

GRILLES & REGISTERS



	ALUMINUM	STEEL	
MODELS	GAA1	GSA1	supply, single deflection
	GAA2	GSA2	supply, double deflection
	GAA4	GSA4	return, single row, fixed 45 degree



GSA20-H

FRONT ROW BLADES DIRECTION: Parallel to width, (default) or add suffix H Parallel to height, add suffix V

DAMPERS: Grilles (no damper) Register (with damper): For registers with steel opposed blade damper: add suffix 7

Single deflection supply grilles and registers are recommended for applications requiring pattern adjustability in a single horizontal or vertical plane, sill or sidewall location at ceiling line, or heating application only.

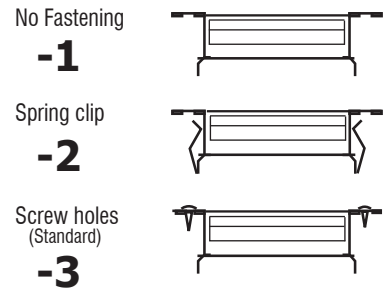
Double-deflection supply grilles and registers are recommended for application in systems requiring optimum flexibility of pattern change to accommodate changing job conditions.

The combination of streamlined foil shaped bars and 17 mm (2/3-inch) bar spacing maintains a high effective area capacity of greater than 80% which minimizes outlet velocity, reduces pressure drop and assures quiet operation. Individually adjustable bars are capable of shortening throw up to one-half with a wide spread deflection requiring only a 20% increase in outlet velocity at a fixed volume.

GAA Series (aluminum) have extruded aluminum frames with roll formed aluminum bars.

GSA Series (steel) have extruded aluminum frames with steel bars. This unique feature combines the beauty and rust resistance of the aluminium frame with the rigidity of steel bars.

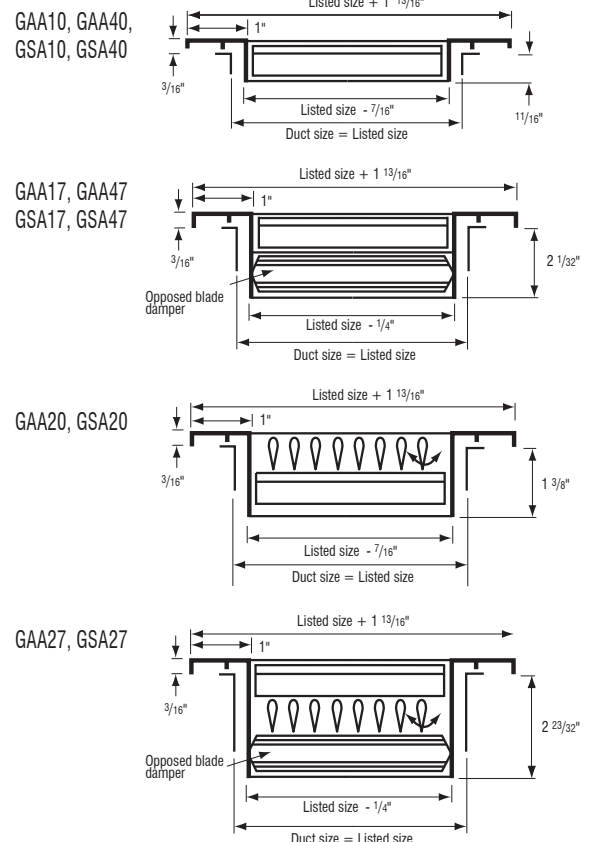
Fastening Methods



Accessories

-SF	-DS	-IS
Supplied w/ sub frame	Debris (Bird) Screen	Insect Screen

Dimensions



HOW TO ORDER GSA/GAA SERIES

GSA17-V -1-SF 1004 /W

MODEL SERIES GSA Steel GAA Aluminium	FINISH (Optional) White (Standard) /W Custom (See chart) /C
AIR PATTERN Single Adjust. 1 Double Adjust. 2 Single Fixed 4	WIDTH (INCHES)
GRILLE/REGISTER Grille 0 Register 7	LENGTH (INCHES)
BLADE ORIENTATION (Optional) Horizontal (Standard) -H Vertical -V	OPTIONS Sub Frame -SF Debris Screen -DS Insect Screen -IS
	FASTENING METHOD (Optional) No Fastening -1 Spring Clip -2 Screw (Standard) -3

MAX. LISTED SIZE: 36"x36" (multiple sections furnished for larger sizes)
FINISH: Powder baked enamel paint for durability. White is standard.
 (Other finishes available)

