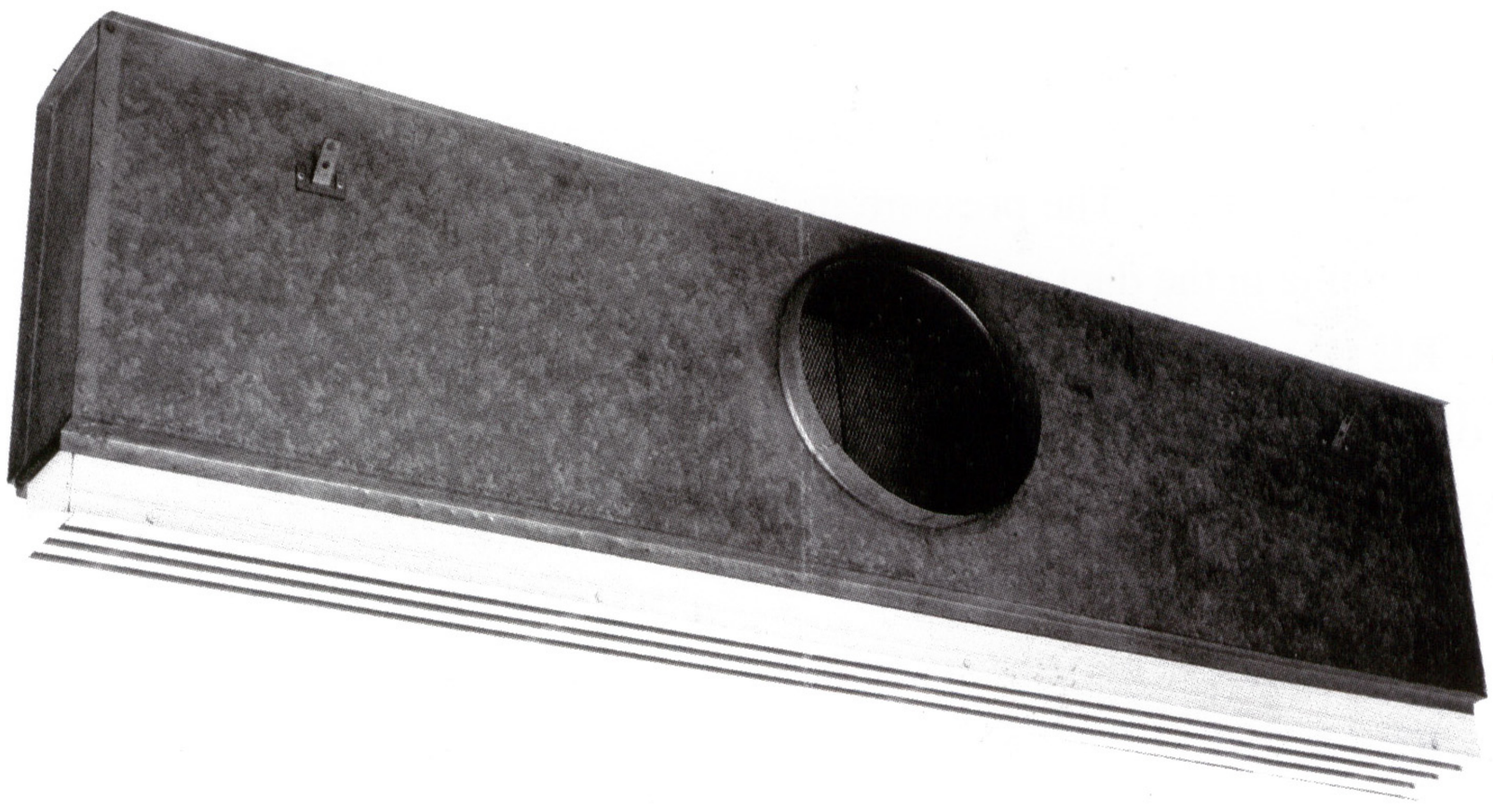
Air Quality Products

Zamzam

Engineering Industries

ALUMINUM

SLOT DIFFUSERS



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GLOSSARY OF TERMS AND DEFINITIONS

GRILLE : A Louvered covering for an opening through which air passes.

DIFFUSER : An outlet discharging supply air in multiple layers with a spreading pattern.

DAMPER : A device used to control the volume of air passing through a duct /or air outlet by varying the cross sectional area.

REGISTER : A grille which is equipped with a damper.

ASPECT RATIO : The ratio of the long side to the short side of a duct section/or air outlet.

