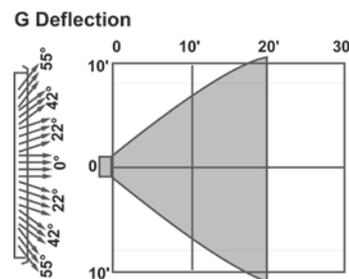
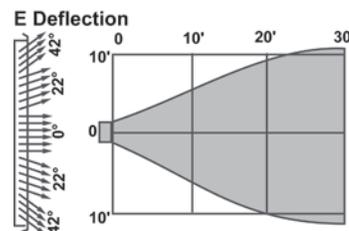
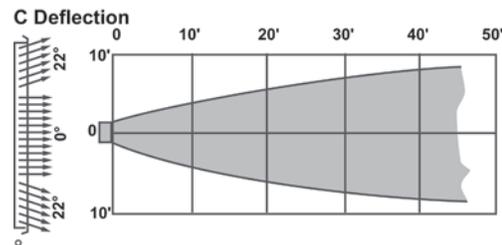
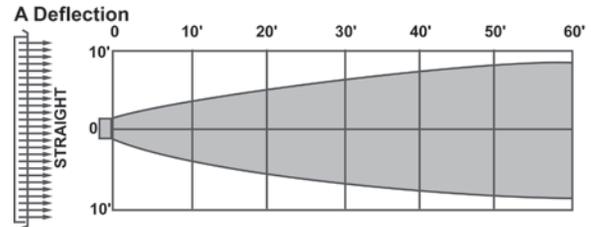


Recommended NC Criteria

	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.

Air Pattern Obtained with Various Deflection Settings



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

PERFORMANCE DATA—LIGHT COMMERCIAL



Models 291, 292, 293, 294

Static Pressure in H ₂ O Neck Velocity (FPM)	4" Height								5" Height								6" Height							
	.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
8" Width																								
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
10" Width																								
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
12" Width																								
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
14" Width																								
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
16" Width																								
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
18" Width																								
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
20" Width																								
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
24" Width																								
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
30" Width																								
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
36" Width																								
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



