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823 Toe-Space Register

827 Toe-Space Grille

Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062
2 x 10	CFM		35	45	50	60	70	75	85
Ak .085	Spread		3.0	5.0	5.0	6.0	7.0	8.0	9.0
	Throw		4.0	4.5	6.0	7.0	8.0	9.0	10.0
2 x 12	CFM	30	40	50	60	70	80	90	100
Ak .100	Spread	3.0	4.0	4.5	5.5	6.5	7.0	8.0	9.0
	Throw	3.5	4.5	6.0	7.0	8.0	9.0	10.0	11.0
2 x 14	CFM	35	45	60	70	80	90	105	115
Ak .115	Spread	3.5	4.0	5.0	7.0	7.0	8.0	9.0	10.0
	Throw	3.5	4.5	6.0	8.0	8.0	9.5	10.5	12.0
4 x 8	CFM	40	50	65	80	90	105	115	130
Ak .130	Spread	3.0	4.0	5.0	6.5	7.5	8.5	9.5	11.0
	Throw	4.0	4.5	6.0	7.5	8.5	10.0	11.0	13.0
4 x 10	CFM	50	70	85	100	120	135	155	170
Ak .170	Spread	4.5	5.0	6.5	7.5	9.0	10.0	11.5	13.0
	Throw	4.0	6.0	8.0	10.0	11.0	12.5	14.0	15.5
4 x 12	CFM	60	80	100	120	140	160	175	195
Ak .195	Spread	5.0	6.5	8.0	9.5	11.5	13.0	14.5	16.0
	Throw	4.0	5.5	7.0	8.0	9.5	11.0	12.0	13.0
4 x 14	CFM	70	90	115	140	160	185	205	230
Ak .230	Spread	5.5	7.0	8.5	10.0	12.0	13.5	15.5	17.0
	Throw	4.5	5.5	7.0	8.5	10.0	11.5	12.5	14.0
6 x 10	CFM	70	95	120	145	170	190	215	240
Ak .240	Spread	5.5	7.0	8.0	10.0	12.0	14.0	15.0	17.0
	Throw	4.0	5.5	7.0	8.5	10.0	11.0	12.5	14.0
6 x 12	CFM	85	115	140	170	200	230	255	285
Ak .285	Spread	6.0	7.5	9.0	11.0	13.0	15.0	17.0	19.0
	Throw	4.5	6.0	7.5	9.0	10.0	12.0	14.0	16.0
6 x 14	CFM	100	130	165	200	230	265	300	330
Ak .330	Spread	6.5	8.0	9.0	12.0	14.0	16.5	18.0	20.0
	Throw	4.5	6.5	8.0	9.5	11.0	13.0	15.0	17.0

Terminal Velocity of 50 FPM

470 Baseboard Diffuser (18")

Face Velocity	300	400	500	600	700	800	900	1000	1200	1400
Pressure Loss	.006	.010	.016	.022	.031	.040	.050	.062	.090	.122
18" Ak .144	CFM	45	60	70	85	100	115	130	145	175
	Throw	11	14	17	20	24	27	31	35	42
	Spread	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5

Tests conducted with a 2 1/4" x 12" register boot.
Terminal Velocity of 50 FPM

72 Supply Air Grille

77 Return Air Grille

Airflow (CFM)		300	400	500	600	700	800
2 feet	CFM	55	75	95	110	130	150
27 sq. in. Ak .187	Spread	6.5	7.5	8.0	8.5	9.0	11.0
	Throw	7.0	8.0	9.5	10.5	12.0	13.0
	Pressure Loss	.009	.017	.029	.038	.054	.072
4 feet	CFM	110	150	185	225	260	300
54 sq. in. Ak .375	Spread	12.0	15.0	17.5	19.0	20.0	21.0
	Throw	7.5	9.0	10.0	11.5	12.5	13.5
	Pressure Loss	.031	.058	.090	.124	.178	.224

Terminal Velocity of 50 FPM

649 Baseboard Register

Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062
8 x 4 Ak .110	CFM	33	44	55	66	77	88	100	110
	Throw	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
10 x 4 Ak .135	CFM	40	54	67	80	95	110	120	135
	Throw	6.5	8.5	10.5	12.5	15.0	17.5	19.0	21.0
12 x 4 and 8 x 6 Ak .180	CFM	55	72	90	108	125	145	162	180
	Throw	7.5	10.0	12.5	15.0	17.5	20.5	23.0	25.0
10 x 6 Ak .230	CFM	70	92	115	140	160	185	205	230
	Throw	9.0	11.5	14.5	17.5	20.0	23.0	25.5	29.0
12 x 6 Ak .290	CFM	85	115	145	175	205	230	260	290
	Throw	10.0	13.0	17.0	20.0	23.5	26.5	30.0	33.0
14 x 6 Ak .340	CFM	102	135	170	205	240	270	305	340
	Throw	11.0	14.5	18.0	22.0	25.5	29.0	32.5	36.0

Terminal Velocity of 75 FPM

AL833 Aluminum Floor Diffuser

Face Velocity		300		400		500		600		700		800		900		1000	
Pressure Loss		.006		.010		.016		.022		.031		.040		.050		.062	
		H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C
2 1/4 x 10	CFM							35	35	40	40	45	50	50	55	55	60
Ak .055 Heating	Spread							3.5	3.5	4.5	4.5	5.0	5.0	5.5	5.5	5.5	6.0
Ak .060 Cooling	Throw							4.0	6.0	5.5	7.5	6.0	8.5	6.5	9.0	7.0	10.0
2 1/4 x 12	CFM					35	35	40	45	45	50	55	60	60	65	65	75
Ak .067 Heating	Spread					3.5	4.0	4.0	4.5	4.5	5.0	5.0	5.5	5.5	6.0*	6.0*	6.0*
Ak .074 Cooling	Throw					4.0	6.0	5.0	6.5	5.5	7.5	6.0	9.0	7.0	10.0	8.0	11.0
2 1/4 x 14	CFM			30	35	40	45	45	50	55	60	65	70	70	80	80	85
Ak .079 Heating	Spread			3.0	4.0	4.0	4.5	4.5	5.0	5.5	5.5	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*
Ak .087 Cooling	Throw			3.5	4.5	5.0	6.0	5.5	7.0	6.5	8.5	7.5	10.0	8.0	11.5	8.5	12.5
4 x 10	CFM	35	40	45	50	55	65	70	75	80	90	90	100	105	115	115	125
Ak .115 Heating	Spread	3.0	3.5	3.5	4.5	4.5	5.5	5.5	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*
Ak .125 Cooling	Throw	3.0	4.5	4.0	6.0	5.5	7.5	6.5	9.5	7.5	10.5	8.5	11.5	9.5	13.5	11.5	15.0
4 x 12	CFM	40	50	55	65	70	80	85	95	100	110	115	130	125	145	140	160
Ak .140 Heating	Spread	3.0	4.0	4.0	5.0	5.0	5.5	5.5	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*
Ak .160 Cooling	Throw	3.5	5.0	4.5	6.5	6.0	8.5	7.5	10.0	11.0	11.5	10.0	13.0	11.0	15.0	12.0	17.0
4 x 14	CFM	50	55	65	70	80	90	100	110	115	125	130	145	150	160	165	180
Ak .165 Heating	Spread	3.5	4.5	4.5	5.0	5.0	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*
Ak .180 Cooling	Throw	4.0	5.5	5.5	7.0	6.5	9.5	8.0	11.0	10.0	12.5	11.0	14.0	12.0	15.5	13.5	17.5
6 x 10	CFM	60	60	75	80	95	105	115	125	135	145	150	165	170	185	190	205
Ak .190 Heating	Spread	3.5	4.5	4.5	5.5	5.5	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*
Ak .205 Cooling	Throw	4.5	6.0	5.5	7.5	7.0	9.5	8.5	11.0	10.0	13.0	11.0	15.0	12.5	16.5	14.0	18.5
6 x 12	CFM	70	75	90	100	115	125	135	150	160	175	180	200	205	225	225	250
Ak .225 Heating	Spread	4.0	5.0	5.0	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*
Ak .250 Cooling	Throw	5.0	6.5	6.0	8.5	8.0	10.5	9.0	12.0	11.0	15.0	12.5	16.5	14.0	18.5	16.0	21.0
6 x 14	CFM	80	90	105	120	135	150	160	180	185	210	210	240	240	270	265	300
Ak .265 Heating	Spread	4.5	5.0	5.0	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*	6.0*
Ak .300 Cooling	Throw	5.0	7.0	7.0	9.5	8.5	11.5	10.0	13.5	12.0	16.0	13.5	18.0	16.0	20.5	17.5	23.5

The spread shown for the heating mode is for a valve setting of 22° left deflection. *The maximum value given for spread for heating is that which occurs at the ceiling height (8 feet). The cooling spread is a straight vertical column of air and is not shown. Throw and spread values are based on a terminal velocity of 50 FPM.



652 Baseboard Return Grille

Average Face Velocity*		300	400	500	600	700
10 x 6	CFM	115	150	190	225	265
Ak .38	Pt	.013	.023	.037	.052	.072
12 x 6	CFM	135	180	230	280	320
Ak .46	Pt	.013	.022	.035	.051	.070
10 x 8	CFM	150	205	255	305	355
Ak .51	Pt	.012	.022	.035	.050	.068
14 x 6	CFM	160	210	265	320	370
Ak .53	Pt	.012	.022	.035	.050	.068
12 x 8	CFM	180	245	305	365	430
Ak .61	Pt	.012	.022	.034	.049	.066
14 x 8	CFM	215	288	360	430	505
Ak .72	Pt	.012	.021	.033	.047	.065
20 x 6	CFM	225	300	375	450	525
Ak .75	Pt	.012	.021	.033	.047	.064
16 x 8	CFM	250	330	415	500	580
Ak .83	Pt	.012	.021	.033	.046	.063
14 x 10 and 24 x 6	CFM	275	365	460	550	640
Ak .92	Pt	.011	.020	.032	.045	.062
14 x 12	CFM	320	430	540	650	755
Ak 1.08	Pt	.011	.020	.031	.045	.060
30 x 6	CFM	335	445	560	670	780
Ak 1.12	Pt	.011	.020	.031	.044	.060
24 x 8	CFM	365	485	605	730	850
Ak 1.21	Pt	.011	.020	.031	.044	.059
20 x 10	CFM	375	500	630	750	880
Ak 1.25	Pt	.011	.019	.030	.043	.059
24 x 10 and 30 x 8	CFM	450	600	750	890	1040
Ak 1.50	Pt	.011	.019	.030	.042	.057
24 x 12	CFM	550	730	910	1100	1270
Ak 1.82	Pt	.010	.018	.029	.041	.056
30 x 10	CFM	575	760	960	1150	1330
Ak 1.91	Pt	.010	.018	.029	.041	.055
30 x 12	CFM	680	900	1130	1350	1570
Ak 2.25	Pt	.010	.018	.028	.040	.054

*Velocity measured 1" from face

60GH / 60GHFF / 60GH7 Stamped-Face Return Grille

Face Velocity*		300	400	500	600	700
6 x 4	CFM	34	45	56	68	79
Ak .110	Ps	.020	.035	.054	.079	.108
6 x 6	CFM	50	67	84	101	117
Ak .170	Ps	.019	.035	.054	.079	.107
8 x 4	CFM	45	60	75	90	105
Ak .150	Ps	.019	.035	.054	.079	.108
8 x 6	CFM	67	89	111	134	156
Ak .220	Ps	.019	.035	.054	.079	.107
8 x 8	CFM	89	118	148	178	207
Ak .300	Ps	.019	.035	.054	.078	.107
10 x 4	CFM	56	74	93	112	130
Ak .190	Ps	.019	.035	.054	.079	.107
10 x 6	CFM	83	111	139	167	194
Ak .280	Ps	.019	.035	.054	.078	.107
10 x 8	CFM	111	147	184	221	258
Ak .370	Ps	.019	.034	.054	.078	.106
10 x 10	CFM	138	184	230	276	322
Ak .460	Ps	.019	.034	.054	.078	.106
12 x 6	CFM	100	133	166	199	233
Ak .330	Ps	.019	.034	.054	.078	.106
12 x 8	CFM	132	177	221	265	309
Ak .440	Ps	.019	.034	.054	.078	.106
12 x 10	CFM	165	220	275	330	385
Ak .550	Ps	.019	.034	.053	.077	.105
12 x 12	CFM	197	263	329	395	461
Ak .660	Ps	.019	.034	.053	.077	.104
12 x 18	CFM	294	392	491	589	687
Ak .980	Ps	.019	.034	.053	.075	.102
14 x 6	CFM	116	155	193	232	271
Ak .390	Ps	.019	.034	.054	.078	.106
14 x 8	CFM	154	205	257	308	360
Ak .510	Ps	.019	.034	.053	.077	.105
14 x 10	CFM	192	256	320	384	448
Ak .640	Ps	.019	.034	.053	.077	.104
14 x 12	CFM	230	306	383	460	536
Ak .770	Ps	.019	.034	.053	.076	.103
14 x 14	CFM	267	357	446	535	624
Ak .890	Ps	.019	.034	.053	.075	.103

Face Velocity*		300	400	500	600	700
14 x 18	CFM	343	457	571	685	800
Ak 1.140	Ps	.019	.033	.052	.074	.101
16 x 6	CFM	132	177	221	265	309
Ak .440	Ps	.019	.034	.054	.078	.106
16 x 8	CFM	176	234	293	352	410
Ak .590	Ps	.019	.034	.053	.077	.105
16 x 10	CFM	219	292	365	438	511
Ak .730	Ps	.019	.034	.053	.076	.104
16 x 12	CFM	262	349	437	524	612
Ak .870	Ps	.019	.034	.053	.076	.103
16 x 14	CFM	305	407	509	610	712
Ak 1.020	Ps	.019	.034	.052	.075	.102
16 x 16	CFM	348	464	580	696	812
Ak 1.160	Ps	.019	.033	.052	.074	.101
16 x 24	CFM	519	692	865	1038	1211
Ak 1.730	Ps	.018	.033	.051	.071	.097
16 x 25	CFM	540	720	900	1081	1261
Ak 1.800	Ps	.018	.033	.051	.071	.097
18 x 6	CFM	149	198	248	297	347
Ak .500	Ps	.019	.034	.054	.077	.105
18 x 18	CFM	439	585	732	878	1024
Ak 1.460	Ps	.019	.033	.052	.073	.099
18 x 24	CFM	583	777	971	1166	1360
Ak 1.940	Ps	.018	.032	.051	.070	.096
20 x 6	CFM	165	220	275	330	385
Ak .550	Ps	.019	.034	.053	.077	.105
20 x 10	CFM	273	364	455	546	637
Ak .910	Ps	.019	.034	.053	.075	.103
20 x 12	CFM	327	435	544	653	762
Ak 1.090	Ps	.019	.033	.052	.074	.101
20 x 14	CFM	380	507	634	760	887
Ak 1.270	Ps	.019	.033	.052	.074	.100
20 x 20	CFM	540	720	900	1081	1261
Ak 1.800	Ps	.018	.033	.051	.071	.097
20 x 24	CFM	647	862	1078	1293	1509
Ak 2.160	Ps	.018	.032	.050	.069	.094
20 x 25	CFM	673	898	1122	1346	1571
Ak 2.240	Ps	.018	.032	.050	.069	.094

Face Velocity*		300	400	500	600	700
24 x 4	CFM	132	177	221	265	309
Ak .440	Ps	.019	.034	.054	.078	.106
24 x 6	CFM	197	263	329	395	461
Ak .660	Ps	.019	.034	.053	.077	.104
24 x 8	CFM	262	349	437	524	612
Ak .870	Ps	.019	.034	.053	.076	.103
24 x 10	CFM	327	435	544	653	762
Ak 1.090	Ps	.019	.033	.052	.074	.101
24 x 12	CFM	391	521	651	782	912
Ak 1.300	Ps	.019	.033	.052	.073	.100
24 x 14	CFM	455	607	758	910	1062
Ak 1.520	Ps	.019	.033	.051	.072	.098
24 x 24	CFM	774	1032	1290	1548	1806
Ak 2.580	Ps	.018	.032	.049	.067	.091
30 x 4	CFM	165	220	275	330	385
Ak .550	Ps	.019	.034	.053	.077	.105
30 x 6	CFM	246	328	410	492	574
Ak .820	Ps	.019	.034	.053	.076	.103
30 x 8	CFM	327	435	544	653	762
Ak 1.090	Ps	.019	.033	.052	.074	.101
30 x 10	CFM	407	543	678	814	949
Ak 1.360	Ps	.019	.033	.052	.073	.100
30 x 12	CFM	487	649	812	974	1136
Ak 1.620	Ps	.018	.033	.051	.072	.098
30 x 14	CFM	567	756	945	1134	1323
Ak 1.890	Ps	.018	.032	.051	.071	.096
30 x 18	CFM	726	968	1210	1452	1694
Ak 2.420	Ps	.018	.032	.050	.068	.092
30 x 20	CFM	806	1074	1343	1611	1880
Ak 2.690	Ps	.018	.031	.049	.067	.091
30 x 24	CFM	964	1286	1607	1928	2250
Ak 3.210	Ps	.017	.031	.048	.064	.087
30 x 30	CFM	1201	1602	2002	2403	2803
Ak 4.000	Ps	.017	.030	.046	.060	.082
36 x 8	CFM	391	521	651	782	912
Ak 1.300	Ps	.019	.033	.052	.073	.100

*Tested without filters. Typical disposable 1-inch capacity is 2 CFM per square inch of gross filter area. Recommended velocity is 300-400 FPM. Velocities higher than 500 FPM will decrease filter performance, increase flow resistance, and possibly blow off agglomerates of collected dirt. Velocity measured 1" from face.

Recommended Noise Criteria and Face Velocity Ranges are on page 96.

Series 500/Series CB Stamped-Face Supply Register

501/CB1

Face Velocity		300	400	500	600	700	800	900	1000
6 x 4 Ak .09	CFM	30	35	45	55	65	75	85	95
	Ps	.007	.013	.020	.029	.040	.052	.066	.081
	Throw	6.0	8.0	9.0	11.0	13.0	15.0	17.0	19.0
8 x 4 Ak .11	CFM	30	45	55	65	75	85	95	105
	Ps	.007	.013	.021	.030	.041	.053	.067	.083
	Throw	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
8 x 6 Ak .12	CFM	35	50	60	75	85	100	110	125
	Ps	.007	.013	.021	.030	.040	.053	.067	.082
	Throw	7.0	9.0	11.0	13.0	15.0	17.0	19.0	22.0
10 x 4 Ak .12	CFM	35	50	60	70	85	95	110	120
	Ps	.008	.013	.021	.030	.041	.054	.068	.084
	Throw	6.0	9.0	11.0	13.0	15.0	17.0	19.0	21.0
10 x 6 Ak .14	CFM	40	55	70	80	95	110	120	135
	Ps	.008	.014	.021	.031	.042	.054	.069	.085
	Throw	7.0	9.0	11.0	14.0	16.0	18.0	20.0	23.0
10 x 8 Ak .19	CFM	55	75	95	115	130	150	170	190
	Ps	.008	.014	.022	.031	.043	.056	.071	.087
	Throw	8.0	11.0	14.0	16.0	19.0	21.0	24.0	27.0
10 x 10 Ak .24	CFM	70	95	120	145	170	190	215	240
	Ps	.008	.014	.021	.030	.042	.054	.069	.085
	Throw	8.0	11.0	14.0	16.0	19.0	22.0	24.0	27.0
12 x 6 Ak .18	CFM	55	75	95	110	130	150	165	185
	Ps	.008	.015	.023	.033	.045	.059	.074	.091
	Throw	7.0	9.0	11.0	13.0	16.0	18.0	20.0	22.0
12 x 8 Ak .22	CFM	65	85	110	130	150	170	195	215
	Ps	.008	.014	.022	.032	.043	.056	.071	.088
	Throw	8.0	11.0	13.0	16.0	19.0	21.0	24.0	26.0
12 x 12 Ak .30	CFM	90	120	150	180	210	235	265	295
	Ps	.008	.014	.022	.032	.044	.057	.073	.090
	Throw	10.0	13.0	16.0	19.0	22.0	25.0	28.0	31.0
14 x 6 Ak .22	CFM	65	85	110	130	150	175	195	215
	Ps	.008	.014	.022	.031	.042	.055	.070	.087
	Throw	7.0	9.0	12.0	14.0	16.0	19.0	21.0	23.0
14 x 8 Ak .24	CFM	75	95	120	145	170	195	220	240
	Ps	.008	.014	.022	.032	.043	.057	.072	.089
	Throw	9.0	12.0	14.0	17.0	20.0	23.0	26.0	29.0
16 x 6 Ak .22	CFM	65	85	110	130	150	175	195	215
	Ps	.008	.014	.022	.032	.043	.056	.071	.088
	Throw	9.0	12.0	14.0	17.0	20.0	23.0	26.0	28.0
16 x 8 Ak .25	CFM	75	100	125	150	175	200	225	250
	Ps	.008	.015	.023	.033	.045	.059	.075	.092
	Throw	9.0	12.0	15.0	18.0	21.0	25.0	28.0	31.0

502H/CB2

Face Velocity		300	400	500	600	700	800	900	1000
6 x 4 Ak .09	CFM	25	35	40	5	6	70	75	85
	Ps	.012	.021	.033	.048	.065	.085	.108	.134
	Throw	3.0	4.0	5.0	6.0	7.0	7.0	8.0	9.0
8 x 4 Ak .11	CFM	30	40	50	65	75	85	95	105
	Ps	.012	.021	.033	.047	.064	.083	.106	.131
	Throw	3.0	4.0	6.0	7.0	8.0	9.0	10.0	11.0
8 x 6 Ak .13	CFM	40	50	65	75	90	100	115	125
	Ps	.012	.020	.032	.046	.063	.082	.104	.128
	Throw	4.0	5.0	6.0	7.0	8.0	9.0	11.0	12.0
10 x 4 Ak .13	CFM	35	50	60	75	85	100	110	125
	Ps	.012	.021	.032	.046	.063	.082	.104	.128
	Throw	3.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0
10 x 6 Ak .17	CFM	50	65	85	100	115	130	150	165
	Ps	.011	.020	.031	.045	.062	.080	.102	.126
	Throw	4.0	6.0	7.0	8.0	9.0	11.0	12.0	13.0
10 x 8 Ak .23	CFM	65	90	110	135	155	180	200	225
	Ps	.011	.020	.031	.044	.061	.079	.100	.124
	Throw	5.0	7.0	8.0	10.0	11.0	13.0	14.0	15.0
10 x 10 Ak .27	CFM	80	110	135	160	190	215	240	270
	Ps	.011	.020	.031	.044	.060	.078	.099	.123
	Throw	5.0	7.0	9.0	10.0	12.0	13.0	15.0	17.0
12 x 6 Ak .21	CFM	60	80	100	125	145	165	15	205
	Ps	.011	.020	.031	.045	.061	.079	.101	.124
	Throw	5.0	6.0	8.0	9.0	10.0	12.0	13.0	15.0
12 x 8 Ak .27	CFM	80	105	130	160	185	210	240	265
	Ps	.011	.020	.031	.044	.060	.079	.099	.123
	Throw	5.0	7.0	9.0	10.0	12.0	14.0	15.0	17.0
12 x 12 Ak .39	CFM	115	155	190	230	270	310	345	385
	Ps	.011	.019	.030	.044	.059	.078	.098	.121
	Throw	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
14 x 6 Ak .24	CFM	70	95	115	140	165	190	210	235
	Ps	.011	.020	.031	.044	.060	.079	.100	.123
	Throw	5.0	7.0	8.0	10.0	11.0	13.0	14.0	16.0
14 x 8 Ak .31	CFM	90	120	150	185	215	245	275	305
	Ps	.011	.020	.031	.044	.060	.078	.099	.122
	Throw	6.0	8.0	9.0	11.0	13.0	14.0	16.0	18.0
16 x 6 Ak .27	CFM	80	105	132	160	185	210	240	265
	Ps	.011	.020	.031	.044	.060	.079	.099	.123
	Throw	5.0	7.0	8.0	10.0	12.0	13.0	15.0	16.0
16 x 8 Ak .35	CFM	105	140	170	205	240	275	310	345
	Ps	.011	.019	.030	.044	.060	.078	.098	.122
	Throw	6.0	8.0	10.0	11.0	13.0	15.0	17.0	19.0

Terminal Velocity of 75 FPM



Series 500/Series CB Stamped-Face Supply Register

502 Standard

Face Velocity		300	400	500	600	700	800	900	1000
6 x 4 Ak .06	CFM	20	25	30	40	45	50	60	65
	Ps	.017	.030	.047	.068	.092	.121	.153	.189
	Throw	3.0	4.0	4.0	5.0	6.0	7.0	8.0	9.0
8 x 4 Ak .09	CFM	25	35	45	50	60	70	80	85
	Ps	.013	.024	.037	.054	.073	.095	.121	.149
	Throw	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
8 x 6 Ak .13	CFM	40	50	65	75	90	100	115	125
	Ps	.012	.021	.033	.048	.065	.085	.108	.133
	Throw	4.0	5.0	6.0	7.0	9.0	10.0	11.0	12.0
10 x 4 Ak .11	CFM	30	45	55	65	75	85	95	110
	Ps	.012	.021	.033	.047	.064	.084	.106	.131
	Throw	3.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0
10 x 6 Ak .17	CFM	50	65	85	100	115	130	150	165
	Ps	.009	.016	.025	.036	.050	.065	.082	.101
	Throw	4.0	6.0	7.0	8.0	10.0	11.0	13.0	14.0
10 x 8 Ak .22	CFM	65	85	110	130	150	175	195	215
	Ps	.009	.017	.026	.037	.051	.066	.084	.103
	Throw	5.0	7.0	8.0	10.0	11.0	13.0	14.0	16.0
10 x 10 Ak .27	CFM	80	110	135	160	190	215	240	270
	Ps	.009	.016	.025	.036	.049	.064	.081	.100
	Throw	6.0	7.0	9.0	11.0	13.0	14.0	16.0	18.0
12 x 6 Ak .19	CFM	60	80	95	115	135	155	175	195
	Ps	.010	.017	.026	.038	.052	.068	.086	.106
	Throw	5.0	6.0	8.0	9.0	11.0	12.0	14.0	15.0
12 x 8 Ak .26	CFM	80	105	130	155	180	205	235	260
	Ps	.009	.016	.025	.036	.049	.064	.081	.100
	Throw	5.0	7.0	9.0	11.0	12.0	14.0	16.0	17.0
12 x 12 Ak .39	CFM	115	155	195	235	270	310	350	390
	Ps	.008	.015	.023	.034	.046	.060	.076	.094
	Throw	4.0	5.0	7.0	8.0	9.0	11.0	12.0	13.0
14 x 6 Ak .23	CFM	70	90	115	135	160	180	205	225
	Ps	.009	.016	.026	.037	.050	.065	.083	.102
	Throw	5.0	7.0	8.0	10.0	11.0	13.0	15.0	16.0
14 x 8 Ak .30	CFM	90	120	150	180	210	240	270	300
	Ps	.009	.016	.024	.035	.048	.062	.079	.097
	Throw	6.0	8.0	10.0	11.0	13.0	15.0	17.0	19.0
16 x 6 Ak .26	CFM	80	105	130	155	180	205	235	260
	Ps	.009	.016	.025	.036	.049	.064	.081	.100
	Throw	5.0	7.0	9.0	11.0	12.0	14.0	16.0	17.0
16 x 8 Ak .34	CFM	105	140	175	205	240	275	310	345
	Ps	.009	.015	.024	.034	.047	.061	.077	.095
	Throw	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0

Terminal Velocity of 75 FPM

503/CB3

Face Velocity		300	400	500	600	700	800	900	1000
6 x 4 Ak .08	CFM	25	35	20	50	60	65	75	85
	Ps	.016	.029	.046	.066	.090	.117	.148	.183
	Throw	4.0	6.0	7.0	8.0	10.0	11.0	13.0	14.0
8 x 4 Ak .10	CFM	30	40	50	65	75	85	95	105
	Ps	.015	.027	.041	.060	.081	.106	.134	.166
	Throw	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
8 x 6 Ak .14	CFM	40	55	70	85	100	115	125	140
	Ps	.015	.026	.041	.059	.080	.104	.132	.163
	Throw	6.0	7.0	9.0	11.0	13.0	15.0	16.0	18.0
10 x 4 Ak .12	CFM	35	50	60	75	85	100	110	125
	Ps	.014	.025	.039	.056	.076	.100	.126	.156
	Throw	5.0	7.0	9.0	10.0	12.0	14.0	15.0	17.0
10 x 6 Ak .17	CFM	50	70	85	105	120	140	155	175
	Ps	.015	.027	.043	.062	.084	.110	.139	.171
	Throw	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
10 x 8 Ak .22	CFM	65	90	110	135	155	180	200	225
	Ps	.012	.022	.034	.049	.066	.086	.109	.135
	Throw	7.0	9.0	12.0	14.0	16.0	18.0	21.0	23.0
10 x 10 Ak .31	CFM	95	125	155	185	220	250	280	310
	Ps	.015	.027	.043	.062	.084	.110	.139	.172
	Throw	8.0	11.0	14.0	16.0	19.0	22.0	24.0	27.0
12 x 6 Ak .21	CFM	60	85	105	125	145	165	185	205
	Ps	.012	.022	.034	.049	.066	.086	.109	.135
	Throw	7.0	9.0	11.0	13.0	15.0	18.0	20.0	22.0
12 x 8 Ak .26	CFM	80	105	130	160	185	210	240	265
	Ps	.008	.014	.022	.032	.044	.057	.072	.089
	Throw	8.0	10.0	13.0	15.0	17.0	20.0	22.0	25.0
12 x 12 Ak .40	CFM	115	155	190	230	270	305	345	385
	Ps	.008	.014	.023	.033	.044	.058	.073	.090
	Throw	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0
14 x 6 Ak .20	CFM	60	80	100	120	145	165	185	205
	Ps	.009	.017	.026	.037	.051	.066	.084	.104
	Throw	7.0	9.0	11.0	13.0	15.0	17.0	20.0	22.0
14 x 8 Ak .30	CFM	90	120	150	185	215	245	275	305
	Ps	.008	.014	.022	.032	.044	.057	.073	.090
	Throw	8.0	11.0	13.0	16.0	19.0	21.0	24.0	27.0
16 x 6 Ak .26	CFM	80	105	130	160	185	210	240	265
	Ps	.008	.014	.022	.032	.044	.057	.072	.089
	Throw	8.0	10.0	12.0	15.0	17.0	20.0	22.0	25.0
16 x 8 Ak .29	CFM	100	130	165	195	230	260	295	325
	Ps	.010	.017	.027	.039	.052	.069	.087	.107
	Throw	8.0	11.0	14.0	17.0	19.0	22.0	25.0	27.0

Terminal Velocity of 75 FPM

504/CB4

Face Velocity		300	400	500	600	700	800	900	1000
6 x 6 Ak .16	CFM	50	65	80	95	110	125	145	160
	Ps	.040	.072	.112	.161	.219	.287	.363	.448
	Throw	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
8 x 8 Ak .22	CFM	65	85	110	130	155	175	195	220
	Ps	.024	.043	.067	.096	.130	.170	.216	.266
	Throw	4.0	5.0	6.0	7.0	8.0	10.0	11.0	12.0
10 x 10 Ak .28	CFM	85	115	140	170	200	225	255	285
	Ps	.016	.029	.045	.064	.087	.114	.144	.178
	Throw	4.0	6.0	7.0	8.0	10.0	11.0	12.0	14.0
12 x 12 Ak .40	CFM	120	160	200	235	275	315	355	395
	Ps	.012	.022	.032	.047	.064	.084	.107	.133
	Throw	5.0	7.0	8.0	10.0	11.0	13.0	14.0	16.0
14 x 14 Ak .48	CFM	145	190	240	285	335	380	430	475
	Ps	.009	.016	.025	.037	.049	.065	.081	.102
	Throw	6.0	7.0	9.0	11.0	12.0	14.0	16.0	18.0

Terminal Velocity of 75 FPM

150 Round Ceiling Diffuser

Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062
Neck Size 6"	CFM		55	65	80	95	105	120	135
Ak .135	Throw		2.5	3.0	3.5	4.0	4.5	5.0	5.5
Neck Size 8"	CFM	70	90	115	135	160	180	200	225
Ak .225	Throw	2.0	3.0	3.5	4.5	5.0	5.5	6.5	7.0
Neck Size 10"	CFM	105	140	175	210	240	275	310	345
Ak .345	Throw	2.5	3.5	4.5	5.0	6.0	7.0	8.0	8.5
Neck Size 12"	CFM	150	200	250	300	350	400	450	500
Ak .500	Throw	3.0	4.0	5.0	6.0	7.5	8.5	9.0	10.5
Neck Size 14"	CFM	190	250	315	375	440	500	565	625
Ak .625	Throw	3.5	4.5	5.5	6.5	8.0	9.0	10.0	11.0
Neck Size 18"	CFM	310	415	520	625	730	830	935	1040
Ak 1.040	Throw	4.5	6.0	7.0	8.5	10.0	11.5	13.0	14.5
Neck Size 22"	CFM	450	600	750	900	1050	1200	1350	1500
Ak 1.500	Throw	5.0	6.5	8.5	10.0	12.0	13.0	15.0	16.0

Terminal Velocity of 50 FPM

Series AL160 Square Ceiling Diffuser

AL161OBD/AL161ML One-Way Air Pattern

Face Velocity		400	500	600	700	900	1100	1500
Pressure Loss		.010	.016	.022	.031	.050	.075	.140
6 x 6	CFM	55	65	75	90	120	140	195
Ak .13	Throw	5.0	6.0	7.0	8.0	10.0	12.0	15.0
8 x 8	CFM	75	90	105	120	150	180	240
Ak .20	Throw	6.0	7.0	8.0	10.0	12.0	15.0	18.0
10 x 10	CFM	115	135	155	175	235	290	395
Ak .29	Throw	7.0	8.0	10.0	12.0	15.0	19.0	24.0
12 x 12	CFM	170	210	255	300	380	470	610
Ak .42	Throw	8.0	10.0	12.0	15.0	19.0	24.0	29.0
14 x 14	CFM	250	305	360	410	505	610	800
Ak .59	Throw	11.0	13.0	15.0	18.0	24.0	30.0	35.0

Terminal Velocity of 75 FPM



AL161 ML

AL164OBD/AL164ML Four-Way Air Pattern

Face Velocity		400	500	600	700	900	1100	1500
Pressure Loss		.010	.016	.022	.031	.050	.075	.140
6 x 6	CFM	55	65	75	90	120	140	195
Ak .13	Throw	2.0	3.0	4.0	5.0	6.0	7.0	9.0
8 x 8	CFM	75	90	105	120	150	180	240
Ak .20	Throw	3.0	4.0	5.0	6.0	8.0	10.0	13.0
10 x 10	CFM	115	135	155	175	235	290	395
Ak .29	Throw	4.0	5.0	6.0	7.0	9.0	12.0	14.0
12 x 12	CFM	170	210	255	300	380	470	610
Ak .42	Throw	5.0	6.0	7.0	8.0	10.0	12.0	15.0
14 x 14	CFM	250	305	360	410	505	610	800
Ak .59	Throw	6.0	7.0	8.0	9.0	11.0	14.0	18.0

Terminal Velocity of 75 FPM



AL164 ML

AL162OBD/AL162ML Two-Way Air Pattern

Face Velocity		400	500	600	700	900	1100	1500
Pressure Loss		.010	.016	.022	.031	.050	.075	.140
6 x 6	CFM	55	65	75	90	120	140	195
Ak .13	Throw	3.0	4.0	5.0	6.0	7.0	9.0	12.0
8 x 8	CFM	75	90	105	120	150	180	240
Ak .20	Throw	4.0	5.0	6.0	7.0	9.0	12.0	16.0
10 x 10	CFM	115	135	155	175	235	290	395
Ak .29	Throw	5.0	6.0	7.0	8.0	10.0	14.0	20.0
12 x 12	CFM	170	210	255	300	380	470	610
Ak .42	Throw	6.0	7.0	8.0	10.0	13.0	17.0	23.0
14 x 14	CFM	250	305	360	410	505	610	800
Ak .59	Throw	7.0	9.0	11.0	13.0	16.0	19.0	27.0

Terminal Velocity of 75 FPM



AL162 ML

AL165OBD/AL165ML Two-Way Corner Air Pattern

Face Velocity		400	500	600	700	900	1100	1500
Pressure Loss		.010	.016	.022	.031	.050	.075	.140
6 x 6	CFM	55	65	75	90	120	140	195
Ak .13	Throw	3.0	4.0	5.0	6.0	7.0	9.0	12.0
8 x 8	CFM	75	90	105	120	150	180	240
Ak .20	Throw	4.0	5.0	6.0	7.0	9.0	12.0	16.0
10 x 10	CFM	115	135	155	175	235	290	395
Ak .29	Throw	5.0	6.0	7.0	8.0	10.0	14.0	20.0
12 x 12	CFM	170	210	255	300	380	470	610
Ak .42	Throw	6.0	7.0	8.0	10.0	13.0	17.0	23.0
14 x 14	CFM	250	305	360	410	505	610	800
Ak .59	Throw	7.0	9.0	11.0	13.0	16.0	19.0	27.0

Terminal Velocity of 75 FPM



AL165 ML

AL163OBD/AL163ML Three-Way Air Pattern

Face Velocity		400	500	600	700	900	1100	1500
Pressure Loss		.010	.016	.022	.031	.050	.075	.140
6 x 6	CFM	55	65	75	90	120	140	195
Ak .13	Throw L/S	3.5/2.5	4.0/3.0	5.0/3.5	5.5/4.0	7.0/5.0	9.0/6.0	12.0/9.0
8 x 8	CFM	75	90	105	120	150	180	240
Ak .20	Throw L/S	4.0/2.0	5.0/2.5	6.0/3.5	7.0/4.0	8.0/4.5	10.0/5.5	12.0/7.0
10 x 10	CFM	115	135	155	175	235	290	395
Ak .29	Throw L/S	5.0/3.0	7.0/4.0	8.0/4.5	10.0/5.5	12.0/7.0	14.0/8.5	18.0/10.5
12 x 12	CFM	170	210	255	300	380	470	610
Ak .42	Throw L/S	7.0/4.0	8.5/4.5	10.0/5.5	12.0/6.5	15.0/8.5	18.0/10.0	23.0/14.0
14 x 14	CFM	250	305	360	410	505	610	800
Ak .59	Throw L/S	8.0/5.5	10.0/6.0	11.5/7.0	13.0/7.5	15.5/9.0	20.0/11.0	27.0/16.0

Terminal Velocity of 75 FPM



AL163 ML

<NC 20	NC 20-30	NC 30-35	NC 35-40

Recommended Noise Criteria and Face Velocity Ranges are on page 96.