CFM : A measure of volume of air in cubic feet per minute .

VELOCITY (V_k) : The velocity in feet per minute is the velocity measured with an Alnor velometer and 2220A jet on the face of the outlet .

TERMINAL VELOCITY (V_t) : The velocity 1N FPM of the air stream at the throw (T) from the air outlet. Values from 75 to 200 FPM are in common use.

EFFECTIVE AREA (A_k) : The calculated area of an outlet based on the average measured velocity at the face vk.

THROW : The distance measured in feet that the air stream travels from the outlet to the point of terminal velocity .

DROP : The vertical distance the air moves between the time it leaves the outlet and the time it reaches the end of its throw.

INDUCTION : Induction is the entrainment of room air by the air ejected from the outlet and in result of the velocity of the outlet air. The air coming directly from the outlet primary air. The room air, which is picked - up, is called secondary air. The entire stream composed of a mixture of primary and secondary air.

WALL / CEILING EFFECT : The tendency of an air stream moving along wall or ceiling surface to remain in contact with that surface. This effect extends the throw and reduces the drop of the air stream.

STATIC PRESSURE (P_s) : The outward force exerted by the air within a duct and /or collar of an air outlet device measured in inches of water .

VELOCITY PRESSURE (P_v) : The pressure in inches of water equated to a velocity that exists for a given air volume in the duct and/or air outlet collar area.

TOTAL PRESSURE (P_t) : The sum of the velocity pressure (Pv) and static pressure (Ps) measured in inches of water .

SOUND POWER LEVEL (LW) : The total sound created by a grille under a specific condition of operation not including specific room acoustic absorption value reductions per frequency octave band. The basis of LW must be stated re 10^{-13} watts, or 10^{-12} watts.

SOUND PRESSURE LEVEL (LP) : Sound pressure measured in the test room or occupied room with a sound level meter referenced to. 0002 microbar. Sound pressure may be measured in octave band with octave band analyzer or total sound pressure in all octaves can be measured.

NOISE CRITERIA : The air outlet device sound rating in pressure level at given condition of operation based on established criteria and specific room acoustic absorption value. Catalog NC rating are base on sound power level (LW) re 10^{-13} watts minus An 18-db room attenuation in all octave bands.

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SLOT DIFFUSER (SD)

SD slot diffusers are designed for installation in the ceiling sidewall or sill and are recommended for supplying heated, ventilated or cooled air and for returning or exhausting room air. Air pattern directional changes through 180° by the integral deflectors permitting pattern adjustment to meet changing requirements. Their reliable performance assures confident use of cooling temperature differentials up to 25° F at predicted low air motion (35 fpm) in the zone of occupancy. When installed in the ceiling **SD diffusers** provide a horizontal air path that is adjustable through 180° in each slot opening. One to ten slot **SD diffusers** can be adjusted to provide one way or two way air patterns by directing the deflector as required to either side. Vertical downward air pattern can be adjusted from all slots. A combination horizontal pattern and vertical down pattern can be effected from a two (or more) **slot diffusers**.

When installed in the side wall near the ceiling or in the sill **SD diffusers** can be adjusted to direct the air path upward to the ceiling, then horizontal along the ceiling.

SD diffusers are fabricated of high-quality aluminum extrusions and are satin anodized. The deflector and damper are coated matte black to accent the slot bolted together for a blemish-free appearance. Keyways and splice plates facilitate hairline butting of 6-foot sections to form continuous lengths.

Volume dampers 2-3 feet long are positioned in each slot and are accessible through the slot opening. They may be used to equalize flow along the diffuser / 90 mitered corner sections are furnished in one piece. Concealed hanger brackets fit in a hemmed duct collar to positively hold the diffuser in ceiling and sidewall installations. **Slot diffusers** used for return or exhaust air are identical to supply sections except the deflectors are removed to increase air capacity.

FEATURES:

- Slot size 3/4 - inch slot.
- One to 8 slots wide for air volumes of 10-250 cfm per foot.
- Extruded aluminum diffuser and accessory construction: mechanical assembly.
- White enamel or satin anodized finish available.
- 180° Adjustable deflector provides positive positioning, constant static pressure, constant outlet area.
- Flush and over lapping margins for use with plaster frames.
- Available butts in continuous lengths with keyway splices.
- Factory cut lengths for precise installation.
- One-piece length to 6 feet.