ENGINEERING PERFORMANCE DATA

SUPPLY AIR GRILLES AND REGISTERS

Single and Double Deflection adjustable Type - Series GSA & GAA



TABLE 1

LISTED HEIGHT					Outlet Velocity 450-600 FPM					Outlet Velocity 550-700 FPM					Outlet Velocity 600-800 FPM					Outlet Velocity 700-1000 FPM										
					CFM	Deflection				CFM	Deflection				CFM	Deflection				CFM	Deflection									
						0°	22°	42°	55°		0°	22°	42°	55°		0°	22°	42°	55°		0°	22°	42°	55°						
						V _K					V _K					V _K					V _K									
						450	500	550	600		550	600	650	700		600	700	750	800		700	800	900	1000						
						P _T					P _T					P _T					P _T									
.01 .01 .02 .02				.02 .02 .03 .03				.02 .03 .04 .04				.03 .04 .05 .06																		
Throw (T) V _T 75					Throw (T) V _T 75					Throw (T) V _T 75					Throw (T) V _T 75															
4	5	6	8	10	12	14	16	18	20	24																				
6	5										40	6	5	4	3	45	8	7	6	4	60	10	9	7	5	65	11	10	8	6
8	6										50	7	6	5	4	60	9	11	6	5	70	11	10	8	6	80	12	11	9	7
10	8	6									75	9	7	6	5	90	10	9	7	6	100	12	11	9	7	125	13	12	10	8
12	10	8									100	10	8	6	5	125	11	9	8	7	150	13	12	9	8	175	14	13	11	8
14	12	10	8								125	11	9	7	6	150	12	11	9	7	175	14	13	10	8	200	16	14	11	9
18	14	12									150	11	10	8	7	175	13	11	10	8	200	15	14	11	9	250	17	15	12	10
20	16	14	10								175	12	11	9	7	200	15	13	11	9	250	17	15	12	9	275	19	17	14	11
24	20	16	12	10							225	13	12	10	8	275	16	14	12	10	300	19	16	13	10	350	21	18	15	12
30	24	20	14	12							300	14	13	11	9	350	18	15	13	10	425	20	17	15	11	475	24	20	17	13
38	30	24	18	14	12						350	17	14	12	9	425	20	17	13	11	500	22	20	17	12	550	26	22	18	14
40	32	26	20	16	14						400	18	16	13	10	475	21	18	15	12	550	24	21	18	13	650	28	24	20	15
44	36	30	24	18	16	14					450	19	17	13	11	550	22	19	17	13	625	26	22	19	14	725	30	25	22	17
44	36	26	22	18	16						500	20	17	14	12	600	24	20	18	13	700	27	24	20	15	800	32	27	23	18
48	40	30	24	20	18	16					600	21	18	15	12	700	25	22	18	14	850	29	25	22	16	950	34	29	25	19
48	40	38	30	24	22	18					700	23	20	17	13	850	28	24	20	15	975	33	28	24	18	1125	37	31	27	21
	40	32	28	24	20	18					800	25	21	18	14	950	31	26	22	17	1125	35	30	26	20	1275	39	34	29	22
	42	36	30	26	24	22	20				900	27	22	19	15	1100	32	27	23	18	1250	36	31	27	21	1450	42	36	31	23
	46	42	36	30	26	24	22				1000	29	25	21	16	1200	34	29	25	19	1400	40	34	29	22	1600	45	39	34	25
		44	38	34	30	28	24				1250	32	27	23	18	1500	36	30	27	23	1750	43	37	31	24	2000	48	43	36	27
		48	42	36	34	28	24				1500	34	29	25	19	1800	39	32	29	25	2100	45	40	34	26	2400	52	46	39	30
		44	40	36	30	24	20				1750	37	32	27	21	2100	42	35	32	27	2450	48	44	37	28	2800	55	49	42	32
			48	42	36	28	24				2000	39	34	29	22	2400	45	38	34	29	2800	52	46	40	30	3200	58	52	44	34
			48	40	36	30	24				2250	41	36	30	24	2700	48	40	36	31	3150	54	48	42	32	3600	61	54	46	37
			42	38	32	25	20				2500	43	38	32	25	3000	51	42	38	33	3500	57	51	44	33	4000	64	57	49	39
			48	40	34	27	20				3000	46	40	34	27	3600	54	45	40	35	4200	60	53	47	35	4800	68	60	52	42

NC 30

NC 35



NC40

- SYMBOLS
- V_T Terminal Velocity in fpm
 - A_K Outlet area in Sq. Feet
 - NC Re 8db Room attenuation
 - V_R Room Velocity in fpm
 - P_T Total Pressure H₂O
 - T Throw in feet at X and Y
 - V_K Outlet Velocity in fpm
 - P_S Static Pressure H₂O