Series RZ600 Rezzin Sidewall Register

RZ602

Two-Way Air Pattern

Face Velocity		300	400	500	600	700	800	900	1000
8 x 4 Ak .095	CFM	28	38	47	57	66	76	85	95
	Ps	.02	.02	.02	.03	.04	.05	.06	.07
	Throw	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
10 x 4 Ak .117	CFM	35	47	59	70	82	94	105	117
	Ps	.01	.01	.02	.02	.03	.04	.05	.06
	Throw	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
10 x 6 Ak .193	CFM	58	77	97	116	135	154	174	193
	Ps	.01	.01	.02	.02	.03	.04	.05	.06
	Throw	1.5	2.0	2.5	3.0	3.5	4.5	5.0	5.5
12 x 6 Ak .238	CFM	71	95	119	143	167	190	214	238
	Ps	.01	.01	.01	.02	.03	.04	.05	.06
	Throw	5.5	7.0	9.0	10.5	12.5	14.0	16.0	17.5
14 x 6 Ak .291	CFM	87	116	145	174	204	233	262	291
	Ps	.01	.01	.02	.02	.03	.04	.05	.06
	Throw	NA	NA	NA	NA	NA	NA	NA	NA
14 x 8 Ak .395	CFM	119	158	198	237	277	316	356	395
	Ps	.01	.01	.01	.02	.03	.04	.05	.06
	Throw	NA	NA	NA	NA	NA	NA	NA	NA

Terminal Velocity of 75 FPM

NA = Not Available

RZ603

Three-Way Air Pattern

Face Velocity		300	400	500	600	700	800	900	1000
8 x 4 Ak .108	CFM	32	43	54	65	75	86	97	108
	Ps	.01	.01	.02	.03	.04	.05	.07	.08
	Throw Short	NA	NA	NA	NA	NA	NA	NA	NA
	Throw Long	NA	NA	NA	NA	NA	NA	NA	NA
10 x 6 Ak .193	CFM	58	77	97	116	135	154	174	193
	Ps	.01	.01	.02	.03	.03	.04	.05	.06
	Throw Short	2.0	3.0	3.5	4.0	5.0	5.5	6.5	7.0
	Throw Long	1.0	1.5	2.0	2.5	2.5	3.0	3.5	4.0
10 x 8 Ak .246	CFM	74	98	123	148	172	197	221	246
	Ps	.01	.01	.01	.02	.03	.03	.04	.05
	Throw Short	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
	Throw Long	2.5	3.5	4.5	5.0	6.0	7.0	7.5	8.5
12 x 6 Ak .238	CFM	71	95	119	143	167	190	214	238
	Ps	.01	.01	.02	.02	.03	.04	.05	.07
	Throw Short	2.5	3.5	4.5	5.0	6.0	7.0	7.5	8.5
	Throw Long	2.5	3.5	4.5	5.0	6.0	7.0	7.5	8.5
14 x 6 Ak .297	CFM	89	119	148	178	208	237	267	297
	Ps	.01	.01	.02	.03	.03	.04	.06	.07
	Throw Short	NA	NA	NA	NA	NA	NA	NA	NA
	Throw Long	NA	NA	NA	NA	NA	NA	NA	NA
14 x 8 Ak .399	CFM	120	160	199	239	279	319	359	399
	Ps	.01	.01	.01	.02	.03	.04	.05	.06
	Throw Short	NA	NA	NA	NA	NA	NA	NA	NA
	Throw Long	NA	NA	NA	NA	NA	NA	NA	NA

Terminal Velocity of 75 FPM

NA = Not Available

RZ604

Four-Way Air Pattern

Face Velocity		300	400	500	600	700	800	900	1000
6 x 6 Ak .124	CFM	37	49	62	74	87	99	111	124
	Ps	.01	.01	.02	.03	.03	.05	.06	.07
	Throw	NA	NA	NA	NA	NA	NA	NA	NA
8 x 8 Ak .231	CFM	69	92	115	139	162	185	208	231
	Ps	.00	.01	.01	.02	.02	.03	.04	.04
	Throw	NA	NA	NA	NA	NA	NA	NA	NA
10 x 10 Ak .347	CFM	104	139	173	208	243	277	312	347
	Ps	.01	.01	.02	.02	.03	.04	.05	.07
	Throw	NA	NA	NA	NA	NA	NA	NA	NA
12 x 12 Ak .510	CFM	153	204	255	306	357	408	459	510
	Ps	.01	.01	.02	.02	.03	.04	.05	.07
	Throw	NA	NA	NA	NA	NA	NA	NA	NA

Terminal Velocity of 75 FPM

NA = Not Available



Series RZ160 Rezzin Square Ceiling Diffuser

RZ165

Two-Way Corner Air Pattern

Neck Velocity		300	400	500	600	700
Neck Size 6"	CFM	60	80	100	120	135
Ak 0.284	Ps	0.002	0.004	0.006	0.008	0.011
Vt 75	Throw	2.5	3.5	4.0	5.0	6.0
Vt 100	Throw	2.5	3.0	4.0	4.5	5.5
Vt 150	Throw	1.5	2.0	2.5	3.0	3.5
Neck size 7"	CFM	82	109	136	164	191
Ak 0.267	Ps	0.009	0.016	0.025	0.037	0.050
Vt 75	Throw	4.0	5.0	6.0	7.5	8.5
Vt 100	Throw	3.5	4.5	5.5	7.0	8.0
Vt 150	Throw	2.5	3.0	4.0	4.5	5.5
Neck size 8"	CFM	105	140	175	209	244
Ak 0.251	Ps	0.016	0.029	0.045	0.065	0.088
Vt 75	Throw	5.0	6.5	8.0	9.5	11.0
Vt 100	Throw	4.5	6.0	7.5	9.0	10.5
Vt 150	Throw	3.0	4.0	5.0	6.0	7.0

RZ163

Three-Way Air Pattern

Neck Velocity		300	400	500	600	700
Neck Size 6"	CFM	60	80	100	120	135
Ak 0.247	Ps	0.002	0.004	0.006	0.008	0.011
Vt 75 S/L	Throw	2.0 2.5	3.0 3.5	3.5 4.5	4.5 5.5	5.0 6.0
Vt 100 S/L	Throw	2.0 2.5	3.0 3.5	3.5 4.0	4.0 5.0	5.0 6.0
Vt 150 S/L	Throw	1.5 1.5	2.0 2.0	2.5 3.0	3.0 3.5	3.0 4.0
Neck Size 7"	CFM	80	110	135	165	190
Ak 0.243	Ps	0.009	0.016	0.026	0.037	0.050
Vt 75 S/L	Throw	2.5 4.0	3.5 5.5	4.5 7.0	5.5 8.5	6.0 9.5
Vt 100 S/L	Throw	2.5 3.5	3.5 5.3	4.0 6.3	5.0 7.5	5.5 9.0
Vt 150 S/L	Throw	1.8 2.5	2.5 3.5	3.0 4.5	3.5 5.5	4.0 6.0
Neck Size 8"	CFM	105	140	175	210	245
Ak 0.239	Ps	0.016	0.029	0.046	0.066	0.090
Vt 75 S/L	Throw	3.0 5.5	4.0 7.5	5.0 9.0	6.0 11.0	7.0 13.0
Vt 100 S/L	Throw	3.0 5.0	3.5 7.0	4.5 8.5	5.5 10.5	6.5 12.0
Vt 150 S/L	Throw	2.0 3.5	2.5 4.5	3.0 6.0	3.5 7.0	4.5 8.0

RZ164

Four-Way Air Pattern

Neck Velocity		300	400	500	600	700
Neck Size 6"	CFM	60	80	100	120	135
Ak 0.210	Ps	0.001	0.002	0.003	0.005	0.006
Vt 75	Throw	3.0	3.5	4.5	5.5	6.5
Vt 100	Throw			4.5	5.0	6.0
Vt 150	Throw	1.5	2.5	3.0	3.5	4.0
Neck Size 7"	CFM	80	110	135	165	190
Ak 0.209	Ps	0.003	0.005	0.008	0.011	0.015
Vt 75	Throw	3.8		6.0	7.5	8.5
Vt 100	Throw	3.5	4.5	5.5	7.0	8.0
Vt 150	Throw	2.5	3.0	4.0	4.5	5.5
Neck Size 8"	CFM	105	140	175	210	245
Ak 0.209	Ps	0.005	0.008	0.013	0.018	0.025
Vt 75	Throw	4.5	6.0	7.5	9.0	10.5
Vt 100	Throw	4.0	5.5	7.0	8.5	10.0
Vt 150	Throw	3.0	3.5	4.5	5.5	6.5

RZ150 Rezzin Round Ceiling Diffuser

Face Velocity		300	400	500	600	700	800	900	1000
Neck Size 6"	CFM	67	89	112	134	157	179	201	224
	Ps	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
Ak .224	Throw	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00
	CFM	69	92	115	137	160	183	206	229
Neck Size 7"	Ps	0.05	0.09	0.13	0.19	0.26	0.34	0.43	0.53
	Throw	1.75	2.25	2.75	3.25	3.75	4.25	5.00	5.50
Neck Size 8"	CFM	70	94	117	141	164	188	211	235
	Ps	0.10	0.17	0.26	0.38	0.52	0.67	0.85	1.05
Ak .235	Throw	2.00	2.50	3.00	3.50	4.00	4.50	5.50	6.00

Terminal Velocity of 50 FPM

Recommended Noise Criteria and Face Velocity Ranges are on page 96.

RZ800 Rezzin Floor Register

Face Velocity		300	400	500	600	700	800	900	1000
2 x 12 Ak .084	CFM	25	34	42	50	59	67	76	84
	Ps	.01	.02	.03	.05	.06	.08	.10	.12
	Throw	2.0	2.5	3.5	4.0	4.5	5.5	6.0	6.5
	Spread	1.5	2.0	2.5	3.0	3.0	3.5	4.0	4.5
4 x 10 Ak .141	CFM	42	56	71	85	99	113	127	141
	Ps	.02	.02	.03	.04	.06	.07	.09	.11
	Throw	2.0	2.5	3.0	3.5	4.5	5.0	5.5	6.0
	Spread	0.5	1.5	2.5	3.0	4.0	5.0	5.5	6.5
4 x 12 Ak .157	CFM	47	63	79	94	110	126	141	157
	Ps	.02	.03	.04	.05	.07	.09	.11	.13
	Throw	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
	Spread	0.5	1.5	2.5	4.0	5.0	6.0	7.0	8.0

Terminal Velocity of 50 FPM

RZ1400 Rezzin T-Bar Directional Diffuser

		Neck Velocity FPM									
		400	500	600	700	800	900	1000	1200	1400	1600
6"	CFM	79	98	118	137	157	177	196	236	275	314
	Static Pressure	.003	.005	.006	.008	.011	.013	.016	.023	.031	.041
	Total Pressure	.015	.024	.034	.046	.060	.076	.094	.134	.183	.238
	NC	-	-	-	-	-	-	15	22	26	31
8"	CFM	140	175	209	244	279	314	349	419	489	559
	Static Pressure	.009	.014	.021	.028	.037	.046	.057	.082	.111	.145
	Total Pressure	.019	.030	.043	.058	.076	.096	.118	.170	.231	.301
	NC	-	-	-	-	18	22	23	31	35	39
10"	CFM	218	273	327	382	436	491	545	654	764	873
	Static Pressure	.009	.014	.021	.028	.037	.047	.058	.083	.113	.148
	Total Pressure	.019	.029	.042	.058	.075	.095	.117	.169	.230	.300
	NC	-	-	-	-	18	22	26	31	36	40
12"	CFM	314	393	471	550	628	707	785	942	1100	1257
	Static Pressure	.015	.022	.032	.044	.059	.076	.095	.142	.198	.264
	Total Pressure	.025	.038	.054	.074	.098	.126	.157	.231	.319	.422
	NC	-	-	-	18	20	26	29	36	41	45
14"	CFM	428	535	641	748	855	962	1069	1283	1497	1710
	Static Pressure	.015	.023	.033	.044	.057	.072	.089	.128	.175	.228
	Total Pressure	.025	.037	.053	.072	.094	.119	.146	.211	.287	.375
	NC	-	-	-	15	21	25	29	35	40	44

RZ1400 Throw - Terminal Velocity of 75 FPM

Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
CFM	79	98	118	137	157	177	196	236	275	314
6"	3.1	3.9	4.6	5.4	6.2	7.0	7.7	9.3	10.8	12.4
CFM	140	175	209	244	279	314	349	419	489	559
8"	5.3	6.7	8.0	9.3	10.7	12.0	13.3	16.0	18.7	21.3
CFM	218	273	327	382	436	491	545	654	764	873
10"	6.3	7.9	9.4	11.0	12.6	14.1	15.7	18.8	22.0	25.1
CFM	314	393	471	550	628	707	785	942	1100	1257
12"	7.1	8.8	10.6	12.4	14.2	15.9	17.7	21.2	24.8	28.3
CFM	428	535	641	748	855	962	1069	1283	1497	1710
14"	9.1	11.3	13.6	15.9	18.1	20.4	22.7	27.2	31.8	36.3

RZ1400 Throw - Terminal Velocity of 150 FPM

Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
CFM	79	98	118	137	157	177	196	236	275	314
6"	1.3	1.7	2.0	2.4	2.7	3.0	3.4	4.0	4.7	5.4
CFM	140	175	209	244	279	314	349	419	489	559
8"	2.2	2.7	3.3	3.8	4.4	4.9	5.5	6.6	7.7	8.8
CFM	218	273	327	382	436	491	545	654	764	873
10"	2.5	3.1	3.7	4.4	5.0	5.6	6.2	7.5	8.7	10.0
CFM	314	393	471	550	628	707	785	942	1100	1257
12"	3.8	4.8	5.8	6.7	7.7	8.6	9.6	11.5	13.4	15.3
CFM	428	535	641	748	855	962	1069	1283	1497	1710
14"	4.2	5.2	6.3	7.3	8.3	9.4	10.4	12.5	14.6	16.7

RZ1444 Rezzin Modular Core Diffuser

		Neck Velocity FPM									
		400	500	600	700	800	900	1000	1200	1400	1600
6"	CFM	79	98	118	137	157	177	196	236	275	314
	Static Pressure	.003	.005	.007	.010	.013	.017	.021	.030	.041	.054
	Total Pressure	.018	.023	.026	.035	.043	.067	.086	.120	.166	.209
	NC	-	-	-	-	-	16	20	24	30	34
8"	CFM	140	175	209	244	279	314	349	419	489	559
	Static Pressure	.004	.006	.008	.011	.014	.017	.020	.028	.036	.045
	Total Pressure	.013	.021	.030	.041	.053	.066	.081	.115	.155	.201
	NC	-	-	-	-	17	22	24	34	37	41
10"	CFM	218	273	327	382	436	491	545	654	764	873
	Static Pressure	.004	.007	.010	.013	.017	.022	.027	.039	.053	.069
	Total Pressure	.014	.021	.031	.042	.055	.070	.086	.124	.170	.222
	NC	-	-	-	17	22	26	34	42	44	48

- Indicates less than NC15.

		Neck Velocity FPM									
		400	500	600	700	800	900	1000	1200	1400	1600
12"	CFM	314	393	471	550	628	707	785	942	1100	1257
	Static Pressure	.006	.009	.012	.017	.022	.028	.034	.048	.065	.084
	Total Pressure	.015	.024	.035	.047	.061	.077	.095	.137	.186	.242
	NC	-	-	-	20	24	27	35	40	45	49
14"	CFM	428	535	641	748	855	962	1069	1283	1497	1710
	Static Pressure	.008	.013	.018	.024	.031	.040	.048	.069	.093	.120
	Total Pressure	.017	.030	.041	.056	.071	.090	.114	.144	.200	.278
	NC	-	-	15	23	27	34	39	44	48	51
16"	CFM	559	698	838	977	1117	1257	1396	1676	1955	2234
	Static Pressure	.012	.019	.028	.037	.048	.061	.075	.107	.145	.189
	Total Pressure	.022	.034	.049	.066	.086	.108	.134	.192	.260	.339
	NC	-	-	24	27	31	38	40	45	49	51

- Indicates less than NC15.

RZ1444 Throw - Terminal Velocity of 75 FPM

Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
CFM	79	98	118	137	157	177	196	236	275	314
1-direction	3.5	4.4	5.3	6.2	7.1	7.9	8.8	10.6	12.4	14.1
2-direction	4.5	5.6	6.8	7.9	9.0	10.2	11.3	13.6	15.8	18.1
3-direction Short	0.9	1.1	1.3	1.5	1.7	2.0	2.2	2.6	3.0	3.5
3-direction Long	1.2	1.5	1.8	2.1	2.5	2.8	3.1	3.7	4.3	4.9
4-direction	0.6	0.8	0.9	1.1	1.2	1.4	1.5	1.8	2.1	2.5

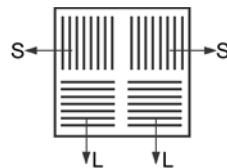
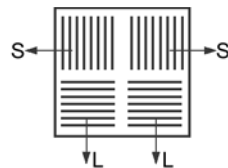
Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
CFM	140	175	209	244	279	314	349	419	489	559
1-direction	3.1	3.9	4.6	5.4	6.2	7.0	7.7	9.3	10.8	12.4
2-direction	4.4	5.5	6.6	7.7	8.8	9.9	11.0	13.2	15.4	17.6
3-direction Short	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0	7.1	8.1
3-direction Long	3.5	4.4	5.3	6.2	7.0	7.9	8.8	10.6	12.3	14.1
4-direction	1.5	1.9	2.3	2.7	3.1	3.4	3.8	4.6	5.4	6.1

Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
CFM	218	273	327	382	436	491	545	654	764	873
1-direction	6.1	7.6	9.2	10.7	12.2	13.7	15.3	18.3	21.4	24.4
2-direction	7.1	8.9	10.7	12.5	14.3	16.1	17.8	21.4	25.0	28.5
3-direction Short	2.1	2.6	3.1	3.7	4.2	4.7	5.2	6.3	7.3	8.4
3-direction Long	6.4	8.0	9.6	11.2	12.8	14.4	16.0	19.2	22.4	25.6
4-direction	2.9	3.6	4.3	5.0	5.7	6.4	7.1	8.6	10.0	11.4

Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
CFM	314	393	471	550	628	707	785	942	1100	1257
1-direction	9.8	12.2	14.7	17.1	19.6	22.0	24.5	29.3	34.2	39.1
2-direction	9.1	11.4	13.6	15.9	18.2	20.5	22.7	27.3	31.8	36.4
3-direction Short	3.6	4.5	5.4	6.3	7.2	8.1	9.0	10.8	12.6	14.4
3-direction Long	8.0	10.0	12.0	14.0	16.0	18.0	20.1	24.1	28.1	32.1
4-direction	2.1	2.6	3.1	3.7	4.2	4.7	5.2	6.3	7.3	8.4

Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
CFM	428	535	641	748	855	962	1069	1283	1497	1710
1-direction	12.1	15.1	18.2	21.2	24.2	27.3	30.3	36.3	42.4	48.5
2-direction	8.4	10.5	12.6	14.7	16.8	18.9	21.0	25.2	29.4	33.6
3-direction Short	3.9	4.9	5.9	6.8	7.8	8.8	9.8	11.7	13.7	15.7
3-direction Long	7.0	8.8	10.5	12.3	14.0	15.8	17.5	21.0	24.5	28.0
4-direction	2.8	3.5	4.2	4.9	5.6	6.3	7.0	8.4	9.8	11.2

Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
CFM	559	698	838	977	1117	1257	1396	1676	1955	2234
1-direction	24.3	30.4	36.5	42.5	48.6	54.7	60.8	72.9	85.1	97.2
2-direction	14.1	17.6	21.1	24.6	28.1	31.7	35.2	42.2	49.3	56.3
3-direction Short	11.2	14.0	16.8	19.7	22.5	25.3	28.1	33.7	39.3	44.9
3-direction Long	16.3	20.4	24.5	28.6	32.7	36.7	40.8	49.0	57.1	65.3
4-direction	3.2	4.0	4.9	5.7	6.5	7.3	8.1	9.7	11.3	12.9



Recommended Noise Criteria and Face Velocity Ranges are on page 96.

Series AL270 Adjustable Curved-Blade Register

AL271ML

One-Way

Face Velocity		300	400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062	.075	.090
8 x 4	CFM	30	45	55	65	75	85	95	105	120	130
Ak .107	Throw	3.5	5.5	6.5	7.5	9.0	10.0	11.5	12.5	14.0	15.5
10 x 4	CFM	40	55	65	80	90	105	120	130	145	160
Ak .132	Throw	4.0	6.0	7.0	8.5	9.5	11.0	12.5	13.5	15.5	17.0
10 x 6	CFM	60	80	100	120	140	160	180	200	220	240
Ak .200	Throw	5.0	6.5	8.5	10.0	11.5	13.5	15.0	16.0	18.0	20.0
12 x 6	CFM	70	95	120	140	165	190	210	235	260	280
Ak .235	Throw	5.5	7.0	9.0	10.5	12.5	14.5	16.0	18.0	20.0	22.0
10 x 8	CFM	80	105	130	160	185	210	240	265	290	315
Ak .264	Throw	5.5	7.5	9.5	11.5	13.0	15.0	17.0	19.0	21.0	23.0
12 x 8	CFM	95	130	160	190	225	255	290	320	350	385
Ak .320	Throw	6.0	8.5	10.5	12.5	14.5	16.5	19.0	21.0	23.0	25.0
14 x 8	CFM	110	145	180	220	255	290	330	365	400	435
Ak .364	Throw	6.5	8.5	11.0	13.0	15.5	17.5	20.0	22.0	24.0	26.0

Terminal Velocity of 75 FPM

AL272ML

Two-Way

Face Velocity		300	400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062	.075	.090
8 x 4	CFM	30	45	55	65	75	85	95	105	120	130
Ak .107	Throw	2.5	4.0	4.5	5.5	6.5	7.0	8.0	9.0	10.0	11.0
10 x 4	CFM	40	55	65	80	90	105	120	130	145	160
Ak .132	Throw	3.0	4.0	5.0	6.0	6.5	8.0	9.0	9.5	11.0	12.0
10 x 6	CFM	60	80	100	120	140	160	180	200	220	240
Ak .200	Throw	3.5	4.5	6.0	7.0	8.5	9.5	10.5	12.0	13.0	14.0
12 x 6	CFM	70	95	120	140	165	190	210	235	260	280
Ak .235	Throw	4.0	5.0	6.5	7.5	9.0	10.0	11.5	12.5	14.0	15.0
10 x 8	CFM	80	105	130	160	185	210	240	265	290	315
Ak .264	Throw	4.0	5.5	6.5	8.0	9.5	10.5	12.0	13.5	14.5	16.0
12 x 8	CFM	95	130	160	190	225	255	290	320	350	385
Ak .320	Throw	4.5	6.0	7.5	8.5	10.5	11.5	13.5	14.5	16.0	18.0
14 x 8	CFM	110	145	180	220	255	290	330	365	400	435
Ak .364	Throw	4.5	6.0	7.5	9.5	11.0	12.5	14.0	15.5	17.0	19.0

Terminal Velocity of 75 FPM

AL273ML

Three-Way

Face Velocity		300	400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062	.075	.090
10 x 6	Total CFM	60	80	100	120	140	160	180	200	220	240
Ak .200	CFM L/S	22/19	29/26	36/32	43/38	50/45	58/51	65/58	72/64	79/70	86/77
	Throw L/S	3.0/2.0	4.0/4.0	5.0/4.5	6.0/5.0	7.0/6.5	8.0/7.5	9.0/8.5	10.0/9.5	11.0/10.5	12.0/11.5
8 x 8	Total CFM	65	85	110	130	150	170	195	215	235	260
Ak .215	CFM L/S	30/18	39/23	50/30	60/35	68/41	78/46	89/53	98/58	108/64	119/70
	Throw L/S	3.5/3.0	4.5/3.5	6.0/4.5	7.0/5.5	8.0/6.5	9.5/7.0	10.5/8.0	11.5/9.0	13.0/10.0	14.0/11.0
12 x 6	Total CFM	70	95	120	140	165	190	210	235	260	280
Ak .235	CFM L/S	21/25	28/33	36/42	42/49	49/58	57/67	63/74	70/82	77/91	83/98
	Throw L/S	3.0/3.0	4.0/4.0	5.0/5.5	6.0/6.5	7.0/7.5	8.0/8.5	9.0/9.5	9.5/10.5	10.5/11.5	11.5/12.5
10 x 10	Total CFM	100	130	165	200	230	265	295	330	365	395
Ak .330	CFM L/S	36/32	47/42	59/63	72/64	83/74	95/85	106/94	119/106	131/117	142/126
	Throw L/S	4.0/3.5	5.0/4.5	6.5/6.0	7.5/7.0	9.0/8.5	10.0/9.5	11.0/10.5	12.5/12.0	14.0/13.0	15.0/14.0

Terminal Velocity of 75 FPM

AL274ML

Four-Way

Face Velocity		300	400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062	.075	.090
8 x 8	Total CFM	65	85	110	130	150	170	195	215	235	260
Ak .215	CFM L/S	15/18	20/23	25/30	30/35	35/41	39/46	45/53	49/58	54/64	60/70
	Throw L/S	2.5/3.0	3.5/3.5	4.0/4.5	5.0/5.5	6.0/6.5	6.5/7.0	7.5/8.0	8.0/9.0	9.0/10.0	10.0/11.0
10 x 10	Total CFM	100	130	165	200	230	265	295	330	365	395
Ak .330	CFM L/S	18/32	24/42	30/53	36/64	42/74	48/85	53/94	60/106	66/117	71/126
	Throw L/S	2.5/3.5	3.5/4.5	4.5/6.0	5.5/7.0	6.5/8.5	7.0/9.5	8.0/10.5	9.0/12.0	10.0/13.0	10.5/14.0
12 x 12	Total CFM	135	180	225	270	315	360	405	450	495	540
Ak .452	CFM L/S	20/47	27/63	34/79	40/95	47/111	54/126	61/142	67/158	74/174	81/190
	Throw L/S	2.5/4.0	3.5/5.5	4.5/7.0	5.5/8.5	6.5/10.0	7.5/11.0	8.5/12.5	9.0/14.0	10.0/15.5	11.0/17.0

Terminal Velocity of 75 FPM

AL278ML Adjustable Fin Register

Deflection A

Face Velocity		300	400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062	.075	.090
8 x 4	CFM	45	60	80	95	110	125	140	155	170	185
Ak .156	Throw	5.0	6.5	8.5	10.0	12.0	13.0	15.0	16.0	18.0	19.0
10 x 4	CFM	60	80	100	120	140	160	180	200	220	240
Ak .198	Throw	6.0	7.5	9.5	12.0	13.0	15.0	17.0	19.0	20.0	22.0
12 x 4	CFM	70	95	120	145	170	190	215	240	265	290
Ak .240	Throw	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	25.0
10 x 6	CFM	95	125	155	190	220	250	280	315	345	375
Ak .313	Throw	7.0	9.0	12.0	14.0	16.0	19.0	21.0	23.0	26.0	28.0
12 x 6	CFM	115	150	190	225	265	305	340	380	415	455
Ak .379	Throw	8.0	10.0	13.0	15.0	18.0	21.0	23.0	26.0	28.0	31.0
10 x 8	CFM	130	170	215	255	300	340	385	425	470	510
Ak .425	Throw	8.0	11.0	14.0	16.0	19.0	21.0	24.0	27.0	30.0	32.0
14 x 6	CFM	135	180	225	270	310	355	400	445	490	545
Ak .446	Throw	8.0	11.0	14.0	17.0	19.0	22.0	25.0	28.0	30.0	33.0
12 x 8	CFM	160	200	265	320	370	425	475	530	585	635
Ak .530	Throw	9.0	11.0	15.0	18.0	21.0	24.0	27.0	30.0	33.0	36.0
14 x 8	CFM	185	250	310	370	435	495	560	620	680	745
Ak .620	Throw	10.0	13.0	16.0	20.0	23.0	26.0	30.0	33.0	36.0	39.0

Terminal Velocity of 75 FPM

Deflection E

Face Velocity		300	400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062	.075	.090
8 x 4	CFM	40	50	65	75	90	100	115	125	140	150
Ak .127	Throw	3.0	4.0	5.0	5.5	7.0	7.5	8.5	9.5	11.0	11.5
10 x 4	CFM	50	65	80	95	115	130	145	160	180	195
Ak .162	Throw	3.0	4.5	5.5	6.5	7.5	8.5	9.5	11.0	12.0	13.0
12 x 4	CFM	60	80	100	120	140	160	175	195	215	235
Ak .197	Throw	4.0	4.5	6.0	7.5	8.5	10.0	11.0	12.0	13.0	14.0
10 x 6	CFM	75	105	130	155	180	205	230	255	285	310
Ak .257	Throw	4.0	5.5	7.5	8.5	9.5	11.0	12.0	14.0	15.0	17.0
12 x 6	CFM	95	125	155	185	220	250	280	310	340	375
Ak .311	Throw	4.5	6.0	7.5	9.0	10.0	11.0	12.0	14.0	15.0	18.0
10 x 8	CFM	105	140	175	210	245	280	315	350	385	420
Ak .350	Throw	5.0	6.0	8.0	10.0	11.0	13.0	14.0	16.0	18.0	19.0
14 x 6	CFM	110	145	185	220	255	290	330	365	400	440
Ak .365	Throw	5.5	6.5	8.5	10.0	11.0	13.0	15.0	16.0	18.0	20.0
12 x 8	CFM	130	175	220	260	305	350	390	435	480	520
Ak .435	Throw	5.0	7.0	9.0	11.0	13.0	15.0	16.0	18.0	20.0	22.0
14 x 8	CFM	155	205	255	305	355	410	460	510	560	610
Ak .510	Throw	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	23.0

Terminal Velocity of 75 FPM

Deflection C

Face Velocity		300	400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062	.075	.090
8 x 4	CFM	40	55	70	85	100	115	125	140	155	170
Ak .141	Throw	3.5	5.0	6.5	7.5	9.0	10.0	11.0	13.0	14.0	15.0
10 x 4	CFM	55	70	90	105	125	140	160	180	195	215
Ak .178	Throw	4.0	5.5	7.0	8.5	10.0	11.0	13.0	14.0	16.0	17.0
12 x 4	CFM	65	85	110	130	150	175	195	215	240	260
Ak .216	Throw	4.5	6.0	8.0	9.5	11.0	13.0	14.0	16.0	18.0	19.0
10 x 6	CFM	85	115	140	170	195	225	255	280	310	340
Ak .282	Throw	5.5	7.5	9.0	11.0	12.0	14.0	16.0	18.0	20.0	22.0
12 x 6	CFM	105	135	170	205	240	275	310	340	375	410
Ak .342	Throw	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0
10 x 8	CFM	115	155	195	235	275	310	350	390	430	470
Ak .390	Throw	6.0	8.0	11.0	13.0	15.0	17.0	19.0	21.0	23.0	26.0
14 x 6	CFM	125	165	205	245	290	330	370	410	455	495
Ak .412	Throw	7.0	9.0	11.0	13.0	16.0	18.0	20.0	22.0	24.0	27.0
12 x 8	CFM	140	190	235	280	330	375	425	470	515	565
Ak .470	Throw	7.0	9.0	12.0	14.0	16.0	19.0	21.0	23.0	25.0	28.0
14 x 8	CFM	165	220	275	330	385	440	495	550	605	660
Ak .550	Throw	8.0	10.0	13.0	15.0	18.0	20.0	23.0	25.0	28.0	30.0

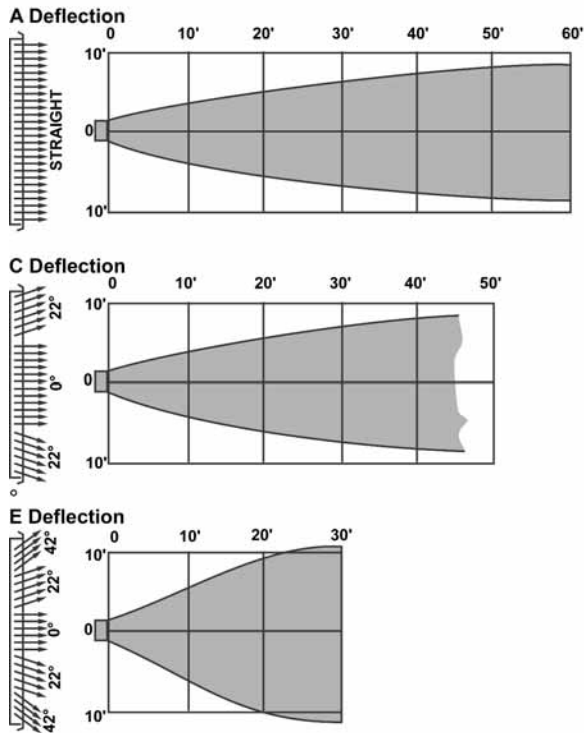
Terminal Velocity of 75 FPM

Deflection G

Face Velocity		300	400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062	.075	.090
8 x 4	CFM	35	45	60	70	85	95	105	120	130	140
Ak .118	Throw	2.0	2.5	3.5	4.0	5.0	5.5	6.0	6.5	7.5	8.0
10 x 4	CFM	45	60	75	90	105	120	135	150	165	180
Ak .149	Throw	2.0	3.0	3.5	4.5	5.0	6.0	6.5	7.5	8.0	9.0
12 x 4	CFM	55	70	90	110	125	145	165	180	200	215
Ak .181	Throw	2.5	3.0	4.0	5.0	5.5	6.5	7.5	8.0	9.0	10.0
10 x 6	CFM	70	95	120	140	165	190	210	235	260	285
Ak .236	Throw	3.0	4.0	5.0	5.5	6.5	7.5	8.5	9.5	10.0	11.0
12 x 6	CFM	85	115	145	170	200	230	255	285	315	345
Ak .286	Throw	3.0	4.0	5.0	6.0	7.0	8.5	9.0	10.0	11.0	12.0
10 x 8	CFM	95	130	160	190	225	255	290	320	350	385
Ak .320	Throw	3.0	4.5	5.5	6.5	7.5	8.5	10.0	11.0	12.0	13.0
14 x 6	CFM	100	135	170	200	235	270	300	335	370	405
Ak .336	Throw	3.5	4.5	5.5	6.5	8.0	9.0	10.0	11.0	12.0	13.0
12 x 8	CFM	120	160	200	235	275	315	355	395	435	475
Ak .395	Throw	3.5	5.0	6.0	7.0	8.0	10.0	11.0	12.0	13.0	15.0
14 x 8	CFM	140	185	230	275	320	370	415	460	505	550
Ak .460	Throw	4.0	5.5	6.5	8.0	9.0	10.5	11.5	13.0	14.5	15.5

Terminal Velocity of 75 FPM

Air Pattern Obtained with Various Deflection Settings



Recommended NC Criteria

	Communication Environment	Typical Occupancy
< NC 25	Extremely quiet environment; suppressed speech is quite audible; suitable for acute pickup of all sounds.	Broadcasting studios, concert halls, music rooms.
NC 30	Very quiet office; suitable for large conferences; telephone use satisfactory.	Residences, theaters, libraries, executive offices, directors rooms.
NC 35	Quiet office; satisfactory for conference at a 15-foot table; normal voice 10 to 30 feet; telephone use satisfactory.	Private offices, schools, hotel guestrooms, courtrooms, churches, hospital rooms.
NC 40	Satisfactory for conferences at a 6- to 8-foot table; normal voice 6 to 12 feet; telephone use satisfactory.	General office, labs, dining rooms.
NC 45	Satisfactory for conferences at a 4- to 5-foot table; normal voice 3 to 6 feet; raised voice 6 to 12 feet; telephone use occasionally difficult.	Retail stores, cafeterias, lobby areas, large drafting and engineering offices, reception areas.
> NC 50	Unsatisfactory for conference of more than two or three persons; normal voice 1 to 2 feet; raised voice 3 to 6 feet; telephone use slightly difficult.	Computer rooms, stenographic pools, print machine rooms, process areas.

Velocity Limitations for Various Applications

The sound caused by an air outlet in operation is directly proportional to the velocity of the air passing through it. By selecting outlets of proper sizes, face velocities can be controlled within safe sound limits.

The following recommended face velocities are within the safe sound limits for most applications, when NC data are not available.

Application	Recommended Velometer Velocities
Broadcasting Studios	500 FPM
Residences	500 to 750 FPM
Apartments	500 to 750 FPM
Churches	500 to 750 FPM
Hotel Guestrooms	500 to 750 FPM
Legitimate Theaters	500 to 1000 FPM
Private Offices, acoustically treated	500 to 1000 FPM
Private Offices, not treated	1000 to 1250 FPM
Motion Picture Theaters	1000 to 1250 FPM
General Offices	1250 to 1500 FPM
Stores, upper floors	1500 FPM
Stores, main floors	1500 FPM
Industrial Buildings	1500 to 2000 FPM

90 Single-Deflection Supply S90 Stationary-Bar Return Grille

Face Velocity		300	400	500	600	700	800	900	1000
6 x 6	CFM	39	52	65	78	91	104	116	129
Ak .130	Ps	.005	.009	.014	.020	.028	.035	.045	.055
8 x 8	CFM	82	110	137	165	192	220	247	275
Ak .270	Ps	.005	.009	.014	.020	.028	.035	.045	.055
10 x 10	CFM	138	184	231	277	323	369	415	461
Ak .460	Ps	.005	.009	.014	.020	.027	.037	.046	.058
12 x 6	CFM	95	127	158	190	221	253	285	316
Ak .320	Ps	.005	.009	.014	.020	.028	.035	.045	.056
14 x 6	CFM	114	151	189	227	265	303	341	378
Ak .380	Ps	.005	.009	.014	.020	.028	.036	.046	.057
14 x 8	CFM	157	209	262	314	366	418	471	523
Ak .520	Ps	.005	.009	.014	.020	.027	.037	.047	.059
12 x 12	CFM	206	275	344	413	481	550	619	688
Ak .690	Ps	.005	.009	.014	.020	.027	.039	.048	.061
24 x 8	CFM	280	373	467	560	654	747	840	934
Ak .930	Ps	.005	.009	.015	.020	.028	.040	.049	.061
18 x 12	CFM	317	422	528	634	739	845	950	1056
Ak 1.060	Ps	.005	.009	.015	.021	.028	.040	.049	.062
30 x 8	CFM	353	471	589	707	825	942	1060	1178
Ak 1.180	Ps	.005	.009	.015	.021	.029	.041	.050	.062
24 x 12	CFM	426	568	710	852	995	1137	1279	1421
Ak 1.420	Ps	.005	.009	.015	.022	.030	.041	.051	.063
18 x 18	CFM	481	641	801	961	1121	1282	1442	1602
Ak 1.600	Ps	.005	.009	.016	.022	.031	.042	.052	.064
30 x 12	CFM	535	713	891	1069	1248	1426	1604	1782
Ak 1.780	Ps	.005	.009	.016	.023	.031	.043	.053	.066
20 x 20	CFM	595	793	991	1189	1387	1585	1784	1982
Ak 1.980	Ps	.005	.010	.016	.024	.032	.044	.054	.067
36 x 12	CFM	642	856	1070	1284	1498	1712	1927	2141
Ak 2.140	Ps	.006	.010	.017	.024	.033	.045	.056	.068
24 x 20	CFM	713	951	1189	1427	1664	1902	2140	2378
Ak 2.380	Ps	.006	.010	.017	.025	.035	.046	.058	.070
30 x 18	CFM	802	1069	1336	1603	1870	2137	2405	2672
Ak 2.670	Ps	.006	.010	.018	.027	.036	.048	.060	.074
24 x 24	CFM	854	1139	1424	1708	1993	2278	2562	2847
Ak 2.850	Ps	.006	.011	.019	.027	.037	.050	.062	.076
36 x 18	CFM	959	1278	1598	1917	2237	2556	2876	3196
Ak 3.200	Ps	.006	.011	.020	.029	.040	.052	.066	.080
30 x 24	CFM	1062	1416	1770	2124	2478	2832	3187	3541
Ak 3.540	Ps	.007	.011	.021	.031	.042	.056	.070	.085
36 x 24	CFM	1266	1688	2110	2532	2955	3377	3799	4221
Ak 4.220	Ps	.008	.013	.024	.035	.047	.063	.081	.097
30 x 30	CFM	1317	1756	2194	2633	3072	3511	3950	4389
Ak 4.390	Ps	.008	.013	.024	.036	.049	.065	.083	.101
36 x 30	CFM	1565	2087	2608	3130	3651	4173	4695	5216
Ak 5.220	Ps	.010	.015	.029	.041	.056	.076	.099	.120
48 x 24	CFM	1662	2217	2771	3325	3879	4433	4987	5542
Ak 5.540	Ps	.011	.016	.030	.043	.060	.080	.106	.129
36 x 36	CFM	1855	2473	3091	3709	4328	4946	5564	6182
Ak 6.180	Ps	.012	.017	.034	.048	.067	.087	.122	.148
48 x 36	CFM	2407	3210	4012	4815	5617	6420	7222	8025
Ak 8.020	Ps	.012	.024	.034	.048	.067	.087	.122	.148
48 x 48	CFM	3089	4119	5148	6178	7208	8237	9267	10297
Ak 10.300	Ps	.012	.024	.034	.048	.067	.087	.122	.148