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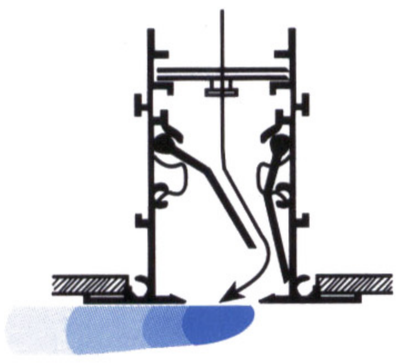
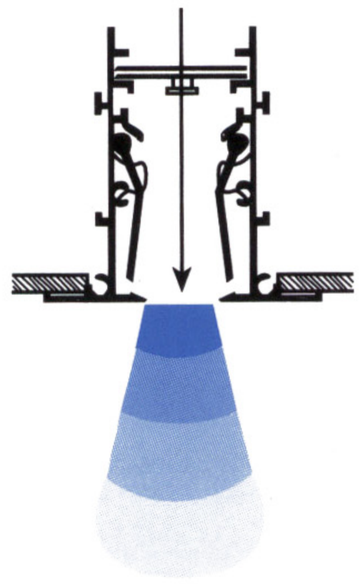
SLOT DIFFUSER TYPE (SD)

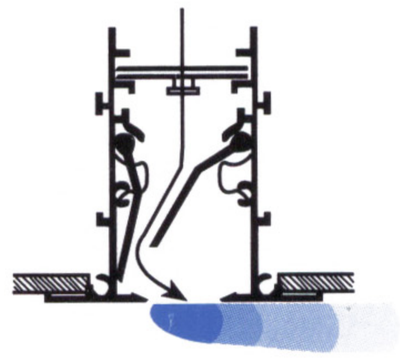
Air Discharge
Horizontal Left



Air Discharge
Vertical

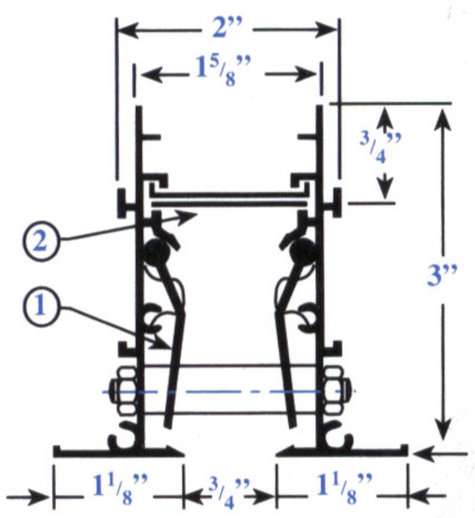


Air Discharge
Horizontal Right

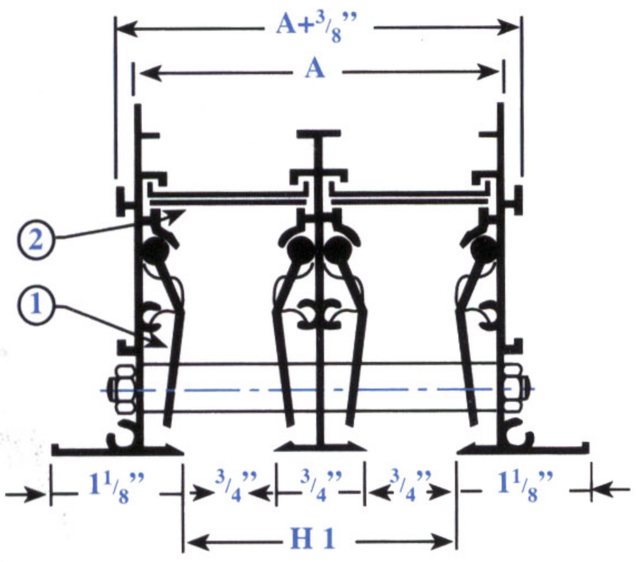


DIMENSION :