ENGINEERING PERFORMANCE DATA

SUPPLY AIR GRILLES AND REGISTERS

Single and Double Deflection adjustable Type - Series GSA & GAA



AIR PATTERN SETTINGS

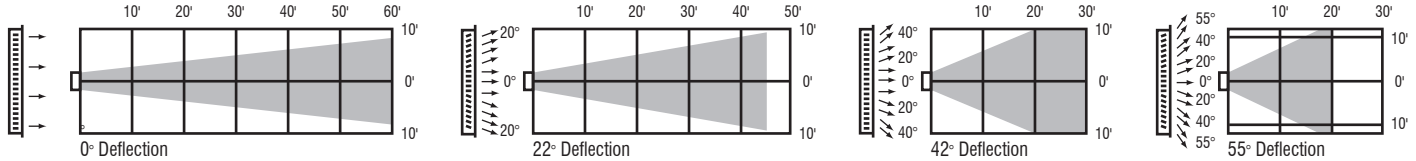


TABLE 1 (Cont'd)

LISTED HEIGHT				Outlet Velocity 900-1200 FPM					Outlet Velocity 1100-1450 FPM				Outlet Velocity 1250-1700 FPM				Outlet Velocity 1450-1900 FPM																																						
				CFM	Deflection				CFM	Deflection				CFM	Deflection				CFM	Deflection																																			
					0°	20°	40°	55°		0°	20°	40°	55°		0°	20°	40°	55°		0°	20°	40°	55°																																
					V _k					V _k					V _k					V _k																																			
					900	1000	1100	1200		1100	1200	1300	1450		1250	1400	1550	1700		1450	1600	1750	1900																																
					P _T					P _T					P _T					P _T																																			
.05 .06 .08 .09				.08 .09 .10 .13				.09 .12 .15 .18				.13 .16 .19 .3																																											
Throw (T) V _r 75				Throw (T) V _r 75				Throw (T) V _r 75				Throw (T) V _r 75																																											
4	5	6	8	10	12	14	16	18	20	24																																													
6	5										80	13	11	9	7	100	15	13	11	8	125	18	15	13	10	150	21	18	14	11	175	25	21	17	13	200	24	20	17	13	225	27	23	19	15										
8	6										200	18	15	13	10	250	22	19	15	12	275	25	21	18	14	325	29	25	21	17	350	33	28	24	18	400	33	28	24	18	425	31	27	22	17	475	36	32	26	20					
10	8	6									350	25	21	18	14	425	30	25	21	17	500	34	30	25	19	550	39	32	27	21	625	37	32	27	22	725	42	36	31	24	850	41	35	30	23	950	45	40	34	26					
12	10	8									700	32	28	24	18	850	39	33	28	21	975	45	39	33	25	1125	49	43	38	28	1200	45	40	34	26	1400	53	45	39	30	1600	58	51	44	34	1950	60	51	45	35	2250	61	54	46	36
14	12	10	8								800	34	30	25	19	950	41	35	30	22	1125	48	41	35	27	1275	52	46	40	31	1450	48	42	36	28	1675	57	48	42	32	1925	61	54	46	36	2250	60	51	45	35					
18	14	12									900	36	31	26	20	1075	43	37	32	24	1250	51	43	37	28	1450	55	49	42	32	1675	52	45	40	31	1950	60	51	45	35	2250	61	54	46	36										
20	16	14	10								1000	39	33	28	22	1200	45	40	34	26	1400	53	45	39	30	1600	58	51	44	34	1950	60	51	45	35	2250	61	54	46	36	2800	61	54	46	36										
24	20	16	12	10							1200	42	36	31	24	1450	48	42	36	28	1675	57	48	42	32	1925	61	54	46	36	2250	61	54	46	36	2800	61	54	46	36	3200	61	54	46	36										
30	24	20	14	12							1400	45	39	34	26	1675	52	45	40	31	1950	60	51	45	35	2250	61	54	46	36	2800	61	54	46	36	3200	61	54	46	36	4000	61	54	46	36										
38	30	24	18	14	12						1600	47	43	37	28	1925	56	48	43	34	2250	54	47	39	2500	62	53	43	34	2500	54	47	39	2500	62	53	43	34	3200	61	54	46	36												
40	32	26	20	16	14						1800	49	44	40	31	2150	59	51	46	35	2500	57	50	41	2750	62	53	43	34	2750	57	50	41	2750	61	54	46	36	3200	61	54	46	36												
44	36	30	24	18	16	14					2000	52	47	42	32	2400	54	49	43	38	2800	61	53	43	3200	62	53	43	34	2800	61	54	46	36	3200	61	54	46	36	4000	61	54	46	36											
44	36	30	24	18	16	14					2500	56	50	45	34	3000	59	53	47	41	3500	58	51	43	3200	62	53	43	34	3500	56	50	45	34	4000	58	51	43	34	4800	58	51	43	34											
48	40	30	24	20	18	16					3000	60	54	48	36	3600	58	52	46	41	4200	58	52	46	41	4800	58	52	46	41	4200	58	52	46	41	4800	58	52	46	41	5400	58	52	46	41										
48	40	30	24	20	18	16					3500	59	53	40		4200					4900	56																																	
48	40	30	24	20	18	16					4000			57	43	4800					5600	60																																	
48	40	30	24	20	18	16					4500			60	45	5400																																							
48	40	30	24	20	18	16					5000			49																																									
48	40	30	24	20	18	16					6000			54																																									