900, 900-50, 990 Supply Registers

Deflection A

Face Velocity	400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000
Pressure Loss	.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249
8 x 4 CFM	65	80	100	110	130	145	160	175	190	210	225	255	290	320
Ak .160 Throw	6.5	8.0	10.0	11.0	13.0	15.0	16.0	18.0	19.0	21.0	23.0	26.0	29.0	32.0
10 x 4 CFM	80	100	120	140	160	180	200	220	240	265	285	325	365	405
Ak .202 Throw	7.0	9.0	11.0	13.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	29.0	33.0	36.0
12 x 4 CFM	100	120	145	170	195	220	245	270	295	315	340	390	440	490
Ak .244 Throw	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	32.0	36.0	40.0
14 x 4 CFM	115	145	170	200	230	255	285	315	345	370	400	460	515	570
Ak .286 Throw	8.5	11.0	13.0	15.0	17.0	19.0	22.0	24.0	26.0	28.0	30.0	35.0	39.0	43.0
12 x 5 CFM	125	155	190	220	250	280	310	345	375	405	435	500	560	625
Ak .312 Throw	9.0	11.0	14.0	16.0	18.0	20.0	22.0	25.0	27.0	29.0	31.0	36.0	41.0	45.0
10 x 6 CFM	125	155	190	220	250	285	315	345	375	410	440	500	565	630
Ak .314 Throw	9.0	11.0	14.0	16.0	18.0	21.0	23.0	25.0	27.0	30.0	32.0	36.0	41.0	45.0
14 x 5 CFM	145	185	220	255	295	330	365	405	440	475	510	585	660	730
Ak .366 Throw	10.0	12.0	15.0	17.0	20.0	22.0	24.0	27.0	29.0	32.0	34.0	39.0	44.0	49.0
12 x 6 CFM	150	190	225	265	305	340	380	415	455	495	530	605	680	760
Ak .379 Throw	10.0	12.0	15.0	17.0	20.0	22.0	25.0	27.0	30.0	33.0	35.0	40.0	45.0	50.0
16 x 5 CFM	170	210	250	295	335	380	420	460	505	545	585	670	755	840
Ak .419 Throw	11.0	13.0	16.0	18.0	21.0	24.0	26.0	29.0	32.0	34.0	37.0	42.0	47.0	53.0
14 x 6 CFM	180	220	265	310	355	400	445	490	535	575	620	710	800	890
Ak .444 Throw	11.0	13.0	16.0	19.0	22.0	24.0	27.0	30.0	32.0	35.0	38.0	43.0	49.0	54.0
16 x 6 CFM	205	255	305	355	410	460	510	560	610	665	715	815	920	1020
Ak .510 Throw	12.0	15.0	17.0	20.0	23.0	26.0	29.0	32.0	35.0	38.0	41.0	47.0	53.0	58.0
20 x 5 CFM	210	265	315	370	420	475	525	580	630	685	735	840	945	1050
Ak .526 Throw	12.0	15.0	18.0	21.0	23.0	27.0	29.0	32.0	35.0	38.0	41.0	47.0	53.0	59.0
24 x 5 CFM	255	315	380	445	505	570	635	695	760	825	890	1015	1140	1270
Ak .634 Throw	13.0	16.0	19.0	23.0	26.0	29.0	32.0	35.0	39.0	42.0	45.0	52.0	58.0	65.0
20 x 6 CFM	255	320	385	445	510	575	640	705	770	830	895	1015	1140	1270
Ak .640 Throw	13.0	16.0	19.0	23.0	26.0	29.0	32.0	36.0	39.0	42.0	45.0	52.0	58.0	65.0
24 x 6 CFM	310	385	465	540	615	695	770	850	925	1000	1080	1235	1390	1540
Ak .771 Throw	14.0	18.0	21.0	25.0	28.0	32.0	35.0	39.0	43.0	46.0	50.0	57.0	64.0	71.0
20 x 8 CFM	345	435	520	610	695	780	870	955	1040	1130	1215	1390	1560	1735
Ak .868 Throw	15.0	19.0	23.0	26.0	30.0	34.0	38.0	41.0	45.0	49.0	53.0	60.0	68.0	75.0
30 x 6 CFM	385	485	580	675	775	870	965	1065	1160	1255	1355	1545	1740	1935
Ak .967 Throw	16.0	20.0	24.0	28.0	32.0	36.0	40.0	44.0	48.0	51.0	56.0	63.0	71.0	79.0
24 x 8 CFM	420	525	625	730	835	940	1045	1150	1255	1360	1465	1670	1880	2090
Ak 1.045 Throw	17.0	21.0	25.0	29.0	33.0	37.0	41.0	46.0	50.0	54.0	58.0	66.0	74.0	83.0
30 x 8 CFM	525	655	785	915	1050	1180	1310	1440	1570	1705	1835	2095	2360	2620
Ak 1.310 Throw	19.0	23.0	28.0	32.0	37.0	42.0	46.0	51.0	56.0	60.0	65.0	74.0	84.0	93.0
24 x 10 CFM	530	660	790	925	1055	1185	1320	1450	1585	1715	1845	2110	2375	2640
Ak 1.319 Throw	19.0	23.0	28.0	33.0	37.0	42.0	46.0	51.0	56.0	60.0	65.0	74.0	84.0	93.0
36 x 8 CFM	630	790	945	1105	1260	1420	1575	1735	1890	2050	2205	2520	2835	3150
Ak 1.576 Throw	20.0	25.0	30.0	36.0	41.0	46.0	51.0	56.0	61.0	66.0	71.0	81.0	91.0	101.0
24 x 12 CFM	635	795	995	1115	1275	1435	1595	1750	1910	2070	2230	2550	2865	3185
Ak 1.593 Throw	20.0	25.0	31.0	36.0	41.0	47.0	51.0	56.0	61.0	66.0	71.0	82.0	92.0	102.0
30 x 10 CFM	660	825	990	1160	1325	1490	1655	1820	1985	2150	2315	2645	2975	3310
Ak 1.654 Throw	21.0	26.0	31.0	37.0	42.0	47.0	52.0	57.0	63.0	68.0	73.0	83.0	94.0	104.0
36 x 10 CFM	795	995	1195	1390	1590	1790	1990	2190	2385	2585	2785	3180	3580	3980
Ak 1.989 Throw	23.0	29.0	34.0	40.0	46.0	51.0	57.0	63.0	68.0	74.0	80.0	91.0	103.0	114.0
30 x 12 CFM	800	1000	1200	1400	1600	1800	2000	2200	2395	2595	2795	3195	3595	3995
Ak 1.997 Throw	23.0	29.0	34.0	40.0	45.0	51.0	57.0	63.0	68.0	74.0	80.0	91.0	103.0	114.0
36 x 12 CFM	960	1200	1440	1680	1920	2160	2400	2640	2880	3120	3365	3845	4325	4805
Ak 2.402 Throw	25.0	31.0	38.0	44.0	50.0	56.0	63.0	69.0	75.0	81.0	88.0	100.0	113.0	125.0

Terminal Velocity of 75 FPM

Deflection C

Face Velocity	400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000
Pressure Loss	.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249
8 x 4 CFM	55	70	85	100	110	125	140	155	170	180	195	225	250	280
Ak .140 Throw	5.0	6.0	7.5	8.5	9.5	11.0	12.0	14.0	15.0	16.0	17.0	20.0	22.0	24.0
10 x 4 CFM	70	90	105	125	140	160	180	195	215	230	250	285	320	355
Ak .178 Throw	5.0	7.0	8.0	9.5	11.0	12.0	14.0	15.0	17.0	18.0	19.0	22.0	25.0	28.0
12 x 4 CFM	85	110	130	150	170	195	215	235	260	280	300	345	385	430
Ak .215 Throw	6.0	8.0	9.0	11.0	12.0	14.0	15.0	17.0	18.0	20.0	21.0	24.0	27.0	30.0
14 x 4 CFM	100	125	150	175	200	225	250	275	300	330	355	405	455	505
Ak .252 Throw	6.5	8.0	10.0	11.0	13.0	15.0	16.0	18.0	20.0	22.0	23.0	26.0	30.0	33.0
12 x 5 CFM	110	135	165	190	220	245	275	300	330	355	385	440	495	550
Ak .274 Throw	7.0	8.5	10.0	12.0	14.0	15.0	17.0	19.0	21.0	22.0	24.0	28.0	31.0	34.0
10 x 6 CFM	110	140	165	195	220	245	275	305	330	360	385	440	495	550
Ak .276 Throw	7.0	8.5	10.0	12.0	14.0	15.0	17.0	19.0	21.0	22.0	24.0	27.0	31.0	34.0
14 x 5 CFM	130	160	195	225	255	290	320	355	385	415	450	515	580	645
Ak .321 Throw	7.5	9.0	11.0	13.0	15.0	17.0	18.0	21.0	22.0	24.0	26.0	30.0	34.0	37.0
12 x 6 CFM	135	165	200	235	265	300	335	365	400	435	465	535	600	665
Ak .333 Throw	7.5	9.5	11.0	13.0	15.0	17.0	19.0	21.0	22.0	25.0	26.0	30.0	34.0	38.0
16 x 5 CFM	150	185	220	260	295	330	370	405	445	480	515	590	665	740
Ak .369 Throw	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	32.0	36.0	40.0
14 x 6 CFM	155	195	235	275	315	350	390	430	470	510	545	625	705	780
Ak .391 Throw	8.0	10.0	12.0	14.0	17.0	18.0	20.0	23.0	25.0	27.0	29.0	33.0	37.0	41.0
16 x 6 CFM	180	225	270	315	360	405	450	495	540	580	625	715	805	895
Ak .448 Throw	9.0	11.0	13.0	15.0	18.0	20.0	22.0	24.0	26.0	28.0	31.0	35.0	39.0	44.0
20 x 5 CFM	185	230	280	325	370	415	465	510	555	600	650	740	835	925
Ak .463 Throw	9.0	11.0	13.0	16.0	18.0	20.0	22.0	25.0	27.0	29.0	31.0	36.0	40.0	44.0
24 x 5 CFM	225	280	335	390	445	500	555	615	670	725	780	890	1005	1115
Ak .557 Throw	10.0	12.0	15.0	17.0	19.0	22.0	24.0	27.0	29.0	32.0	34.0	40.0	44.0	49.0
20 x 6 CFM	225	280	340	395	450	505	565	620	675	730	790	900	1015	1125
Ak .563 Throw	10.0	12.0	15.0	17.0	20.0	22.0	25.0	27.0	29.0	32.0	34.0	39.0	44.0	49.0
24 x 6 CFM	270	340	405	475	540	610	680	745	815	880	950	1085	1220	1355
Ak .678 Throw	11.0	14.0	16.0	19.0										

900, 900-50, 990 Supply Registers

Deflection E

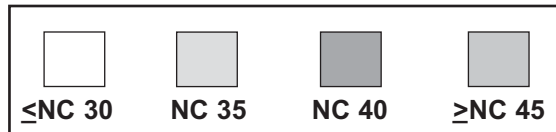
Table with columns for Face Velocity, Pressure Loss, and various register sizes (8x4 to 36x12) and types (CFM, Throw). Values range from 50 to 3730.

Terminal Velocity of 75 FPM

Deflection G

Table with columns for Face Velocity, Pressure Loss, and various register sizes (8x4 to 36x12) and types (CFM, Throw). Values range from 50 to 3730.

Terminal Velocity of 75 FPM

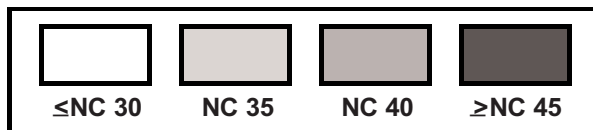


ALH and ALV - Supply Grille

Deflection A

Face Velocity		400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249
8x4	CFM	60	80	95	110	125	140	155	170	185	205	220	250	280	310
Ak .156	Throw	6.5	8.5	10	12	13	15	16	18	19	22	23	26	29	33
10x4	CFM	80	100	120	140	160	180	200	220	240	260	275	315	355	395
Ak .198	Throw	7.5	9.5	12	13	15	17	19	20	22	24	26	29	33	37
12x4	CFM	95	120	145	170	190	215	240	265	290	310	335	385	430	480
Ak .240	Throw	8	10	12	14	16	18	20	22	25	26	28	33	36	41
14x4	CFM	115	140	170	195	225	255	280	310	340	365	395	450	510	565
Ak.282	Throw	9	11	13	15	18	20	22	24	27	29	31	35	40	44
12x5	CFM	125	155	185	215	250	280	310	340	370	405	435	495	560	620
Ak .310	Throw	9	12	14	16	19	21	23	25	28	30	32	37	42	46
10x6	CFM	125	155	190	220	250	280	315	345	375	405	440	500	565	625
Ak .313	Throw	9	12	14	16	19	21	23	26	28	30	33	37	42	46
14x5	CFM	145	180	220	255	290	330	365	400	435	475	510	580	655	730
Ak .364	Throw	10	12	15	18	20	23	25	28	30	33	35	40	45	50
12x6	CFM	150	190	225	265	305	340	380	415	455	495	530	605	680	760
Ak .379	Throw	10	13	15	18	21	23	26	28	31	33	36	41	46	51
16x5	CFM	165	210	250	295	335	375	420	460	500	545	585	670	750	835
Ak .418	Throw	11	13	16	19	22	24	27	30	32	35	38	43	48	54
14x6	CFM	180	225	270	310	355	400	445	490	535	580	625	715	805	890
Ak .446	Throw	11	14	17	19	22	25	28	30	33	36	39	44	50	55
16x6	CFM	205	255	305	360	410	460	510	565	615	665	715	820	920	1025
Ak .512	Throw	11	14	17	20	22	25	28	31	34	36	39	45	55	56
20x5	CFM	210	265	315	370	420	475	525	580	630	685	735	840	945	1050
Ak .526	Throw	12	15	18	21	24	27	30	33	36	39	42	48	54	60
24x5	CFM	255	315	380	445	505	570	635	695	760	825	890	1015	1140	1270
Ak .634	Throw	13	16	20	23	26	30	33	36	40	43	46	53	59	66
20x6	CFM	260	325	385	450	515	580	645	710	775	840	905	1030	1160	1290
Ak .645	Throw	13	17	20	23	27	30	33	37	40	43	47	53	60	67
24x6	CFM	310	390	465	545	620	700	775	855	930	1010	1090	1245	1400	1555
Ak .777	Throw	15	18	22	26	29	33	37	40	44	48	51	59	66	73
20x8	CFM	355	440	530	615	705	795	880	970	1060	1145	1235	1410	1590	1765
Ak .882	Throw	16	19	23	27	31	35	39	43	47	51	55	62	70	78
30x6	CFM	390	490	585	685	780	880	975	1075	1170	1270	1365	1560	1755	1950
Ak .976	Throw	16	21	25	29	33	37	41	45	49	53	57	66	74	82
24x8	CFM	425	530	635	740	850	955	1060	1165	1270	1380	1485	1695	1910	2120
Ak 1.06	Throw	17	21	23	30	34	38	43	47	51	56	60	68	77	85
30x8	CFM	535	670	805	940	1070	1205	1340	1475	1610	1740	1875	2145	2410	2680
Ak 1.34	Throw	19	24	29	34	38	43	48	53	58	62	67	77	87	96
24x10	CFM	540	675	810	945	1080	1215	1350	1485	1620	1755	1890	2160	2430	2700
Ak 1.35	Throw	19	24	29	34	39	43	48	53	58	63	68	77	87	97
36x8	CFM	645	805	965	1125	1290	1450	1610	1770	1930	2095	2255	2575	2900	3220
Ak 1.61	Throw	21	26	32	37	42	47	52	58	63	68	73	84	94	105
24x12	CFM	655	820	985	1150	1310	1475	1640	1805	1970	2130	2295	2625	2950	3280
Ak 1.64	Throw	21	27	32	37	43	48	53	59	64	69	75	85	96	107
30x10	CFM	675	845	1015	1185	1350	1520	1690	1860	2030	2195	2365	2705	3040	3380
Ak 1.69	Throw	21	27	32	38	43	48	54	59	65	70	75	86	97	108
36x10	CFM	815	1020	1225	1430	1630	1835	2040	2245	2450	2650	2855	3265	3670	4080
Ak 2.04	Throw	24	30	36	42	47	53	59	65	71	77	83	95	107	119
30x12	CFM	820	1025	1230	1435	1640	1845	2050	2255	2460	2665	2870	3280	3690	4100
Ak 2.05	Throw	24	30	36	42	48	54	59	65	71	77	83	95	107	119
36x12	CFM	990	1235	1480	1730	1975	2225	2470	2715	2965	3120	3460	3950	4445	4940
Ak 2.47	Throw	26	33	39	46	52	59	65	72	78	85	91	104	114	130

Terminal Velocity of 75 FPM

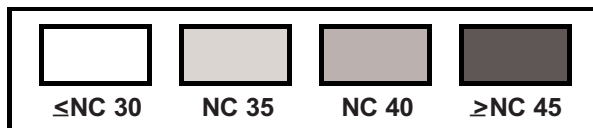


ALH and ALV - Supply Grille

Deflection C

Face Velocity		400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249
8x4	CFM	55	70	85	100	115	125	140	155	170	185	195	225	255	280
Ak .141	Throw	5	6.5	7.5	9	10	11	13	14	15	17	18	20	23	25
10x4	CFM	70	90	105	125	140	160	180	195	215	230	250	285	320	355
Ak .178	Throw	5.5	7	8.5	10	11	13	14	16	17	18	20	23	26	29
12x4	CFM	85	110	130	150	175	195	215	240	260	280	300	345	390	430
Ak .216	Throw	6	8	9.5	11	13	14	16	18	19	20	22	25	28	31
14x4	CFM	100	125	150	180	205	230	255	280	305	330	355	405	455	510
Ak.254	Throw	7	8.5	10	12	14	16	17	19	21	22	24	27	31	34
12x5	CFM	110	140	165	195	225	250	280	305	335	365	390	445	500	560
Ak .279	Throw	7	9	11	13	14	16	18	20	22	23	25	29	32	36
10x6	CFM	115	140	170	195	225	255	280	310	340	365	395	450	510	565
Ak .282	Throw	7.5	9	11	12	14	16	18	20	22	23	25	29	33	36
14x5	CFM	130	165	195	230	260	295	330	360	395	425	460	525	590	655
Ak .328	Throw	7.5	10	12	14	15	17	20	21	23	25	27	31	35	39
12x6	CFM	135	170	205	240	275	310	340	375	410	445	480	545	615	685
Ak .342	Throw	8	10	12	14	16	18	20	22	24	26	28	32	36	40
16x5	CFM	150	190	225	265	300	340	375	415	450	490	525	605	680	755
Ak .377	Throw	8.5	11	12	15	17	19	21	23	25	27	29	34	38	41
14x6	CFM	165	205	245	290	330	370	410	455	495	535	575	660	740	825
Ak .412	Throw	9	11	13	16	18	22	22	24	27	28	31	35	40	44
16x6	CFM	185	230	275	325	370	415	460	510	555	600	645	740	830	925
Ak .462	Throw	9	11	13	15	18	20	22	24	26	28	31	35	39	44
20x5	CFM	190	235	285	330	380	425	475	520	570	615	665	760	855	950
Ak .474	Throw	9.5	12	14	16	19	21	23	26	28	30	33	38	42	47
24x5	CFM	230	285	345	400	460	515	570	630	685	745	800	915	1030	1145
Ak .572	Throw	10	13	15	18	21	23	26	28	33	33	36	41	46	51
20x6	CFM	230	290	350	405	465	525	580	640	695	755	815	930	1045	1160
Ak .581	Throw	10	13	16	18	21	23	26	29	31	34	36	41	47	52
24x6	CFM	280	350	420	490	560	630	700	770	840	910	980	1120	1260	1400
Ak .701	Throw	11	14	17	20	23	26	28	31	34	37	40	45	51	57
20x8	CFM	320	400	475	555	635	715	795	875	955	1035	1115	1270	1430	1590
Ak .795	Throw	12	15	18	21	24	27	30	33	36	39	42	48	54	61
30x6	CFM	350	440	530	615	705	790	880	970	1055	1145	1230	1410	1585	1760
Ak .880	Throw	13	16	19	22	26	29	32	35	38	41	46	51	57	64
24x8	CFM	385	480	575	670	765	865	960	1055	1150	1245	1345	1535	1725	1920
Ak .959	Throw	13	17	20	23	27	30	33	37	40	43	47	53	60	67
30x8	CFM	480	600	720	840	960	1080	1200	1320	1440	1560	1680	1920	2160	2400
Ak 1.20	Throw	15	19	22	26	30	33	37	41	45	48	52	60	67	74
24x10	CFM	490	610	730	855	975	1100	1220	1340	1465	1585	1710	1950	2200	2440
Ak 1.22	Throw	15	19	22	26	30	34	38	41	45	49	53	60	68	75
36x8	CFM	580	725	870	1015	1160	1305	1450	1595	1740	1885	2030	2320	2610	2900
Ak 1.45	Throw	16	20	25	29	33	37	41	45	49	53	57	65	74	82
24x12	CFM	590	735	880	1030	1175	1325	1470	1615	1765	1910	2060	2350	2645	2940
Ak 1.47	Throw	17	21	25	29	33	37	41	45	49	53	58	66	74	82
30x10	CFM	610	765	920	1070	1225	1375	1530	1685	1835	1990	2140	2450	2755	3060
Ak 1.53	Throw	17	21	25	29	34	38	42	46	50	55	59	67	76	84
36x10	CFM	735	920	1105	1290	1470	1655	1840	2025	2210	2390	2575	2945	3310	3680
Ak 1.84	Throw	18	23	28	32	37	42	46	51	55	60	65	74	83	92
30x12	CFM	740	925	1110	1295	1480	1665	1850	2035	2220	2405	2590	2960	3330	3700
Ak 1.85	Throw	19	23	28	32	37	42	46	51	56	60	65	74	83	93
36x12	CFM	890	1115	1340	1560	1785	2000	2230	2455	2675	2900	3120	3570	4015	4460
Ak 2.23	Throw	20	25	31	36	41	46	51	56	61	66	71	81	92	102

Terminal Velocity of 75 FPM



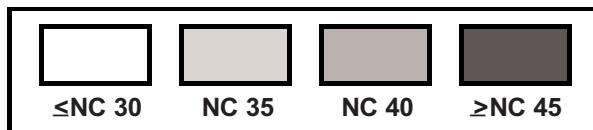
Recommended Noise Criteria and Face Velocity Ranges are on page 96.

ALH and ALV - Supply Grille

Deflection E

Face Velocity		400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249
8x4	CFM	45	60	70	85	95	105	120	130	140	155	165	190	210	235
Ak .127	Throw	2.5	3.5	4	5	5.5	6	6.5	7.5	8	8.5	9.5	11	12	13
10x4	CFM	60	75	90	105	120	135	150	165	180	195	210	240	270	300
Ak .162	Throw	3	3.5	4.5	5	6	6.5	7.5	8	9	9.5	10	12	13	15
12x4	CFM	80	100	120	140	160	175	195	215	235	255	275	315	355	395
Ak .197	Throw	4.5	6	7.5	8.5	10	11	12	13	14	16	17	19	22	24
14x4	CFM	90	115	140	160	185	210	230	255	275	300	325	370	415	460
Ak.231	Throw	5	6.5	8	9	11	12	13	14	16	17	18	21	23	26
12x5	CFM	100	125	150	180	205	230	255	280	305	330	355	405	455	510
Ak .254	Throw	5.5	6.5	8	9.5	12	12	14	15	16	18	19	22	25	27
10x6	CFM	105	130	155	180	205	230	255	285	310	335	360	410	465	515
Ak .257	Throw	5.5	7.5	8.5	9.5	11	12	14	15	17	18	19	22	25	28
14x5	CFM	120	150	180	210	240	270	300	330	360	385	415	475	535	595
Ak .291	Throw	6	7.5	9	10	12	13	15	16	18	19	21	24	27	30
12x6	CFM	125	155	185	220	250	280	310	340	375	405	435	500	560	620
Ak .311	Throw	6	7.5	9	11	12	14	15	17	18	20	21	24	28	30
16x5	CFM	135	170	205	240	275	310	345	375	410	445	480	550	615	685
Ak .343	Throw	6.5	8	9.5	11	13	14	16	17	19	21	22	26	29	32
14x6	CFM	145	185	220	255	290	330	365	400	440	475	510	585	655	730
Ak .365	Throw	6.5	8.5	10	11	13	15	16	18	20	21	23	26	29	33
16x6	CFM	170	215	260	300	345	390	430	475	545	560	605	690	775	860
Ak .431	Throw	7	9	11	12	14	16	18	20	21	23	25	28	32	36
20x5	CFM	190	235	280	330	375	425	470	515	565	610	660	750	845	940
Ak .470	Throw	7.5	9.5	11	13	15	17	19	20	22	24	26	30	33	37
24x5	CFM	210	260	310	365	415	470	520	570	625	675	730	830	935	1040
Ak .520	Throw	8	10	12	14	16	18	20	21	24	25	27	31	35	39
20x6	CFM	210	265	315	370	420	475	530	580	635	685	740	845	950	1055
Ak .528	Throw	8	10	12	14	16	18	20	22	24	26	28	32	35	39
24x6	CFM	255	320	380	445	510	575	635	700	765	830	890	1020	1145	1275
Ak .637	Throw	8.5	11	13	15	17	20	22	24	26	28	30	35	39	43
20x8	CFM	290	360	435	505	580	650	725	795	870	940	1010	1155	1300	1445
Ak .723	Throw	9	12	14	16	19	21	23	25	28	30	32	37	42	46
30x6	CFM	320	400	480	560	640	720	800	880	960	1040	1120	1280	1440	1600
Ak .800	Throw	10	12	15	17	19	22	24	27	29	32	34	39	44	49
24x8	CFM	350	435	525	610	700	785	870	960	1045	1135	1220	1400	1570	1745
Ak .872	Throw	10	13	15	18	20	23	25	28	30	33	36	41	48	51
30x8	CFM	435	545	655	765	870	980	1090	1200	1310	1415	1525	1745	1960	2180
Ak 1.09	Throw	11	14	17	20	23	25	28	31	34	37	40	45	51	57
24x10	CFM	445	555	665	775	890	1000	1110	1220	1330	1445	1555	1775	2000	2220
Ak 1.11	Throw	11	14	17	20	23	26	29	31	34	37	40	46	52	57
36x8	CFM	530	660	790	925	1055	1190	1320	1450	1585	1715	1850	2110	2375	2640
Ak 1.32	Throw	14	17	21	24	27	31	34	38	41	45	48	55	62	69
24x12	CFM	535	670	805	940	1070	1205	1340	1475	1610	1740	1875	2145	2410	2680
Ak 1.34	Throw	13	16	19	22	25	28	31	35	38	41	44	50	57	63
30x10	CFM	555	695	835	975	1110	1250	1390	1530	1670	1805	1945	2225	2500	2780
Ak 1.39	Throw	13	16	19	22	26	29	32	38	38	42	45	51	58	64
36x10	CFM	670	835	1000	1170	1335	1505	1670	1835	2005	2170	2340	2670	3005	3340
Ak 1.67	Throw	14	18	21	25	28	32	35	39	42	46	49	56	63	70
30x12	CFM	670	840	1010	1175	1345	1510	1680	1850	2015	2185	2350	2690	3025	3360
Ak 1.68	Throw	14	16	21	25	28	32	35	39	42	46	49	56	63	70
36x12	CFM	810	1015	1220	1420	1625	1825	2030	2235	2435	2640	2840	3250	3655	4060
Ak 2.03	Throw	15	19	23	27	31	35	39	43	46	50	54	62	70	78

Terminal Velocity of 75 FPM

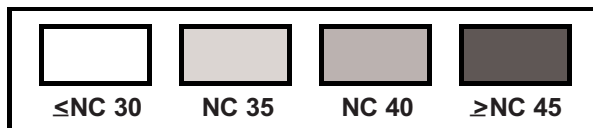


ALH and ALV - Supply Grille

Deflection G

Face Velocity		400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249
8x4	CFM	45	60	70	85	95	105	120	130	140	155	165	190	210	235
Ak .118	Throw	2.5	3.5	4	5	5.5	6	6.5	7.5	8	8.5	9.5	11	12	13
10x4	CFM	60	75	90	105	120	135	150	165	180	195	210	240	270	300
Ak .149	Throw	3	3.5	4.5	5	6	6.5	7.5	8	9	9.5	10	12	13	15
12x4	CFM	70	90	110	125	145	165	180	200	215	235	255	290	325	360
Ak .181	Throw	3	4	5	5.5	6.5	7.5	8	9	10	11	12	13	15	16
14x4	CFM	85	105	125	150	170	190	210	235	255	275	300	340	380	425
Ak.212	Throw	3.5	4.5	5	6.5	7	8	9	10	11	12	13	14	16	18
12x5	CFM	95	115	140	165	185	210	235	255	280	305	325	375	420	465
Ak .233	Throw	4	4.5	5.5	6.5	7.5	8.5	9.5	10	11	12	13	15	17	19
10x6	CFM	95	120	140	165	190	210	235	260	285	305	330	380	425	470
Ak .236	Throw	4	5	5.5	6.5	7.5	8.5	9.5	10	11	12	13	15	17	19
14x5	CFM	110	135	165	190	220	245	275	300	330	355	385	440	495	550
Ak .274	Throw	4	5	6	7	8	9	10	11	12	13	14	16	18	20
12x6	CFM	115	145	170	200	230	255	285	315	345	370	400	460	515	570
Ak .286	Throw	4	5	6	7	8.5	9	10	11	12	13	14	17	19	21
16x5	CFM	125	160	190	220	250	285	315	345	380	410	440	505	565	630
Ak .315	Throw	4.5	5.5	6.5	7.5	8.5	10	11	12	13	14	15	17	19	22
14x6	CFM	135	170	200	235	270	300	335	370	405	435	470	540	605	670
Ak .336	Throw	4.5	5.5	6.5	8	9	10	11	12	13	13	16	18	20	22
16x6	CFM	155	195	230	270	310	345	385	425	465	500	540	620	695	770
Ak .386	Throw	4.5	5.5	6.5	8	9	10	11	12	14	15	16	18	20	23
20x5	CFM	160	200	240	280	320	355	395	435	475	515	555	635	715	795
Ak .397	Throw	5	6	7.5	8.5	10	11	12	13	15	16	17	19	22	24
24x5	CFM	190	240	285	335	380	430	480	525	575	620	670	765	860	955
Ak .478	Throw	5.5	6.5	8	9.5	11	12	13	15	16	17	19	21	24	27
20x6	CFM	195	245	290	340	390	435	485	535	585	630	680	780	875	970
Ak .486	Throw	5.5	7	8	9.5	11	12	13	15	16	17	19	22	24	27
24x6	CFM	235	295	350	410	470	525	585	645	705	760	820	940	1055	1170
Ak .586	Throw	6	7.5	9	10	12	13	15	16	18	19	21	24	27	29
20x8	CFM	265	335	400	465	530	600	665	730	800	865	930	1065	1195	1330
Ak .665	Throw	6.5	8	9.5	11	13	14	16	17	19	21	22	25	28	32
30x6	CFM	295	370	440	515	590	660	735	810	885	955	1030	1180	1325	1470
Ak .736	Throw	6.5	8.5	10	12	13	15	17	18	20	21	23	27	30	33
24x8	CFM	320	400	480	560	640	720	800	880	960	1045	1125	1285	1445	1605
Ak .802	Throw	7	8.5	10	12	14	15	17	19	21	22	24	28	31	35
30x8	CFM	405	505	605	705	810	910	1010	1110	1210	1315	1415	1615	1820	2020
Ak 1.01	Throw	8	9.5	12	14	16	17	19	21	23	25	27	31	35	39
24x10	CFM	410	510	610	715	815	920	1020	1120	1225	1325	1430	1630	1835	2040
Ak 1.02	Throw	8	9.5	12	14	16	18	19	21	23	25	27	31	35	40
36x8	CFM	485	605	725	845	970	1090	1210	1330	1450	1575	1695	1935	2180	2420
Ak 1.21	Throw	8.5	11	13	15	17	19	21	23	25	28	30	34	38	42
24x12	CFM	490	615	740	860	985	1105	1230	1355	1475	1600	1720	1970	2215	2460
Ak 1.23	Throw	8.5	11	13	15	17	19	21	24	26	28	30	34	39	43
30x10	CFM	510	640	770	900	1025	1150	1280	1410	1535	1665	1790	2050	2305	2560
Ak 1.28	Throw	8.5	11	13	15	18	20	22	24	26	28	31	35	39	44
36x10	CFM	615	770	925	1080	1230	1385	1540	1695	1850	2000	2155	2465	2770	3080
Ak 1.54	Throw	9.5	12	14	17	19	22	24	26	29	31	34	38	43	48
30x12	CFM	620	775	930	1085	1240	1395	1550	1705	1860	2015	2170	2480	2790	3100
Ak 1.55	Throw	9.5	12	14	17	19	22	24	26	29	31	34	38	43	48
36x12	CFM	745	930	1115	1300	1490	1675	1860	2045	2230	2420	2605	2975	3350	3720
Ak 1.86	Throw	11	13	16	18	21	24	26	29	31	34	37	42	47	52

Terminal Velocity of 75 FPM



Recommended Noise Criteria and Face Velocity Ranges are on page 96.

ALHR90
Return Air Registers and Grilles

Average Face Velocity*		400	500	600	700	800	900	1000
6 x 6	CFM	50	63	76	88	101	113	126
Ak .126	Ps	.011	.018	.025	.036	.044	.056	.069
8 x 8	CFM	103	129	155	181	207	233	259
Ak .259	Ps	.011	.017	.024	.034	.043	.054	.067
12 x 6	CFM	119	148	178	208	237	267	297
Ak .297	Ps	.011	.017	.024	.034	.043	.054	.067
14 x 6	CFM	141	177	212	248	283	318	354
Ak .354	Ps	.011	.017	.024	.033	.042	.053	.066
14 x 8	CFM	195	244	292	341	390	438	487
Ak .487	Ps	.010	.016	.023	.032	.041	.052	.064
12 x 12	CFM	256	320	384	448	512	576	640
Ak .640	Ps	.010	.016	.022	.030	.040	.050	.062
24 x 8	CFM	348	435	523	610	697	784	871
Ak .871	Ps	.009	.015	.021	.028	.038	.045	.055
18 x 12	CFM	395	493	592	691	789	888	987
Ak .987	Ps	.009	.014	.021	.027	.037	.044	.054
30 x 8	CFM	441	552	662	772	882	993	1103
Ak 1.10	Ps	.009	.014	.020	.026	.036	.043	.053
24 x 12	CFM	535	668	802	936	1069	1203	1337
Ak 1.34	Ps	.009	.014	.019	.025	.035	.042	.052
18 x 18	CFM	605	756	907	1059	1210	1361	1512
Ak 1.51	Ps	.008	.013	.018	.023	.033	.040	.050
30 x 12	CFM	676	845	1014	1182	1351	1520	1689
Ak 1.69	Ps	.008	.013	.018	.023	.032	.039	.049
20 x 20	CFM	755	943	1132	1321	1509	1698	1887
Ak 1.89	Ps	.008	.012	.017	.022	.031	.038	.048
36 x 12	CFM	818	1023	1227	1432	1636	1841	2045
Ak 2.05	Ps	.007	.012	.017	.021	.030	.037	.047
24 x 20	CFM	914	1142	1370	1599	1827	2055	2284
Ak 2.28	Ps	.007	.012	.016	.021	.028	.035	.045
30 x 18	CFM	1034	1292	1551	1809	2068	2326	2584
Ak 2.58	Ps	.007	.011	.015	.020	.026	.033	.043
24 x 24	CFM	1106	1383	1659	1936	2213	2489	2766
Ak 2.77	Ps	.007	.011	.016	.021	.025	.035	.042
36 x 18	CFM	1252	1565	1878	2191	2505	2818	3131
Ak 3.13	Ps	.007	.011	.017	.022	.027	.037	.045
30 x 24	CFM	1399	1749	2099	2449	2799	3149	3499
Ak 3.50	Ps	.008	.012	.018	.023	.029	.039	.048
36 x 24	CFM	1697	2122	2546	2971	3395	3819	4244
Ak 4.24	Ps	.008	.014	.020	.026	.033	.044	.054
30 x 30	CFM	1773	2216	2659	3102	3546	3989	4432
Ak 4.43	Ps	.009	.014	.020	.027	.034	.045	.056
36 x 30	CFM	2154	2692	3231	3769	4307	4846	5384
Ak 5.38	Ps	.010	.016	.023	.031	.040	.051	.063
48 x 24	CFM	2308	2885	3462	4039	4616	5193	5771
Ak 5.77	Ps	.010	.017	.024	.032	.042	.053	.066
36 x 36	CFM	2621	3276	3931	4587	5242	5897	6552
Ak 6.55	Ps	.011	.018	.026	.035	.046	.058	.072
48 x 36	CFM	3588	4485	5382	6279	7176	8073	8971
Ak 8.97	Ps	.010	.016	.023	.031	.040	.051	.063
48 x 48	CFM	4946	6183	7419	8656	9893	11129	12366
Ak 12.40	Ps	.010	.016	.023	.031	.041	.052	.064

ALH45FF and ALHR45
Return Air Registers and Grilles

Average Face Velocity*		400	500	600	700	800	900	1000
6 x 6	CFM	60	70	90	100	120	130	150
Ak .145	Ps	.037	.058	.083	.113	.148	.189	.232
8 x 8	CFM	100	120	140	170	190	220	240
Ak .241	Ps	.032	.050	.072	.098	.128	.163	.200
12 x 6	CFM	110	140	170	190	220	250	280
Ak .278	Ps	.031	.048	.069	.094	.122	.155	.191
14 x 6	CFM	130	170	200	230	270	300	330
Ak .334	Ps	.029	.045	.065	.088	.114	.145	.179
14 x 8	CFM	190	230	280	330	370	420	460
Ak .464	Ps	.025	.039	.055	.075	.097	.123	.152
12 x 12	CFM	250	310	370	430	490	550	610
Ak .614	Ps	.021	.032	.046	.062	.079	.100	.125
24 x 8	CFM	340	420	500	590	670	760	840
Ak .839	Ps	.020	.032	.046	.061	.079	.100	.124
18 x 12	CFM	380	480	570	670	760	860	950
Ak .952	Ps	.020	.032	.046	.061	.080	.101	.124
30 x 8	CFM	430	530	640	750	850	960	1100
Ak 1.07	Ps	.020	.032	.046	.061	.080	.101	.124
24 x 12	CFM	520	650	780	900	1000	1200	1300
Ak 1.29	Ps	.020	.032	.046	.062	.081	.102	.124
18 x 18	CFM	580	730	880	1000	1200	1300	1500
Ak 1.46	Ps	.020	.032	.046	.062	.081	.102	.124
30 x 12	CFM	650	820	980	1100	1300	1500	1600
Ak 1.63	Ps	.021	.032	.046	.062	.082	.103	.124
20 x 20	CFM	730	910	1100	1300	1500	1600	1800
Ak 1.82	Ps	.021	.032	.046	.063	.083	.104	.124
36 x 12	CFM	790	990	1200	1400	1600	1800	2000
Ak 1.98	Ps	.021	.032	.046	.063	.084	.105	.125
24 x 20	CFM	880	1100	1300	1500	1800	2000	2200
Ak 2.21	Ps	.021	.032	.047	.064	.085	.107	.126
30 x 18	CFM	1000	1200	1500	1700	2000	2200	2500
Ak 2.50	Ps	.021	.033	.048	.065	.087	.109	.128
24 x 24	CFM	1100	1300	1600	1900	2100	2400	2700
Ak 2.67	Ps	.022	.033	.048	.066	.088	.110	.130
36 x 18	CFM	1200	1500	1800	2100	2400	2700	3000
Ak 3.02	Ps	.023	.035	.051	.069	.092	.116	.137
30 x 24	CFM	1300	1700	2000	2400	2700	3000	3400
Ak 3.37	Ps	.024	.037	.053	.073	.096	.121	.144
36 x 24	CFM	1600	2000	2400	2900	3300	3700	4100
Ak 4.08	Ps	.027	.040	.058	.080	.105	.132	.158
30 x 30	CFM	1700	2100	2600	3000	3400	3800	4300
Ak 4.26	Ps	.027	.041	.060	.081	.107	.135	.162
36 x 30	CFM	2100	2600	3100	3600	4100	4600	5200
Ak 5.15	Ps	.030	.045	.066	.090	.117	.149	.179
48 x 24	CFM	2200	2800	3300	3900	4400	5000	5500
Ak 5.51	Ps	.031	.047	.069	.093	.122	.154	.186
36 x 36	CFM	2500	3100	3700	4400	5000	5600	6200
Ak 6.24	Ps	.034	.051	.074	.100	.130	.165	.200
48 x 36	CFM	3400	4200	5100	5900	6800	7600	8500
Ak 8.48	Ps	.025	.038	.055	.075	.098	.124	.153
48 x 48	CFM	4600	5800	6900	8100	9200	10000	12000
Ak 11.60	Ps	.022	.034	.048	.066	.086	.109	.134

*Velocity measured 1 inch from face. Multiple readings are taken in face areas not exceeding 6" x 6", but in no case less than 6 readings, to ensure a representative CFM = Ak x Average Measured Velocity.

**ALC Series
Curved-Blade Diffusers
Selection Procedure**

1. Determine the diffuser air pattern best suited to the duct layout and room area to be served.
2. Select the air pattern type and CFM per outlet. The ALC tables gives the recommended limits of air volume per outlet for various ceiling heights. Choose the correct table for the style diffuser selected. Outlets are assumed to be mounted flush on the ceiling with no obstruction to the air stream.
3. Turn to the proper SIZE TABLE for the air pattern desired.
4. Determine the appropriate size based on the CFM, Throw, Pressure Loss, and Face Velocity requirements.