SD-ONE SLOT



SD-TWO SLOT

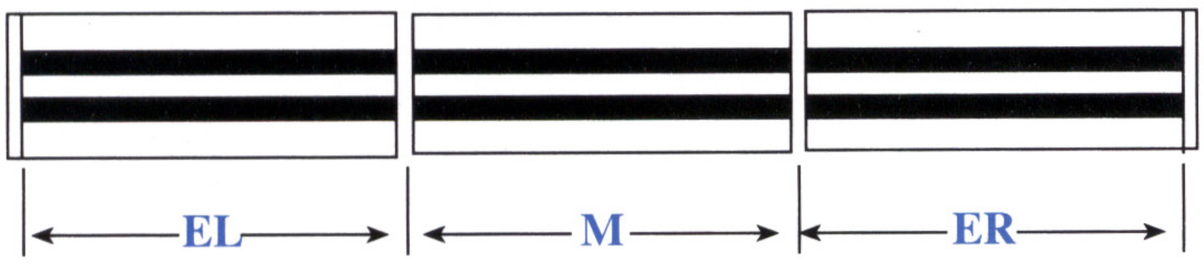


① Air Defiection Blade
② Hit And Miss Damper

SLOT DIFFUSER DIMENSION :

	No. Of Slots							
	1	2	3	4	5	6	7	8
H1 (Inch)	3/4"	2 1/4"	3 3/4"	5 1/4"	6 3/4"	8 1/4"	9 3/4"	11 1/4"
A (Inch)	1 5/8"	3 3/16"	4 3/4"	6 5/16"	7 7/8"	9 7/16"	11 "	12 9/16"

HOW TO SPECIFY :



SD	2	4	E	4	W

Type

Finish : S-Satin Anodized
W-White
O-Other Color

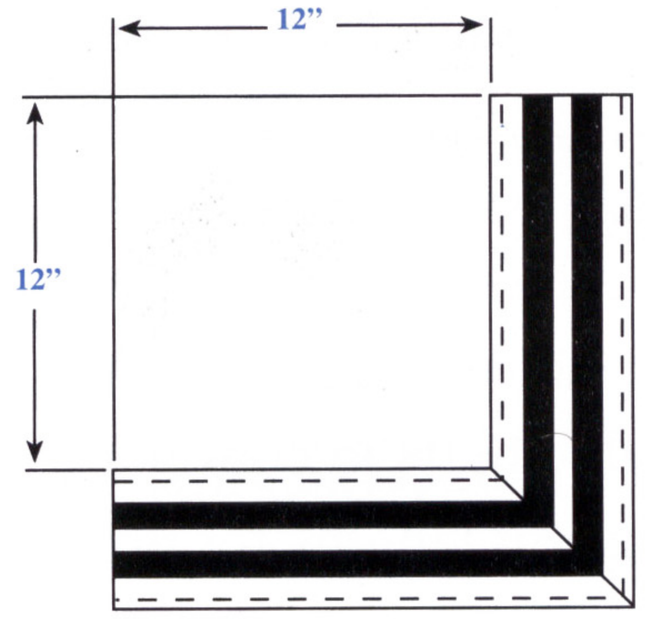
Slot Length (FEET)

\- : Slot Diffuser In One Piece With Endcapc On Both Sides
E : End Piece, With One Endcap (ER Right EL Left)
M : Intermediate Piece, Without Endcape
C : Corner Section

Number Of Slots

0 : Exhaust Or Return, No Deflectors, Dampers
1 : Exhaust Or Return, No Deflectors
3 : Supply, With Deflectors & Dampers
4 : Supply, With Deflectors

CORNER SECTION :



For All Slot Types Coner Sections Are Available. These Are Furnished In One Piece In The Dimensions As Indicated And Are Standard 90°

ENGINEERING PERFORMANCE DATA

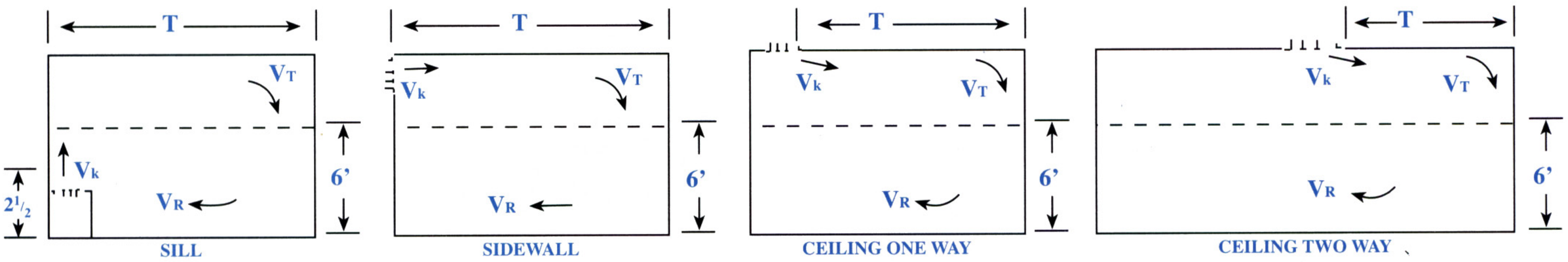


TABLE 1 SUPPLY AIR :

