



Models 1274, 12P, 12PFF

Return Air Grille Balancing Data

Neck Area

The cross-sectional area (sq. ft.) of the duct at the point where the diffuser is attached, all dimensions are nominal.

Neck Velocity

Airflow Rate (CFM) divided by Neck Area (sq. ft.) equals Neck Velocity (FPM).

Static Pressure

Static Pressure Drop is given in inches of W.G.

To Determine CFM:

- Use an ALNOR Velometer with No. 2220 or 2220A Tip or a 4" rotating vane anemometer. If a 4" rotating vane anemometer is used, place dial face against perforated plate, and sample in a random manner for at least 1 minute.

Neck Velocity		200	300	400	500	600	650	700	750	800	900	
S.P. Drop w/OBD		.012	.027	.049	.078	.110	.130	.150	.170	.190	.240	
Size	Ak ALNOR	Ak 4" ROT. Vane	Air Capacities - CFM									
10 x 10	.39	.55	140	210	285	350	415	450	485	520	555	625
12 x 12	.46	.79	200	300	400	500	600	650	700	750	800	900
14 x 14	.62	1.07	270	410	545	680	815	885	955	1020	1090	1225
10 x 22	.71	1.21	305	460	610	765	915	995	1070	1150	1220	1375
16 x 16	.82	1.40	355	530	710	890	1065	1155	1245	1335	1425	1600
18 x 18	1.05	1.77	450	675	900	1125	1350	1460	1575	1690	1800	2030
20 x 20	1.28	2.25	555	835	1110	1390	1665	1805	1945	2080	2220	2500
22 x 22	1.55	2.70	670	1010	1345	1680	2020	2180	2350	2520	2690	3020

- Select proper Ak from Table by unit size and instrument used for measuring velocity.
- Determine CFM by the following equation: $CFM = Ak \times \text{Average Velocity}$.

Sample Problem

Determine Return Airflow Rate (CFM) through a 10 x 10, using an ALNOR Velometer with Tip No. 2220 or 2220A.

Solution

- Assume the average of 6 velocity readings taken with an ALNOR Velometer is 2000 FPM.
- From Table, the Area Factor for a 10 x 10 using an ALNOR Velometer is Ak = .39 sq. ft.
- $CFM = Ak \times \text{Average Velocity} = .39 \text{ sq. ft.} \times 2000 \text{ FPM} = 780 \text{ CFM}$

1275 Perforated Face with Flanges

1276 Perforated Removable Face with Open Plenum

Neck Velocity		300	400	500	600	700	800	900	1000	1200	1400
Velocity Pressure		.006	.010	.016	.022	.031	.040	.051	.062	.090	.122
24 x 12 Panel Size	Airflow Rate	450	600	750	900	1050	1200	1350	1500	1800	2100
	Static Pressure	.022	.040	.062	.089	.121	.159	.201	.248	.357	.485
Noise Criteria		<20	<20	<20	21	26	30	35	38	42	47
24 x 24 Panel Size	Airflow Rate	1008	1344	16880	2016	2352	2688	3024	3360	4032	4704
	Static Pressure	.012	.021	.033	.047	.064	.084	.106	.131	.189	.258
Noise Criteria		<20	<20	24	29	33	37	41	44	49	53
24 x 48 Panel Size	Airflow Rate	2109	2812	3515	4218	4921	5624	6327	7030	8436	9842
	Static Pressure	.025	.045	.070	.100	.137	.178	.226	.279	.401	.546
Noise Criteria		22	28	33	37	41	44	47	51	55	60

Notes:

- Tests conducted in accordance with ANSI/ASHRAE 70-1991 at isothermal conditions.
- Tests conducted with a straight rigid inlet condition. Other inlet conditions may alter performance.
- Unit of measure: Neck Velocity = FPM; Velocity Pressure = in. w.c.; Airflow Rate = CFM; Total Pressure = in. w.c. negative.
- Noise Criteria (NC) is based upon 10dB room absorption (Re: 10⁻¹² watts) evaluated at 125 thru 4000 Hz octave bands.
- Flow hoods are recommended for system balancing.

Model 4250-PDSD

Neck Velocity		300	400	500	600	700	800	900	1000	1200
6" Diameter	CFM	60	80	100	120	135	155	175	195	235
	Ps	.007	.013	.020	.029	.037	.048	.062	.076	.110
	NC	<20	<20	<20	20	21	24	28	33	37
An .200	1-Way Throw	4.0	6.0	7.0	8.0	10.0	11.0	13.0	14.0	16.0
	2- and 3-Way Throw	3.5	4.5	6.0	7.0	8.0	9.5	10.5	11.5	13.0
	4-Way Throw	2.5	3.5	4.5	5.0	6.0	7.0	7.5	8.0	9.0
	CFM	105	140	175	210	245	280	315	350	420
8" Diameter	Ps	.011	.019	.030	.043	.059	.077	.097	.120	.173
	NC	<20	<20	<20	20	22	27	31	35	40
	1-Way Throw	6.0	8.0	10.0	11.5	13.0	14.5	16.0	18.0	21.0
An .350	2- and 3-Way Throw	5.0	7.0	8.5	10.5	12.0	13.5	14.5	16.0	19.0
	4-Way Throw	4.0	5.0	6.5	7.5	9.0	10.0	11.5	12.5	14.0
	CFM	165	220	275	325	380	435	490	545	655
	Ps	.015	.026	.040	.046	.076	.100	.125	.115	.225
10" Diameter	NC	<20	<20	<20	21	27	33	37	40	45
	1-Way Throw	8.5	11.0	14.0	16.5	19.0	22.0	25.0	27.0	30.0
	2- and 3-Way Throw	7.5	10.0	12.5	14.5	17.0	19.5	22.0	24.0	27.0
An .540	4-Way Throw	5.0	7.0	8.5	10.5	12.0	14.0	15.5	17.0	20.0
	CFM	235	315	395	470	550	630	705	785	940
	Ps	.016	.029	.045	.068	.086	.113	.140	.170	.250
	NC	<20	<20	<20	20	25	32	35	38	44
12" Diameter	1-Way Throw	10.0	13.0	16.5	19.5	22.0	25.0	27.0	30.0	34.0
	2- and 3-Way Throw	8.5	11.5	14.5	17.5	20.0	22.0	25.0	27.0	30.0
	4-Way Throw	6.0	8.0	10.0	12.0	14.0	16.5	18.0	20.0	23.0
	CFM	320	430	535	640	750	855	960	1070	1285
14" Diameter	Ps	.021	.037	.057	.082	.112	.145	.180	.225	.320
	NC	<20	<20	20	26	31	36	40	44	49
	1-Way Throw	11.0	15.0	19.0	22.5	26.0	29.0	32.0	35.0	39.0
An 1.070	2- and 3-Way Throw	10.0	13.5	17.0	20.0	23.0	26.0	28.0	31.0	35.0
	4-Way Throw	7.0	10.0	12.0	14.4	17.0	19.0	21.0	23.0	27.0

Notes: The use of a balancing hood is recommended to balance the system.

NC is based on 10dB room attenuation (Re: 10⁻¹² watts) ASHRAE 36-72.
Terminal Velocity of 75 FPM

Recommended Noise Criteria and Face Velocity Ranges are on page 98.