ALC Series Curved-Blade Diffusers

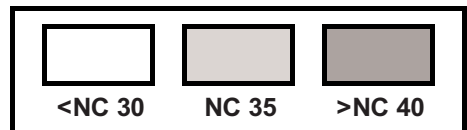
One-Way, Two Way

Face Velocity		400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090
6 x 6	CFM	0.35	45	55	65	70	80	90	100	110
Ak .09	Throw 1/2	3.5/2.5	5/3.5	6/4	7/5	7.5/5.5	8.5/6	9.5/7	11/7.5	1.5/8.5
8 x 6	CFM	40	50	60	70	80	90	100	110	120
Ak .10	Throw 1/2	3.5/2.5	4.5/3	5.5/4	6.5/4.5	7/5	8/6	9/6.5	10/7	11/7.5
10 x 6	CFM	60	75	90	105	120	135	150	165	180
Ak .15	Throw 1/2	5/3.5	6/4.5	7/5	8.5/6	9.5/7	11/7.5	12/8.5	13/9.5	14/10
8 x 8	CFM	65	80	95	110	130	145	160	175	190
Ak .16	Throw 1/2	5/3.5	6/4.5	7.5/5	8.5/6	10/7	11/8	12/9	14/9.5	15/10
12 x 6	CFM	70	90	110	125	145	160	180	200	215
Ak .18	Throw 1/2	5/3.5	6.5/4.5	8/5.5	9/6.5	11/7.5	12/8.5	13/9.5	15/10	16/11
14 x 6	CFM	85	105	125	145	170	190	210	230	250
Ak .21	Throw 1/2	5.5/4	7/5	8.5/6	10/7	11/8	13/9	14/10	16/11	17/12
10 x 10	CFM	95	120	145	170	190	215	240	265	290
Ak .24	Throw 1/2	6/4	7.5/5	9/6.5	10/7.5	12/8	13/9.5	15/10	16/11	18/13
12 x 10	CFM	115	145	175	205	230	260	290	320	350
Ak .29	Throw 1/2	6.5/4.5	8/5.5	9.5/7	11/8	13/9	14/10	16/11	18/13	19/14
16 x 8	CFM	125	155	185	215	250	280	310	340	370
Ak .31	Throw 1/2	6.5/5	8.5/6	10/7	12/8	13/9.5	15/11	17/12	18/13	20/14
12 x 12	CFM	140	175	210	245	280	315	350	385	420
Ak .35	Throw 1/2	7/5	9/6	11/7.5	12/8.5	14/10	16/11	18/12	19/14	21/15
16 x 12	CFM	185	230	275	320	370	415	460	505	550
Ak .46	Throw 1/2	8/5.5	10/7	12/8.5	14/10	16/11	18/13	20/14	22/16	24/17
14 x 14	CFM	190	240	290	335	385	430	480	530	575
Ak .48	Throw 1/2	8/5.5	10/7.5	12/9	14/10	17/12	18/13	21/15	23/16	25/17
16 x 16	CFM	250	315	380	440	505	565	630	695	755
Ak .63	Throw 1/2	9.5/6.5	12/8.5	14/10	16/12	19/13	21/15	23/17	26/18	28/20
20 x 14	CFM	270	340	410	475	545	610	680	750	815
Ak .68	Throw 1/2	9.5/7	12/8.5	15/10	17/12	19/14	22/15	24/17	27/19	29/21
24 x 12	CFM	280	350	420	490	560	630	700	770	840
Ak .70	Throw 1/2	10/7	12/8.5	15/10	17/12	20/14	22/16	25/17	27/19	30/21
30 x 10	CFM	290	365	440	510	585	655	730	805	875
Ak .73	Throw 1/2	10/7	13/9	15/11	18/12	20/14	23/16	25/18	28/20	30/21
36 x 10	CFM	350	440	530	615	705	790	880	970	1055
Ak .88	Throw 1/2	11/8	14/10	17/12	19/14	22/16	25/18	28/20	31/22	33/24
36 x 12	CFM	420	525	630	735	840	945	1050	1155	1260
Ak 1.05	Throw 1/2	12/8.5	15/11	18/13	21/15	24/17	27/19	30/21	33/23	36/25
30 x 16	CFM	460	575	690	805	920	1035	1150	1265	1380
Ak 1.15	Throw 1/2	12/9	16/11	19/13	22/15	25/18	28/20	31/22	34/24	37/26
36 x 16	CFM	560	700	840	980	1120	1260	1400	1540	1680
Ak 1.40	Throw 1/2	14/9.5	17/12	21/15	24/17	27/19	31/22	34/24	38/27	41/29

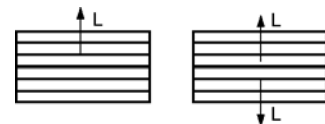
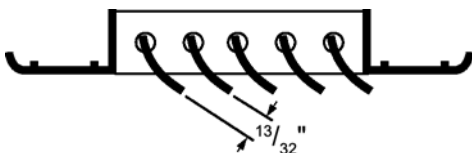
Terminal Velocity of 75 FPM

Curved-Blade - ALC Series

Ceiling Height in Feet	Maximum Cooling Temperature Differential (°F)	Maximum CFM per Outlet			
		1-way	2-way	3-way	4-way
7	15°	75	150	225	300
8	18°	100	200	300	400
9	20°	200	400	600	800
10	22°	300	600	900	1200
11	25°	400	800	1200	1600
12	25°	500	1000	1500	2000
14	25°	700	1400	2100	2800
16	25°	900	1800	2700	3600



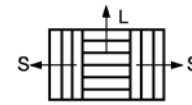
The Face Bars on the Curved-Blade Diffuser should be preset to the dimension shown below.



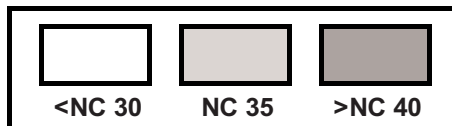
ALC Series Curved-Blade Diffusers

Three-Way

Face Velocity		400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090
6 x 6 Ak .09	Total CFM	35	45	55	65	70	80	90	100	110
	CFM L/S	9/13	11/17	15/20	17/24	18/26	22/29	24/33	26/37	30/40
	Throw L/S	2/2	2.5/3	3/3.5	3.5/4	4/4.5	4.5/5	5/6	5.5/6.5	6/7
8 x 6 Ak .10	Total CFM	40	50	60	70	80	90	100	110	120
	CFM L/S	18/11	24/13	28/16	32/19	36/22	42/24	46/27	50/30	56/32
	Throw L/S	2.5/2	3/2.5	3.5/3	4.5/3.5	5/4	5.5/4.5	6/5	7/5	7.5/5.5
10 x 6 Ak .15	Total CFM	60	75	90	105	120	135	150	165	180
	CFM L/S	22/19	27/24	32/29	39/33	44/38	49/43	54/48	61/52	66/57
	Throw L/S	3/2.5	3.5/3	4.5/4	5/4.5	6/5	6.5/5.5	7/6.5	8/7	9/7.5
8 x 8 Ak .16	Total CFM	65	80	95	110	130	145	160	175	190
	CFM L/S	31/17	36/22	43/26	50/30	60/35	67/39	74/43	81/47	88/51
	Throw L/S	3.5/2.5	4/3.5	5/4	5.5/4.5	7/5	7.5/6	8.5/6.5	9/7	10/7.5
12 x 6 Ak .18	Total CFM	70	90	110	125	145	160	180	200	215
	CFM L/S	20/25	26/32	32/39	37/44	43/51	48/56	54/63	60/70	65/75
	Throw L/S	2.5/3	3.5/4	4.5/5	5/5.5	5.5/6.5	6.5/7	7/8	8/8.5	8.5/9.5
14 x 6 Ak .21	Total CFM	85	105	125	145	170	190	210	230	250
	CFM L/S	21/32	27/39	31/47	37/54	44/63	48/71	54/78	58/86	64/93
	Throw L/S	2.5/3.5	3.5/4.5	4/5	5/6	6/7	6.5/8	7/8.5	8/9.5	17/12
10 x 10 Ak .24	Total CFM	95	120	145	170	190	215	240	265	290
	CFM L/S	35/30	44/38	53/46	62/54	70/60	79/68	88/76	97/84	106/92
	Throw L/S	3.5/3	4.5/4	5.5/5	6/6	7/6.5	8/7.5	9/8	10/9	11/10
12 x 10 Ak .29	Total CFM	115	145	175	205	230	260	290	320	350
	CFM L/S	35/40	44/51	53/61	62/72	70/80	78/91	88/101	96/112	106/122
	Throw L/S	3.5/4	4.5/5	5.5/5.5	6.5/7	7/7.5	8/8.5	9/9.5	9.5/11	11/11
16 x 8 Ak .31	Total CFM	125	155	185	215	250	280	310	340	370
	CFM L/S	43/41	55/50	65/60	75/70	88/81	98/91	108/101	120/110	130/120
	Throw L/S	4/4	5/4.5	6/5.5	7/6.5	8/7.5	9/8.5	10/9.5	11/10	12/11
12 x 12 Ak .35	Total CFM	140	175	210	245	280	315	350	385	420
	CFM L/S	42/49	53/61	62/74	73/86	84/98	95/110	105/123	115/135	126/147
	Throw L/S	4/4	5/5	6/6.5	6.5/7.5	7.5/8.5	8.5/9.5	9.5/10	11/11	13/13
16 x 12 Ak .46	Total CFM	185	230	275	320	370	415	460	505	550
	CFM L/S	65/60	80/75	97/89	113/104	130/120	146/134	162/149	178/164	194/178
	Throw L/S	4.5/4.5	6/5.5	7/7	8.5/8	9.5/9	11/10	12/11	13/12	14/14
14 x 4 Ak .48	Total CFM	190	240	290	335	385	430	480	530	575
	CFM L/S	48/71	62/89	74/108	86/125	99/143	110/160	123/179	136/197	147/214
	Throw L/S	4/5	5/6.5	6.5/7.5	7.5/9	8.5/10	9.5/11	10/13	12/14	13/15
16 x 16 Ak .63	Total CFM	250	315	380	440	505	565	630	695	755
	CFM L/S	88/81	111/102	134/123	155/143	178/164	199/183	222/204	245/225	266/245
	Throw L/S	5.5/5.5	7/7	8.5/8	9.5/9.5	11/11	13/12	14/13	15/15	17/16
20 x 14 Ak .68	Total CFM	270	340	410	475	545	610	680	750	815
	CFM L/S	76/97	95/122	115/148	133/171	153/196	171/220	190/245	210/270	228/293
	Throw L/S	5/6	6.5/7	7.5/9	9/10	10/12	12/13	13/15	14/16	15/17
24 x 12 Ak .70	Total CFM	280	350	420	490	560	630	700	770	840
	CFM L/S	90/95	112/119	134/143	156/167	178/191	200/215	222/239	244/263	268/286
	Throw L/S	5.5/5.5	7/7	8.5/8.5	9.5/10	11/12	12/13	14/14	15/16	17/17
30 x 10 Ak .73	Total CFM	290	365	440	510	585	655	730	805	875
	CFM L/S	92/99	117/124	140/150	164/173	187/199	210/223	234/248	258/274	280/298
	Throw L/S	5.5/6	7/7.5	8.5/9	10/10	11/12	13/13	14/15	16/16	17/18
36 x 10 Ak .88	Total CFM	350	440	530	615	705	790	880	970	1055
	CFM L/S	113/118	143/149	172/179	199/208	228/238	256/267	285/297	314/328	342/357
	Throw L/S	6.5/6.5	8/8	9.5/9.5	11/11	13/13	14/14	16/16	17/18	19/19
36 x 12 Ak 1.05	Total CFM	420	525	630	735	840	945	1050	1155	1260
	CFM L/S	135/142	169/178	203/214	237/249	270/285	304/320	338/356	372/392	406/427
	Throw L/S	7/7	8.5/9	10/11	12/12	14/14	15/16	17/18	19/19	20/21
30 x 16 Ak 1.15	Total CFM	460	575	690	805	920	1035	1150	1265	1380
	CFM L/S	148/156	183/196	220/235	258/274	295/313	331/352	368/391	405/430	442/469
	Throw L/S	7/7	9/9	10/11	12/13	14/15	16/16	18/18	19/20	21/22
36 x 16 Ak 1.40	Total CFM	560	700	840	980	1120	1260	1400	1540	1680
	CFM L/S	180/190	226/237	270/285	316/332	360/380	406/427	450/475	496/522	540/570
	Throw L/S	8/8	10/10	12/12	14/14	16/16	18/18	19/20	21/22	23/24



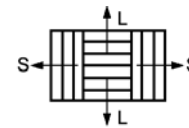
Terminal Velocity of 75 FPM



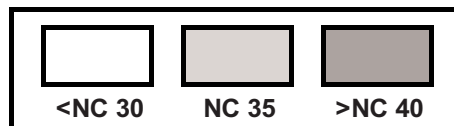
ALC Series Curved-Blade Diffusers

Four-Way

Face Velocity		400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090
6 x 6 Ak .09	Total CFM	35	45	55	65	70	80	90	100	110
	CFM L/S	5/13	6/17	7/20	9/24	9/26	11/29	12/33	13/37	15/40
	Throw L/S	1.5/2	1.5/3	2/3.5	2.5/4	2.5/4.5	3.5	3.5/6	4/6.5	4.5/7
8 x 6 Ak .10	Total CFM	40	50	60	70	80	90	100	110	120
	CFM L/S	9/11	12/13	14/16	16/19	18/22	21/24	23/27	25/30	28/32
	Throw L/S	1.5/1.5	2.5/2	2.5/2.5	3/2.5	3.5/3	4/3.5	4.5/4	4.5/4.5	5.5/4.5
10 x 6 Ak .15	Total CFM	60	75	90	105	120	135	150	165	180
	CFM L/S	11/19	14/24	16/29	19/33	22/38	25/43	27/48	30.52	33/57
	Throw L/S	2/2.5	2.5/3.5	3/4	3.5/4.5	4/5.5	4.5/6	5/7	5.5/7.5	6/8
8 x 8 Ak .16	Total CFM	65	80	95	110	130	145	160	175	190
	CFM L/S	15/17	18/22	22/26	25/30	30/35	33/39	37/43	40/47	44/51
	Throw L/S	2.5/2	3/2.5	3.5/3	4/3.5	5/4.5	5.5/5	6/5.5	6.5/6	7/6.5
12 x 6 Ak .18	Total CFM	70	90	110	125	145	160	180	200	215
	CFM L/S	10/25	13/32	16/39	19/44	22/51	24/56	27/63	30/70	32.75
	Throw L/S	2/3	2.5/4	3/5	3.5/5.5	4/6.5	4.5/7	5/8	5.5/8.5	6/9.5
14 x 6 Ak .21	Total CFM	85	105	125	145	170	190	210	230	250
	CFM L/S	11/32	13/39	16/47	18/54	22/63	24/71	27/78	29/86	32/93
	Throw L/S	2/3.5	2.5/4.5	3/5	3.5/6	4/7	4.5/8	5/8.5	5.5/9.5	6/10
10 x 10 Ak .24	Total CFM	95	120	145	170	190	215	240	265	290
	CFM L/S	17/30	22/38	26/46	31/54	35/60	39/68	44/76	48/84	53/92
	Throw L/S	2.5/3	3/4	3.5/5	4.5/6	5/6.5	5.5/7.5	6.5/8	7/9	7.5/10
12 x 10 Ak .29	Total CFM	115	145	175	205	230	260	290	320	350
	CFM L/S	17/40	22/51	26/61	31/72	35/80	39/91	44/101	48/112	53.122
	Throw L/S	2.5/4	3/5	3.5/5.5	4.5/7	5/7.5	5.5/8.5	6.5/9.5	7/11	7.5/11
16 x 8 Ak .31	Total CFM	125	155	185	215	250	280	310	340	370
	CFM L/S	22/41	27/50	33/60	38/70	44/81	49/91	55/100	60/110	65/120
	Throw L/S	3/4	3.5/4.5	4/5.5	5/6.5	5.5/7.5	6.5/8.5	7/9.5	7.5/10	8.5/11
12 x 12 Ak .35	Total CFM	140	175	210	245	280	315	350	385	420
	CFM L/S	21/49	26.61	31/74	37/86	42.98	47/110	52/123	58/135	63/147
	Throw L/S	2.5/4	3.5/5	4/6.5	5/7.5	5.5/8.5	6/9.5	7/10	7.5/11	8/13
16 x 12 Ak .46	Total CFM	185	230	275	320	370	415	460	505	550
	CFM L/S	33/60	40/75	48/89	56/104	65/120	73.135	81/149	89/164	97/178
	Throw L/S	3.5/4.5	4/5.5	5/7	6/8	7/9	7.5/10	8.5/11	9/12	10/14
14 x 4 Ak .48	Total CFM	190	240	290	335	385	430	480	530	575
	CFM L/S	24/71	31/89	37/108	43/125	49/143	55/160	61/179	68/197	74/214
	Throw L/S	3/5	3.5/6.5	4.5/7.5	5/9	6/10	6.5/11	7.5/13	8/14	9/15
16 x 16 Ak .63	Total CFM	250	315	380	440	505	565	630	695	755
	CFM L/S	44/81	55/102	67/123	77/143	89/164	99/183	111/204	122/225	133/245
	Throw L/S	4/5.5	5/6.5	6/8	7/9.5	8/11	9/12	10/13	11/15	12/16
20 x 14 Ak .68	Total CFM	270	340	410	475	545	610	680	750	815
	CFM L/S	38/97	48/122	57/148	67/171	76/196	85/220	95/245	105/270	114/293
	Throw L/S	3.5/6	4.5/7	5.5/9	6.5/10	7/12	8/13	9/15	10/16	11/17
24 x 12 Ak .70	Total CFM	280	350	420	490	560	630	700	770	840
	CFM L/S	45/95	56/119	67/143	78/167	89/191	100/215	111/239	122/263	134/286
	Throw L/S	4/5.5	5/7	6/8.5	7/10	8/12	9/13	10/14	11/16	12/17
30 x 10 Ak .73	Total CFM	290	365	440	510	585	655	730	805	875
	CFM L/S	46/99	58/124	70/150	82/173	94/199	105/223	117/248	129/274	140/298
	Throw L/S	4/6	5/7.5	6/9	7/10	8/12	9/13	10/15	11/16	12/18
36 x 10 Ak .88	Total CFM	350	440	530	615	705	790	880	970	1055
	CFM L/S	57/118	71/149	86/179	100/208	114/238	128/267	143/297	157/328	171/357
	Throw L/S	4.5/6.5	5.5/8	6.5/9.5	8/11	9/13	10/14	11/16	12/18	13/19
36 x 12 Ak 1.05	Total CFM	420	525	630	735	840	945	1050	1155	1260
	CFM L/S	67/142	85/178	101/214	118/249	135/285	152/320	169/356	186/392	203/427
	Throw L/S	5/7	6/9	7/11	8.5/12	9.5/14	11/16	12/18	13/19	14/21
30 x 16 Ak 1.15	Total CFM	460	575	690	805	920	1035	1150	1265	1380
	CFM L/S	74/156	92/196	110/235	129/274	147/313	166/352	184/391	202/430	221/469
	Throw L/S	5/7	6/9	7.5/11	8.5/13	10/15	11/16	12/18	14/20	15/22
36 x 16 Ak 1.40	Total CFM	560	700	840	980	1120	1260	1400	1540	1680
	CFM L/S	90/190	113/237	135/285	158/332	180/380	203/427	225/475	248/522	270/570
	Throw L/S	5.5/8	7/10	8.5/12	9.5/14	11/16	12/18	14/20	15/22	17/24



Terminal Velocity of 75 FPM



Recommended Noise Criteria and Face Velocity Ranges are on page 96.

**ALHR45T and ALH45TFF
T-Bar Return Air Grilles and Filter Grilles**

Type and Size		Average Face Velocity FPM							
		300	400	500	600	700	800	900	1000
ALHR45T									
22x22	CFM	785	1045	1305	1565	1825	2090	2350	2610
Ak 2.61	-Ps	.015	.030	.043	.062	.084	.120	.140	.170
46x22		CFM	1635	2180	2725	3270	3815	4360	4905
Ak 5.46	-Ps	.015	.030	.040	.059	.081	.116	.136	.165
ALH45TFF									
20x20	CFM	650	870	1085	1300	1520	1735	1955	2170
Ak 2.17	-Ps	.015	.025	.040	.060	.080	.105	.135	.152
44x20	CFM	1430	1910	2385	2860	3340	3815	4295	4770
Ak 4.77	-Ps	.015	.024	.039	.058	.078	.103	.132	.148

Models 291, 292, 293, 294

Static Pressure in H ₂ O Neck Velocity (FPM)	4" Horizontal								5" Horizontal								6" Horizontal							
	.033	.055	.088	.130	.173	.224	.287	.355	.033	.055	.088	.130	.173	.224	.287	.355	.033	.055	.088	.130	.173	.224	.287	.355
Noise Criteria	<30	30	33	35	37	39	42	46	<30	30	33	35	38	40	42	46	<30	30	33	37	39	42	47	50
CFM	87	89	111	134	156	178	200	223	84	111	139	167	195	223	250	278	100	134	167	201	234	268	301	334
1-Way Throw (ft)	13	18	23	28	32	36	40	43	14	19	24	29	34	38	42	45	15	20	25	30	35	40	44	48
2-Way Throw (ft)	12	15	19	23	27	30	33	37	13	17	20	25	28	31	35	38	13	17	21	26	29	33	37	41
3-Way Throw (ft)	11	14	17	21	24	27	30	33	12	15	18	22	25	28	32	35	12	15	19	23	27	30	33	37
4-Way Throw (ft)	10	13	16	19	22	25	28	31	11	13	16	20	24	27	30	33	11	14	17	21	25	28	31	34
Noise Criteria	<30	30	34	36	38	40	43	47	<30	30	34	36	38	40	43	47	<30	30	34	37	40	44	47	50
CFM	94	111	139	167	195	223	250	278	104	139	174	209	243	278	313	348	125	167	208	250	282	334	375	417
1-Way Throw (ft)	14	19	24	29	34	38	42	45	15	20	25	30	35	40	44	48	16	21	26	31	36	42	46	50
2-Way Throw (ft)	13	16	20	25	28	32	35	39	13	17	21	26	29	33	37	40	14	18	22	27	30	35	39	42
3-Way Throw (ft)	12	15	18	22	25	28	32	35	12	15	19	23	26	30	33	37	13	16	20	25	27	31	35	39
4-Way Throw (ft)	11	13	17	20	24	26	30	33	11	14	17	21	25	28	31	35	12	15	19	23	26	29	32	36
Noise Criteria	<30	30	34	36	38	42	45	48	<30	30	35	37	39	42	46	50	<30	30	35	37	41	45	48	51
CFM	100	134	167	210	234	268	301	334	125	167	208	250	282	334	375	417	150	200	250	300	350	400	450	500
1-Way Throw (ft)	15	20	25	30	35	40	44	48	16	21	26	31	36	42	46	50	17	22	27	33	38	44	48	52
2-Way Throw (ft)	13	17	21	26	29	33	37	40	14	18	22	27	30	35	39	42	14	19	23	28	32	37	41	44
3-Way Throw (ft)	12	15	19	23	26	30	33	37	13	16	20	24	27	31	35	39	13	17	21	26	29	33	37	41
4-Way Throw (ft)	11	14	18	21	25	27	31	34	12	15	18	22	26	29	32	36	12	16	20	24	27	30	34	37
Noise Criteria	<30	30	35	38	40	42	46	51	<30	30	36	38	40	43	46	52	<30	30	36	39	42	46	48	53
CFM	117	156	194	233	272	311	350	389	146	195	243	282	340	389	438	486	175	233	292	350	408	466	525	584
1-Way Throw (ft)	16	21	26	31	36	41	46	50	18	22	28	33	38	44	48	52	18	23	29	34	40	46	50	54
2-Way Throw (ft)	14	18	22	26	30	34	38	42	14	18	24	27	32	36	40	44	15	20	25	29	33	38	42	46
3-Way Throw (ft)	12	16	20	24	27	31	35	38	13	17	21	25	28	32	36	40	14	17	22	26	30	34	38	42
4-Way Throw (ft)	11	15	18	22	26	28	32	35	12	16	19	23	27	30	34	37	13	16	20	25	28	31	35	39
Noise Criteria	<30	30	35	38	41	43	47	52	<30	30	36	38	41	43	47	52	<30	30	36	39	42	46	50	53
CFM	133	178	222	267	311	356	400	444	167	222	278	333	389	444	500	555	200	267	334	400	467	537	600	668
1-Way Throw (ft)	17	22	27	32	38	42	48	52	19	23	29	35	40	46	50	54	19	24	30	36	42	47	51	56
2-Way Throw (ft)	14	18	23	27	31	34	40	43	15	19	25	28	33	37	42	46	16	20	25	30	34	39	43	48
3-Way Throw (ft)	13	16	20	25	28	32	36	39	13	17	22	26	30	33	37	41	14	18	23	27	31	35	39	43
4-Way Throw (ft)	12	15	19	23	26	30	33	37	12	16	20	24	27	31	35	38	13	17	21	25	29	32	36	40
Noise Criteria	<30	30	35	38	41	43	47	52	<30	30	36	39	42	44	47	52	<30	30	36	39	43	46	51	54
CFM	150	200	250	300	350	400	450	500	188	250	313	376	438	500	564	626	225	300	375	450	525	600	675	750
1-Way Throw (ft)	18	23	28	34	39	44	49	53	19	24	30	36	41	48	51	56	20	25	31	37	44	49	52	58
2-Way Throw (ft)	15	19	24	28	32	36	41	44	16	20	25	29	34	38	43	47	16	21	25	31	35	40	44	50
3-Way Throw (ft)	13	17	21	26	29	32	37	40	14	18	22	27	30	35	38	42	14	18	24	28	32	36	41	44
4-Way Throw (ft)	12	16	20	24	27	30	34	38	13	17	21	25	28	32	36	40	13	17	22	26	30	33	37	41
Noise Criteria	<30	30	35	38	42	44	48	52	<30	30	36	39	42	44	48	52	<30	30	37	39	43	46	51	54
CFM	167	222	278	333	389	444	500	555	208	278	347	417	486	555	625	695	250	334	416	500	584	666	750	844
1-Way Throw (ft)	19	24	29	35	40	46	50	54	19	25	31	37	43	49	52	57	20	26	32	38	45	50	56	61
2-Way Throw (ft)	15	20	25	28	33	37	42	46	16	21	26	30	35	39	44	48	17	22	27	32	36	41	46	51
3-Way Throw (ft)	13	17	22	26	30	33	38	41	14	18	23	27	31	36	40	43	15	20	25	28	33	37	42	46
4-Way Throw (ft)	12	16	20	25	27	31	35	38	13	17	22	26	29	33	37	41	13	18	22	27	31	35	38	42
Noise Criteria	<30	30	35	38	43	45	49	53	<30	30	36	39	43	45	49	53	<30	30	36	40	44	47	51	54
CFM	200	267	333	400	467	534	600	667	250	334	416	500	584	666	750	844	300	400	500	600	700	800	900	1000
1-Way Throw (ft)	19	25	30	36	43	48	52	56	20	26	32	38	45	50	56	61	21	27	34	40	47	52	59	63
2-Way Throw (ft)	16	21	26	30	35	40	43	48	17	22	27	31	36	41	46	51	17	23	28	33	38	43	48	53
3-Way Throw (ft)	14	18	23	27	31	35	39	43	15	19	24	28	33	37	41	46	15	20	26	30	34	38	43	48
4-Way Throw (ft)	13	17	21	26	29	33	36	40	14	18	23	27	31	35	38	42	14	19	24	28	32	36	40	44
Noise Criteria	<30	30	35	39	44	47	51	55	<30	30	38	39	44	47	52	56	<30	30	38	40	45	48	53	56
CFM	250	334	416	500	584	666	750	844	313	417	522	625	730	835	940	1040	375	500	625	750	875	1000	1125	1250
1-Way Throw (ft)	20	26	32	38	45	50	56	61	21	27	35	40	47	52	59	63	22	28	36	42	49	57	63	67
2-Way Throw (ft)	17	22	27	31	36	41	46	51	17	23	28	33	38	43	48	53	18	24	30	35	40	45	51	57
3-Way Throw (ft)	15	19	24	28	32	37	41	46	15	20	26	30	35	39	43	49	16	21	27	31	36	41	46	51
4-Way Throw (ft)	14	18	23	27	31	35	38	42	14	19	24	28	32	37	41	45	15	20	25	29	33	38	42	47
Noise Criteria	<30	30	36	40	45	48	52	56	<30	30	38	39	45	48	52	57	<30	30	38	41	46	49	54	57
CFM	300	400	500	600	700	800	900	1000	375	500	625	750	875	1000	1125	1250	450	600	750	900	1050	1200	1350	1500
1-Way Throw (ft)	21	27	34	40	47	51	59	63	22	28	36	42	49	57	63	67	23	30	37	44	50	59	65	71
2-Way Throw (ft)	17	23	28	33	38	43	48	53	18	24	29	35	40	45	51	56	19	25	31	36	42	47	53	60
3-Way Throw (ft)	16	20	26	30	34	38	43	48	16	21	27	31	36	41	45	51	17	22	28	33	38	42	48	53
4-Way Throw (ft)	14	19	24	28	32	36	40	44	15	20	25	29	34	38	42	47	16	21	26	30	35	40	44	50
Noise Criteria	<30	30	37	41	46	49	53	57	<30	30	38	41	46	49	54	57	<30	30	39	42	47	50	55	58
CFM																								

Models 291, 292, 293, 294

Static Pressure in H ₂ O Neck Velocity (FPM)	8" Horizontal								10" Horizontal								12" Horizontal							
	.033	.055	.088	.130	.173	.224	.287	.355	.033	.055	.088	.130	.173	.224	.287	.355	.033	.055	.088	.130	.173	.224	.287	.355
Noise Criteria	<30	30	35	37	42	44	48	50	<30	30	35	39	44	47	50	53	<30	30	35	41	45	49	52	55
8" Vertical CFM	133	178	222	267	311	356	400	444	208	278	347	417	486	555	625	695	300	400	500	600	700	800	900	1000
1-Way Throw (ft)	16	21	27	32	38	42	48	52	19	25	31	37	43	49	52	57	21	27	34	40	47	52	59	63
2-Way Throw (ft)	14	18	23	27	31	35	40	43	16	21	26	30	35	40	44	49	17	22	28	33	38	43	48	53
3-Way Throw (ft)	13	16	21	25	28	32	36	40	14	18	23	27	31	35	40	44	15	20	26	30	34	38	43	48
4-Way Throw (ft)	12	15	19	23	26	30	33	36	13	17	21	25	29	33	37	41	13	18	24	28	32	36	40	44
Noise Criteria	<30	30	35	38	43	46	49	52	<30	30	37	40	44	46	51	54	<30	30	37	42	45	50	53	57
10" Vertical CFM	167	222	278	333	389	444	500	555	250	334	416	500	584	666	750	844	300	400	500	600	700	800	900	1000
1-Way Throw (ft)	17	23	29	35	40	46	50	54	20	26	32	38	45	50	56	61	21	27	34	40	47	52	59	63
2-Way Throw (ft)	15	19	25	28	33	37	42	46	17	22	27	32	36	42	46	51	17	22	28	33	38	43	48	53
3-Way Throw (ft)	13	17	22	25	30	33	37	42	15	19	24	28	33	37	42	46	15	20	26	30	34	38	43	48
4-Way Throw (ft)	12	16	20	24	28	31	35	39	13	18	22	26	30	35	38	42	13	18	24	28	32	36	40	44
Noise Criteria	<30	30	37	39	43	47	51	54	<30	30	37	41	44	48	52	56	<30	30	37	42	45	50	53	57
12" Vertical CFM	200	267	333	400	467	534	600	637	292	389	486	583	680	776	875	972	350	467	584	700	817	935	1050	1170
1-Way Throw (ft)	18	24	30	36	42	48	52	56	21	26	33	39	47	51	58	63	22	28	34	40	47	53	60	68
2-Way Throw (ft)	16	20	25	30	35	39	43	48	17	22	27	32	36	42	46	51	18	23	29	34	40	45	50	55
3-Way Throw (ft)	14	18	23	27	31	35	39	43	15	19	24	28	33	37	42	46	16	21	26	31	36	40	44	50
4-Way Throw (ft)	13	17	21	25	29	33	36	41	14	18	23	27	31	36	40	44	15	20	25	29	33	37	41	46
Noise Criteria	<30	30	36	39	42	47	51	54	<30	30	36	40	43	47	51	55	<30	30	36	40	43	47	51	55
14" Vertical CFM	234	312	389	467	545	623	700	779	334	445	555	667	778	890	1000	1110	400	545	667	800	935	1070	1200	1335
1-Way Throw (ft)	19	25	32	37	44	49	55	58	21	27	35	41	48	53	61	65	22	29	35	41	48	55	62	71
2-Way Throw (ft)	16	21	26	31	36	41	45	50	18	23	28	34	39	44	50	54	18	25	30	35	41	46	51	58
3-Way Throw (ft)	14	19	24	28	32	36	41	44	15	20	25	30	34	38	43	48	16	21	26	31	36	40	44	50
4-Way Throw (ft)	13	17	22	26	30	34	38	42	14	18	23	27	31	36	40	44	15	20	25	30	34	39	42	48
Noise Criteria	<30	30	37	39	43	46	51	55	<30	30	37	40	43	47	51	55	<30	30	37	41	43	47	53	56
16" Vertical CFM	266	356	445	533	622	710	800	890	375	500	625	750	875	1000	1125	1250	450	600	750	900	1050	1200	1350	1500
1-Way Throw (ft)	20	26	33	38	46	50	57	61	22	28	36	42	49	57	63	67	23	30	36	42	50	57	63	73
2-Way Throw (ft)	17	22	27	32	37	42	46	52	18	23	28	34	39	44	50	54	19	25	30	36	42	47	52	60
3-Way Throw (ft)	15	20	25	28	33	37	42	46	16	21	26	31	35	40	44	50	17	22	28	32	38	43	47	52
4-Way Throw (ft)	14	18	23	27	31	35	39	43	15	19	24	28	32	37	41	46	16	21	26	30	35	40	44	50
Noise Criteria	<30	30	37	39	44	46	52	55	<30	30	37	40	44	47	53	55	<30	30	37	42	45	49	54	56
18" Vertical CFM	300	400	500	600	700	800	900	1000	417	555	695	834	973	1110	1250	1390	500	667	834	1000	1167	1334	1500	1667
1-Way Throw (ft)	21	27	34	40	47	52	59	63	22	29	37	43	50	58	65	69	24	30	37	43	51	59	66	76
2-Way Throw (ft)	17	22	28	33	38	43	48	53	18	24	29	35	40	45	51	56	19	26	31	37	43	49	53	61
3-Way Throw (ft)	15	20	25	30	34	38	43	48	16	21	27	31	36	41	46	51	17	22	28	32	38	43	47	52
4-Way Throw (ft)	14	19	23	28	32	36	40	44	15	20	25	29	34	38	42	47	16	21	26	30	35	40	44	50
Noise Criteria	<30	30	37	39	44	46	52	55	<30	30	37	40	44	47	53	55	<30	30	37	42	45	49	54	56
20" Vertical CFM	334	445	555	667	778	890	1000	1110	502	669	836	1005	1170	1340	1505	1670	600	800	1000	1200	1400	1600	1800	2000
1-Way Throw (ft)	21	27	35	41	48	53	61	65	25	32	40	48	55	62	70	75	26	33	41	49	57	65	75	90
2-Way Throw (ft)	17	23	28	34	39	44	50	54	19	26	32	37	42	48	54	61	21	27	33	39	45	51	57	64
3-Way Throw (ft)	16	21	26	31	35	40	44	50	17	22	27	32	37	42	48	52	18	25	30	35	41	46	51	57
4-Way Throw (ft)	15	20	24	29	33	37	41	45	16	21	26	30	35	40	43	48	17	22	28	33	38	41	48	53
Noise Criteria	<30	30	37	40	45	47	52	56	<30	30	37	42	45	48	54	57	<30	31	37	43	46	50	55	58
24" Vertical CFM	400	545	667	800	935	1070	1200	1335	625	833	1040	1250	1460	1667	1875	2080	750	1000	1250	1500	1750	2000	2250	2500
1-Way Throw (ft)	22	28	36	42	50	57	63	68	23	31	38	46	51	60	68	72	25	32	39	46	53	62	70	82
2-Way Throw (ft)	18	25	30	35	41	46	52	57	19	26	32	37	42	48	54	61	21	27	33	39	45	51	57	64
3-Way Throw (ft)	16	22	27	32	37	42	46	52	17	23	28	34	39	44	50	54	18	25	30	35	41	46	51	57
4-Way Throw (ft)	15	20	26	30	34	39	42	48	16	22	27	31	36	41	46	51	17	22	28	33	38	41	48	53
Noise Criteria	<30	31	38	42	46	50	54	58	<30	31	38	42	46	49	55	59	<30	31	39	43	47	49	57	-
30" Vertical CFM	502	669	836	1005	1170	1340	1505	1670	750	1000	1250	1500	1750	2000	2250	2500	900	1200	1500	1800	2100	2400	2700	3000
1-Way Throw (ft)	23	31	38	46	51	60	68	72	25	32	40	48	55	62	70	75	26	33	41	49	57	65	75	90
2-Way Throw (ft)	19	26	32	37	42	49	54	61	21	27	33	40	45	52	58	65	22	28	35	41	47	54	61	68
3-Way Throw (ft)	17	23	28	34	39	44	50	54	18	25	30	36	41	46	52	58	19	26	31	37	43	48	54	61
4-Way Throw (ft)	16	21	27	31	36	41	46	51	17	23	28	33	38	42	49	53	18	24	29	35	40	45	50	56
Noise Criteria	<30	31	38	43	47	51	55	59	<30	31	39	44	48	56	56	<30	32	39	44	49	53	57	-	
36" Vertical CFM	600	800	1000	1200	1400	1600	1800	2000	875	1167	1459	1750	2041	2332	2623	1167	1556	1945	2334	2723	3112	3501	3890	
1-Way Throw (ft)	25	32	40	48	55	62	70	75	27	35	42	50	59	66	78	79	28	35	43	51	60	70	82	98
2-Way Throw (ft)	21	27	33	39	45	51	57	64	22	28	35	41	47	54	61	69	23	29	36	43	50	57	65	73
3-Way Throw (ft)	18	25	30	35	41	46	51	57	19	26	31	37	42	49	54	61	20	26	33	39	45	51	57	65
4-Way Throw (ft)	17	23	28	32	38	42	48	52	18	24	29	35	40	45	51	56	18	25	31	36	41	48	52	59
Noise Criteria	<30	31	39	43	48	51	56																	

Models 291, 292, 293, 294

Static Pressure in H ₂ O Neck Velocity (FPM)	14" Horizontal								16" Horizontal								18" Horizontal							
	.033	.055	.088	.130	.173	.224	.287	.355	.033	.055	.088	.130	.173	.224	.287	.355	.033	.055	.088	.130	.173	.224	.287	.355
Noise Criteria	<30	30	37	42	46	51	54	58																
14" Vertical																								
CFM	408	545	680	816	955	1090	1225	1360																
1-Way Throw (ft)	22	29	35	42	49	55	63	71																
2-Way Throw (ft)	18	25	30	35	41	46	52	58																
3-Way Throw (ft)	16	22	27	32	37	42	46	52																
4-Way Throw (ft)	15	20	25	30	35	39	43	48																
Noise Criteria	<30	30	36	42	44	46	53	57	<30	30	37	43	47	52	56	59	<30	33	38	44	49	53	57	61
16" Vertical																								
CFM	467	623	778	935	1090	1245	1400	1555	534	710	890	1070	1245	1425	1600	1780								
1-Way Throw (ft)	23	30	37	43	50	57	65	74	23	31	38	45	52	60	67	78								
2-Way Throw (ft)	19	26	31	37	42	48	53	60	20	26	32	38	43	50	56	62								
3-Way Throw (ft)	17	23	28	33	38	43	48	53	17	23	29	34	40	44	50	55								
4-Way Throw (ft)	16	21	26	31	35	40	44	50	16	21	27	32	36	41	46	51								
Noise Criteria	<30	30	37	42	44	48	54	57	<30	31	37	42	45	49	56	59	<30	33	38	44	49	53	57	61
18" Vertical																								
CFM	525	700	875	1050	1225	1400	1575	1750	600	800	1000	1200	1400	1600	1800	2000	675	900	1125	1350	1575	1800	2025	2250
1-Way Throw (ft)	23	31	38	44	51	59	67	78	24	32	39	46	53	61	69	82	25	32	40	47	55	63	72	86
2-Way Throw (ft)	20	26	31	38	43	49	55	62	21	27	33	39	45	51	57	63	21	27	34	40	46	52	60	67
3-Way Throw (ft)	17	23	28	34	40	44	50	55	18	24	30	35	41	46	52	57	18	25	30	36	41	47	52	60
4-Way Throw (ft)	16	22	27	31	36	41	46	51	17	22	28	33	38	41	48	52	17	23	28	34	39	43	50	54
Noise Criteria	<30	31	38	43	46	50	55	57	<30	31	38	43	47	51	56	59	<30	32	38	45	49	53	56	60
20" Vertical																								
CFM	584	779	973	1170	1360	1550	1750	1945	668	890	1110	1335	1560	1780	2000	2220	750	1000	1250	1500	1750	2000	2250	2500
1-Way Throw (ft)	24	32	39	46	53	61	70	81	25	32	40	47	55	63	72	86	26	33	41	49	56	65	76	90
2-Way Throw (ft)	20	27	32	39	44	51	57	63	20	27	34	40	46	53	60	67	22	28	35	41	47	53	61	69
3-Way Throw (ft)	18	24	30	35	40	45	52	57	18	25	30	36	42	47	53	59	19	26	31	37	42	48	54	61
4-Way Throw (ft)	17	22	28	32	37	41	47	52	17	23	29	34	39	42	50	54	18	24	29	35	40	45	51	56
Noise Criteria	<30	31	38	43	47	51	56	59	<30	31	38	44	47	51	57	-	<30	34	39	46	52	56	60	-
24" Vertical																								
CFM	700	934	1170	1400	1634	1870	2100	2334	800	1070	1335	1600	1870	2135	2400	2665	900	1200	1500	1800	2100	2400	2700	3000
1-Way Throw (ft)	26	33	41	48	56	64	73	88	26	34	41	50	58	67	78	92	27	35	43	51	60	69	82	98
2-Way Throw (ft)	21	28	34	41	46	53	60	67	22	28	35	41	48	55	63	72	23	29	36	43	50	58	65	73
3-Way Throw (ft)	19	25	31	37	42	48	53	60	20	26	32	37	43	50	56	63	20	27	33	39	44	51	57	65
4-Way Throw (ft)	17	23	29	34	40	43	50	55	18	24	30	35	40	45	51	57	19	25	31	36	41	47	52	59
Noise Criteria	<30	31	39	44	48	52	57	-	<30	32	40	44	49	53	59	-	<30	32	40	45	49	55	-	-
30" Vertical																								
CFM	875	1170	1460	1750	2040	2330	2625	2915	1000	1335	1670	2000	2335	2670	3000	3335	1125	1500	1875	2250	2625	3000	3355	3750
1-Way Throw (ft)	27	35	42	51	60	69	81	98	27	36	43	52	61	72	85	105	28	37	46	53	63	75	90	100
2-Way Throw (ft)	23	29	36	43	49	56	63	73	23	30	37	43	51	58	67	77	24	31	38	46	52	61	70	80
3-Way Throw (ft)	20	26	32	39	44	50	56	63	21	27	33	40	46	52	59	67	21	28	35	41	48	53	61	70
4-Way Throw (ft)	18	25	30	36	41	46	52	58	19	25	31	37	42	48	53	61	20	26	32	38	43	50	55	62
Noise Criteria	<30	32	40	45	48	53	58	-	<30	33	40	45	50	56	-	-	<30	33	41	46	51	57	-	-
36" Vertical																								
CFM	1050	1400	1750	2100	2450	2800	3150	3500	1200	1600	2000	2400	2800	3200	3600	4000	1350	1800	2250	2700	3150	3600	4050	4500
1-Way Throw (ft)	28	36	44	52	62	73	86	110	26	37	46	55	66	77	93	118	30	38	47	57	67	81	100	130
2-Way Throw (ft)	24	30	38	45	52	60	68	78	25	32	39	46	53	62	72	82	25	32	40	47	56	64	73	85
3-Way Throw (ft)	21	27	34	41	47	52	60	68	22	28	35	41	48	54	62	70	22	29	36	43	50	57	65	74
4-Way Throw (ft)	19	26	32	37	42	49	54	62	2	26	32	39	43	51	56	63	21	27	33	40	45	52	59	67
Noise Criteria	<30	33	42	46	51	57	-	-	<30	33	42	46	51	58	-	-	<30	34	43	47	52	58	-	-
48" Vertical																								
CFM	1400	1870	2330	2800	3265	3730	4200	4660	1600	2135	2670	3200	3740	4260	4800	5340	1800	2400	3000	3600	4200	4800	5400	6000
1-Way Throw (ft)	30	39	48	58	68	82	100	130	31	40	45	60	72	86	110	143	32	41	51	61	74	91	118	155
2-Way Throw (ft)	26	32	40	48	56	65	75	87	27	34	42	50	58	68	78	85	27	35	43	51	60	70	82	98
3-Way Throw (ft)	23	30	37	43	50	57	65	75	23	31	37	44	52	60	67	80	25	32	38	46	53	61	72	83
4-Way Throw (ft)	21	27	34	40	46	52	60	67	22	28	35	41	48	53	61	70	22	29	36	42	50	56	64	73