CFM Per Foot In Direction of T	No. Of Slots	Min. Ps In. H_20	Outlet Velocity (V_k) FPM	Throw (T) in Feet			Minimum Ceiling Height in feet		NC
				Ceiling	Sidewall	Sill			
				Min. - Max.	Min. - Max.	Min. - Max.	@ - 18F-ΔT	@ - 25F-ΔT	
10	1	.01	335	4-6	2-4	1-2	7 1/2	9	<20
20	1	.04	670	8-11	6-9	2-3	8	9	20
	2	<.01	400	6-9	4-7	1-2			<20
30	1	.09	1000	10-14	8-12	3-4	9	10	25
	2	.02	600	8-11	6-9	2-3			20
	3	<.01	430	7-9	5-7	1-2			<20
40	1	.16	1340	13-17	11-15	4-6	9	11	30
	2	.04	800	10-14	8-12	3-4			25
	3	.02	575	9-12	7-10	2-3			20
	4	.01	445	8-11	6-9	2-3			<20
50	2	.06	1000	11-15	9-13	4-6	9 1/2	11	25
	3	.03	715	10-14	8-12	3-4			20
	4	.02	555	9-13	7-11	2-4			<20
	5	<.01	415	7-12	6-10	2-3			<20
60	2	.09	1200	13-17	11-15	5-8	9 1/2	12	30
	3	.04	860	12-16	10-14	4-7			25
	4	.02	665	11-15	9-13	3-6			20
	5	.01	500	9-13	7-11	3-4			<20
70	2	.13	1400	15-20	13-18	6-11	10	12	30
	3	.06	1000	13-18	11-16	5-9			25
	4	.03	775	12-16	10-14	4-7			20
	5	.02	585	10-15	8-13	3-5			<20
	6	.01	500	9-14	7-12	2-5			<20
80	3	.07	1140	14-20	12-18	6-11	10 1/2	12 1/2	30
	4	.04	885	13-19	11-17	5-10			25
	5	.03	665	13-17	11-15	4-8			20
	6	.02	575	12-16	10-14	3-7			<20
	7	<.01	500	11-15	9-13	3-6			<20
90	3	.09	1290	17-24	15-21	8-14	11	13	30
	4	.05	1000	16-22	14-20	7-13			25
	5	.03	750	15-20	13-18	6-11			20
	6	.02	645	14-18	12-16	5-9			20
	7	.01	560	13-17	11-15	4-8			<20
100	3	.13	1430	19-26	17-23	10-16	11	13	35
	4	.06	1110	18-25	16-22	9-15			30
	5	.04	830	16-23	14-20	7-13			25
	6	.03	715	14-20	12-18	6-11			20
	7	.02	630	13-19	11-17	5-10			<20
120	4	.09	1330	19-27	17-24	10-16	11 1/2	13	30
	5	.06	1000	18-26	16-23	8-15			25
	6	.04	860	17-25	15-22	7-14			20
	7	.03	750	16-23	14-20	6-12			20
	8	.02	630	15-20	13-18	5-10			<20
140	5	.08	1170	20-30	18-27	10-19	11 1/2	14	30
	6	.06	1000	19-28	17-25	9-17			25
	7	.04	875	18-26	16-23	8-15			25
	8	.03	740	16-24	14-21	6-13			20
160	6	.07	1150	21-32	19-29	10-20	12	15	25
	7	.05	1000	20-30	18-27	9-18			25
	8	.04	840	18-27	16-24	8-16			20
180	6	.09	1290	24-35	21-31	12-22	12	15	30
	7	.07	1130	23-34	20-30	11-21			30
	8	.06	950	20-31	18-28	9-19			25
200	6	.11	1440	26-40	23-36		12	15	30
	7	.08	1250	25-38	22-34	-			30
	8	.06	1110	24-36	21-32				25
250	8	.10	1315	26-46	23-41	-	13	15	35

SYMBOLS
V_t Terminal Velocity in FPM
V_R Room Velocity in FPM
V_K Outlet Velocity in FPM
A_K Outlet Area in Sq. Ft.
A_n Neck Area in Sq. Ft.
P_S Static Pressure inches H_2 0
N_C re 18db Room Attenuation
T Throw in Feet
ΔT Temperature Differential