PERFORMANCE DATA—LIGHT COMMERCIAL

Models 291, 292, 293, 294

Static Pressure in H ₂ O Neck Velocity (FPM)	8" Height								10" Height								12" Height							
	.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" Width																								
CFM	133	178	222	267	311	356	400	444																
1-Way Throw (ft)	16	21	27	32	38	42	48	52																
2-Way Throw (ft)	14	18	23	27	31	35	40	43																
3-Way Throw (ft)	13	16	21	25	28	32	36	40																
4-Way Throw (ft)	12	15	19	23	26	30	33	36																
Noise Criteria	<30	30	35	38	43	46	49	52	<30	30	35	39	44	47	50	53	<30	30	35	41	45	49	52	55
10" Width																								
CFM	167	222	278	333	389	444	500	555	208	278	347	417	486	555	625	695								
1-Way Throw (ft)	17	23	29	35	40	46	50	54	19	25	31	37	43	49	52	57								
2-Way Throw (ft)	15	19	25	28	33	37	42	46	16	21	26	30	35	40	44	49								
3-Way Throw (ft)	13	17	22	25	30	33	37	42	14	18	23	27	31	35	40	44								
4-Way Throw (ft)	12	16	20	24	28	31	35	39	13	17	21	25	29	33	37	41								
Noise Criteria	<30	30	36	39	43	47	50	53	<30	30	37	40	44	46	51	54	<30	30	35	41	45	49	52	55
12" Width																								
CFM	200	267	333	400	467	534	600	637	250	334	416	500	584	666	750	844	300	400	500	600	700	800	900	1000
1-Way Throw (ft)	18	24	30	36	42	48	52	56	20	26	32	38	45	50	56	61	21	27	34	40	47	52	59	63
2-Way Throw (ft)	16	20	25	30	35	39	43	48	17	22	27	32	36	42	46	51	17	22	28	33	38	43	48	53
3-Way Throw (ft)	14	18	23	27	31	35	39	43	15	19	24	28	33	37	42	46	15	20	26	30	34	38	43	48
4-Way Throw (ft)	13	17	21	25	29	33	36	41	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
14" Width																								
CFM	234	312	389	467	545	623	700	779	292	389	486	583	680	776	875	972	350	467	584	700	817	935	1050	1170
1-Way Throw (ft)	19	25	32	37	44	49	55	58	21	26	33	39	47	51	58	63	22	28	34	40	47	53	60	68
2-Way Throw (ft)	16	21	26	31	36	41	45	50	17	22	27	33	38	43	48	53	18	23	29	34	40	45	50	55
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	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
16" Width																								
CFM	266	356	445	533	622	710	800	890	334	445	555	667	778	890	1000	1110	400	545	667	800	935	1070	1200	1335
1-Way Throw (ft)	20	26	33	38	46	50	57	61	21	27	35	41	48	53	61	65	22	29	35	41	48	55	62	71
2-Way Throw (ft)	17	22	27	32	37	42	46	52	18	23	28	34	39	44	50	54	18	25	30	35	41	46	51	58
3-Way Throw (ft)	15	20	25	28	33	37	42	46	16	21	26	31	35	40	44	50	16	22	27	32	37	42	46	51
4-Way Throw (ft)	14	18	23	27	31	35	39	43	15	19	24	28	32	37	41	46	15	20	25	30	34	39	42	48
Noise Criteria	<30	30	36	39	43	46	51	55	<30	30	36	40	43	47	52	59	<30	30	37	41	43	47	53	56
18" Width																								
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	52	59	63	22	28	36	42	49	57	63	67	23	30	36	42	50	57	63	73
2-Way Throw (ft)	17	22	28	33	38	43	48	53	18	24	29	35	40	45	51	56	19	25	30	36	42	47	52	60
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" Width																								
CFM	334	445	555	667	778	890	1000	1110	417	555	695	834	973	1110	1250	1390	500	667	834	1000	1167	1334	1500	1667
1-Way Throw (ft)	21	27	35	41	48	53	61	65	22	29	37	43	50	58	65	69	24	30	37	43	51	59	66	76
2-Way Throw (ft)	17	23	28	34	39	44	50	54	18	25	30	36	41	46	52	58	19	26	31	37	43	49	53	61
3-Way Throw (ft)	16	21	26	31	35	40	44	50	17	22	27	32	37	42	48	52	17	23	28	33	39	44	49	53
4-Way Throw (ft)	15	20	24	29	33	37	41	45	16	21	26	30	35	40	43	48	16	21	27	31	36	41	45	51
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" Width																								
CFM	400	545	667	800	935	1070	1200	1335	502	669	836	1005	1170	1340	1505	1670	600	800	1000	1200	1400	1600	1800	2000
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" Width																								
CFM	502	669	836	1005	1170	1340	1505	1670	625	833	1040	1250	1460	1667	1875	2080	750	1000	1250	1500	1750	2000	2250	2500
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" Width																								
CFM	600	800	1000	1200	1400	1600	1800	2000	750	1000	1250	1500	1750	2000	2250	2500	900	1200	1500	1800	2100	2400	2700	3000
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	60	<30	32	40	44	49	54	58	-	<30	32	41	45	50	56	-	-
48" Width																								
CFM	800	1070	1335	1600	1870	2140	2400	2670	1000	1335	1670	2000	2340	2670	3000	3340	1200	1600	2000	2400	2800	3200	3600	4000
1-Way Throw (ft)	27	35	43	50	60	66	74	79	28	37	45	53	63	70	80	83	29	37	46	55	65	77	92	118
2-Way Throw (ft)	22	28	35	42	48																			



Models 291, 292, 293, 294

Static Pressure in H ₂ O Neck Velocity (FPM)	14" Height								16" Height								18" Height							
	.033	.055	.088	.130	.173	.224	.287	.355	.033	.055	.088	.130	.173	.224	.287	.355	.033	.055	.088	.130	.173	.224	.287	.355
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	30	37	42	46	51	54	58	<30	30	37	43	47	52	56	59	<30	33	38	44	49	53	57	61
14" Width																								
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" Width																								
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" Width																								
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" Width																								
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" Width																								
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" Width																								
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" Width																								
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" Width																								
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



PERFORMANCE DATA—LIGHT COMMERCIAL

Models 291, 292, 293, 294

	20" Height								24" Height								30" Height							
	.033	.055	.088	.130	.173	.224	.287	.355	.033	.055	.088	.130	.173	.224	.287	.355	.033	.055	.088	.130	.173	.224	.287	.355
Static Pressure in H ₂ O 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" Width																								
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" Width																								
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	49	55	60	-	-
30" Width																								
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" Width																								
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" Width																								
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 H₂O Neck Velocity (FPM)	.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	36	43	50	56	62	-	-	<30	37	47	58	58	67	-	-	<30	36	46	55	57	65	-	-
36" Width																								
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	46	55	57	65	-	-
48" Width																								
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.