Models 291, 292, 293, 294

	20" Horizontal								24" Horizontal								30" Horizontal							
Static Pressure in H ₂ O	.033	.055	.088	.130	.173	.224	.287	.355	.033	.055	.088	.130	.173	.224	.287	.355	.033	.055	.088	.130	.173	.224	.287	.355
Neck Velocity (FPM)	300	400	500	600	700	800	900	1000	300	400	500	600	700	800	900	1000	300	400	500	600	700	800	900	1000
Noise Criteria	<30	34	39	46	51	55	58	61	<30	35	41	47	53	58	60	-	<30	35	42	48	54	60	-	-
20" Vertical																								
CFM	835	1110	1390	1670	1945	2220	2500	2780																
1-Way Throw (ft)	26	34	42	50	59	67	80	95																
2-Way Throw (ft)	22	29	35	42	49	56	63	72																
3-Way Throw (ft)	20	26	32	38	43	50	56	63																
4-Way Throw (ft)	18	25	30	35	41	47	51	58																
Noise Criteria	<30	34	39	46	52	56	60	-	<30	35	41	47	53	58	60	-	<30	35	42	48	54	60	-	-
24" Vertical																								
CFM	1000	1335	1670	2000	2340	2665	3000	3330	1200	1600	2000	2400	2800	3200	3600	4000								
1-Way Throw (ft)	27	36	43	52	61	72	86	105	28	37	46	55	66	77	93	118								
2-Way Throw (ft)	23	30	37	43	51	59	67	77	25	32	39	46	53	62	72	82								
3-Way Throw (ft)	21	27	33	40	46	52	59	67	22	28	35	41	48	54	62	71								
4-Way Throw (ft)	19	26	31	37	42	49	53	61	21	26	33	39	44	50	56	63								
Noise Criteria	<30	33	41	47	52	58	-	-	<30	33	41	47	52	59	-	-	<30	35	42	48	54	60	-	-
30" Vertical																								
CFM	1250	1670	2080	2500	2920	3340	3750	4170	1500	2000	2500	3000	3500	4000	4500	5000	1875	2500	3125	3750	4375	5000	5625	6250
1-Way Throw (ft)	29	38	46	56	66	79	95	120	30	40	48	59	70	85	105	140	32	42	52	62	76	93	120	153
2-Way Throw (ft)	25	32	40	46	54	62	72	83	26	33	41	48	57	66	77	90	27	35	43	52	60	72	83	100
3-Way Throw (ft)	22	28	36	42	49	55	63	72	23	30	37	43	51	58	67	77	25	32	39	46	53	62	72	83
4-Way Throw (ft)	20	27	33	39	44	51	57	65	22	28	35	41	47	52	61	68	22	30	36	42	50	57	65	75
Noise Criteria	<30	34	41	47	52	58	-	-	<30	34	42	48	53	60	-	-	<30	35	42	49	55	60	-	-
36" Vertical																								
CFM	1500	2000	2500	3000	3500	4000	4500	5000	1800	2400	3000	3600	4200	4800	5400	6000	2250	3000	3750	4500	5250	6000	6750	7500
1-Way Throw (ft)	30	40	48	59	70	84	105	140	32	41	51	62	74	91	118	155	33	43	54	67	81	103	138	180
2-Way Throw (ft)	26	33	41	48	57	65	76	90	27	35	43	51	60	70	82	98	28	37	45	54	64	76	90	110
3-Way Throw (ft)	23	30	37	43	51	58	66	76	25	31	38	46	53	61	72	83	26	33	41	48	57	66	76	90
4-Way Throw (ft)	21	28	35	41	47	53	61	68	23	29	36	42	50	55	64	73	23	31	38	44	52	60	68	80
Noise Criteria	<30	34	43	47	53	60	-	-	<30	35	44	48	54	60	-	-	<30	36	45	49	54	62	-	-
48" Vertical																								
CFM	2000	2670	3330	4000	4670	5330	6000	6660	2400	3200	4000	4800	5600	6400	7200	8000	3000	4000	5000	6000	7000	8000	9000	10000
1-Way Throw (ft)	32	42	53	63	77	95	125	165	34	44	55	68	83	108	144	187	36	47	59	72	90	122	165	210
2-Way Throw (ft)	28	36	44	53	62	72	85	103	28	37	46	55	65	77	92	118	30	40	48	59	70	83	104	140
3-Way Throw (ft)	25	32	40	47	54	63	73	85	26	33	42	50	57	67	80	92	27	36	43	52	62	72	86	105
4-Way Throw (ft)	23	30	37	43	51	58	65	77	25	31	39	45	52	61	70	83	26	33	41	48	56	65	75	90
Static Pressure in H ₂ O	.033	.055	.088	.130	.173	.224	.287	.355	.033	.055	.088	.130	.173	.224	.287	.355	.033	.055	.088	.130	.173	.224	.287	.355
Neck Velocity (FPM)	300	400	500	600	700	800	900	1000	300	400	500	600	700	800	900	1000	300	400	500	600	700	800	900	1000
Noise Criteria	<30	36	43	50	56	62	-	-	<30	37	47	58	58	67	-	-	<30	36	45	54	62	-	-	-
36" Vertical																								
CFM	2700	3600	4500	5400	6300	7200	8100	9000																
1-Way Throw (ft)	35	46	57	70	86	115	155	200																
2-Way Throw (ft)	30	38	47	57	68	81	98	128																
3-Way Throw (ft)	27	35	42	51	60	70	83	98																
4-Way Throw (ft)	25	32	40	47	54	62	71	86																
Noise Criteria	<30	36	46	55	57	65	-	-	<30	37	47	58	58	67	-	-	<30	36	45	54	62	-	-	-
48" Vertical																								
CFM	3600	4800	6000	7200	8400	9600	10800	12000	4800	6400	8000	9600	11200	12800	14400	16000								
1-Way Throw (ft)	38	50	63	77	100	140	185	240	40	53	68	87	120	165	220	300								
2-Way Throw (ft)	32	42	51	62	77	92	120	155	33	44	55	68	83	108	145	188								
3-Way Throw (ft)	28	37	45	54	66	78	92	116	31	40	50	60	72	86	108	145								
4-Way Throw (ft)	27	35	41	51	59	68	81	95	28	37	45	53	63	74	90	115								

The 290 Series grille has many applications for any heating or cooling requirement either on ceiling or sidewall installation. You can create practically any pattern necessary. The easy and quick individual adjustment of the curved-blade louvers can be accomplished without removing the grilles from the wall or ceiling. Ideal for overhead duct systems where air conditioning is being installed. Correct the air pattern problem in remodeling installations where air outlets are located at baseboard; direct the air where it is most desirable.

1230 Perforated Return

Neck Velocity		200	300	400	500	600	700	800
- Ps		.01	.02	.03	.05	.07	.10	.12
6"								
An .20	CFM	40	60	80	100	120	140	160
8"								
An .35	CFM	70	105	140	175	210	245	280
10"								
An .54	CFM	110	165	220	275	330	385	440
12"								
An .78	CFM	160	240	320	395	475	550	630
14"								
An 1.07	CFM	215	320	430	535	640	750	855

Notes:

1. The use of a balancing hood is recommended to balance the system.
2. An = Neck Area in square feet
3. -Ps = Negative Static Pressure Loss in inches of water

1231 Curved-Blade Perforated Supply

Neck Velocity - V _N		300	400	500	600	700	800	1000	1200
6"	CFM	60	80	100	120	135	155	195	235
	Ps	.012	.022	.034	.049	.066	.086	.135	.194
	An .200	1.00	1.50	1.50	2.00	2.50	3.00	3.50	4.00
	Ak .330	0.50	1.00	1.00	1.50	1.50	1.50	0.20	2.50
	NC	<20	<20	<20	21	27	30	36	41
8"	CFM	105	140	175	210	245	280	350	420
	Ps	.012	.022	.034	.049	.066	.086	.135	.195
	An .350	2.25	3.00	3.50	4.50	5.25	6.00	7.50	9.00
	Ak .450	1.25	2.00	2.50	3.00	3.50	3.50	4.50	5.50
	NC	<20	<20	10	25	30	34	39	45
10"	CFM	165	220	275	325	380	435	545	655
	Ps	.012	.022	.034	.049	.066	.087	.135	.195
	An .550	3.50	4.50	5.50	7.00	8.00	9.00	11.50	13.50
	Ak .570	2.00	3.00	3.50	4.50	5.00	5.50	7.00	8.50
	NC	<20	<20	20	28	33	37	42	48
12"	CFM	235	315	395	470	550	630	785	945
	Ps	.014	.025	.039	.056	.076	.099	.155	.223
	An .790	5.00	6.00	7.50	9.50	11.00	12.50	15.50	18.50
	Ak .700	3.00	4.00	5.00	6.00	7.00	7.50	9.50	11.50
	NC	<20	<20	21	28	34	38	44	50
14"	CFM	320	430	535	640	750	855	1070	1285
	Ps	.016	.028	.044	.063	.086	.112	.175	.252
	An 1.070	6.00	7.50	9.50	11.50	13.50	15.50	19.00	23.00
	Ak .840	3.50	5.00	6.00	7.00	8.50	9.50	12.00	14.50
	NC	<20	<20	21	28	35	39	46	52

1234 Curved-Blade Perforated Diffuser

One-Way Supply

Neck Size	Neck Velocity - V _N								
	300	400	500	600	700	800	1000	1200	
6"	CFM	60	80	100	120	140	160	200	240
	Ps	.060	.080	.100	.150	.200	.260	.400	.580
	Throw	2.5-4.0-5.0	3.5-5.0-6.0	4.0-6.0-7.0	4.5-7.0-8.5	5.5-8.0-9.5	6.5-9.5-11.5	8.0-12.0-14.5	9.5-14.0-17.0
	NC	<20	<20	<20	22	26	30	40	>45
8"	CFM	105	140	175	210	245	280	350	420
	Ps	.080	.110	.160	.240	.320	.420	.650	.930
	Throw	4.0-6.0-7.0	5.5-8.0-9.5	6.5-10.0-12.0	8.0-12.0-14.5	7.5-14.0-17.0	10.5-10.6-19.0	13.5-20.0-24.0	16.0-24.0-29.0
	NC	<20	<20	21	26	31	39	>45	>45
10"	CFM	165	220	275	325	380	435	545	650
	Ps	.080	.110	.170	.250	.320	.430	.660	.940
	Throw	4.5-7.0-8.5	6.5-9.5-11.5	8.0-12.0-14.5	9.5-14.5-17.5	11.0-16.5-20.0	12.5-19.0-23.0	16.0-24.0-29.0	19.0-28.5-34.0
	NC	<20	<20	23	26	34	40	>45	>45
12"	CFM	235	315	395	470	550	630	790	940
	Ps	.080	.110	.170	.250	.340	.440	.690	.980
	Throw	5.5-8.5-10.0	7.5-11.0-13.5	9.5-14.0-17.0	11.0-16.5-20.0	13.0-19.5-26.5	14.5-22.0-26.5	18.5-27.5-33.0	22.0-33.0-39.5
	NC	<20	<20	20	33	40	45	>45	>45
14"	CFM	325	430	535	640	750	860	1075	1275
	Ps	.110	.140	.210	.300	.420	.550	.860	1.200
	Throw	4.5-7.0-8.5	6.5-9.5-11.5	8.0-12.0-14.5	9.5-14.5-17.5	11.5-17.0-20.5	13.0-17.5-23.5	16.5-24.5-29.5	19.5-29.0-35.0
	NC	<20	<20	25	30	38	44	>45	>45
16"	CFM	420	560	700	840	980	1120	1400	1680
	Ps	.020	.040	.060	.080	.110	.140	.220	.260
	Throw	5.0-8.0-10.0	7.0-10.0-12.0	10.0-13.0-16.0	12.0-15.0-18.0	13.0-18.0-21.0	14.0-19.0-24.0	18.0-26.0-30.0	20.0-31.0-36.0
	NC	<20	<20	26	34	39	43	>45	>45

1234 Curved-Blade Perforated Diffuser

Two-Way Supply

Neck Size		Neck Velocity - V _N								
		300	400	500	600	700	800	1000	1200	
6"	CFM	60	80	100	120	140	160	200	240	
	Ps	.050	.070	.090	.130	.170	.220	.340	.500	
	Throw NC	2.0-3.0-3.5 <20	2.5-3.5-4.5 <20	3.5-5.0-6.0 <20	4.0-5.5-6.5 20	4.5-6.5-8.0 24	5.0-7.5-9.0 28	6.5-9.5-11.5 37	7.5-11.5-13.5 44	
8"	CFM	105	140	175	210	245	280	350	420	
	Ps	.400	.054	.084	.120	.165	.215	.330	.480	
	Throw NC	3.0-4.5-5.5 <20	3.5-5.5-6.5 <20	4.5-7.0-8.5 <20	5.5-8.5-10.0 23	6.5-9.5-11.5 29	7.5-11.0-13.0 36	9.5-14.0-17.0 43	11.0-16.5-20.0 >45	
10"	CFM	165	220	275	325	380	435	545	650	
	Ps	.060	.080	.130	.180	.250	.310	.510	.730	
	Throw NC	4.5-6.5-7.5 <20	5.5-8.5-10.0 <20	7.0-10.5-12.5 <20	8.5-12.5-15.0 25	9.5-14.5-17.5 29	11.0-16.5-20.0 37	14.0-21.0-25.0 45	16.5-25.0-30.0 >45	
12"	CFM	235	315	395	470	550	630	790	940	
	Ps	.050	.070	.110	.150	.210	.270	.430	.600	
	Throw NC	4.5-6.5-7.5 <20	5.5-8.5-10.0 <20	7.0-10.5-12.5 23	8.5-12.5-15.0 30	10.0-15.0-18.0 37	11.5-17.0-20.5 43	14.5-21.5-26.0 >45	17.0-25.5-30.5 >45	
14"	CFM	325	430	535	640	750	860	1075	1275	
	Ps	.050	.070	.100	.150	.200	.260	.410	.570	
	Throw NC	3.5-5.5-6.5 <20	4.5-7.0-8.5 <20	6.0-9.0-11.0 22	7.0-10.5-12.5 28	8.5-12.5-15.0 35	9.5-14.0-17.0 40	11.5-17.5-21.0 >45	14.0-21.0-25.0 >45	
16"	CFM	420	560	700	840	980	1120	1400	1680	
	Ps	.020	.040	.060	.080	.110	.140	.220	.260	
	Throw NC	4.0-6.0-8.0 <20	5.0-8.0-9.0 <20	7.0-10.0-12.0 26	9.0-11.0-13.0 34	10.0-14.0-16.0 39	11.0-16.0-19.0 43	13.0-19.0-24.0 >45	16.0-22.0-27.0 >45	

Three-Way Supply

Neck Size		Neck Velocity - V _N								
		300	400	500	600	700	800	1000	1200	
6"	CFM	60	80	100	120	140	160	200	240	
	Ps	.020	.030	.040	.060	.080	.100	.150	.230	
	Throw NC	2.5-3.5-4.5 <20	3.0-4.5-5.5 <20	3.5-5.5-6.5 <20	4.5-6.5-8.0 <20	5.0-7.5-9.0 23	5.5-8.5-10.5 25	7.5-11.0-13.5 34	8.5-13.0-15.5 40	
8"	CFM	105	140	175	210	245	280	350	420	
	Ps	.020	.030	.040	.060	.080	.100	.160	.220	
	Throw NC	3.0-4.0-5.0 <20	4.0-5.5-6.5 <20	4.5-7.0-8.5 <20	5.5-8.0-9.5 21	6.5-9.5-11.5 26	7.5-11.0-13.5 33	9.0-13.5-16.0 39	11.0-16.5-20.0 44	
10"	CFM	165	220	275	325	380	435	545	650	
	Ps	.030	.040	.060	.090	.120	.150	.240	.340	
	Throw NC	4.5-6.5-8.0 <20	5.5-8.5-10.5 <20	7.0-10.5-12.5 <20	8.5-12.5-15.0 21	9.5-14.5-17.5 26	11.5-17.0-20.5 34	14.0-21.0-25.0 41	17.0-25.0-30.0 >45	
12"	CFM	235	315	395	470	550	630	790	940	
	Ps	.020	.030	.050	.070	.100	.130	.200	.290	
	Throw NC	4.5-6.5-8.0 <20	5.5-8.5-10.0 <20	7.0-10.5-12.5 21	8.5-12.5-15.0 27	10.0-14.5-17.5 34	11.0-16.5-20.0 39	13.5-20.5-24.5 44	16.5-24.5-29.5 >45	
14"	CFM	325	430	535	640	750	860	1075	1275	
	Ps	.020	.030	.050	.070	.100	.130	.200	.280	
	Throw NC	4.0-5.0-7.0 <20	5.5-8.0-9.5 <20	6.0-9.0-11.0 20	8.0-12.0-14.5 25	9.5-14.0-17.0 32	10.5-16.0-19.5 37	13.5-20.0-24.0 44	15.5-23.5-28.0 >45	
16"	CFM	420	560	700	840	980	1120	1400	1680	
	Ps	.020	.040	.060	.080	.110	.140	.220	.260	
	Throw NC	5.0-6.0-8.0 <20	6.0-9.0-10.0 <20	7.0-9.0-12.0 26	9.0-13.0-15.0 34	10.0-13.0-16.0 39	11.0-15.0-18.0 43	12.0-18.0-21.0 >45	15.0-21.0-26.0 >45	

Four-Way Supply

Neck Size		Neck Velocity - V _N								
		300	400	500	600	700	800	1000	1200	
6"	CFM	60	80	100	120	140	160	200	240	
	Ps	<.010	.010	.020	.030	.040	.050	.080	.120	
	Throw NC	1.5-2.0-2.5 <20	1.5-2.5-3.0 <20	2.0-3.0-4.0 <20	2.5-3.5-4.5 <20	3.0-4.5-5.5 21	3.5-5.0-6.0 24	4.0-6.0-7.0 32	5.0-7.5-9.0 38	
8"	CFM	105	140	175	210	245	280	350	420	
	Ps	<.010	.010	.020	.030	.040	.060	.090	.120	
	Throw NC	1.5-2.5-3.0 <20	2.0-3.0-4.0 <20	2.5-4.0-5.0 <20	3.5-5.0-6.0 <20	4.0-5.5-7.0 25	4.5-6.5-8.0 31	5.5-8.0-10.0 37	6.5-9.5-11.5 42	
10"	CFM	165	220	275	325	380	435	545	650	
	Ps	0.01	.020	.030	.040	.060	.070	.110	.160	
	Throw NC	3.0-4.0-5.0 <20	3.5-5.5-6.5 <20	4.5-6.5-8.0 <20	5.5-8.0-10.0 21	6.0-9.0-11.0 27	7.0-10.5-12.5 32	9.0-13.0-15.5 39	10.5-15.5-18.5 44	
12"	CFM	235	315	395	470	550	630	790	940	
	Ps	.010	.020	.030	.040	.060	.080	.120	.170	
	Throw NC	2.5-3.5-4.0 <20	3.0-4.5-5.5 <20	3.5-5.5-6.5 20	4.5-7.0-8.5 26	5.5-8.0-9.5 32	6.0-7.0-11.0 37	7.5-11.5-14.0 42	9.0-13.5-16.0 >45	
14"	CFM	325	430	535	640	750	860	1075	1275	
	Ps	.010	.020	.030	.050	.060	.080	.130	.180	
	Throw NC	2.0-3.0-3.5 <20	2.5-4.0-5.0 <20	3.5-5.0-6.0 <20	4.0-6.0-7.0 24	4.5-7.0-8.5 30	5.5-8.0-10.0 35	6.5-10.0-12.0 42	7.5-11.5-14.0 >45	
16"	CFM	420	560	700	840	980	1120	1400	1680	
	Ps	.020	.040	.060	.080	.110	.140	.220	.260	
	Throw NC	3.0-4.0-5.0 <20	4.0-6.0-7.0 <20	5.0-8.0-11.0 26	6.0-9.0-12.0 34	8.0-11.0-14.0 39	9.0-13.0-16.0 43	10.0-15.0-19.0 >45	12.0-17.0-22.0 >45	

Notes:

1. P_s is static Pressure Loss in inches of H₂O.
2. NC is based on 10dB room attenuation (RE: 10⁻¹² watts).
3. Throw is isothermal air at 150, 100, 75 FPM terminal velocities.
4. The use of a balancing hood is recommended to balance the system.

1101, 1102, 1103, 1104, 1120/AL1120

Step-Down Ceiling Diffusers

N.V. S.P.	100 .004		150 .005		200 .015		250 .019		300 .029		350 .039		400 .048		450 .063		500 .077		550 .092		600 .106		700 .150		800 .194		
	SIZE	CFM	TH	CFM	TH	CFM	TH	CFM	TH	CFM	TH	CFM	TH	CFM	TH	CFM	TH	CFM	TH	CFM	TH	CFM	TH	CFM	TH	CFM	TH
8 x 8					90	5	110	7	135	8	155	9	180	11	200	12	220	13	245	15	265	16	310	19	335	22	
9 x 9				85	5	110	6	140	8	170	9	195	11	225	12	255	14	280	15	310	17	335	18	395	21	450	24
10 x 10				105	5	140	7	175	8	210	10	245	12	280	13	315	15	350	17	380	18	415	20	485	23	555	27
12 x 12	100	4	150	6	200	8	250	10	300	12	350	14	400	16	450	18	500	20	55	21	600	23	700	27	800	31	
14 x 14	135	4	205	7	270	9	340	11	410	13	475	15	545	17	610	20	680	22	750	24	815	26	950	30	1090	35	
15 x 15	155	5	235	7	315	9	390	12	470	14	545	16	624	19	705	21	780	23	860	26	940	28	1095	33	1250	38	
16 x 16	180	5	265	7	355	10	445	12	535	14	625	17	710	19	800	22	890	24	980	26	1070	29	1245	34	1425	38	
18 x 18	225	5	340	7	450	11	565	14	675	16	790	19	900	22	1015	24	1125	24	980	26	1070	29	1245	34	1425	38	
20 x 20	280	6	415	9	555	12	695	15	835	18	975	20	1110	23	1250	26	1390	29	1530	32	1670	35	1945	41	2225	47	
21 x 21	305	6	460	9	615	12	765	15	920	18	1070	21	1225	25	1380	28	1530	31	1685	34	1840	37	2145	43	2450	49	
22 x 22	335	6	505	10	670	13	840	16	1010	19	1175	22	1345	26	1510	29	1680	32	1850	35	2015	38	2350	45	2690	51	
24 x 24	400	7	600	10	800	14	1000	17	1200	20	1400	24	1600	27	1800	31	2000	34	2200	37	2400	41	2800	48	3200	54	
26 x 26	470	8	705	11	940	15	1175	19	1410	23	1645	26	1880	30	2110	34	2345	38	2580	41	2815	45	3285	53	3755	60	
27 x 27	505	8	760	11	1010	15	1265	19	1520	23	1770	27	2025	30	2280	34	2530	38	2785	42	3035	46	3545	53	4050	61	
28 x 28	545	8	815	12	1090	16	1360	20	1635	24	1905	28	2180	32	2450	36	2720	40	2995	44	3265	50	3810	56	4355	64	
30 x 30	625	8	940	13	1250	17	1565	21	1875	25	2190	30	2500	34	2815	38	3125	42	3440	46	3750	51	4375	59	5000	68	
32 x 32	710	9	1065	13	1420	18	1780	22	2135	27	2490	31	2845	36	3200	40	3555	44	3910	49	4265	53	4980	62	5690	71	
33 x 33	755	9	1135	14	1515	18	1890	23	2270	27	2645	32	3025	37	3405	41	3780	46	4160	50	4540	55	5295	64	6050	73	
34 x 34	805	9	1205	14	1605	18	2005	23	2410	27	2810	32	3210	37	3615	41	4015	46	4415	50	4815	55	5620	64	6425	73	
36 x 36	900	10	1350	15	1800	20	2250	25	2700	29	3150	34	3600	39	4050	44	4500	49	4950	54	5400	59	6300	69	7200	78	

Ak Factors for Model 1101, 1102, 1103, 1104

Size	Ak	Size	Ak
7 x 7	.14	22X22	1.8
8 x 8	.18	24X24	2.2
9 x 9	.24	26X26	2.7
10 x 10	.30	27X27	2.9
12 x 12	.45	28X28	3.1
14 x 14	.64	30X30	3.7
15 x 15	.75	32X32	4.3
16 x 16	.93	33X33	4.6
18 x 18	1.2	34X34	5.1
20 x 20	1.5	36X36	5.6
21 x 21	1.6		

AL1130 Evaporative Cooler Diffuser

Face Velocity	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
14 x 14	CFM 368	460	552	664	736	828	920	1104	1288	1472	1656	1840
Ak .920	Pt .013	.020	.028	.038	.050	.063	.078	.112	.152	.199	.251	.310
16 x 16	CFM 484	605	726	847	968	1089	1210	1452	1694	1936	2178	2420
Ak 1.210	Pt .013	.020	.028	.038	.050	.063	.078	.112	.153	.199	.252	.311
18 x 18	CFM 564	705	846	987	1128	1269	1410	1692	1974	2256	2538	2820
Ak 1.410	Pt .012	.019	.027	.036	.047	.060	.074	.106	.144	.188	.238	.294
20 x 20	CFM 756	945	1134	1323	1512	1701	1890	2268	2646	3024	3402	3780
Ak 1.890	Pt .013	.020	.028	.038	.050	.063	.078	.113	.153	.200	.252	.311

Notes:

1. Diffusers tested with damper fully open.
2. Pt = Total Pressure, and is the sum of the status and velocity pressure.
3. Ak is the effective area of the diffuser face. V_k is the mean air velocity measured at the diffuser face.

1150 Evaporative Cooler Diffuser

Face Velocity	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
14 x 14 CFM	383	479	574	670	766	861	957	1148	1340	1531	1723	1914
Ak .960 Pt	.043	.064	.090	.119	.152	.188	.228	.318	.421	.536	.665	.806
18 x 18 CFM	464	580	696	812	928	1044	1160	1392	1624	1856	2088	2320
Ak 1.160 Pt	.028	.042	.056	.075	.094	.115	.138	.190	.248	.313	.383	.460
20 x 20 CFM	537	670	804	938	1072	1206	1340	1608	1876	2144	2412	2680
Ak 1.340 Pt	.028	.042	.059	.077	.098	.121	.146	.203	.267	.339	.419	.505
22 x 22 CFM	668	836	1003	1170	1337	1504	1671	2005	2339	2674	3008	3342
Ak 1.670 Pt	.017	.027	.040	.056	.075	.097	.121	.179	.250	.333	.428	.537
24 x 24 CFM	730	912	1094	1277	1459	1642	1824	2189	2554	2918	3283	3648
Ak 1.820 Pt	.032	.048	.066	.086	.109	.134	.161	.222	.291	.367	.452	.544
30 x 30 CFM	1118	1398	1678	1957	2237	2516	2796	3355	3914	4474	5033	5592
Ak 2.790 Pt	.026	.040	.057	.076	.098	.122	.149	.211	.283	.365	.457	.558
36 x 36 CFM	1404	1756	2107	2458	2809	3160	3511	4213	4915	5618	6320	7022
Ak 3.510 Pt	.030	.043	.060	.078	.098	.120	.144	.197	.257	.324	.397	.477

Notes:

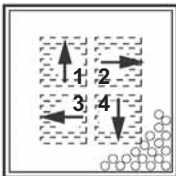
1. Tests conducted in accordance with ASHRAE 70-1991.
2. Total Pressure is the sum of the status and velocity pressure.
3. Ak is the effective area of the diffuser face.
4. Tests conducted with all valves in fully opened position.

1160 Evaporative Cooler

Listed Size	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
22 x 22 Ak 1.343	Airflow Rate (CFM)	537	537	672	806	940	1074	1209	1343	1612	1880	2149	2417
	Total Pressure (in WC)	.028	.042	.059	.077	.098	.121	.146	.203	.267	.339	.419	.505

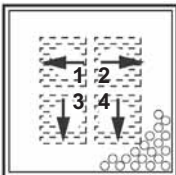
Notes:

1. Tests conducted in accordance with ASHRAE 70-1991.
2. Total Pressure is the sum of the status and velocity pressure.
3. Ak is the effective area of the diffuser face.
4. Tests conducted with all valves in fully opened position.



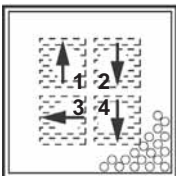
Four-Way (Short Throw)

- For throw in all four directions, use short throw data.



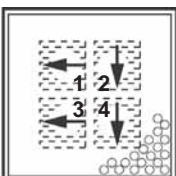
Three-Way (Short Throw)

- For throw in all three directions, use short throw data.



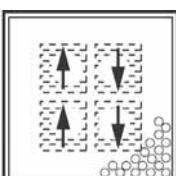
Three-Way (Long and Short)

- For throw in the #2 and #4 directions, use long throw data.
- For throw in the #1 and #3 directions, use short throw data.



Two-Way Corner (Long and Short)

- For throw in the #2 and #4 directions, use long throw data.
- For throw in the #1 and #3 directions, use short throw data.



Two-Way (Long Throw)

- For throw in both directions, use long throw data.

1235 Perforated Supply

Neck Velocity	300	400	500	600	700	800	900	1000	1200	1400
Velocity Pressure	.006	.010	.016	.022	.031	.040	.051	.062	.090	.122
6" Diameter	CFM	60	80	100	120	140	160	180	200	240
	Total Pressure	.005	.008	.013	.025	.025	.032	.041	.050	.027
	Short Horizontal Throw	2-1-1	2-1-1	3-1-1	3-2-1	4-2-1	4-2-1	5-2-2	5-3-2	6-3-2
	Long Horizontal Throw	3-1-1	4-2-1	5-2-2	6-3-2	7-3-2	8-4-3	9-4-3	10-5-3	12-6-4
Noise Criteria	<20	<20	<20	<20	<20	22	24	26	31	37
8" Diameter	CFM	105	140	175	210	245	280	315	350	420
	Total Pressure	.009	.015	.024	.034	.046	.061	.077	.095	.136
	Short Horizontal Throw	3-1-1	4-2-1	5-2-2	6-4-3	7-3-2	8-4-3	9-4-3	10-5-3	12-6-4
	Long Horizontal Throw	5-3-2	7-4-2	9-5-3	11-5-4	13-6-4	15-7-5	16-8-5	18-9-6	22-11-7
Noise Criteria	<20	<20	<20	<20	20	25	30	34	39	44
10" Diameter	CFM	165	220	275	330	385	440	495	550	660
	Total Pressure	.013	.023	.036	.052	.071	.092	.117	.144	.208
	Short Horizontal Throw	5-2-2	6-3-2	8-4-3	10-5-3	11-6-4	13-6-4	14-7-5	16-8-5	19-10-6
	Long Horizontal Throw	9-5-3	12-6-4	15-8-5	18-9-6	21-11-7	24-12-8	27-14-9	30-15-10	36-18-12
Noise Criteria	<20	<20	<20	22	25	28	33	36	41	47
12" Diameter	CFM	240	320	400	480	560	640	720	800	960
	Total Pressure	.017	.030	.047	.068	.093	.121	.153	.189	.273
	Short Horizontal Throw	7-4-2	10-5-3	12-6-4	15-7-5	17-9-6	20-10-7	22-11-7	25-12-8	30-15-10
	Long Horizontal Throw	14-7-5	19-9-6	23-12-8	28-14-9	33-16-11	37-19-12	42-21-14	47-23-16	56-28-19
Noise Criteria	<20	<20	21	25	29	32	35	38	44	50
14" Diameter	CFM	330	440	550	660	770	880	990	1100	1320
	Total Pressure	.020	.036	.057	.081	.111	.145	.183	.226	.326
	Short Horizontal Throw	11-6-4	15-7-5	18-9-6	22-11-7	26-13-9	29-15-10	33-17-11	37-18-12	44-22-15
	Long Horizontal Throw	21-10-7	28-14-9	34-17-11	41-21-14	48-24-16	55-28-18	62-31-21	69-34-23	83-41-28
Noise Criteria	<20	<20	25	31	36	40	43	45	48	53

Notes: Tests conducted in accordance with ANSI/ASHRAE 70-1991 at isothermal conditions.

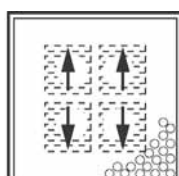
Tests conducted with a straight rigid inlet condition. Other inlet conditions may alter performance.

Unit of measure: Neck Velocity = FPM; Velocity Pressure = in. w.c.; Airflow Rate = CFM; Total Pressure = in. w.c.;

Throw = ft at 50, 100, and 150 FPM terminal velocity

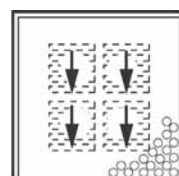
Noise Criteria (NC) is based upon 10dB room absorption (Re: 10⁻¹² watts) evaluated at 125 thru 4000 Hz octave bands.

Flow hoods are recommended for system balancing.



Two-Way (Short Throw)

- For throw in both directions, use short throw data.



One-Way (Long Throw)

- For throw, use long throw data.

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:

1. 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.
2. Select proper Ak from Table by unit size and instrument used for measuring velocity.
3. 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

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

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	Ak	Air Capacities - CFM									
	ALNOR	4" ROT. Vane	140	210	285	350	415	450	485	520	555	625
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

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	1688	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:

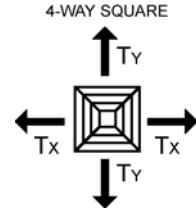
1. Tests conducted in accordance with ANSI/ASHRAE 70-1991 at isothermal conditions.
2. Tests conducted with a straight rigid inlet condition. Other inlet conditions may alter performance.
3. Unit of measure: Neck Velocity = FPM; Velocity Pressure = in. w.c.; Airflow Rate = CFM; Total Pressure = in. w.c.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

Series 1400/AL1400 Square/Rectangular Ceiling Diffuser

Four-Way Square

Face Velocity	500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss	.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
6 x 6	CFM 50	60	70	80	90	100	120	140	160	180	200
Ak .100	Throw X/Y 2-3/2-3	2-3/2-3	2-4/2-4	2-4/2-4	3-5/3-5	3-5/3-5	4-6/4-6	4-8/4-8	5-8/5-8	5-9/5-9	6-11/6-11
9 x 9	CFM 110	135	155	180	205	225	270	315	360	410	450
Ak .220	Throw X/Y 2-4/2-4	2-4/2-4	3-5/3-5	3-5/3-5	4-6/4-6	5-8/5-8	5-9/5-9	6-11/6-11	6-12/6-12	7-13/7-13	8-14/8-14
12 x 12	CFM 200	240	280	320	360	400	480	560	640	725	800
Ak .400	Throw X/Y 3-5/3-5	4-6/4-6	4-8/4-8	5-8/5-8	5-9/5-9	6-11/6-11	6-12/6-12	7-13/7-13	8-15/8-15	9-17/9-17	10-19/10-19
15 x 15	CFM 310	375	440	500	565	625	750	875	1000	1125	1250
Ak .620	Throw X/Y 4-6/4-6	4-8/4-8	5-9/5-9	6-11/6-11	6-11/6-11	6-12/6-12	8-15/8-15	10-18/10-18	10-19/10-19	12-21/12-21	13-23/13-23
18 x 18	CFM 450	540	630	720	810	900	1080	1260	1440	1620	1800
Ak .900	Throw X/Y 4-8/4-8	5-9/5-9	5-11/5-11	6-12/6-12	7-13/7-13	8-15/8-15	10-17/10-17	11-20/11-20	13-23/13-23	15-27/15-27	16-30/16-30
21 x 21	CFM 615	740	860	985	1110	1230	1475	1725	1970	2220	2460
Ak 1.230	Throw X/Y 5-9/5-9	6-11/6-11	7-13/7-13	8-14/8-14	9-15/9-15	9-17/9-17	11-21/11-21	13-25/13-25	15-29/15-29	17-31/17-31	19-35/19-35
24 x 24	CFM 800	960	1120	1275	1440	1600	1925	2240	2570	2890	3200
Ak 1.600	Throw X/Y 5-11/5-11	7-13/7-13	7-14/7-14	8-15/8-15	9-17/9-17	10-19/10-19	12-23/12-23	14-29/14-29	16-31/16-31	18-35/18-35	20-39/20-39
27 x 27	CFM 1010	1215	1420	1615	1820	2020	2430	2840	3240	3650	4040
Ak 2.020	Throw X/Y 6-12/6-12	7-13/7-13	8-15/8-15	10-18/10-18	10-19/10-19	12-22/12-22	14-27/14-27	16-32/16-32	18-35/18-35	20-38/20-38	23-42/23-42
33 x 33	CFM 1370	1650	1925	2200	2470	2750	3300	3850	4400	4950	5500
Ak 2.750	Throw X/Y 7-13/7-13	9-16/9-16	10-18/10-18	21-21/12-21	14-24/14-24	16-27/16-27	18-33/18-33	19-37/19-37	23-41/23-41	27-46/27-46	31-50/31-50

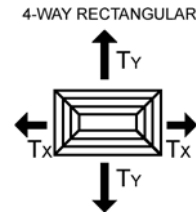
Note: The minimum Throw Dimension is based on a terminal velocity of 200 FPM. The maximum Throw Dimension is based on a terminal velocity of 100 FPM.