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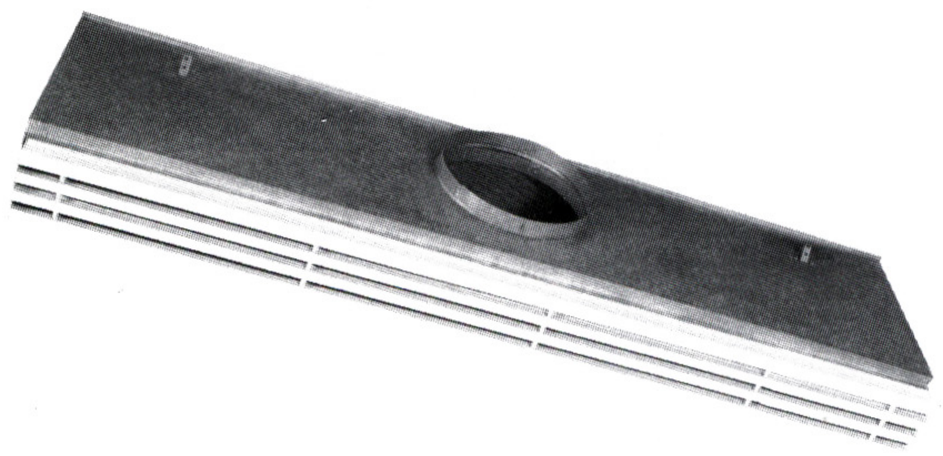
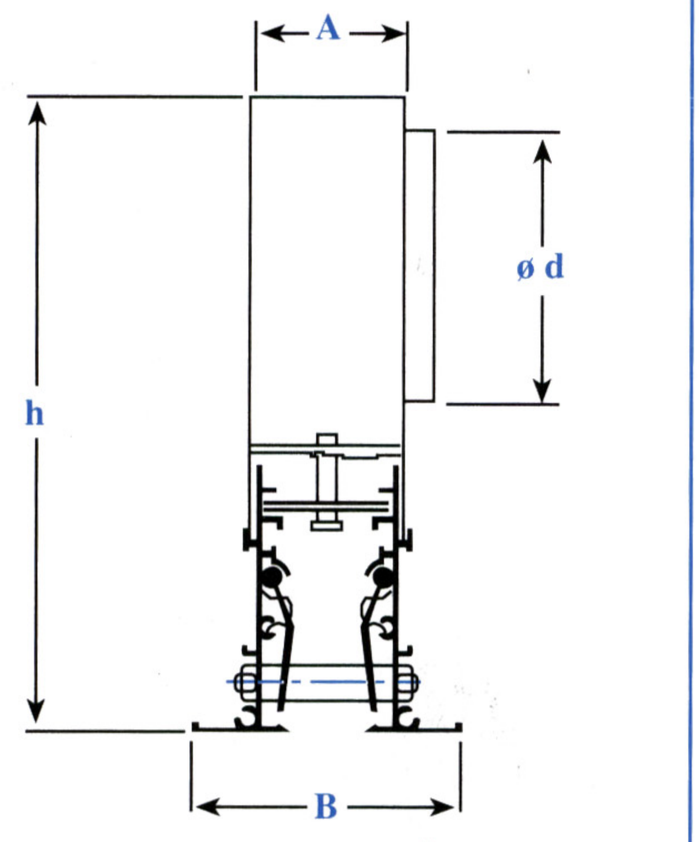
DISTRIBUTION PLENUMS (DP)



Type DP
The distribution plenum are especially designed for an easy mounting of the SD slot diffusers.
Construction : The plenum is made out of galvanized sheet with or without a damper in the inlet collar.
On request the plenum can be insulated.

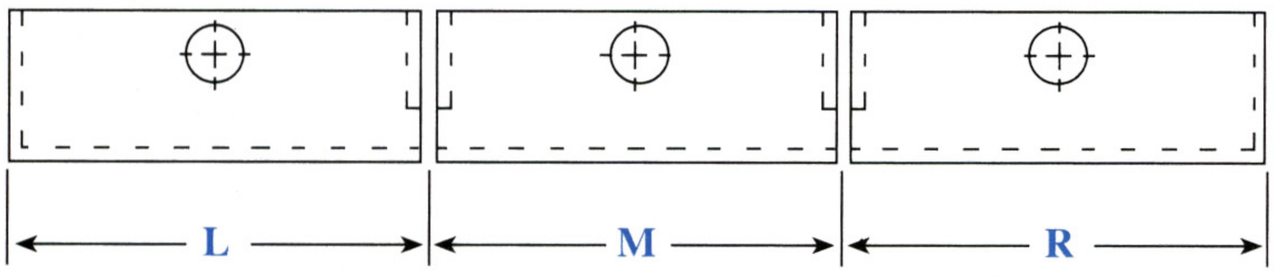
OPTIONAL PLENUM BOX ASSEMBLY



PLENUM BOX DIMENSIONS

No.Of Slots	Length (Feet)					
	4		6		8	
	d	h	d	h	d	h
1	5	12	6	12	8	12
2	6	12	8	12	10	14
3	8	12	10	14	10	16
4	10	14	10	16	12	20
5	10	14	12	20	16	20
6	12	20	16	20	16	20
7	12	20	16	20	16	20
8	14	20	16	20	18	22

HOW TO SPECIFY



DP	0	4	M	1	4

- DP — Type
- 0 : Without Damper In The Inlet Collar; 1 : With Damper In The Inlet Collar
- 4 — Number Of Slots
- \- : One piece; R : End Piece Right; L : End Piece Left; M : Intermediate Piece
- 1 : None Insulated Plenum; 2 : Insulated Plenum
- 4 — Slot Iength In (Feet)

Slots	A	B
1	$1\ ^{5}/_{8}$"	3 "
2	$3\ ^{3}/_{16}$"	$4\ ^{1}/_{2}$"
3	$4\ ^{3}/_{4}$"	6 "
4	$6\ ^{5}/_{16}$"	$7\ ^{1}/_{2}$"
5	$7\ ^{7}/_{8}$"	9 "
6	$9\ ^{7}/_{16}$"	$10\ ^{1}/_{2}$"
7	11 "	12 "
8	$12\ ^{9}/_{16}$"	$13\ ^{1}/_{2}$"

ENGINEERING PERFORMANCE DATA

NOTES:

a. Table 1 based on 4- foot Diffuser length. For longer lengths, correct throw and NC per Table 2.

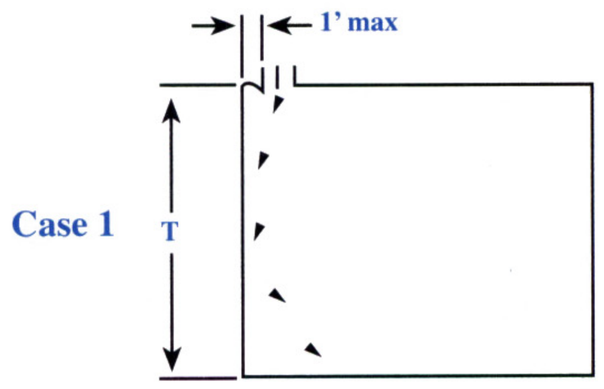
b. For 2-way ceiling throw, proportion cfm and number of slots each direction of T and select from 1-way data, Table 1.

c. When using continuous diffuser lengths with alternate active and inactive sections, a reduction in throw can be obtained by omitting the factors contained in Table 2.

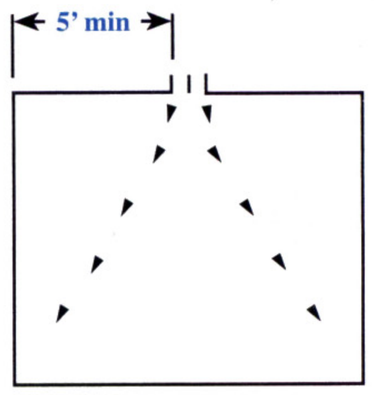
d. Ps constant for horizontal 1-way, 2-way and vertical pattern adjustment.

e. Supply air temperature effect on horizontal throw is shown in Table 3. vertical throw at varying supply air temperatures is shown in Table 4.

f. Terminal velocities (V_t) at the minimum and maximum throw (T) positions are rated at 150 fpm and 100 fpm respectively with corresponding room velocities (V_t) of 50 fpm and 35 fpm.