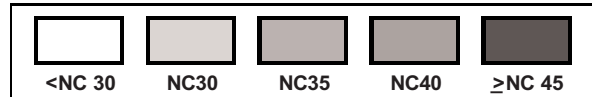
Four-Way Rectangular

Face Velocity	500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss	.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
9 x 6	CFM 75	90	105	120	135	150	180	210	240	270	300
Ak .150	Throw X/Y 1-3/2-4	1-3/3-5	2-4/3-5	2-4/4-6	3-5/4-6	3-5/4-8	4-6/5-9	4-6/5-9	4-8/7-13	5-9/8-15	6-11/8-15
12 x 6	CFM 100	120	140	160	180	200	240	280	320	360	400
Ak .200	Throw X/Y 1-3/3-5	1-3/4-6	2-4/4-8	2-4/4-8	2-4/5-9	3-5/6-11	4-6/7-13	4-8/8-15	4-8/8-15	5-9/10-18	6-11/11-21
12 x 9	CFM 150	180	210	240	270	300	360	420	480	540	600
Ak .300	Throw X/Y 2-4/3-5	2-4/3-5	3-5/4-6	4-6/4-8	4-7/5-10	4-8/6-11	5-9/6-12	6-11/7-13	7-13/9-17	7-13/10-18	8-14/11-19
15 x 9	CFM 185	225	265	300	340	375	450	525	600	675	750
Ak .370	Throw X/Y 2-4/4-6	2-4/4-6	3-5/5-9	4-6/6-11	4-6/6-12	4-8/8-14	5-9/8-15	5-9/9-17	6-12/11-21	7-13/13-25	7-13/13-25
18 x 9	CFM 225	270	315	360	405	450	540	630	720	810	900
Ak .450	Throw X/Y 2-4/4-6	2-4/5-9	3-5/6-11	4-6/6-12	4-6/8-14	4-8/8-15	5-9/10-19	5-10/11-23	6-12/13-25	8-14/15-29	10-17/17-32
21 x 9	CFM 265	320	370	425	475	530	635	740	850	955	1060
Ak .530	Throw X/Y 2-4/5-9	2-4/6-11	3-5/8-14	4-6/8-15	4-8/10-18	4-8/10-19	5-9/11-21	6-17/13-25	8-13/16-31	9-15/19-35	10-17/21-38
15 x 12	CFM 250	300	350	400	450	500	600	700	800	900	1000
Ak .500	Throw X/Y 3-5/4-6	3-5/4-8	4-6/5-9	4-8/6-11	5-9/6-12	6-11/7-13	6-12/8-15	7-13/10-18	8-15/11-21	10-18/13-23	12-21/14-27
18 x 12	CFM 295	355	415	475	535	595	715	835	950	1070	1190
Ak .590	Throw X/Y 2-4/4-8	3-5/5-9	4-6/6-11	4-8/7-13	5-9/8-14	6-11/8-15	6-12/10-18	8-14/11-21	9-16/13-23	10-18/15-27	12-21/17-31
21 x 12	CFM 345	415	485	555	625	690	830	970	1100	1240	1375
Ak .690	Throw X/Y 3-5/5-9	3-5/6-11	4-6/7-13	4-8/8-14	4-8/8-15	5-9/10-18	6-11/11-21	7-13/14-26	8-15/16-29	9-17/17-31	10-19/19-35
24 x 12	CFM 400	480	560	640	720	800	960	1140	1280	1440	1600
Ak .800	Throw X/Y 2-4/6-11	4-6/7-13	4-6/8-14	4-8/9-16	4-8/10-18	5-9/11-21	6-12/14-26	8-14/15-29	9-17/17-31	10-19/19-35	10-19/21-39
18 x 15	CFM 375	450	525	600	675	750	900	1050	1200	1350	1500
Ak .75	Throw X/Y 4-6/4-8	4-8/5-9	5-9/6-11	6-11/6-12	6-12/8-14	7-13/8-15	8-15/10-18	9-17/10-19	10-19/13-23	12-22/15-26	14-25/17-29
24 x 15	CFM 500	600	700	800	900	1000	1200	1400	1600	1800	2000
Ak 1.000	Throw X/Y 4-6/6-11	4-8/6-12	5-9/8-14	6-11/9-17	6-12/10-18	7-13/11-21	8-15/13-25	10-18/15-29	11-21/17-32	13-23/20-36	15-27/22-39
24 x 18	CFM 600	720	840	960	1080	1200	1440	1680	1920	2160	2400
Ak 1.200	Throw X/Y 4-8/6-11	5-9/6-12	6-11/7-14	6-12/8-15	7-14/10-19	8-15/11-21	10-18/13-23	11-21/15-27	13-25/18-34	15-30/21-37	16-32/23-41
33 x 21	CFM 960	1150	1340	1530	1725	1920	2300	2690	3070	3450	3840
Ak 1.920	Throw X/Y 4-8/8-15	6-11/10-18	7-13/12-22	8-14/13-25	8-15/15-29	10-18/17-31	12-21/21-35	14-26/24-39	16-29/26-43	17-31/29-47	21-39/35-56
30 x 24	CFM 1000	1200	1400	1600	1800	2000	2400	2800	3200	3600	4000
Ak 2.000	Throw X/Y 6-11/7-13	6-12/8-15	8-14/10-18	8-15/11-21	10-18/13-23	10-19/14-26	12-23/16-29	15-28/19-35	16-31/21-39	19-35/24-43	22-40/29-51

Note: The minimum Throw Dimension is based on a terminal velocity of 200 FPM. The maximum Throw Dimension is based on a terminal velocity of 100 FPM.



Ceiling Height in Feet	Max. Rec. Cooling Temp. Differential	Max. Rec. CFM Per Diff. 1400/AL1400			
		Four-Way	Three-Way	Two-Way	One-Way
7	15°	400	300	200	100
8	20°	600	450	300	150
9	25°	1200	900	600	300
10	25°	1800	1350	900	450
12	30°	3200	2400	1600	800
14	30°	4800	3600	2400	1200
16	30°	6000	4500	3000	1500



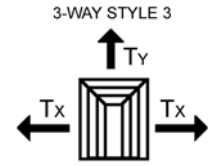
See Description of NC Criteria on page 96.

Series 1400/AL1400 Square/Rectangular Ceiling Diffuser

Three-Way Style 3

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
6 x 6	CFM	50	60	70	80	90	100	120	140	160	180	200
Ak .100	Throw X/Y	2-4/1-2	2-4/1-2	3-5/2-3	3-5/2-3	4-7/2-4	4-7/2-4	5-9/3-6	6-10/3-6	6-11/4-7	6-11/4-7	7-13/4-8
9 x 9	CFM	110	135	155	180	205	225	270	315	360	410	450
Ak .220	Throw X/Y	2-4/2-3	3-6/2-3	4-7/2-4	4-8/2-4	5-9/3-6	5-9/3-6	6-12/4-7	7-13/5-9	9-15/6-10	10-18/6-11	11-20/7-12
12 x 12	CFM	200	240	280	320	360	400	480	560	640	725	800
Ak .400	Throw X/Y	4-7/2-5	5-9/3-6	6-10/4-7	6-10/4-7	6-11/4-8	7-13/5-9	9-16/6-10	12-21/7-12	13-22/8-13	14-24/8-14	16-27/9-15
15 x 15	CFM	310	375	440	500	565	625	750	875	1000	1125	1250
Ak .620	Throw X/Y	4-8/2-4	6-11/4-7	7-13/4-7	8-14/4-8	8-15/5-9	9-16/6-10	11-19/7-12	13-23/9-15	15-26/10-18	17-29/11-20	19-33/12-21
18 x 18	CFM	450	540	630	720	810	900	1080	1260	1440	1620	1800
Ak .900	Throw X/Y	4-9/3-5	6-11/4-7	7-13/5-9	9-15/6-10	10-18/6-11	11-20/7-12	13-24/9-15	15-26/10-18	18-32/11-20	20-35/12-22	23-40/14-25
21 x 21	CFM	615	740	860	985	1110	1230	1475	1725	1970	2220	2460
Ak 1.230	Throw X/Y	5-11/3-6	7-13/4-8	11-19/6-11	11-20/7-12	12-21/8-13	13-23/8-14	16-29/10-17	19-34/11-20	21-39/14-23	24-42/16-25	27-45/18-29
24 x 24	CFM	800	960	1120	1275	1440	1600	1925	2240	2570	2890	3200
Ak 1.600	Throw X/Y	7-14/5-9	9-16/6-11	11-19/7-13	13-21/8-14	14-24/9-15	16-27/9-16	17-31/11-19	21-35/14-24	25-39/16-27	28-43/18-31	32-47/20-33
27 x 27	CFM	1010	1215	1420	1615	1820	2020	2430	2840	3240	3650	4040
Ak 2.020	Throw X/Y	7-13/4-9	9-16/6-11	11-20/7-13	13-23/9-15	14-25/9-16	15-27/10-18	18-31/12-21	22-37/14-25	25-41/18-30	28-46/19-33	31-50/21-36

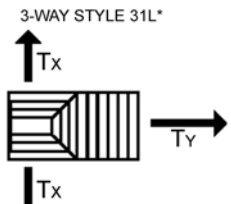
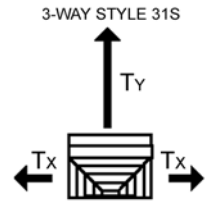
Note: The minimum Throw Dimension is based on a terminal velocity of 170 FPM. The maximum Throw Dimension is based on a terminal velocity of 85 FPM.



Three-Way Style 31S and Style 31L*

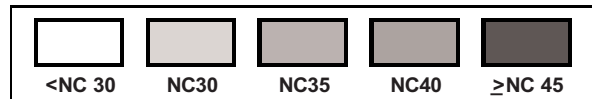
Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
9 x 6	CFM	75	90	105	120	135	150	180	210	240	270	300
Ak .150	Throw X/Y	2-3/4-7	2-3/4-7	2-3/4-7	2-4/4-8	3-5/5-8	3-6/5-9	4-7/6-11	4-8/7-12	6-10/9-15	6-11/10-17	6-11/11-19
9 x 9*	CFM	115	135	155	180	200	225	270	315	360	405	450
Ak .220	Throw X/Y	1-3/4-7	2-3/5-9	2-3/6-11	2-4/7-12	3-6/8-14	3-6/9-16	4-7/10-18	4-8/12-21	5-9/14-24	6-10/16-28	6-11/18-32
12 x 9	CFM	150	180	210	240	210	300	360	420	480	540	600
Ak .300	Throw X/Y	2-3/4-8	2-4/5-9	3-6/6-10	4-7/7-12	4-8/8-14	4-8/8-14	5-9/9-16	6-10/11-20	7-12/14-24	8-13/15-26	9-15/16-28
12 x 12*	CFM	200	240	280	320	360	400	480	560	640	720	800
Ak .40	Throw X/Y	2-3/5-11	2-4/7-13	3-6/9-15	3-6/10-17	4-7/11-19	4-8/12-21	6-10/15-26	6-11/18-32	7-12/20-34	7-13/21-36	8-14/24-42
15 x 15*	CFM	310	375	440	500	565	625	750	875	1000	1125	1250
Ak .620	Throw X/Y	2-4/7-13	3-6/10-18	4-7/11-20	4-8/12-21	5-9/14-25	5-9/14-25	6-11/19-34	7-13/22-38	8-14/25-43	9-16/27-44	10-18/30-45
18 x 15	CFM	375	450	525	600	675	750	900	1050	1200	1350	1500
Ak .750	Throw X/Y	3-6/7-13	4-7/9-15	4-8/9-16	5-9/11-20	6-10/13-23	6-11/15-26	7-13/17-30	9-16/19-35	10-18/22-39	11-20/27-40	13-25/30-46
21 x 18	CFM	525	630	735	840	945	1050	1260	1475	1680	1890	2100
Ak 1.050	Throw X/Y	4-7/8-14	4-8/10-18	5-9/11-20	6-10/18-23	6-11/14-25	7-12/16-28	9-15/19-34	10-18/22-39	11-20/27-40	13-23/29-46	15-26/33-51
21 x 21*	CFM	615	740	860	985	1110	1230	1475	1725	1970	2210	2460
Ak 1.230	Throw X/Y	3-6/9-17	4-8/12-21	5-9/16-27	6-10/17-30	7-11/19-32	7-12/21-36	9-15/26-40	11-19/30-45	13-22/34-51	15-25/39-56	17-28/43-60
27 x 21	CFM	780	940	1080	1250	1400	1560	1870	2180	2500	2800	3120
Ak 1.560	Throw X/Y	5-9/10-18	5-9/11-20	6-10/13-22	7-12/15-26	8-14/18-32	9-16/21-36	11-19/23-40	13-21/25-43	15-24/29-47	17-29/34-53	19-33/38-59
30 x 24	CFM	1000	1200	1400	1600	1800	2000	2400	2800	3200	3500	4000
Ak 2.000	Throw X/Y	5-9/11-20	6-11/13-23	7-13/16-27	8-14/17-31	9-16/20-35	10-18/22-40	12-21/25-44	14-25/31-48	16-29/34-53	18-32/38-57	20-35/43-61
33 x 27	CFM	1230	1475	1725	1970	2220	2460	2950	3450	3925	4425	4920
Ak 2.460	Throw X/Y	6-10/13-23	7-13/17-28	8-14/19-33	9-16/21-35	11-18/23-39	12-20/25-44	14-25/29-47	16-29/33-51	18-33/37-56	22-37/42-59	25-41/47-64

Note: The minimum Throw Dimension is based on a terminal velocity of 170 FPM. The maximum Throw Dimension is based on a terminal velocity of 85 FPM.



*Style 31L not available in square configuration

Ceiling Height in Feet	Max. Rec. Cooling Temp. Differential	Max. Rec. CFM Per Diff. 1400/AL1400			
		Four-Way	Three-Way	Two-Way	One-Way
7	15°	400	300	200	100
8	20°	600	450	300	150
9	25°	1200	900	600	300
10	25°	1800	1350	900	450
12	30°	3200	2400	1600	800
14	30°	4800	3600	2400	1200
16	30°	6000	4500	3000	1500



See Description of NC Criteria on page 96.

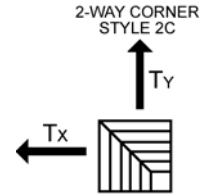
Recommended Noise Criteria and Face Velocity Ranges are on page 96.

Series 1400/AL1400 Square/Rectangular Ceiling Diffuser

Two-Way Corner Style 2C

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
6 x 6	CFM	45	55	60	70	80	90	105	125	140	160	180
Ak .090	Throw X/Y	1-3/1-3	2-5/2-5	2-5/2-5	3-7/3-7	3-7/3-7	5-8/5-8	5-8/5-8	6-11/6-11	7-12/7-12	8-13/8-13	9-14/9-14
9 x 9	CFM	95	115	135	155	175	195	235	275	315	350	390
Ak .190	Throw X/Y	4-6/4-6	4-6/4-6	5-7/5-7	5-8/5-8	6-10/6-10	6-11/6-11	8-13/8-13	9-14/9-14	10-16/10-16	13-20/13-20	14-22/14-22
12 x 12	CFM	175	210	245	280	315	350	420	480	560	635	700
Ak .350	Throw X/Y	5-7/5-7	5-8/5-8	6-11/6-11	8-13/8-13	8-13/8-13	9-14/9-14	10-16/10-16	13-19/13-19	14-22/14-22	16-26/16-26	19-29/19-29
15 x 15	CFM	275	330	385	440	495	550	660	775	885	995	1100
Ak .550	Throw X/Y	5-9/5-9	7-12/7-12	8-13/8-13	9-14/9-14	10-16/10-16	11-18/11-18	13-21/13-21	15-25/15-25	19-29/19-29	21-33/21-33	23-36/23-36
18 x 18	CFM	390	470	545	625	700	780	935	1090	1250	1410	1560
Ak .780	Throw X/Y	7-12/7-12	9-14/9-14	10-15/10-15	10-16/10-16	12-19/12-19	14-22/14-22	16-25/16-25	18-29/18-29	21-33/21-33	25-38/25-38	28-42/28-42
21 x 21	CFM	540	650	760	865	975	1080	1300	1515	1730	1945	2160
Ak 1.080	Throw X/Y	8-13/8-13	10-15/10-15	12-18/12-18	13-21/13-21	15-23/15-23	17-28/17-28	20-32/20-32	22-35/22-35	25-39/25-39	29-43/29-43	32-47/32-47
24 x 24	CFM	705	845	990	1130	1270	1410	1690	1950	2250	2540	2820
Ak 1.410	Throw X/Y	9-16/9-16	11-18/11-18	13-21/13-21	15-24/15-24	17-27/17-27	19-29/19-29	22-34/22-34	25-38/25-38	29-42/29-42	33-47/33-47	37-51/37-51
27 x 27	CFM	880	1055	1230	1410	1585	1760	2110	2470	2820	3170	3520
Ak 1.760	Throw X/Y	10-17/10-17	12-19/12-19	14-22/14-22	16-26/16-26	19-29/19-29	21-33/21-33	24-37/24-37	28-41/28-41	32-46/32-46	35-50/35-50	39-55/39-55

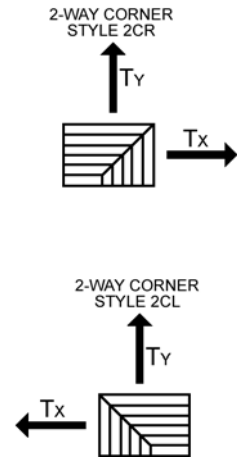
Note: The minimum Throw Dimension is based on a terminal velocity of 135 FPM. The maximum Throw Dimension is based on a terminal velocity of 65 FPM.



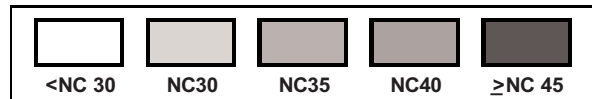
Two-Way Corner Style 2CR

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
9 x 6	CFM	65	80	95	105	120	130	160	185	210	240	260
Ak .130	Throw X/Y	2-4/3-5	3-5/4-7	4-6/5-8	4-6/5-8	5-7/6-11	5-7/6-11	6-9/8-13	6-10/9-14	7-12/11-16	8-13/13-21	10-16/16-25
12 x 6	CFM	90	105	120	140	160	175	210	245	280	315	350
Ak .170	Throw X/Y	2-4/3-6	3-5/5-8	3-5/6-11	4-6/7-12	5-7/8-13	5-7/9-14	5-8/10-15	6-11/13-20	7-12/15-24	8-13/17-26	10-15/19-29
15 x 6	CFM	110	130	155	175	200	220	265	310	350	395	440
Ak .220	Throw X/Y	2-4/5-8	3-5/6-10	3-5/7-12	4-6/8-13	5-7/10-15	5-8/11-17	6-9/13-20	6-10/15-24	8-12/17-27	10-14/20-30	11-17/22-34
12 x 9	CFM	130	155	180	210	235	260	310	365	415	470	520
Ak .260	Throw X/Y	4-6/5-7	4-6/5-8	5-7/6-10	5-8/6-11	6-10/8-12	6-11/9-14	8-13/10-16	11-17/14-21	19-19/16/24	13-20/17-26	14-23/19-30
15 x 9	CFM	165	195	230	260	295	325	390	460	525	590	650
Ak .320	Throw X/Y	4-6/6-10	5-7/6-11	6-8/8-12	6-9/10-14	6-11/10-16	7-12/12-19	9-14/14-22	10-15/16-25	12-17/19-29	13-20/21-33	14-22/23-35
18 x 9	CFM	195	235	275	310	350	390	470	545	625	700	780
Ak .390	Throw X/Y	4-6/6-11	5-7/8-13	5-7/9-14	5-8/10-15	6-10/11-18	7-12/13-21	8-13/16-25	9-15/19-29	11-17/22-33	12-20/23-35	14-22/26-39
21 x 9	CFM	230	275	320	365	410	455	545	635	730	820	910
Ak .450	Throw X/Y	4-6/8-13	5-7/10-15	6-8/11-17	6-9/12-19	6-10/13-21	6-11/15-24	8-13/18-29	10-15/22-34	12-18/24-38	13-21/26-42	15-25/30-47
15 x 12	CFM	220	260	305	350	390	435	525	610	700	785	870
Ak .430	Throw X/Y	5-7/5-8	5-8/6-11	6-10/8-13	7-12/9-14	8-13/10-16	9-14/12-19	11-18/14-22	13-20/16-25	15-24/19-29	16-26/21-32	18-29/24-37
18 x 12	CFM	260	315	370	420	475	525	630	735	840	945	1050
Ak .520	Throw X/Y	4-7/6-11	5-8/8-13	6-10/9-14	7-12/11-17	9-14/13-21	10-15/14-22	12-18/17-26	14-20/21-30	16-24/23-34	18-27/27-38	21-31/29-42
21 x 15	CFM	380	455	530	605	685	760	915	1060	1220	1370	1520
Ak .760	Throw X/Y	6-10/8-13	6-11/9-14	8-13/11-18	9-14/13-20	10-16/15-24	12-19/16-26	13-21/19-29	15-26/22-33	18-29/25-38	21-33/29-44	25-38/32-49
24 x 15	CFM	440	525	615	700	790	875	1050	1225	1400	1575	1750
Ak .870	Throw X/Y	4-9/8-14	6-11/10-16	8-13/13-20	9-14/15-24	10-16/16-26	12-19/19-29	14-22/22-34	16-25/25-38	19-29/29-44	21-32/33-48	25-37/37-52
21 x 18	CFM	460	550	640	735	825	915	1100	1280	1465	1645	1830
Ak .980	Throw X/Y	6-11/8-13	8-13/10-15	10-15/11-18	11-17/12-20	12-19/14-22	13-21/16-25	16-26/19-29	19-30/22-34	22-34/26-39	25-38/29-43	27-42/32-48
27 x 21	CFM	690	830	965	1100	1245	1380	1655	1935	2210	2490	2760
Ak 1.380	Throw X/Y	8-13/10-17	10-15/13-20	12-19/15-24	14-21/17-27	15-23/19-30	16-26/21-33	20-30/25-37	24-36/29-42	28-41/33-46	30-46/37-51	34-51/42-56

Note: The minimum Throw Dimension is based on a terminal velocity of 135 FPM. The maximum Throw Dimension is based on a terminal velocity of 65 FPM.



Ceiling Height in Feet	Max. Rec. Cooling Temp. Differential	Max. Rec. CFM Per Diff. 1400/AL1400			
		Four-Way	Three-Way	Two-Way	One-Way
7	15°	400	300	200	100
8	20°	600	450	300	150
9	25°	1200	900	600	300
10	25°	1800	1350	900	450
12	30°	3200	2400	1600	800
14	30°	4800	3600	2400	1200
16	30°	6000	4500	3000	1500



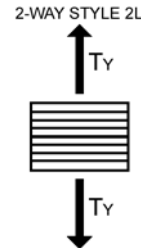
See Description of NC Criteria on page 96.

Series 1400/AL1400 Square/Rectangular Ceiling Diffuser

Two-Way Style 2L

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
9 x 6	CFM	65	80	95	105	120	130	160	185	210	240	260
Ak .130	Throw Y	3-5	3-5	5-7	6-8	7-10	7-10	8-12	10-14	11-17	14-20	16-23
12 x 6	CFM	90	105	120	140	160	175	210	245	280	315	350
Ak .170	Throw Y	3-5	5-7	6-8	6-9	7-10	8-12	10-14	12-18	15-21	16-23	17-25
15 x 6	CFM	110	130	155	175	200	220	265	310	350	395	440
Ak .220	Throw Y	4-6	6-8	6-9	7-10	9-13	10-14	10-15	13-19	15-21	18-26	21-30
12 x 9	CFM	130	155	180	210	235	260	310	365	415	470	520
Ak .260	Throw Y	5-7	6-8	6-9	8-12	10-14	10-14	11-17	14-21	16-24	19-27	20-31
15 x 9	CFM	165	195	230	260	295	325	390	460	525	590	650
Ak .320	Throw Y	6-8	7-10	8-12	9-13	10-15	12-18	14-20	16-24	18-26	21-31	24-35
18 x 9	CFM	195	235	275	310	350	390	470	545	625	700	780
Ak .390	Throw Y	6-9	8-12	9-13	10-14	11-17	13-19	15-21	17-25	19-29	22-33	25-39
21 x 9	CFM	230	275	320	365	410	455	545	635	730	820	910
Ak .450	Throw Y	7-10	8-12	9-13	11-16	12-18	14-20	16-24	19-27	22-32	25-36	29-41
15 x 12	CFM	220	260	305	350	390	435	525	610	700	785	870
Ak .430	Throw Y	6-9	8-12	10-14	10-15	12-18	14-20	15-24	18-27	22-32	24-36	28-41
18 x 12	CFM	260	315	370	420	475	525	630	735	840	945	1050
Ak .520	Throw Y	7-11	9-13	11-15	12-18	13-19	15-21	18-26	20-29	23-34	27-39	31-42
21 x 15	CFM	380	455	530	605	685	760	915	1060	1220	1370	1520
Ak .760	Throw Y	9-13	10-15	12-18	14-20	15-23	17-25	20-30	23-34	27-40	31-44	34-48
24 x 15	CFM	440	525	615	700	790	875	1050	1225	1400	1575	1750
Ak .870	Throw Y	8-14	11-16	13-19	15-21	17-25	19-29	22-33	25-38	29-42	33-48	38-54
21 x 18	CFM	460	550	640	735	825	915	1100	1280	1465	1645	1830
Ak .910	Throw Y	10-15	11-17	13-19	16-22	19-25	20-28	23-33	26-38	29-42	34-46	38-51
27 x 21	CFM	690	830	965	1100	1245	1380	1655	1935	2210	2490	2760
Ak 1.300	Throw Y	11-17	14-20	17-24	19-27	21-31	23-35	27-40	34-46	38-51	42-56	47-61

Note: The minimum Throw Dimension is based on a terminal velocity of 135 FPM. The maximum Throw Dimension is based on a terminal velocity of 65 FPM.



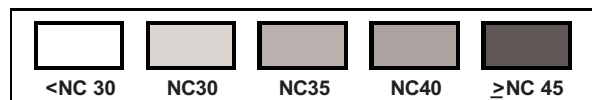
Two-Way Style 2S

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
9 x 6	CFM	65	80	95	105	120	130	160	185	210	240	265
Ak .130	Throw X	3-6	4-7	5-8	6-9	8-12	9-13	10-14	11-17	13-19	15-23	17-26
12 x 6	CFM	90	105	120	140	160	175	210	245	280	315	350
Ak .170	Throw X	4-7	6-8	7-10	8-12	9-13	10-14	11-17	14-20	15-23	17-25	19-29
15 x 6	CFM	110	130	155	175	200	220	265	310	350	395	440
Ak .220	Throw X	5-7	6-9	7-10	9-13	10-15	11-17	13-19	15-23	18-26	21-30	23-34
12 x 9	CFM	130	155	180	210	235	260	310	365	415	470	520
Ak .260	Throw X	6-8	6-9	7-10	9-13	9-13	10-15	13-19	15-21	17-25	19-29	21-31
15 x 9	CFM	165	195	230	260	295	325	390	460	525	590	650
Ak .320	Throw X	7-10	8-12	9-13	10-14	12-18	14-20	16-24	18-26	19-29	23-33	27-39
18 x 9	CFM	195	235	275	310	350	390	470	545	625	700	780
Ak .390	Throw X	7-10	9-13	11-17	12-18	13-19	15-23	18-27	20-30	22-32	25-38	29-43
21 x 9	CFM	230	275	320	365	410	455	545	635	730	820	910
Ak .450	Throw X	9-13	9-14	10-15	12-18	15-21	16-24	19-29	22-33	26-38	29-42	32-47
15 x 12	CFM	220	260	305	350	390	435	525	610	700	785	870
Ak .430	Throw X	7-10	8-12	10-14	11-17	13-19	15-21	16-24	19-27	22-33	25-38	29-42
18 x 12	CFM	260	315	370	420	475	525	630	735	840	945	1050
Ak .520	Throw X	8-11	10-14	10-15	12-18	14-20	15-23	18-27	23-33	25-37	29-42	32-47
21 x 15	CFM	380	455	530	605	685	760	915	1060	1220	1370	1520
Ak .760	Throw X	10-15	11-17	14-20	15-23	18-26	20-29	22-33	26-38	29-42	35-46	39-51
24 x 15	CFM	440	525	615	700	790	875	1050	1225	1400	1575	1750
Ak .870	Throw X	9-14	11-17	15-21	17-25	19-29	22-32	25-37	28-41	33-45	38-51	43-56
21 x 18	CFM	460	550	640	735	825	915	1100	1280	1465	1645	1830
Ak .910	Throw X	11-17	12-18	14-20	16-24	19-27	20-29	23-34	27-40	32-45	37-49	40-55
27 x 21	CFM	690	830	965	1100	1245	1380	1655	1935	2210	2490	2760
Ak 1.300	Throw X	12-18	15-21	18-25	21-29	23-33	25-37	29-43	33-48	38-53	43-59	49-63

Note: The minimum Throw Dimension is based on a terminal velocity of 135 FPM. The maximum Throw Dimension is based on a terminal velocity of 65 FPM.



Ceiling Height in Feet	Max. Rec. Cooling Temp. Differential	Max. Rec. CFM Per Diff. 1400/AL1400			
		Four-Way	Three-Way	Two-Way	One-Way
7	15°	400	300	200	100
8	20°	600	450	300	150
9	25°	1200	900	600	300
10	25°	1800	1350	900	450
12	30°	3200	2400	1600	800
14	30°	4800	3600	2400	1200
16	30°	6000	4500	3000	1500



See Description of NC Criteria on page 96.

Recommended Noise Criteria and Face Velocity Ranges are on page 96.

Series 1400/AL1400 Square/Rectangular Ceiling Diffuser

Two-Way Style 2

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
6 x 6	CFM	45	55	60	70	80	90	105	125	140	160	180
Ak .090	Throw Y	3-5	3-5	4-7	4-7	5-8	5-8	6-9	9-13	10-15	11-17	12-18
9 x 9	CFM	95	115	135	155	175	195	235	275	315	350	390
Ak .190	Throw Y	5-7	6-8	6-8	6-9	8-12	9-13	11-17	12-18	14-20	16-24	18-26
12 x 12	CFM	175	210	245	280	315	350	420	480	560	635	700
Ak .350	Throw Y	4-7	6-9	9-13	10-15	11-17	12-18	14-20	17-23	18-27	21-31	23-35
15 x 15	CFM	275	330	385	440	495	550	660	775	885	995	1100
Ak .550	Throw Y	8-12	10-14	10-15	12-18	14-20	15-23	18-27	22-32	24-36	26-39	29-43
18 x 18	CFM	390	470	545	625	700	780	935	1090	1250	1410	1560
Ak .780	Throw Y	9-15	11-17	12-18	14-20	15-23	18-26	20-30	24-36	27-42	31-45	36-51
21 x 21	CFM	540	650	760	865	975	1080	1300	1515	1730	1945	2160
Ak 1.080	Throw Y	11-17	14-20	15-23	18-26	19-29	23-35	26-40	29-44	34-49	38-54	43-59
24 x 24	CFM	705	845	990	1130	1270	1410	1690	1950	2250	2540	2820
Ak 1.410	Throw Y	12-19	14-22	17-25	20-30	21-33	23-35	27-40	34-46	39-51	42-56	46-60
27 x 27	CFM	880	1055	1230	1410	1585	1760	2110	2470	2820	3170	3520
Ak 1.760	Throw Y	12-20	15-23	18-26	21-31	24-36	26-40	30-45	35-50	39-56	43-61	48-66

2-WAY STYLE 2

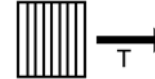


Note: The minimum Throw Dimension is based on a terminal velocity of 135 FPM. The maximum Throw Dimension is based on a terminal velocity of 65 FPM.

One-Way Style

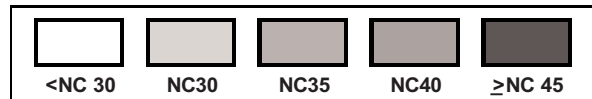
Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
6 x 6	CFM	45	55	60	70	80	90	105	125	140	160	180
Ak .090	Throw	3-5	4-7	5-8	6-9	8-10	9-12	10-14	12-18	14-20	15-22	16-24
9 x 9	CFM	95	115	135	155	175	195	235	275	315	350	390
Ak .190	Throw	6-9	7-10	9-13	10-14	11-17	13-19	15-21	18-26	19-29	22-33	25-38
12 x 12	CFM	175	210	245	280	315	350	420	480	560	635	700
Ak .350	Throw	8-12	10-14	12-18	13-19	15-21	18-26	21-31	24-36	27-40	30-43	33-45
15 x 15	CFM	275	330	385	440	495	550	660	775	885	995	1100
Ak .550	Throw	10-16	13-19	14-22	18-26	19-29	21-31	25-37	30-43	35-46	38-50	42-56
18 x 18	CFM	390	470	545	625	700	780	935	1090	1250	1410	1560
Ak .780	Throw	13-21	15-23	18-26	19-29	22-33	25-38	29-42	35-46	42-49	44-52	49-56
21 x 21	CFM	540	650	760	865	975	1080	1300	1515	1730	1945	2160
Ak 1.080	Throw	14-23	17-25	21-30	24-36	27-40	30-43	34-48	39-54	44-60	48-64	53-68
24 x 24	CFM	705	845	990	1130	1270	1410	1690	1950	2250	2540	2820
Ak 1.410	Throw	20-29	23-33	24-36	27-40	30-44	35-48	39-54	43-60	48-65	52-69	56-74
27 x 27	CFM	880	1055	1230	1410	1585	1760	2110	2470	2820	3170	3520
Ak 1.760	Throw	19-27	22-31	25-38	28-42	33-47	36-53	43-58	49-63	54-68	60-73	65-77

1-WAY STYLE



Note: The minimum Throw Dimension is based on a terminal velocity of 135 FPM. The maximum Throw Dimension is based on a terminal velocity of 65 FPM.

Ceiling Height in Feet	Max. Rec. Cooling Temp. Differential	Max. Rec. CFM Per Diff. 1400/AL1400			
		Four-Way	Three-Way	Two-Way	One-Way
7	15°	400	300	200	100
8	20°	600	450	300	150
9	25°	1200	900	600	300
10	25°	1800	1350	900	450
12	30°	3200	2400	1600	800
14	30°	4800	3600	2400	1200
16	30°	6000	4500	3000	1500



See Description of NC Criteria on page 96.

Series 1400/AL1400 Square/Rectangular Ceiling Diffuser

One-Way Style 1L

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
9 x 6	CFM	65	80	95	105	120	130	160	185	210	240	265
Ak .130	Throw	5-8	6-9	7-11	8-12	9-13	10-15	12-18	15-21	16-24	19-29	21-32
12 x 6	CFM	90	105	120	140	160	175	210	245	280	315	350
Ak .170	Throw	5-8	6-9	6-13	9-14	10-15	12-18	14-20	17-25	18-27	20-30	23-35
15 x 6	CFM	110	130	155	175	200	220	265	310	350	395	440
Ak .220	Throw	5-8	7-10	9-13	10-15	12-18	14-20	16-24	18-27	21-31	24-36	28-41
12 x 9	CFM	130	155	180	210	235	260	310	365	415	470	520
Ak .260	Throw	7-10	8-12	10-14	11-17	12-18	14-20	17-25	19-29	22-23	25-37	28-41
15 x 9	CFM	165	195	230	260	295	325	390	460	525	590	650
Ak .320	Throw	9-13	10-14	11-17	12-18	15-23	17-25	20-30	22-33	25-37	29-42	32-45
18 x 9	CFM	195	235	275	310	350	390	470	545	625	700	780
Ak .390	Throw	9-13	10-15	12-18	14-20	16-24	18-26	20-30	25-37	27-40	31-44	36-48
15 x 12	CFM	220	260	305	350	390	435	525	610	700	785	870
Ak .430	Throw	10-14	11-17	13-19	15-23	18-26	19-29	22-32	26-39	30-43	35-48	39-54
18 x 12	CFM	260	315	370	420	475	525	630	735	840	945	1050
Ak .520	Throw	10-15	12-18	14-20	17-25	19-27	21-30	25-36	28-41	32-45	36-49	42-54
21 x 15	CFM	380	455	530	605	685	760	915	1060	1220	1370	1520
Ak .760	Throw	13-19	15-21	18-26	19-29	22-34	25-38	29-42	34-46	38-51	43-56	48-61
24 x 15	CFM	440	525	615	700	790	875	1050	1225	1400	1575	1750
Ak .870	Throw	14-22	16-24	18-27	21-31	24-36	27-40	30-43	35-47	41-52	46-57	53-61
21 x 18	CFM	460	550	640	735	825	915	1100	1280	1465	1645	1830
Ak .910	Throw	14-20	16-24	19-29	22-32	24-36	26-39	30-43	35-47	41-51	45-56	49-62
27 x 21	CFM	690	830	965	1100	1245	1380	1655	1935	2210	2490	2760
Ak 1.380	Throw	17-27	19-29	23-35	26-40	30-45	34-49	38-54	43-60	48-67	54-72	59-80

Note: The minimum Throw Dimension is based on a terminal velocity of 135 FPM. The maximum Throw Dimension is based on a terminal velocity of 65 FPM.

1-WAY STYLE 1L

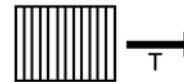


One-Way Style 1S

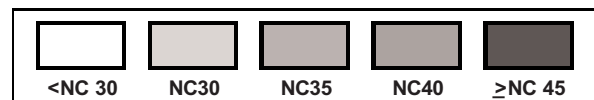
Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
9 x 6	CFM	65	80	95	105	120	130	160	185	210	240	265
Ak .130	Throw	4-7	5-9	7-11	9-13	11-17	13-19	15-21	16-24	18-27	21-32	23-35
12 x 6	CFM	90	105	120	140	160	175	210	245	280	315	350
Ak .170	Throw	6-10	8-12	10-15	12-17	14-19	15-21	17-25	21-31	23-35	25-37	29-44
15 x 6	CFM	110	130	155	175	200	220	265	310	350	395	440
Ak .220	Throw	9-12	10-14	12-18	14-20	16-24	18-26	21-31	23-35	27-40	31-45	35-51
12 x 9	CFM	130	155	180	210	235	260	310	365	415	470	520
Ak .260	Throw	8-12	10-14	10-15	12-18	14-20	16-24	18-27	23-33	24-37	28-42	30-44
15 x 9	CFM	165	195	230	260	295	325	390	460	525	590	650
Ak .320	Throw	10-15	12-18	13-19	15-21	18-26	22-32	23-35	26-39	30-43	35-46	38-47
18 x 9	CFM	195	235	275	310	350	390	470	545	625	700	780
Ak .390	Throw	11-17	13-19	15-23	17-25	20-30	22-33	25-38	31-44	34-45	38-47	42-51
15 x 12	CFM	220	260	305	350	390	435	525	610	700	785	870
Ak .430	Throw	11-16	12-18	15-21	17-25	19-29	22-32	25-38	28-44	33-45	36-49	42-54
18 x 12	CFM	260	315	370	420	475	525	630	735	840	945	1050
Ak .520	Throw	12-18	14-20	16-24	19-27	21-31	22-33	27-40	32-45	37-47	42-50	45-56
21 x 15	CFM	380	455	530	605	685	760	915	1060	1220	1370	1520
Ak .760	Throw	14-20	16-24	19-29	22-32	24-37	28-41	33-45	39-48	43-52	48-58	54-63
24 x 15	CFM	440	525	615	700	790	875	1050	1225	1400	1575	1750
Ak .870	Throw	16-23	18-26	22-32	25-37	28-41	32-45	37-47	44-54	49-59	54-66	59-71
21 x 18	CFM	460	550	640	735	825	915	1100	1280	1465	1645	1830
Ak .910	Throw	18-24	18-26	21-31	24-33	26-38	28-41	33-47	39-53	44-58	48-63	54-69
27 x 21	CFM	690	830	965	1100	1245	1380	1655	1935	2210	2490	2760
Ak 1.380	Throw	19-29	21-32	25-38	31-44	37-49	40-51	42-55	46-61	51-66	56-71	61-77

Note: The minimum Throw Dimension is based on a terminal velocity of 135 FPM. The maximum Throw Dimension is based on a terminal velocity of 65 FPM.

1-WAY STYLE 1S



Ceiling Height in Feet	Max. Rec. Cooling Temp. Differential	Max. Rec. CFM Per Diff. 1400/AL1400			
		Four-Way	Three-Way	Two-Way	One-Way
7	15°	400	300	200	100
8	20°	600	450	300	150
9	25°	1200	900	600	300
10	25°	1800	1350	900	450
12	30°	3200	2400	1600	800
14	30°	4800	3600	2400	1200
16	30°	6000	4500	3000	1500



See Description of NC Criteria on page 96.

Recommended Noise Criteria and Face Velocity Ranges are on page 96.

ADJ1400 Square/Rectangular Ceiling Diffuser

Face Velocity	300	400	500	600	700	800	900	1000
Pressure Loss	.006	.010	.016	.022	.031	.040	.051	.062

	CFM	75	100	125	150	175	200	225	250
6 x 6 Collar Horizontal Ak 0.10	Throw	8-4-3	11-5-4	13-7-4	16-8-5	18-9-6	21-11-7	24-12-8	26-13-9
	Noise Criteria	<15	<15	16	19	23	27	31	35
6 x 6 Collar Vertical Ak 0.08	Throw	6-3-2	9-4-3	11-5-4	13-6-4	15-7-5	17-9-6	19-10-6	21-11-7
	Noise Criteria	<15	17	20	23	27	31	35	39

	CFM	165	220	275	330	385	440	495	550
9 x 9 Collar Horizontal Ak 0.23	Throw	11-5-4	14-7-5	18-9-6	21-11-7	25-12-8	28-14-9	32-16-11	35-18-12
	Noise Criteria	<15	16	20	24	28	32	36	40
9 x 9 Collar Vertical Ak 0.18	Throw	7-3-2	9-5-3	12-6-4	14-7-5	16-8-5	19-9-6	21-10-7	23-12-8
	Noise Criteria	16	20	24	28	32	36	40	44

	CFM	300	400	500	600	700	800	900	1000
12 x 12 Collar Horizontal Ak 0.40	Throw	15-7-5	20-10-7	25-12-8	30-15-10	35-17-12	40-20-13	45-22-15	50-25-17
	Noise Criteria	<15	16	24	29	33	37	41	45
12 x 12 Collar Vertical Ak 0.33	Throw	8-4-3	10-5-3	13-8-4	16-8-5	18-9-6	21-10-7	23-12-8	26-13-9
	Noise Criteria	16	20	28	33	37	41	45	49

	CFM	465	620	775	930	1085	1240	1395	1550
15 x 15 Collar Horizontal Ak 0.63	Throw	18-9-6	24-12-8	31-15-10	37-18-12	43-21-14	49-24-16	55-28-18	61-31-20
	Noise Criteria	18	21	25	31	35	39	43	47
15 x 15 Collar Vertical Ak 0.51	Throw	8-4-3	11-8-4	14-7-5	17-8-6	19-10-6	22-11-7	25-12-8	28-14-9
	Noise Criteria	21	25	29	35	39	43	47	51

	CFM	675	900	1125	1350	1575	1800	2025	2250
18 x 18 Collar Horizontal Ak 0.90	Throw	22-11-7	30-15-10	37-18-12	44-22-15	52-26-17	59-30-20	66-33-22	74-37-25
	Noise Criteria	20	24	28	32	37	41	45	49
18 x 18 Collar Vertical Ak 0.74	Throw	9-4-3	12-6-4	15-7-5	18-9-6	21-10-7	24-12-8	27-13-9	30-15-10
	Noise Criteria	24	28	32	36	41	45	49	53

	CFM	930	1240	1550	1860	2170	2480	2790	3100
21 x 21 Collar Horizontal Ak 1.24	Throw	27-13-9	35-18-12	44-22-15	53-27-18	62-31-21	71-35-24	80-40-27	88-44-29
	Noise Criteria	21	26	32	38	42	46	50	54
21 x 21 Collar Vertical Ak 1.01	Throw	9-5-3	13-6-4	16-8-5	19-9-6	22-11-7	26-13-8	28-14-9	32-16-11
	Noise Criteria	25	30	36	42	46	50	54	58

	CFM	1200	1600	2000	2400	2800	3200	3600	4000
24 x 24 Collar Horizontal Ak 1.61	Throw	29-15-10	39-19-13	49-24-16	59-29-19	66-34-23	78-39-26	87-44-29	97-49-32
	Noise Criteria	21	29	35	39	43	47	51	55
24 x 24 Collar Vertical Ak 1.31	Throw	10-5-3	13-6-4	16-8-5	19-10-6	23-11-8	26-13-9	29-15-10	32-16-11
	Noise Criteria	25	33	39	43	47	51	55	59

Notes:

1. Tests conducted in accordance with ANSI/ASHRAE 70-1991 at isothermal conditions.
2. Tests conducted with a straight rigid inlet condition. Other inlet conditions may alter performance.
3. Units of measure: Neck Velocity = FPM; Velocity Pressure = in. w.c.; Airflow Rate = CFM; Total Pressure = in. w.c.; Throw = ft. at 50, 100 and 150 FPM terminal velocity; Effective Area (Ak) = ft².
4. Noise Criteria (NC) is based upon 10dB room absorption (Re: 10⁻¹² watts) evaluated at 125 thru 4000 Hz octave bands.
5. Tests conducted on base unit only with no neck damper, grid or pattern baffle.

1444 Modular Core Supply Diffuser

Module Size	3 x 3	4 x 4	5 x 5	6 x 6	7 x 7	8 x 8	9 x 9	10 x 10	11 x 11	12 x 12	Jet Velocity	Neck Velocity	Static Pressure
Area of Module in Sq. Ft.		.063	.111	.174	.250	.340	.445	.562	.695	.840	1.0		
No. of Blades in Module	3	4	5	6	7	8	9	10	11	12			
Effective Area (Ak) in Sq. Ft.	.026	.045	.071	.102	.140	.184	.235	.285	.348	.411			
CFM per Module	12	22	34	50	67	90	112	139	169	201	CFM		
Throw in FPM min-max	2-3	3-4	4-5	5-7	6-8	6-9	7-10	8-11	9-12	10-14	RAD	500	200
Noise Criteria	17	17	20	20	20	20	20	20	20	20	NC		.014
CFM per Module	20	34	52	75	104	137	170	210	256	305	CFM		
Throw in FPM min-max	3-5	4-5	4-6	6-8	7-10	8-11	9-12	10-13	11-15	12-16	RAD	750	300
Noise Criteria	20	20	20	20	20	20	20	20	20	25	NC		.032
CFM per Module	25	44	70	104	135	170	210	256	305	355	CFM		
Throw in FPM min-max	4-6	6-8	6-8	7-10	8-13	9-13	10-15	12-15	13-19	14-19	RAD	1000	400
Noise Criteria	22	22	25	25	25	25	25	25	25	25	NC		.058
CFM per Module	32	56	87	125	170	224	280	348	420	500	CFM		
Throw in FPM min-max	5-7	7-9	7-9	8-12	10-14	11-16	12-18	13-20	15-22	16-24	RAD	1250	500
Noise Criteria	24	25	25	25	25	25	30	31	32	33	NC		.090
CFM per Module	37	68	105	150	207	270	341	420	512	607	CFM		
Throw in FPM min-max	6-8	7-10	8-11	9-13	11-17	12-18	13-20	15-21	18-25	18-27	RAD	1500	600
Noise Criteria	26	30	30	30	32	32	34	34	35	35	NC		.130
CFM per Module	45	79	122	175	242	315	396	485	597	708	CFM		
Throw in FPM min-max	6-9	8-11	10-15	12-18	13-20	15-23	16-24	18-27	20-30	21-31	RAD	1750	700
Noise Criteria	28	35	35	35	35	36	37	38	39	40	NC		.180
CFM per Module	50	91	140	200	275	358	452	558	677	805	CFM		
Throw in FPM min-max	7-10	9-12	10-14	11-17	14-20	15-22	17-24	18-26	20-30	23-34	RAD	2000	800
Noise Criteria	32	35	35	35	36	37	37	38	39	40	NC		.220

1500 / 1520 / 1530 / 1540 / 1560 / 1570 Step-Down Ceiling Diffusers

Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
6" CFM	80	100	120	135	155	175	195	235	275	315
An .200 Ps	.008	.012	.017	.021	.028	.035	.043	.063	.086	.112
NC	<20	<20	<20	<20	<20	20	20	25	30	35
Ak .780 Throw	2.0	3.0	3.0	3.5	4.0	4.5	5.0	6.0	7.0	8.0
8" CFM	140	175	210	245	280	315	350	420	490	560
An .350 Ps	.010	.015	.022	.029	.038	.049	.060	.086	.117	.150
NC	<20	<20	<20	<20	20	25	30	35	40	45
Ak .920 Throw	3.5	4.5	5.5	6.5	7.0	8.0	9.0	10.5	12.5	14.5
10" CFM	220	270	325	380	435	490	545	655	765	870
An .540 Ps	.014	.021	.030	.041	.054	.068	.084	.122	.167	.212
NC	<20	<20	<20	20	25	30	35	40	45	50
Ak 1.200 Throw	5.5	7.0	8.5	10.0	11.0	12.5	14.0	17.0	19.5	22.0
12" CFM	315	390	470	550	630	705	785	940	1100	1255
An .780 Ps	.015	.023	.033	.045	.060	.072	.094	.132	.180	.230
NC	<20	<20	20	25	30	35	40	45	50	55
Ak 1.650 Throw	6.0	7.5	9.0	10.5	12.0	13.5	15.0	18.0	21.0	24.0
14" CFM	430	535	640	750	855	960	1070	1285	1500	1710
An 1.070 Ps	.023	.036	.051	.071	.093	.115	.140	.205	.277	.350
NC	<20	<20	20	25	30	35	40	45	50	55
Ak 2.060 Throw	6.5	8.0	9.5	11.5	13.0	14.5	16.0	19.0	22.5	25.0

Terminal Velocity of 75 FPM
An = Neck Area in square feet
Ak = Effective Area in square feet
Ps = Static Pressure Loss in inches of water
NC = Noise Criteria, based on a 10dB room attenuation (RE: 10⁻¹² watts) ASHRAE 36-72
Note: The use of a balancing hood is recommended to balance the system.

1580/1590 T-Bar Plate Diffuser

Neck Velocity	300	400	500	600	700	800	900	1000	1200	1400	1600
6" CFM	60	80	100	120	135	155	175	195	235	275	315
An .200 Ps	.004	.006	.010	.014	.018	.023	.030	.037	.054	.073	.096
NC	<20	<20	<20	<20	20	20	25	30	35	40	
Ak .279 Throw	1.0	1.0	1.5	1.5	2.0	2.0	2.5	3.0	3.5	4.0	
8" CFM	105	140	175	210	245	280	315	350	420	490	560
An .350 Ps	.010	.010	.015	.022	.029	.038	.049	.060	.086	.117	.150
NC	<20	<20	<20	<20	20	25	30	30	35	40	45
Ak .354 Throw	1.5	2.0	2.0	2.5	3.0	3.5	4.0	4.5	5.5	6.5	7.0
10" CFM	165	220	275	325	380	435	490	545	655	765	875
An .540 Ps	.014	.014	.021	.030	.041	.054	.068	.084	.122	.167	.212
NC	<20	<20	<20	<20	20	25	30	35	40	45	50
Ak 400 Throw	2.0	3.0	3.5	4.0	5.0	5.5	6.5	7.0	8.5	10.0	10.5
12" CFM	235	315	395	470	550	630	705	785	945	1100	1260
An .780 Ps	.015	.015	.023	.033	.045	.060	.072	.094	.132	.180	.230
NC	<20	<20	<20	20	25	30	35	35	40	45	50
Ak .397 Throw	3.0	4.0	5.0	6.0	7.0	8.0	8.5	9.5	11.5	13.5	14.0
14" CFM	320	430	535	640	750	855	960	1070	1280	1500	1710
An 1.070 Ps	.023	.023	.036	.051	.071	.093	.115	.140	.205	.277	.350
NC	<20	<20	<20	25	30	35	35	40	45	50	55
Ak .393 Throw	5.0	7.0	8.5	10.5	12.0	13.5	15.5	17.0	20.5	24.0	24.5

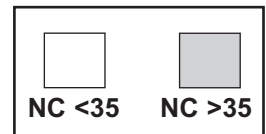
Terminal Velocity of 75 FPM
An = Neck Area in Sq. Ft.
NC = Noise Criteria, based on a 10dB room attenuation (RE: 10⁻¹² watts) ASHRAE 36-72

Recommended Noise Criteria and Face Velocity Ranges are on page 96.

1600 Adjustable Round Diffuser

Face Velocity	500	600	700	800	900	1000	1200	1400	1600	1800
6" CFM	80	95	110	130	145	160	190	225	255	290
Ak .160 Ps	<.010	<.010	<.010	.014	.016	.020	.027	.038	.049	.062
Throw	2.0	2.5	3	3.5	4.5	5.0	6.0	7.0	8.0	9.0
8" CFM	140	170	195	225	250	280	335	390	450	505
Ak .280 Ps	<.010	<.010	<.010	.013	.016	.020	.028	.038	.050	.063
Throw	3.5	4.0	4.5	5.0	5.5	6.5	7.5	9.0	10.5	12.0
10" CFM	220	265	310	350	395	440	530	615	705	790
Ak .440 Ps	<.010	<.010	.010	.013	.016	.020	.029	.041	.051	.065
Throw	4.0	4.5	5.0	6.0	7.0	8.0	9.0	11.0	13.0	14.0
12" CFM	330	395	460	530	595	660	790	925	1025	1190
Ak .660 Ps	<.010	<.010	.010	.013	.017	.021	.029	.040	.050	.063
Throw	5.0	6.0	7.0	8.0	9.0	10.0	12.0	14.0	16.0	18.0
14" CFM	455	545	640	730	820	910	1090	1275	1455	1640
Ak .910 Ps	<.010	<.010	.011	.014	.017	.021	.030	.040	.053	.067
Throw	6.0	7.0	8.0	9.0	10.5	12.0	14.0	16.0	18.0	21.0
16" CFM	600	720	840	960	1080	1200	1440	1680	1920	2160
Ak 1.200 Ps	<.010	<.010	.010	.013	.016	.020	.028	.039	.050	.063
Throw	7.0	8.0	9.0	10.5	12.0	13.5	16.0	19.0	22.0	24.0
18" CFM	750	900	1050	1200	1350	1500	1800	2100	2400	2700
Ak 1.500 Ps	<.010	<.010	.010	.013	.017	.021	.030	.040	.052	.062
Throw	8.0	9.0	10.0	12.0	13.5	15.0	18.0	21.0	24.0	27.0

Note: Core in "out" position. Terminal velocity of 100 FPM
When diffusers are used on an exposed duct, multiply throw by 0.7.



Series 2900 Roto Aire Drum Louver

2906 = 6 inches

Standard Finish: **Satin Aluminum**

Size (in x in)	Area Factors	Neck Area (Ft ²)	Outlet* Velocity	800	1000	1200	1400	1600	1800	2100
			Velocity Pressure	.007	.010	.015	.025	.030	.040	.052
			Total Pressure	.039	.065	.100	.147	.194	.254	.330
9 x 6	0.16	0.375	CFM	128	160	192	224	256	288	336
			Throw	6-7-13	8-11-14	10-14-23	12-17-26	4-19-29	16-21-32	17-23-35
12 x 6	0.21	0.500	CFM	168	210	252	294	336	378	441
			Throw	8-10-18	10-15-24	12-17-27	14-18-30	15-20-33	17-22-37	18-23-41
18 x 6	0.32	0.750	CFM	256	320	384	448	512	576	672
			Throw	10-14-23	13-18-30	15-20-34	18-23-38	20-26-43	23-30-48	25-32-52
24 x 6	0.41	1.000	CFM	328	410	492	574	656	738	861
			Throw	12-17-28	16-21-35	19-25-40	22-29-45	24-33-51	27-36-56	30-38-61
30 x 6	0.52	1.250	CFM	416	520	624	728	832	936	1092
			Throw	15-20-33	18-24-39	22-28-44	25-32-50	27-37-56	30-40-61	33-43-66
36 x 6	0.62	1.500	CFM	496	620	744	868	992	1116	1302
			Throw	17-23-37	20-26-43	24-30-47	28-35-54	31-40-60	34-44-65	37-46-72
48 x 6	0.83	2.000	CFM	664	830	996	1162	1328	1494	1743
			Throw	20-26-41	23-29-47	26-35-55	32-41-62	36-45-66	40-49-72	44-53-78
60 x 6	1.05	2.500	CFM	840	1000	1260	1470	1680	1890	2205
			Throw	22-29-45	25-32-52	29-39-61	36-46-70	41-50-79	46-54-86	49-59-96

*Outlet velocity and Ak based on 15° deflection.

Series 2900 Roto Aire Drum Louver

2910 = 10 inches

Standard Finish: **Satin Aluminum**

Size (in x in)	Area Factors	Neck Area (Ft ²)	Outlet* Velocity	800	1000	1200	1400	1600	1800	2100
			Velocity Pressure	.007	.010	.015	.025	.030	.040	.052
			Total Pressure	.039	.065	.100	.147	.194	.254	.330
20 x 10	0.60	1.390	CFM	480	600	720	840		1080	1260
			Throw	19-23-33	23-27-40	26-31-46	29-35-53		35-42-64	38-46-69
25 x 10	0.75	1.740	CFM	600	750	900	1050		1350	1575
			Throw	21-24-38	25-29-46	28-34-53	32-38-60		38-46-73	41-50-79
30 x 10	0.90	2.080	CFM	720	900	1080	1260	1440	1620	1890
			Throw	22-25-41	27-31-51	31-36-58	35-41-66	39-46-74	42-50-81	46-54-88
35 x 10	1.05	2.440	CFM	840	1050	1260	1470	1680	1890	2205
			Throw	22-27-43	27-33-53	32-39-62	37-45-71	41-50-81	45-54-89	49-59-98
40 x 10	1.20	2.780	CFM	960	1200	1440	1680	1920	2160	2520
			Throw	23-28-47	28-34-58	34-41-69	39-48-79	44-59-88	48-59-96	53-65-105
50 x 10	1.50	3.470	CFM	1200	1500	1800	2100	2400	2700	3150
			Throw	25-31-52	31-39-63	37-46-74	44-53-82	48-59-91	54-65-100	60-72-110
60 x 10	1.85	4.170	CFM	1480	1850	2220	2590	2960	3330	3885
			Throw	25-33-59	33-42-73	40-50-84	47-58-95	54-55-108	61-74-118	68-81-128
70 x 10	2.15	4.860	CFM	1720	2150	2580	3010	3440	3870	4515
			Throw	38-36-62	35-46-78	43-54-93	50-63-108	58-71-123	65-79-135	72-87-147

*Outlet velocity and Ak based on 15° deflection.

Throw data is based on Terminal Velocities of 150 FPM, 100 FPM and 50 FPM, respectively.

Throw, NC and Total Pressure are based on 15° blade deflection. For 0° or 30° deflection, the following correction factors should be applied to the table values.

Deflection	Throw	Total Pressure	NC
0°	1.2	0.795	-4
30°	0.8	1.430	+5

□	□	□	□
≤NC 30	NC 35	NC 40	≥NC 50

Series 2900 Roto Aire Drum Louver

2912 = 12 inches

Standard Finish: **Satin Aluminum**

Size (in x in)	Area Factors	Neck Area (Ft ²)	Outlet* Velocity	800	1000	1200	1400	1600	1800	2100
			Velocity Pressure	.007	.010	.015	.025	.030	.040	.052
			Total Pressure	.039	.065	.100	.147	.194	.254	.330
20 x 12	0.70	1.670	CFM	560	700	840	980	1120	1260	1470
			Throw	10-20-35	18-25-43	23-31-51	26-35-58	29-39-64	33-44-71	36-48-78
30 x 12	1.05	2.500	CFM	840	1050	1260	1470	1680	1890	2205
			Throw	17-25-42	24-32-53	28-38-63	33-43-72	38-49-81	43-55-90	48-60-99
40 x 12	1.40	3.330	CFM	1120	1400	1680	1960	2240	2520	2940
			Throw	20-28-49	27-36-62	32-43-74	38-50-86	44-57-97	49-64-107	55-61-120
50 x 12	1.75	4.160	CFM	1400	1750	2100	2450	2800	3150	3675
			Throw	22-29-56	29-39-71	37-48-85	44-56-99	51-64-117	58-73-127	64-81-138
60 x 12	2.15	5.000	CFM	1720	2150	2580	3010	3440	3870	4515
			Throw	25-33-61	33-44-78	42-53-94	49-63-110	58-74-125	66-83-140	75-92-155
70 x 12	2.50	5.830	CFM	2000	2500	3000	3500	4000	4500	5250
			Throw	28-37-68	37-49-87	47-61-107	57-73-125	67-86-142	76-97-160	86-110-180

*Outlet velocity and Ak based on 15° deflection.

Series 2900 Roto Aire Drum Louver

2915 = 15 inches

Standard Finish: **Satin Aluminum**

Size (in x in)	Area Factors	Neck Area (Ft ²)	Outlet* Velocity	800	1000	1200	1400	1600	1800	2100
			Velocity Pressure	.007	.010	.015	.025	.030	.040	.052
			Total Pressure	.039	.065	.100	.147	.194	.254	.330
15 x 15	0.75	1.560	CFM	600	750	900	1050	1200	1350	1575
			Throw	3-10-28	9-18-36	14-24-36	21-27-50	24-30-56	25-32-58	29-38-69
20 x 15	1.00	2.080	CFM	800	1000	1200	1400	1600	1800	2100
			Throw	9-17-35	17-24-43	22-28-52	25-32-60	29-37-68	31-40-72	35-44-80
25 x 15	1.25	2.600	CFM	1000	1250	1500	1750	2000	2250	2625
			Throw	13-21-38	21-26-48	25-32-58	29-38-68	34-43-77	38-48-86	42-54-95
30 x 15	1.55	3.120	CFM	1240	1550	1860	2170	2480	2790	3255
			Throw	14-23-42	22-28-54	27-35-65	32-41-76	37-47-86	41-54-97	46-59-107
40 x 15	2.05	4.170	CFM	1640	2050	2460	2870	3280	3690	4305
			Throw	19-25-48	27-35-66	34-43-79	39-50-93	45-58-105	51-65-118	57-72-130
50 x 15	2.55	5.210	CFM	2040	2550	3060	3570	4080	4590	5355
			Throw	24-30-61	31-40-78	38-48-96	45-58-114	52-66-130	58-75-145	65-83-163
60 x 15	3.00	6.250	CFM	2400	3000	3600	4200	4800	5400	6300
			Throw	27-34-68	35-46-88	43-58-106	52-68-125	60-79-143	68-89-160	76-100-176
70 x 15	3.50	7.300	CFM	2800	3500	4200	4900	5600	6300	7350
			Throw	29-38-72	40-51-95	50-64-118	60-76-140	71-89-160	81-101-184	90-112-195

*Outlet velocity and Ak based on 15° deflection.

Throw data is based on Terminal Velocities of 150 FPM, 100 FPM and 50 FPM, respectively.

Throw, NC and Total Pressure are based on 15° blade deflection. For 0° or 30° deflection, the following correction factors should be applied to the table values.

Deflection	Throw	Total Pressure	NC
0°	1.2	0.795	-4
30°	0.8	1.430	+5

☐	☐	☐	☐
≤NC 30	NC 35	NC 40	≥NC 50

ALSDS Spiral Diffuser

1/2" wide slot - nonducted

1-Slot	Airflow Rate (CFM/Linear Foot)	7	10	13	17	20	23	27	30	33	37
	Static Pressure	.002	.003	.006	.009	.016	.018	.024	.030	.037	.045
	Horizontal Throw	7-4-2	11-6-4	15-7-5	19-9-6	22-11-7	26-13-9	30-15-10	33-17-11	37-19-12	41-20-14
	Noise Criteria	<15	<15	<15	<15	<15	<15	19	21	23	25
2-Slot	Airflow Rate (CFM/Linear Foot)	10	17	23	30	37	43	50	57	63	70
	Static Pressure	.001	.002	.004	.007	.011	.015	.020	.026	.032	.039
	Horizontal Throw	6-3-2	9-5-3	13-6-4	17-8-6	20-10-7	24-12-8	28-14-9	31-16-10	35-18-12	39-19-13
	Noise Criteria	<15	<15	<15	<15	<15	<15	19	23	27	31
3-Slot	Airflow Rate (CFM/Linear Foot)	13	23	33	43	53	63	73	83	93	103
	Static Pressure	.001	.002	.004	.006	.009	.012	.017	.021	.027	.033
	Horizontal Throw	5-3-2	10-5-3	14-7-5	18-9-6	22-11-7	26-13-9	30-15-10	34-17-11	38-19-13	42-21-14
	Noise Criteria	<15	<15	<15	<15	<15	18	21	25	30	33
4-Slot	Airflow Rate (CFM/Linear Foot)	17	30	43	57	70	83	97	110	123	137
	Static Pressure	.001	.002	.003	.005	.008	.012	.016	.020	.025	.031
	Horizontal Throw	6-3-2	10-5-3	15-8-5	20-10-7	24-12-8	29-14-10	31-17-11	38-19-13	43-21-14	47-24-16
	Noise Criteria	<15	<15	<15	<15	18	20	22	27	32	34

3/4" wide slot - nonducted

1-Slot	Airflow Rate (CFM/Linear Foot)	10	15	20	25	30	35	40	45	50	55
	Static Pressure	.002	.004	.007	.011	.015	.020	.027	.034	.042	.050
	Horizontal Throw	6-3-2	9-5-3	12-6-4	15-8-5	18-9-6	22-11-7	25-12-8	28-14-9	31-15-10	34-17-11
	Noise Criteria	<15	<15	<15	<15	19	21	25	30	34	39
2-Slot	Airflow Rate (CFM/Linear Foot)	15	25	35	45	55	65	75	85	95	105
	Static Pressure	.001	.003	.005	.008	.012	.017	.022	.029	.036	.044
	Horizontal Throw	5-2-2	8-4-3	11-5-4	14-7-5	17-8-6	20-10-7	23-12-8	26-13-9	29-15-10	32-16-11
	Noise Criteria	<15	<15	<15	<15	19	26	32	35	38	41
3-Slot	Airflow Rate (CFM/Linear Foot)	20	35	50	65	80	95	110	125	140	155
	Static Pressure	.001	.002	.004	.007	.010	.014	.019	.024	.030	.037
	Horizontal Throw	5-2-2	8-4-3	11-6-4	15-7-5	18-9-6	22-11-7	25-12-8	28-14-9	32-16-11	35-18-12
	Noise Criteria	<15	<15	<15	18	23	28	33	37	40	43
4-Slot	Airflow Rate (CFM/Linear Foot)	25	45	65	85	105	125	145	165	185	205
	Static Pressure	.001	.002	.004	.006	.009	.013	.017	.023	.028	.035
	Horizontal Throw	5-2-2	9-4-3	13-6-4	16-8-5	20-10-7	24-12-8	28-14-9	32-16-11	38-19-12	40-20-13
	Noise Criteria	<15	<15	17	22	25	29	33	37	40	43

1" wide slot - nonducted

1-Slot	Airflow Rate (CFM/Linear Foot)	13	20	27	33	40	47	53	60	67	73
	Static Pressure	.002	.005	.009	.014	.020	.027	.036	.045	.056	.067
	Horizontal Throw	5-2-2	7-4-2	10-5-3	12-6-4	15-7-5	17-9-6	20-10-7	22-11-7	25-12-8	27-14-9
	Noise Criteria	<15	<15	<15	20	25	31	37	41	43	45
2-Slot	Airflow Rate (CFM/Linear Foot)	20	33	47	60	79	87	100	113	127	140
	Static Pressure	.001	.003	.007	.011	.016	.023	.030	.038	.048	.059
	Horizontal Throw	4-2-1	6-3-2	9-4-3	11-6-4	14-7-5	16-8-5	19-9-6	21-10-7	23-12-8	26-13-9
	Noise Criteria	<15	<15	<15	23	32	35	40	44	48	51
3-Slot	Airflow Rate (CFM/Linear Foot)	27	47	67	87	107	127	147	167	187	207
	Static Pressure	.001	.003	.005	.009	.013	.019	.025	.032	.040	.049
	Horizontal Throw	4-2-1	6-3-2	9-5-3	12-6-4	15-7-5	17-9-6	20-10-7	23-11-8	25-13-8	28-14-9
	Noise Criteria	<15	<15	<15	23	32	35	40	44	48	51
4-Slot	Airflow Rate (CFM/Linear Foot)	33	60	87	113	140	167	193	220	247	273
	Static Pressure	.001	.002	.005	.008	.012	.017	.023	.030	.038	.046
	Horizontal Throw	4-2-1	7-3-2	10-5-3	13-7-4	16-8-5	19-10-8	22-11-7	25-13-8	29-14-10	32-16-11
	Noise Criteria	<15	16	22	27	31	37	42	46	50	54

ALSDS Spiral Diffuser

Notes:

- Tests conducted in accordance with ANSI/ASHRAE 70-1991 at isothermal conditions.
- Engineering Units: Airflow Rate = CFM/linear foot
Static Pressure = in. w.c.
Throw = ft. at 50, 100, and 150 FPM terminal velocity
- Noise Criteria is based on 10 dB room absorption (Re: 10¹² watts) evaluated at 125 through 4000 Hz octave bands.
- Throw data are based on a horizontal discharge in one direction only. For two-way discharge pattern, the throw is determined from the published engineering data based on the number of slots and CFM/linear feet discharging in each direction.
- Throw data are for 4-foot active diffuser lengths. For other active lengths, throw may be determined by applying the following multiplication factors.

Diffuser Length (Feet)	Multiplication Factor
1	0.50
2	0.85
3	0.95
4	1.00

- Sound data are for 4-foot active diffuser lengths. For other lengths, add or deduct the following values to or from the reported NC level.

Diffuser Length (Feet)	NC Correction
1	-2
2	-2
3	-1
4	0

ALSDV, ALSDVH Spiral Diffuser

UALSDV, UALSDVH

Universal Spiral Diffuser

Face Velocity		300	400	500	600	700	800	1000	1200
Total Pressure		.016	.029	.046	.066	.090	.117	.183	.263
10 x 3 Ak .14	CFM	42	56	70	84	98	112	140	168
	Horizontal Throw	7-3	8-4	9-5	10-6	11-7	12-8	13-9	14-10
	Noise Criteria	-	-	-	-	-	23	29	35
12 x 3 Ak .18	CFM	54	72	90	108	126	144	180	216
	Horizontal Throw	8-5	9-6	10-7	11-8	12-8	13-9	14-10	16-11
	Noise Criteria	-	-	-	-	20	24	31	36
10 x 4 14 x 3 Ak .21	CFM	63	84	105	126	147	168	210	252
	Horizontal Throw	8-5	10-7	11-8	12-8	13-9	14-10	16-11	17-12
	Noise Criteria	-	-	-	-	21	25	31	37
16 x 3 12 x 4 Ak .25	CFM	75	100	125	150	175	200	250	300
	Horizontal Throw	9-5	11-7	12-8	13-9	14-10	15-11	17-12	19-13
	Noise Criteria	-	-	-	-	21	25	32	37
24 x 3 12 x 6 Ak .39	CFM	117	156	195	234	273	312	390	468
	Horizontal Throw	12-7	13-9	15-10	17-11	18-12	19-13	21-15	24-16
	Noise Criteria	-	-	-	-	23	27	34	39
24 x 4 16 x 6 Ak .52	CFM	156	208	260	312	364	416	520	624
	Horizontal Throw	13-8	16-11	18-12	19-13	21-14	22-15	25-17	27-19
	Noise Criteria	-	-	-	20	24	28	35	40
14 x 8 18 x 6 Ak .63	CFM	189	252	315	378	441	504	630	756
	Horizontal Throw	15-8	17-12	19-13	21-14	23-16	24-17	27-19	30-20
	Noise Criteria	-	-	-	20	25	29	36	41
20 x 6 Ak .66	CFM	198	264	330	396	462	528	660	792
	Horizontal Throw	15-9	18-12	20-13	22-15	24-16	25-17	28-19	31-21
	Noise Criteria	-	-	-	21	25	29	36	41
16 x 8 Ak .71	CFM	213	284	355	426	497	568	710	852
	Horizontal Throw	16-9	18-13	20-14	23-15	24-17	26-18	30-20	35-22
	Noise Criteria	-	-	-	21	26	30	36	42
24 x 6 18 x 8 Ak .88	CFM	264	352	440	528	616	704	880	1056
	Horizontal Throw	18-10	20-14	23-16	25-17	27-18	29-20	32-22	36-24
	Noise Criteria	-	-	-	22	26	30	37	43
20 x 8 16 x 10 Ak .98	CFM	294	392	490	588	686	784	980	1176
	Horizontal Throw	19-10	21-15	24-17	26-18	28-19	30-21	34-23	38-25
	Noise Criteria	-	-	-	23	27	31	38	44
18 x 10 Ak 1.11	CFM	333	444	555	666	777	888	1110	1332
	Horizontal Throw	20-11	23-16	25-18	28-19	30-21	32-22	36-25	40-27
	Noise Criteria	-	-	-	23	27	31	38	44
36 x 6 18 x 12 Ak 1.35	CFM	405	540	675	810	945	1080	1350	1620
	Horizontal Throw	22-12	25-17	28-19	31-21	34-23	36-24	40-27	44-30
	Noise Criteria	-	-	-	24	28	32	39	44
24 x 10 20 x 12 Ak 1.49	CFM	447	596	745	894	1043	1192	1490	1788
	Horizontal Throw	23-13	26-18	30-20	32-22	35-24	37-26	42-29	46-31
	Noise Criteria	-	-	-	24	29	33	39	45
24 x 12 Ak 1.82	CFM	546	728	910	1092	1274	1456	1820	2184
	Horizontal Throw	25-14	30-20	33-22	36-25	39-27	42-28	47-32	51-35
	Noise Criteria	-	-	-	25	30	34	40	46
36 x 10 30 x 12 Ak 2.29	CFM	687	916	1145	1374	1603	1832	2290	2748
	Horizontal Throw	29-16	33-22	37-25	41-28	44-30	47-32	53-36	61-42
	Noise Criteria	-	-	-	20	26	30	34	41
36 x 12 Ak 2.75	CFM	825	1100	1375	1650	1925	2200	2750	3300
	Horizontal Throw	31-18	36-25	41-28	44-30	48-33	51-35	57-39	63-43
	Noise Criteria	-	-	-	21	27	31	35	42

Terminal Velocity of 75 and 150 FPM, respectively

Notes:

- Total Pressure in inches water column.
- Throw data are in feet at terminal velocities of 75 and 150 FPM, respectively.
- Noise Criteria based on a 10 dB room attenuation (Re: 10¹² watts).

4230 Perforated Return

Neck Velocity		200	300	400	500	600	700	800
6" Diameter	CFM	40	60	80	100	120	135	155
	-Ps	.003	.007	.012	.019	.027	.034	.044
8" Diameter	CFM	70	105	140	175	210	245	380
	-Ps	.004	.010	.017	.026	.037	.051	.068
10" Diameter	CFM	110	165	220	275	325	380	435
	-Ps	.005	.011	.020	.030	.043	.058	.076
12" Diameter	CFM	155	235	315	395	470	550	630
	-Ps	.005	.012	.021	.033	.046	.063	.083
14" Diameter	CFM	215	320	430	535	640	750	855
	-Ps	.006	.013	.023	.035	.050	.069	.090
16" Diameter	CFM	280	420	560	700	840	975	1115
	-Ps	.008	.018	.031	.048	.070	.094	.120
18" Diameter	CFM	355	530	705	885	1060	1235	1415
	-Ps	.008	.018	.031	.049	.070	.092	.125
24" x 24"	CFM	735	1100	1470	1835	2200	2570	2935
	-Ps	.008	.018	.032	.050	.070	.095	.130

4214 Louvered-Face Supply Diffuser

6" Diameter Inlet Ak .307	CFM	100	150	200	250	300	350	400
	Total Pressure	.032	.072	.129	.201	.289	.394	.514
	NC	<20	21	25	29	31	35	38
	Throw	4-5-9	5-8-12	7-9-13	9-11-15	9-12-16	10-12-18	11-13-19
8" Diameter Inlet Ak .548	CFM	250	300	350	400	500	600	700
	Total Pressure	.051	.073	.099	.129	.202	.291	.396
	NC	23	26	28	30	33	36	39
	Throw	7-10-15	8-12-16	9-12-18	11-13-19	12-15-21	13-16-23	14-18-25
10" Diameter Inlet Ak .856	CFM	300	400	500	600	700	800	900
	Total Pressure	.026	.047	.073	.106	.144	.188	.238
	NC	21	25	29	32	34	36	38
	Throw	7-10-16	9-13-19	11-15-21	13-16-23	14-18-25	15-19-27	16-20-28
12" Diameter Inlet Ak 1.232	CFM	300	400	500	600	800	1000	1200
	Total Pressure	.012	.021	.032	.046	.082	.128	.185
	NC	<20	22	25	28	32	36	39
	Throw	5-8-16	7-11-19	9-14-21	11-16-23	14-19-27	17-21-30	19-23-33
14" Diameter Inlet Ak 1.678	CFM	400	600	800	900	1000	1200	1400
	Total Pressure	.010	.023	.042	.053	.065	.093	.127
	NC	<20	25	29	31	33	36	38
	Throw	5-9-19	9-14-23	12-19-27	14-20-28	15-21-30	19-23-33	20-25-35

4235 Perforated Supply

Neck Velocity		300	400	500	600	700	800	900	1000	1100
6" Diameter An .200	CFM	60	80	100	120	140	160	180	200	220
	Ps	.008	.011	.017	.024	.032	.042	.054	.066	.080
	NC	<20	<20	<20	<20	24	27	32	36	38
	Throw	1.0	2.0	3.0	3.0	4.0	4.0	5.0	5.0	6.0
8" Diameter An .350	CFM	105	140	175	210	245	280	310	350	385
	Ps	.008	.011	.017	.024	.034	.043	.054	.068	.083
	NC	<20	<20	<20	20	24	27	30	34	38
	Throw	2.0	3.0	4.0	4.0	5.0	6.0	7.0	8.0	8.5
10" Diameter An .540	CFM	165	220	270	325	385	430	490	550	600
	Ps	.008	.012	.017	.024	.032	.043	.056	.068	.082
	NC	<20	<20	20	24	29	33	36	39	42
	Throw	2.0	3.0	4.0	5.0	5.0	6.0	7.0	8.0	9.0
12" Diameter An .780	CFM	230	310	390	470	550	610	700	780	870
	Ps	.009	.016	.026	.037	.050	.065	.080	.100	.125
	NC	<20	<20	20	23	26	31	34	37	40
	Throw	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0
14" Diameter An 1.070	CFM	315	430	535	640	750	855	960	1090	1200
	Ps	.009	.016	.026	.037	.050	.065	.083	.125	.150
	NC	<20	20	25	30	35	39	43	45	48
	Throw	3.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0

Note: 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 An = Neck Area in Sq. Ft.

AL4240 Ceiling Supply

Neck Velocity		180	220	300	350	400	450	500	580	650	700
6" Diameter Ak .430	CFM	35	45	60	70	80	90	100	115	130	140
	Ps	.002	.003	.004	.006	.008	.010	.012	.015	.020	.022
	NC	<20	<20	<20	<20	<20	<20	20	22	26	30
	Throw	3.0	3.5	4.5	5.5	6.5	7.5	8.0	9.0	11.0	11.0
8" Diameter Ak .530	CFM	65	75	105	120	140	155	175	200	225	245
	Ps	.002	.003	.006	.008	.010	.013	.016	.021	.027	.032
	NC	<20	<20	<20	<20	<20	22	25	25	35	38
	Throw	4.0	5.0	6.0	7.0	8.5	9.5	11.0	11.0	13.0	15.0
10" Diameter Ak .620	CFM	100	120	165	190	220	245	275	315	355	380
	Ps	.003	.005	.009	.011	.015	.019	.024	.031	.040	.045
	NC	<20	<20	<20	<20	20	23	27	33	35	39
	Throw	4.0	5.5	7.0	8.0	9.5	11.0	12.0	13.0	15.0	16.0
12" Diameter Ak .700	CFM	140	175	235	275	315	355	395	455	510	550
	Ps	.005	.007	.013	.018	.023	.029	.036	.048	.061	.071
	NC	<20	<20	<20	<20	21	24	27	33	36	40
	Throw	4.5	5.5	7.0	8.0	10.0	11.0	12.0	14.0	15.0	17.0
14" Diameter Ak .750	CFM	190	235	320	375	430	480	535	620	695	750
	Ps	.007	.011	.020	.027	.036	.044	.055	.074	.094	.107
	NC	<20	<20	<20	<20	20	24	28	32	35	40
	Throw	4.5	5.5	7.0	8.5	10.0	11.0	12.0	14.0	16.0	17.0

Termination Velocity of 75 FPM

Note: The use of a balancing hood is recommended to balance the system.
Ak = Effective Area in square feet.
Ps = Static Pressure Loss in inches of water
NC = Noise Criteria, based on a 10dB room attenuation (Re: 10⁻¹² watts) ASHRAE 36-72.