Case 1



Case 2

TABLE 2 : CONTINUOUS DIFFUSER LENGTH FACTORS

Modify Table 1 By Factors For Diffuser Lengths Above 4 Feet				
Diffuser Length	Throw (T)			NC
	Ceiling Min.-Max.	Sidewall Min.-Max.	Sill Min.-Max.	
4' - 6'	No Change			+ 0
7' - 20'	T x 1.10			+ 5
21' - 100'	T x 1.15			+ 10

TABLE 3 : SUPPLY AIR TEMPERATURE FACTORS

Multiply Throw In Table 1 (Or Factor In Table 2 If Used) By Listed Value			
	@ - 20F ΔT	@ 0F ΔT	@ + 25F ΔT
Ceiling Sidewall Sill	T x 1.0	T x 1.1	T x 1.2

TABLE 4 : VERTICAL DOWN-THROW AND SUPPLY TEMPERATURE FACTORS

Multiply Throw In Table 1 (Or Factor In Table 2 If Used) By Listed Value			
	@ - 20F ΔT Cooling	@ 0F ΔT Ventilating	@ + 25F ΔT Heating
Case 1	T x 1.0	T x .90	T x .60
Case 2	T x 7.0	T x .60	T x .40

RETURN AIR CFM PER FOOT OF LENGTH

No.Of Slots	Ak Area	NC 20-25 Application Non-Ducted		NC 30 Application Ducted		NC 35-40 Application Ducted	
		-.02"Ps	-.03"Ps	-.08"Ps	-.10"Ps	-.15"Ps	-.20"Ps
		CFM	CFM	CFM	CFM	CFM	CFM
1	.04	25	35	50	65	75	90
2	.08	50	60	100	110	135	160
3	.12	80	100	160	180	220	250
4	.16	100	120	200	225	275	320
5	.20	130	160	260	295	360	420
6	.24	160	195	320	360	440	510
7	.28	175	215	350	390	475	550
8	.32	200	245	400	445	545	630

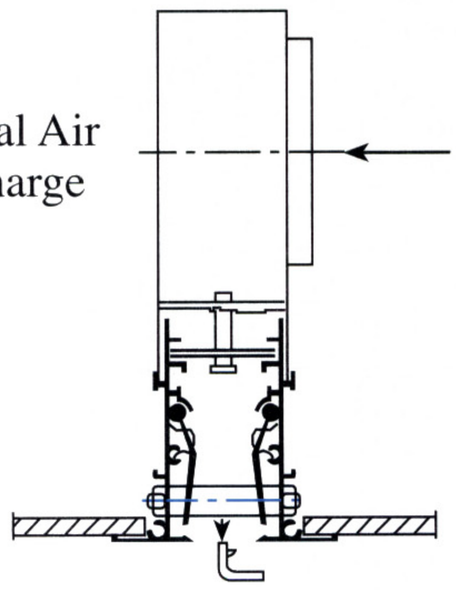
- Capacity Based On Diffuser Without Pattern Controller. When Pattern Controller Is Used cfm Capacities Are Reduced By 65% At Listed Ps. NC. And Ak.

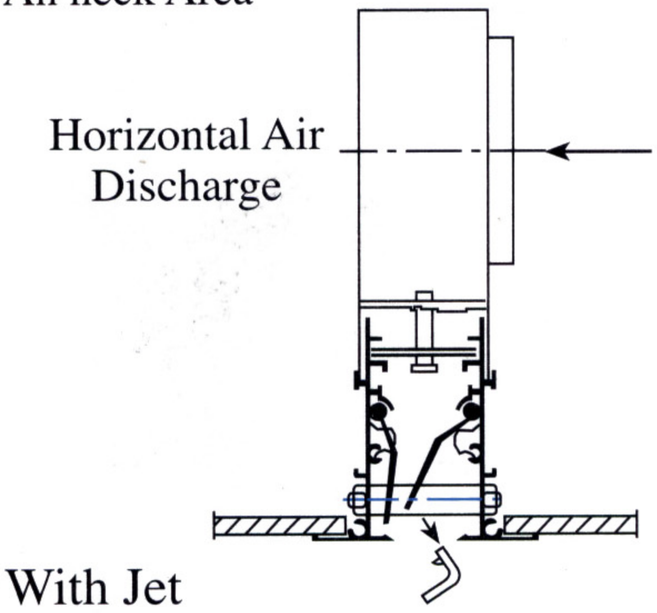
SUPPLY DIFFUSER AREAS PER FOOT OF LENGTH

	No. Of Slots							
	1	2	3	4	5	6	7	8
Ak Area	.03	.05	.07	.09	.12	.14	.16	.19
An Area	.12	.24	.36	.48	.60	.72	.84	.96

■ An neck Area

AIR MEASUREMENT





Velometer With Jet
2220A Or 6070

Ak Constant For Horizontal 1-way, 2-way And Vertical Pattern
CFM=AK X Legth In Feet X Vk