4205FF
Eggcrate Return Filter Grille

6" Diameter Inlet Ak .840	CFM	100	150	200	225	250	275	300
	NC	<20	<20	<20	22	25	28	32
	Static Pressure	-.040	-.091	-.162	-.205	-.253	-.306	-.364
8" Diameter Inlet Ak .930	CFM	150	200	250	300	400	500	600
	NC	<20	<20	<20	<20	24	30	36
	Static Pressure	-.029	-.051	-.080	-.115	-.205	-.320	-.460
10" Diameter Inlet Ak 1.035	CFM	400	500	600	700	800	900	1000
	NC	<20	<20	23	27	31	35	39
	Static Pressure	-.084	-.131	-.189	-.257	-.335	-.424	-.524
12" Diameter Inlet Ak 1.175	CFM	500	600	700	800	1000	1200	1400
	NC	<20	<20	<20	22	27	32	38
	Static Pressure	-.063	-.091	-.124	-.162	-.253	-.364	-.495
14" Diameter Inlet Ak 1.330	CFM	800	900	1000	1200	1400	1600	1800
	NC	<20	<20	20	24	27	31	35
	Static Pressure	-.087	-.110	-.136	-.196	-.267	-.349	-.442
16" Diameter Inlet Ak 1.520	CFM	800	1000	1200	1400	1800	2200	2600
	NC	<20	<20	<20	21	27	33	39
	Static Pressure	-.051	-.080	-.115	-.157	-.259	-.387	-.540

4260FF
Stamped-Face Return Filter Grille

6" Diameter Inlet Ak .730	CFM	100	150	200	225	250	275	300
	NC	<20	<20	21	24	27	30	32
	Static Pressure	-.057	-.127	-.226	-.287	-.354	-.428	-.509
8" Diameter Inlet Ak .795	CFM	150	200	250	300	400	500	550
	NC	<20	<20	<20	<20	25	31	36
	Static Pressure	-.040	-.072	-.112	-.161	-.287	-.448	-.542
10" Diameter Inlet Ak .880	CFM	300	400	500	600	700	800	850
	NC	<20	<20	<20	24	28	33	35
	Static Pressure	-.066	-.117	-.183	-.264	-.359	-.469	-.530
12" Diameter Inlet Ak .980	CFM	400	500	600	700	800	1000	1200
	NC	<20	<20	<20	<20	22	28	34
	Static Pressure	-.057	-.088	-.127	-.173	-.226	-.354	-.509
14" Diameter Inlet Ak 1.105	CFM	600	700	800	1000	1200	1400	1600
	NC	<20	<20	<20	20	24	28	34
	Static Pressure	-.069	-.094	-.122	-.191	-.275	-.374	-.489
16" Diameter Inlet Ak 1.240	CFM	800	1000	1200	1600	1800	2000	2200
	NC	<20	<20	<20	25	28	31	36
	Static Pressure	-.072	-.117	-.161	-.287	-.363	-.448	-.542

4212FF
Perforated Return Filter Grille

6" Diameter Inlet Ak .885	CFM	100	125	150	175	200	225	250
	NC	<20	<20	<20	<20	<20	21	23
	Static Pressure	-.081	-.126	-.182	-.248	-.323	-.409	-.505
8" Diameter Inlet Ak .935	CFM	150	200	250	300	350	400	450
	NC	<20	<20	<20	<20	21	24	27
	Static Pressure	-.058	-.102	-.160	-.230	-.313	-.409	-.518
10" Diameter Inlet Ak .990	CFM	200	250	300	400	500	600	700
	NC	<20	<20	<20	<20	<20	23	27
	Static Pressure	-.042	-.065	-.094	-.168	-.262	-.377	-.513
12" Diameter Inlet Ak 1.065	CFM	400	500	600	700	800	900	1000
	NC	<20	<20	<20	<20	21	24	26
	Static Pressure	-.081	-.126	-.182	-.248	-.323	-.409	-.505
14" Diameter Inlet Ak 1.150	CFM	400	500	600	800	1000	1200	1400
	NC	<20	<20	<20	<20	<20	24	27
	Static Pressure	-.044	-.068	-.098	-.175	-.273	-.393	-.535
16" Diameter Inlet Ak 1.250	CFM	650	800	950	1100	1250	1550	1850
	NC	<20	<20	<20	<20	<20	23	27
	Static Pressure	-.068	-.102	-.144	-.193	-.250	-.384	-.547

4290FF
Bar-Type Return Filter Grille

6" Diameter Inlet Ak .880	CFM	100	125	150	175	200	250	275
	NC	<20	<20	<20	<20	<20	23	27
	Static Pressure	-.073	-.114	-.164	-.223	-.291	-.455	-.550
8" Diameter Inlet Ak .935	CFM	200	250	300	350	400	450	500
	NC	<20	<20	<20	<20	22	25	30
	Static Pressure	-.092	-.144	-.207	-.282	-.368	-.466	-.576
10" Diameter Inlet Ak 1.000	CFM	400	450	500	550	600	650	700
	NC	<20	<20	<20	<20	20	23	25
	Static Pressure	-.151	-.191	-.236	-.285	-.340	-.398	-.462
12" Diameter Inlet Ak 1.085	CFM	500	600	700	800	900	1000	1100
	NC	<20	<20	<20	<20	22	25	29
	Static Pressure	-.114	-.164	-.223	-.291	-.368	-.455	-.550
14" Diameter Inlet Ak 1.185	CFM	600	800	1000	1200	1300	1400	1500
	NC	<20	<20	<20	21	23	26	29
	Static Pressure	-.088	-.157	-.245	-.354	-.415	-.481	-.562

Notes:

1. All performance was determined from testing in accordance with ASHRAE Standard 70-1991 in an ADC-certified testing laboratory.
2. Total and static pressures are given in inch w.c.
3. NC values are given for a typical office (12 feet wide x 12 feet long x 9 feet high) as determined from the octave band sound power levels in accordance with ARI Standard 885.
4. Throw distances (measured in feet) are listed for isothermal conditions with terminal velocities of 150 FPM, 100 FPM and 50 FPM, respectively.
5. Area factor (Ak) determined with an Alnor 2220 probe.
6. Data based on units without opposed-blade dampers.
7. Return filter grille tests performed with standard 1-inch fiberglass filter (by others) in place.

Recommended Noise Criteria and Face Velocity Ranges are on page 96.

Series AL2000

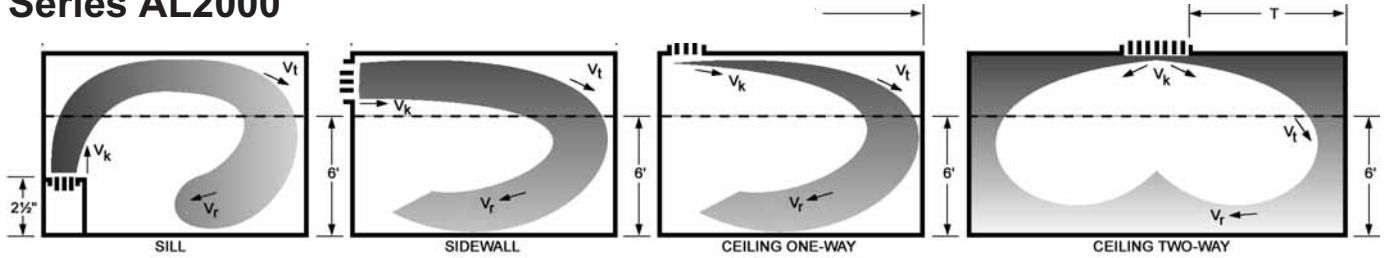


Table 1 - Supply Air
Type 50 1/2" Slot

CFM per Foot	Number of Slots	Min. P _s in H ₂ O	Outlet Velocity (V _k) FPM	Throw (T) in Feet			Minimum Ceiling Height in Feet		NC		
				Ceiling	Sidewall	Sill	@ -18F Δ T	@ -25F Δ T			
				Min.-Max.	Min.-Max.	Min.-Max.					
10	1	.02	500	5-7	3-5	1-2	7½	9	<20		
	2	<.01	335	4-6	2-4	1-2			<20		
20	1	.08	1000	10-13	8-11	1-3	8	9	20		
	2	.02	670	8-11	6-9	2-3			<20		
	3	.01	400	6-9	4-7	1-2			<20		
30	1	.08	1500	11-16	10-14	4-6	9	10	25		
	2	.05	1000	10-14	8-12	3-4			20		
	3	.02	600	8-11	6-9	2-3			<20		
	4	.01	430	7-9	5-7	1-2			<20		
40	2	.08	1330	13-17	11-15	4-6	9	11	25		
	3	.04	800	10-14	8-12	3-5			20		
	4	.02	570	9-12	7-10	2-3			20		
	5	.01	445	8-11	6-9	2-3			<20		
	3	.06	1000	11-15	9-13	4-6			9½	11	25
4	.03	710	10-14	8-12	3-4	20					
5	.02	560	9-13	7-11	2-4	20					
6	.01	500	8-12	7-10	1-3	<20					
60	3	.08	1200	13-17	11-15	5-8	9½	12	25		
	4	.05	855	12-16	10-14	4-7			25		
	5	.03	670	11-15	9-13	3-6			20		
	6	.02	600	10-14	8-12	3-5			<20		
	7	.01	500	9-13	7-11	2-4			<20		
	3	.12	1400	15-20	13-18	6-11			10	12	25
	4	.06	1000	13-18	11-16	5-9					25
5	.04	780	12-16	10-14	4-7	20					
6	.03	700	11-15	9-13	3-6	20					
80	7	.02	580	10-15	8-13	2-5	10½	12½	20		
	4	.08	1140	14-20	12-18	6-11			25		
	5	.05	890	13-19	11-17	5-10			25		
	6	.04	800	13-18	11-16	5-9			25		
	7	.03	670	13-17	11-15	4-8			20		
	8	.02	570	12-16	10-14	3-7			20		
	4	.10	1280	17-24	15-21	8-14			11	13	30
	5	.07	1000	16-22	14-20	7-13					25
6	.05	900	16-21	14-19	7-12	25					
7	.04	750	15-20	13-18	6-11	25					
8	.03	640	14-18	12-16	5-9	20					
100	9	.02	600	13-17	11-15	5-8	11	13	20		
	5	.09	1120	18-25	16-22	9-15			25		
	6	.06	1000	17-24	15-21	8-14			25		
	7	.05	830	16-23	14-20	7-13			25		
	8	.03	710	14-20	12-18	6-11			20		
	9	.03	670	13-19	11-17	5-10			20		
	10	.02	590	12-18	10-16	5-10			<20		
	6	.09	1200	19-27	17-24	10-16			11½	13	30
	7	.07	1000	18-25	16-23	8-15					25
	8	.05	860	17-25	15-22	7-14					25
9	.04	800	16-24	14-21	6-13	20					
10	.03	705	15-22	13-19	5-11	20					
140	7	.10	1170	20-30	18-27	10-19	11½	14	25		
	8	.06	1000	19-28	17-25	9-17			25		
	9	.05	930	18-27	16-24	8-16			20		
	10	.04	825	17-25	15-22	7-14			20		
160	8	.08	1140	21-32	19-29	10-20	12	15	25		
	9	.07	1070	20-30	18-27	9-18			25		
	10	.05	940	19-28	17-25	8-17			20		
180	8	.10	1280	24-35	21-31	12-22	12	15	30		
	9	.08	1200	23-34	20-30	11-21			25		
	10	.07	1060	22-32	19-29	10-20			25		
200	9	.10	1335	25-39	22-35	-	12	15	30		
	10	.08	1175	24-37	21-33	-			25		

Outlet Velocity (V _k) FPM										
500	600	700	800	900	1000	1200	1400	1600	1800	2000
Total Pressure (P _t) inches H ₂ O										
.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25

Symbols:

- V_t Terminal Velocity in FPM
- V_r Room Velocity in FPM
- V_k Face Velocity in FPM
- A_k Outlet Area in Square Feet
- A_n Neck Area in Square Feet
- P_s Static Pressure in H₂O
- NC 18dB Room Attenuation
- T Throw in Feet; see Note 6, page 136
- ΔT Temperature Differential

Series AL2000

Table 1 - Supply Air
Type 75 ¾" Slot

CFM per Foot	Number of Slots	Min. P _s in H ₂ O	Outlet Velocity (V _s) FPM	Throw (T) in Feet			Minimum Ceiling Height in Feet		NC			
				Ceiling	Sidewall	Sill	@ -18F Δ T	@ -25F Δ T				
				Min.-Max.	Min.-Max.	Min.-Max.						
10	1	.01	335	4-6	2-4	1-2	7½	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	9½	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	9½	12	30
3	.04	860	12-16	10-14	4-7	25						
	.02	665	11-15	9-13	3-6	20						
	.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	10½	12½	30
4	.04	885	13-19	11-17	5-10	25						
	.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	11½	13	30
	5	.06	1000	18-26	16-23	8-15			25			
.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	11½	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			
	9	.02	665	15-21	13-19	5-11			<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			
	9	.03	760	17-26	15-23	6-14			<20			
	10	.02	695	16-25	14-22	5-13			<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	.05	950	20-31	18-28	9-19			25			
	9	.04	860	19-30	17-27	8-18			20			
	10	.03	780	18-29	16-26	7-17			<20			
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			
	9	.05	955	22-33	20-30	-			25			
	10	.04	870	21-31	19-28	-			20			
250	8	.10	1315	26-46	23-41	-	13	15	35			
	9	.07	1190	25-42	22-38	-			30			
	10	.06	1085	24-39	21-35	-			25			

Series AL2000

Table 1 - Supply Air

Type 10 1" Slot

CFM per Foot	Number of Slots	Min. P _s in H ₂ O	Outlet Velocity (V _o) FPM	Throw (T) in Feet			Minimum Ceiling Height in Feet		NC		
				Ceiling	Sidewall	Sill	@ -18F Δ T	@ -25F Δ T			
				Min.-Max.	Min.-Max.	Min.-Max.					
20	1	.02	500	6-8	4-7	1-2	8	9	20		
30	1	.03	750	9-13	7-10	2-3	9	10	20		
	2	.02	500	7-9	5-7	1-2			20		
40	1	.06	1000	10-14	9-14	4-6	9	11	25		
	2	.03	670	8-10	6-9	2-3			20		
50	1	.09	1250	12-15	10-14	3-5	9½	11	30		
	2	.04	835	10-14	8-12	3-4			20		
	3	.02	555	9-11	7-10	2-3			20		
60	2	.06	1000	18-15	9-13	4-6	9½	12	30		
	3	.03	665	10-13	7-11	2-4			20		
	4	.02	500	8-11	6-9	2-3			20		
	2	.09	1165	13-17	11-15	5-8			30		
70	3	.04	780	11-16	9-14	4-6	10	12	25		
	4	.02	585	10-14	7-11	3-4			20		
	2	.11	1335	15-19	14-17	6-10			10½	12½	35
	3	.05	890	12-17	10-14	4-7					25
4	.03	665	10-14	8-12	3-5	20					
5	.02	533	9-13	7-11	2-4	20					
90	3	.06	1000	14-19	11-17	5-10	11	13	30		
	4	.04	750	13-18	11-15	4-8			20		
	5	.02	600	12-16	10-14	3-7			20		
	6	.02	500	11-15	9-13	3-6			20		
100	3	.08	1110	16-21	14-20	7-12	11	13	30		
	4	.04	835	15-20	13-28	6-11			25		
	5	.03	665	14-18	12-16	5-9			20		
	6	.02	555	13-17	11-15	4-8			20		
120	3	.11	1335	18-25	16-22	8-13	11½	13	35		
	4	.06	1000	17-24	15-20	7-13			30		
	5	.04	800	16-23	14-21	6-12			25		
	6	.03	665	15-21	13-19	5-11			20		
	7	.02	570	14-20	12-17	4-10			20		
140	4	.09	1165	18-25	16-21	8-15	11½	14	30		
	5	.05	935	18-26	16-22	8-14			30		
	6	.04	780	17-25	15-22	7-14			25		
	7	.03	665	16-23	14-20	6-12			20		
	8	.02	585	15-20	13-20	5-10			20		
160	4	.11	1335	19-27	17-24	10-16	12	15	35		
	5	.07	1065	18-26	16-23	8-15			30		
	6	.05	890	17-25	15-22	7-14			25		
	7	.04	760	16-23	14-20	6-12			25		
	8	.03	665	15-20	13-18	5-10			20		
	9	.02	590	14-19	12-17	4-9			20		
180	5	.09	1200	20-30	18-27	10-19	12	15	35		
	6	.06	1000	19-28	17-25	9-17			30		
	7	.05	850	18-26	16-23	8-15			25		
	8	.04	750	16-24	14-21	6-13			20		
	9	.03	665	15-21	13-19	5-11			20		
	10	.02	600	14-19	12-18	4-10			20		
200	5	.11	1335	23-33	20-30	12-21	12	15	35		
	6	.08	1110	21-32	19-29	10-20			30		
	7	.06	950	20-31	18-27	9-18			30		
	8	.04	835	18-27	16-24	8-16			25		
	9	.03	740	17-26	15-23	6-14			20		
	10	.03	665	16-25	14-22	5-10			20		
250	6	.12	1390	24-35	21-31	-	13	15	35		
	7	.09	1190	23-34	20-30	-			35		
	8	.07	1040	21-32	19-28	-			30		
	9	.05	925	20-31	18-27	-			25		
	10	.04	833	19-30	17-26	-			25		
300	7	.13	1430	25-40	23-35	-	13	16	35		
	8	.10	1250	24-36	22-32	-			35		
	9	.08	1110	23-34	20-30	-			30		
	10	.06	1000	22-32	19-28	-			30		
350	8	.13	1460	27-47	24-43	-	14	16	40		
	9	.11	1300	26-45	23-41	-			35		
	10	.09	1165	25-42	22-39	-			30		

Series AL2000

Notes:

- Table 1 based on 4-foot diffuser length. For longer lengths, correct throw and NC per Table 2.
- For 2-way ceiling throw, proportion CFM and number of slots in each direction of T, and select from 1-way data, Table 1.
- 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.
- P_S constant for horizontal 1-way, 2-way and vertical pattern adjustment.
- Supply air temperature effect on horizontal throw is shown in Table 3. Vertical throw at varying supply air temperatures is shown in Table 4.
- 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_r) of 50 FPM and 35 FPM.

Table 2 - Continuous Diffuser Length Factors

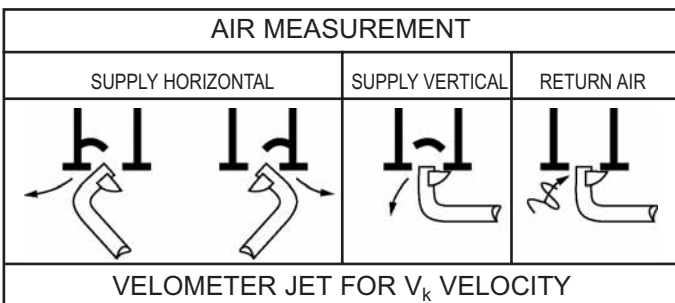
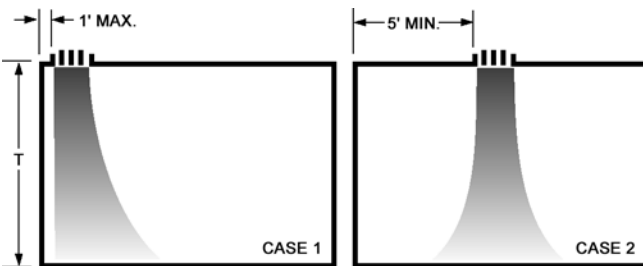
Modify Table 1 by listed values for diffuser lengths above 4 feet.				
Diffuser Length in Feet	Throw (T)			NC
	Ceiling Min.-Max.	Sidewall Min.-Max.	Sill Min.-Max.	
4-6	No change			+ 0
7-20	T x 1.10			+ 5
21-100	T x 1.15			+ 10

Table 3 - Supply Air Temperature Factors

Multiply Throw in Table 1 (or factor in Table 2 if used) by listed value.			
Ceiling	@-20F Δ T	@ 0F Δ T	@+25F Δ T
Sidewall			
Sill	T x 1.00	T x 1.10	T x 1.20

Table 4 - Vertical Down-Throw and Supply Air Temperature Factors

Multiply Throw-Sidewall in Table 1 (or factor in Table 2 if used) by listed value.			
Case	@-20F Δ T Cooling	@ 0F Δ T Ventilating	@+25F Δ T Heating
Case 1	T x 1.00	T x .90	T x .60
Case 2	T x .70	T x .60	T x .40



Type 50 Supply Diffuser Areas per Foot of Length

	No. of Slots									
	1	2	3	4	5	6	7	8	9	10
A _k Area	.02	.03	.05	.07	.09	.10	.12	.14	.15	.17
A _n Area	.08	.17	.25	.33	.42	.50	.58	.67	.75	.84

Type 75 Supply Diffuser Areas per Foot of Length

	No. of Slots									
	1	2	3	4	5	6	7	8	9	10
A _k Area	.03	.05	.07	.09	.12	.14	.16	.19	.21	.23
A _n Area	.12	.24	.36	.48	.60	.72	.84	.96	1.10	1.20

Type 10 Supply Diffuser Areas per Foot of Length

	No. of Slots									
	1	2	3	4	5	6	7	8	9	10
A _k Area	.04	.06	.09	.12	.15	.18	.21	.24	.27	.30
A _n Area	.17	.33	.50	.67	.83	1.00	1.17	1.33	1.50	1.67

A_k constant for horizontal 1-way, 2-way, and vertical pattern.
CFM = A_k x length in feet x V_k

Type 50 Return Air CFM per Foot of Length*

No. of Slots	A _k	NC 20-25 Application Nonducted		NC 30 Application Ducted		NC 35-40 Application Ducted	
		-.02" P _s CFM	-.03" P _s CFM	-.08" P _s CFM	-.10" P _s CFM	-.15" P _s CFM	-.20" P _s CFM
1	.03	15	20	30	35	40	45
2	.06	35	45	70	80	95	110
3	.08	55	70	110	125	150	175
4	.11	70	85	140	155	190	220
5	.14	90	110	180	200	245	285
6	.16	110	135	220	245	300	345
7	.20	130	160	260	290	355	410
8	.22	140	170	280	310	385	440
9	.25	165	200	330	370	450	520
10	.28	185	225	370	415	505	585

Type 75 Return Air CFM per Foot of Length*

No. of Slots	A _k	NC 20-25 Application Nonducted		NC 30 Application Ducted		NC 35-40 Application Ducted	
		-.02" P _s CFM	-.03" P _s CFM	-.08" P _s CFM	-.10" P _s CFM	-.15" P _s CFM	-.20" P _s 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
9	.36	235	290	470	525	640	740
10	.40	260	320	520	580	710	820

Type 10 Return Air CFM per Foot of Length*

No. of Slots	A _k	NC 20-25 Application Nonducted		NC 30 Application Ducted		NC 35-40 Application Ducted	
		-.02" P _s CFM	-.03" P _s CFM	-.08" P _s CFM	-.10" P _s CFM	-.15" P _s CFM	-.20" P _s CFM
1	.06	35	43	70	80	95	110
2	.11	70	85	140	155	190	220
3	.17	105	130	210	235	285	330
4	.23	140	170	280	310	380	440
5	.28	175	215	350	390	475	550
6	.33	210	255	420	465	570	660
7	.39	245	300	490	545	665	770
8	.44	280	340	560	620	760	880
9	.50	315	385	630	700	855	990
10	.55	350	425	700	775	950	1100

* Capacity based on diffuser without pattern controller. When pattern controller is used, CFM capacities are reduced by 65% at listed P_s, NC, and A_k.

Series AL2500

Table 1 - Supply Air

CFM per Foot	Listed Width in Inches	Min. P _s in H ₂ O		Face Velocity (V _k) FPM		Throw (T) in Feet		Minimum Ceiling Height in Feet		NC
		Bar Style		Bar Style		Sidewall	Sill/Floor			
		00 and 15	30 and 01	00 and 15	30 and 01	Min.-Max.	Min.-Max.	@ -18F Δ T	@ -25F Δ T	
20	1½	.01	.01	500	575	6-9	1-2	8	9	<20
30	1½	.03	.04	750	865	7-10	2-3	9	10	25
	2	.01	.01	475	545	6-9	1-2			20
40	1½	.05	.07	1000	1150	9-13	3-5	9	11	30
	2	.02	.03	635	730	8-11	2-4			25
	2½	.01	.01	460	530	7-10	2-3			20
50	1½	.03	.12	1250	1440	11-16	4-9	9½	11	30
	2	.03	.04	790	910	10-14	3-7			25
	2½	.02	.03	575	660	9-13	2-6			20
	3	<.01	.01	440	505	8-12	2-5			<20
60	2	.05	.07	950	1090	12-18	5-11	9½	12	30
	2½	.02	.03	690	795	11-16	4-9			25
	3	.01	.01	530	610	10-14	3-7			20
	4	<.01	.01	370	425	8-12	2-5			<20
70	2	.06	.08	1110	1275	14-20	7-13	10	12	30
	2½	.03	.04	810	935	13-19	6-12			30
	3	.02	.03	660	760	11-16	4-9			25
	4	<.01	.01	435	500	10-14	3-7			<20
80	2	.08	.10	1275	1450	16-23	9-16	10½	12½	30
	2½	.04	.05	920	1060	15-21	8-14			30
	3	.03	.04	700	805	13-18	6-11			25
	4	.01	.01	495	570	11-16	4-9			20
90	2½	.05	.07	1030	1185	17-24	10-17	11	13	30
	3	.04	.05	785	905	15-21	8-14			30
	4	.01	.02	550	635	13-18	6-11			25
	5	<.01	.01	450	520	11-16	4-9			20
100	2½	.06	.08	1150	1325	19-27	12-20	11	13	30
	3	.04	.05	875	1010	16-23	9-16			30
	4	.02	.03	620	715	14-20	7-13			25
	5	.01	.01	500	575	12-18	5-11			20
120	3	.06	.08	1050	1210	19-28	11-20	11½	13	30
	4	.03	.04	745	855	17-24	9-16			30
	5	.02	.03	600	680	15-22	7-14			25
	6	<.01	.01	480	550	13-19	5-11			20
140	3	.08	.11	1220	1410	22-32	14-24	11½	14	35
	4	.04	.05	870	1000	19-28	11-20			30
	5	.02	.03	700	810	17-25	9-17			25
	6	.01	.01	560	645	15-22	7-14			20
160	4	.05	.07	990	1140	22-32	13-23	12	15	35
	5	.03	.04	800	925	19-29	10-20			30
	6	.02	.03	640	735	18-26	9-17			25
	8	.01	.01	460	530	15-22	6-13			20
180	4	.07	.09	1110	1275	25-36	16-27	12	15	35
	5	.04	.05	900	1035	22-33	13-24			30
	6	.03	.04	725	835	20-30	11-21			25
	8	.02	.03	520	600	17-25	8-16			20
200	4	.08	.11	1240	1425	28-41	-	12	15	40
	5	.05	.07	1000	1150	24-36	-			35
	6	.04	.05	800	925	23-33	-			30
	8	.02	.03	575	665	20-28	-			25
250	5	.08	.11	1250	1440	30-46	-	13	15	40
	6	.05	.07	1000	1150	27-39	-			35
	8	.03	.04	720	830	25-35	-			30
	10	.01	.01	550	625	21-32	-			25
300	6	.07	.09	1200	1375	33-48	-	13	15	40
	8	.04	.05	865	1000	29-42	-			35
	10	.02	.03	665	765	25-39	-			30
	12	.01	.01	545	630	23-33	-			25
350	8	.05	.08	1020	1175	34-48	-	13	15	40
	10	.03	.04	780	900	29-45	-			35
	12	.02	.03	640	735	26-38	-			30
400	8	.08	.11	1170	1350	40-55	-	14	16	45
	10	.04	.05	890	1025	33-50	-			40
	12	.03	.04	730	845	33-44	-			35

Symbols:

- V_t Terminal Velocity in FPM
- V_r Room Velocity in FPM
- V_k Face Velocity in FPM
- A_k Outlet Area in Square Feet
- A_n Neck Area in Square Feet
- P_s Static Pressure in H₂O
- NC 18dB Room Attenuation
- T Throw in Feet; see Note 6.
- ΔT Temperature Differential

Notes:

1. Table 1 based on 4-foot grille length. For longer lengths, correct throw and NC per **Table 2**.
2. When using continuous grille lengths with alternate active and inactive sections, a reduction in throw can be obtained by omitting the factors contained in **Table 2**.
3. Bar style 30 and 0
Increase **Table 1** NC + 5 NC
4. Supply air temperature effect on horizontal throw is shown in **Table 3**.
Vertical down-throw at varying supply temperatures is shown in **Table 4**.
5. When spreading the air path with a horizontal deflection of 22° per side in grille lengths up to 4 feet:
Multiply **Table 1** Throw x .75
Increase **Table 1** NC + 5 NC
Multiply **Table 1** P_s x 1.20
Multiply **Table 5** A_k x .90
6. Terminal velocities (V_t) at the minimum and maximum throw (T) values are rated at 125 FPM and 75 FPM, respectively, with corresponding room velocities (V_r) of 50 FPM and 35 FPM.

Series AL2500

Table 2 - Continuous Grille Length Factors

Modify Table 1 by listed values for grille lengths above 4 feet.			
Grille Length in Feet	Throw (T)		NC
	Sidewall Min.-Max.	Sill/Floor 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

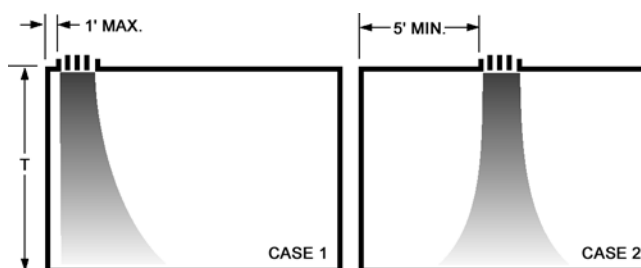
Multiply Throw in Table 1 (or factor in Table 2 if used) by listed value.			
Sidewall Sill/Floor	@-20F Δ T	@ 0F Δ T	@+25F Δ T
		T x 1.00	T x 1.10

Table 4 - Vertical Down-Throw and Supply Air Temperature Factors

Multiply Throw-Sidewall in Table 1 (or factor in Table 2 if used) by listed value.			
Case	@-20F Δ T Cooling	@ 0F Δ T Ventilating	@+25F Δ T Heating
Case 1	T x 1.00	T x .90	T x .60
Case 2	T x .70	T x .60	T x .40

Table 5 - Supply Grille Areas (per foot of length)




		Listed Width in Inches																
		1½	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	30	36
A_n		.13	.17	.21	.25	.33	.42	.50	.67	.84	1.00	1.20	1.30	1.50	1.70	2.00	2.50	3.00
		00 and 15 Bar Styles																
A_k		.04	.06	.09	.11	.16	.20	.25	.35	.45	.55	.68	.79	.90	1.00	1.30	1.60	2.10
		30 and 01 Bar Styles																
A_k		.03	.05	.08	.09	.14	.17	.21	.30	.38	.47	.58	.67	.77	.85	1.10	1.40	1.80



AL2810 Supply with OBD

Table 1a




Face Velocity (FPM)	300	400	500	600	700	800	900	1000	
Static Pressure Loss (inches W.G.)	.02	.03	.05	.07	.09				
Size	Effective Area (square feet)	Air Capacities (CFM)							
8 x 4	0.26	80	105	130	155	180	210	235	260
8 x 6	0.34	100	135	170	205	240	270	305	340
10 x 6	0.42	125	170	210	250	295	335	380	420
16 x 4	0.50	150	200	250	300	350	400	450	500
12 x 6	0.76	230	305	380	455	530	610	685	760
18 x 6	0.89	265	355	445	535	625	710	800	890
12 x 12	1.10	330	440	550	660	770	880	990	1100
24 x 8	1.50	450	600	750	900	1050	1200	1350	1500
36 x 6	1.80	540	720	900	1080	1260	1440	1620	1800
48 x 6	2.40	720	960	1200	1440	1680	1920	2160	2400
34 x 12	2.70	810	1080	1350	1620	1890	2160	2430	2700
40 x 10	4.10	1230	1640	2050	2460	2870	3280	3690	4100
48 x 20	5.20	1560	2080	2600	3120	3640	4160	4680	5200
48 x 30	7.40	2200	2960	3700	4440	5180	5920	6660	7400

			
<NC 20	NC 20-25	NC 25-30	NC 30-35

AL2815 Supply with OBD

Table 1b

Face Velocity (FPM)	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600		
Static Pressure Loss (inches W.G.)	.010	.015	.020	.030	.040	.050	.060	.080	.090	.110	.120	.140	.160		
Size	Outlet Area (square feet)	Air Capacities (CFM)													
6 x 4	0.10	CFM Throw	40 6	50 7	60 9	70 11	80 12	90 13	100 15	110 16	120 18	130 19	140 20	150 22	160 24
10 x 4	0.15	CFM Throw	60 8	75 9	90 10	105 12	120 14	135 16	150 18	165 20	180 22	195 24	210 26	225 28	240 30
12 x 4	0.20	CFM Throw	80 9	100 10	120 11	140 13	160 15	180 17	200 19	220 21	240 23	260 25	280 27	300 29	320 31
12 x 6	0.30	CFM Throw	120 11	150 12	180 13	210 16	240 18	270 20	300 22	330 24	360 27	390 29	420 32	450 34	480 37
16 x 6	0.40	CFM Throw	160 13	200 15	240 17	280 19	320 21	360 23	400 25	440 28	480 31	520 34	560 37	600 40	640 43
16 x 8	0.50	CFM Throw	200 14	250 16	300 19	350 21	400 23	450 27	500 29	550 32	600 35	650 37	700 40	750 43	800 46
18 x 8	0.60	CFM Throw	240 15	300 17	360 20	420 23	480 25	540 29	600 31	660 34	720 37	780 40	840 43	900 46	960 49
18 x 10	0.72	CFM Throw	300 17	372 19	450 22	525 25	600 28	675 31	750 34	825 37	900 40	975 43	1050 46	1125 49	1200 52
24 x 10	1.00	CFM Throw	400 19	500 22	600 26	700 31	800 33	900 36	1000 39	1100 43	1200 46	1300 50	1400 55	1500 60	1600 65
30 x 12	1.50	CFM Throw	600 22	750 26	900 30	1050 35	1200 39	1350 43	1500 46	1650 50	1800 55	1950 61	2100 64		
34 x 14	2.00	CFM Throw	800 25	1000 30	1200 35	1400 40	1600 45	1800 50	2000 55	2200 60	2400 65				
36 x 20	3.00	CFM Throw	200 130	1500 36	4800 43	2100 49	2400 56	2700 61	3000 67	3300 74					
48 x 20	4.00	CFM Throw	600 136	2000 42	2400 48	2800 55	3200 64	3600 72							
48 x 24	5.00	CFM Throw	2000 41	2500 47	3000 54	3500 63	4000 74								
48 x 30	6.00	CFM Throw	2400 45	3000 55	3600 64	4200 75									

		
<NC 25	NC 25-30	NC 30-35

Side Spread Deflection

Face Velocity and Effective Area are based on 4" rotating vane anemometer.
CFM = Effective Area x Face Velocity.
NC re 8dB room attenuation.
10⁻¹² watts reference.

Table 2
Multiply Table 1a and 1b Data By Factor
For Various Spread Angles At Listed CFM

Spread Angle	Throw	V _k	A _x	NC	P _T
20°	.85	1.03	.97	+0	1.2
40°	.70	1.06	.94	+3	1.5

Position the Vertical Rear Vanes to obtain the air patterns shown. Determine change in T, P_T, A_k, and V_k from Table 2.

Symbols:

- V_T Terminal Velocity of 75 FPM
- V_k Outlet Velocity in FPM
- NC re 8db room attenuation 10⁻¹² watts reference
- T Throw in Feet
- A_k Outlet Area in Sq. Ft.
- P_T Total Pressure in H₂O
- CFM - A_k x V_k

ALEC5, ALEC10, ALEC15, ALEC5FF

Core Area (square feet)	Core Velocity (FPM)											
	Velocity Pressure											
	Nominal Size	Neg. SP	.300	.400	.500	.600	.700	.800	1000	1200	1400	1500
0.15	6 x 4	CFM	45	60	75	90	105	120	150	180	210	225
	6 x 5	NC	25	28	30	32	33	35	37	39	40	41
0.18	8 x 4	CFM	54	72	90	108	126	144	180	216	252	270
	7 x 5	NC	25	28	30	32	33	34	36	38	40	40
0.22	10 x 4	CFM	66	88	110	132	154	176	220	264	308	330
	8 x 5	NC	24	27	29	31	33	34	36	38	39	40
0.26	12 x 4	CFM	78	104	130	156	182	208	260	312	364	390
	10 x 5	NC	24	27	29	31	32	34	36	38	39	40
0.30	14 x 4	CFM	90	120	150	180	210	240	300	360	420	450
		NC	24	26	29	30	32	33	35	37	39	39
0.34	16 x 4	CFM	102	136	170	204	238	272	340	408	476	510
	12 x 5	NC	23	26	28	30	32	33	35	37	38	39
0.39	18 x 4	CFM	117	156	195	234	273	312	390	468	546	585
	14 x 5	NC	23	26	28	30	31	33	35	37	38	39
0.46	20 x 4	CFM	138	184	230	276	322	368	460	552	644	690
	16 x 5	NC	23	26	28	30	31	32	35	36	38	39
0.52	24 x 4	CFM	165	208	260	312	364	416	520	624	728	780
	18 x 5	NC	23	25	28	29	31	32	34	36	38	38
0.60	28 x 4	CFM	180	240	300	360	420	480	600	720	840	900
	20 x 5	NC	22	25	27	29	31	32	34	36	37	38
0.69	30 x 4	CFM	207	276	345	414	483	552	690	828	966	1035
	24 x 5	NC	22	25	27	29	30	32	34	36	37	38
0.81	36 x 4	CFM	243	324	405	486	567	648	810	972	1134	1215
	28 x 5	NC	22	24	27	28	30	31	33	35	37	37
0.90	40 x 4	CFM	270	360	450	540	630	720	900	1080	1260	1350
	30 x 5	NC	21	24	26	28	30	31	33	35	36	37
1.07	48 x 4	CFM	321	428	535	642	749	856	1070	1284	1498	1605
	36 x 5	NC	21	24	26	28	29	31	33	35	36	37
1.18	34 x 6	CFM	354	472	590	708	826	944	1180	1416	1652	1770
	24 x 8	NC	21	24	26	28	29	30	33	34	36	37
1.34	60 x 4	CFM	402	536	670	804	938	1072	1340	1608	1876	2010
	48 x 5	NC	21	23	26	27	29	30	32	34	36	36
1.60	72 x 4	CFM	480	640	800	960	1120	1280	1600	1920	2240	2400
	30 x 8	NC	20	23	25	27	29	30	32	34	35	36
1.80	60 x 5	CFM	540	720	900	1080	1260	1440	1800	2160	2520	2700
	48 x 6	NC	20	23	25	27	29	30	32	34	35	36
2.08	72 x 5	CFM	624	832	1040	1248	1456	1664	2080	2496	2912	3120
	60 x 6	NC	20	23	25	27	28	29	32	33	35	35
2.45	72 x 6	CFM	735	980	1225	1470	1715	1960	2450	2940	3430	3575
	48 x 8	NC	19	22	24	26	28	29	31	33	34	35
2.78	36 x 12	CFM	834	1112	1390	1668	1946	2224	2780	3336	3892	4170
	30 x 14	NC	19	22	24	26	27	29	31	33	34	35
3.11	60 x 8	CFM	933	1244	1555	1866	2177	2488	3110	3732	4354	4665
	48 x 10	NC	19	22	24	26	27	29	31	32	34	45
3.61	72 x 8	CFM	1083	1444	1805	2166	2527	2888	3610	4332	5054	5415
	60 x 10	NC	19	21	24	25	27	28	30	32	34	34
4.29	48 x 14	CFM	1287	1716	2145	2574	3003	3432	4290	5148	6006	6435
	36 x 18	NC	18	21	23	25	27	28	30	32	33	34
4.65	72 x 10	CFM	1395	1860	2325	2790	3255	3720	4650	5580	6510	6975
	48 x 16	NC	18	21	23	25	26	28	30	32	33	34
5.58	72 x 12	CFM	1674	2232	2790	3348	3906	4464	5580	6696	7812	8370
	60 x 14	NC	18	21	23	24	26	27	29	31	33	33
6.25	72 x 14	CFM	1875	2500	3125	3750	4375	5000	6250	7500	8750	9375
	60 x 16	NC	17	20	22	24	26	27	29	31	33	33

Notes:

1. All pressures are in inches of water.
2. Neg. SP is negative static pressure.
3. NC values are based on room absorption of 10 db., re 10⁻¹² watts.
4. Bold dividing lines denote ranges of NC values.

Recommended Noise Criteria and Face Velocity Ranges are on page 96.

700/AL700 Nonvision Door Grille

Size	ALUMINUM						STEEL					
	*Face Velocity (FPM)	100	200	300	400	500	*Face Velocity (FPM)	150	200	300	400	500
	Static Pressure Drop	.010	.037	.083	.150	.220	Static Pressure Drop	.012	.021	.046	.084	.130
*Effective Area (square feet)	Air Capacities (CFM)					*Effective Area (square feet)	Air Capacities (CFM)					
12 x 6	0.30	30	60	90	120	150	0.33	50	65	100	130	165
12 x 8	0.40	40	80	120	160	200	0.46	70	90	140	185	230
12 x 10	0.52	50	105	155	210	260	0.58	85	115	175	230	290
12 x 12	0.62	60	125	185	250	310	0.69	105	140	205	275	345
18 x 12	0.97	95	195	290	390	485	1.00	150	200	300	400	500
24 x 12	1.31	130	260	395	525	655	1.40	210	280	420	560	700
24 x 16	1.76	175	350	530	705	880	1.88	280	375	565	750	940
36 x 12	2.00	200	400	600	800	1000	2.15	320	430	645	860	1075
30 x 16	2.25	225	450	675	900	1125	2.40	360	480	720	960	1200
36 x 16	2.75	275	550	825	1100	1375	2.97	445	595	890	1190	1485
30 x 24	3.50	350	700	1050	1400	1750	3.62	545	725	1085	1450	1810
36 x 24	4.23	425	845	1270	1690	2115	4.40	660	880	1320	1760	2200
48 x 24	5.80	580	1160	1740	2320	2900	5.90	885	1180	1770	2360	2950
36 x 36	6.60	660	1320	1980	2640	3300	6.65	995	1330	1995	2660	3325

*Face Velocity and Effective Area based on 4" Rotating Vane Anemometer.

To determine CFM using this table:

- 1) Under "aluminum" or "steel" find the Effective Area of the grille.
- 2) Using a 4" Rotating Vane Anemometer, measure the velocity on the intake side of the grille.
- 3) Determine CFM by the following equation: $CFM = \text{Effective Area} \times \text{Measured Face Velocity}$.