ENGINEERING PERFORMANCE DATA

SUPPLY AIR GRILLES AND REGISTERS

Single and Double Deflection adjustable Type - Series GSA & GAA



THROW FACTORS

Throw values (T) in Table 1 are based on a Terminal Velocity (V_T) of 75 fpm. Throw values at other terminal velocities (V_T 50 to V_T 150 fpm) are established by multiplying throw (T) in table 1 by Throw Factor in table below.

Multiply Throw (T) in Table 1 by Factor				
VT (fpm)	50	75	100	150
Throw factor	x 1.5	x 1.0	x .76	x .5

Grille sound ratings will be increased by integral or localized air volume dampering, by non-uniform air flow in the grille collar and by the addition of inherent system noise.

REGISTER THROTTLING CORRECTION

Damper throttling effect (excess pressure drop due to part closing of damper)	Press. Drop In. H ₂ O		
	.05"	.05"	.05"
Approximate damper opening	3/4	2/3	1/2
NC addition to single outlet sound rating	5	10	15

Damper throttling effect = excess pressure drop created by partially closing the register damper.

NC addition to be added to NC values of table 1.

Performance of any size not shown in the tables will be the same as for the size shown with the same listed size area.

EXAMPLE:

A 36 x 16 size (not shown) has a listed area of 576 sq. in. Its performance will be identical to a 24 x 24 size (shown) which has the same listed size area of 576 sq. in.

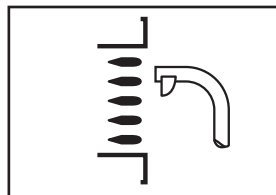
A_K OUTLET AREA IN SQ. FEET

LISTED WIDTH	LISTED HEIGHT								DEFLECTION						
	4	5	6	8	10	12	14	16	18	20	24	0°	22°	42°	55°
	6	5											.09	.08	.07
8	6											.11	.10	.09	.08
10	8	6										.17	.15	.13	.12
12	10	8										.22	.20	.18	.17
14	12	10	8									.28	.25	.23	.21
18	14	12										.33	.30	.27	.25
20	16	14	10									.39	.35	.32	.29
24	20	16	12	10								.50	.45	.41	.38
30	24	20	14	12								.67	.60	.55	.50
38	30	24	18	14	12							.78	.70	.64	.58
40	32	26	20	16	14							.89	.80	.73	.67
44	36	30	24	18	16	14						1.0	.90	.82	.75
44	36	26	22	18	16							1.1	1.0	.91	.83
48	40	30	24	20	18	16						1.3	1.2	1.1	1.0
48	48	38	30	24	22	18						1.6	1.4	1.3	1.2
		40	32	28	24	20	18					1.8	1.6	1.5	1.3
		42	36	30	26	24	22	20				2.0	1.8	1.6	1.5
		46	42	36	30	26	24	22				2.2	2.0	1.8	1.7
				44	38	34	30	28	24			2.8	2.5	2.3	2.1
					48	42	36	34	28			3.3	3.0	2.7	2.5
						44	40	36	30			3.9	3.5	3.2	2.9
							48	42	36			4.5	4.0	3.6	3.3
								48	40			5.0	4.5	4.1	3.8
									42			5.6	5.0	4.5	4.2
									48			6.7	6.0	5.4	5.0

Example;

Listed size 24 x 10 GAA27 deflection setting 42° A_K area = 1.1 sq. feet.

AIR MEASUREMENT



2220A Velometer Jet for V_K velocity measurement $CFM = A_K \times V_K$

ENGINEERING PERFORMANCE DATA

SUPPLY AIR GRILLES AND REGISTERS

Single and Double Deflection adjustable Type - Series GSA & GAA



Total air drop from sidewall outlet

The drop of an air stream varies directly with cooling temperature differential, throw and inversely with outlet velocity (V_k). The total drop of a cooled air stream is tabulated for two typical conditions of cooling temperature differentials and a range of throws and outlet velocities.

V_k in fpm	Sidewall Throw In Feet													
	10		15		20		25		30		40		50	
	- 18F	- 25F	- 18F	- 25F	- 18F	- 25F	- 18F	- 25F	- 18F	- 25F	- 18F	- 25F	- 18F	- 25F
500	3.5	4.0	5.5	6.0	7.5	8.5	9.0	10.0	10.5	13.5	15.5	18.0	18.5	23.0
750	2.5	3.5	4.0	5.5	6.0	6.5	7.0	8.0	8.5	10.5	11.5	14.5	15.0	18.5
1000	2.0	3.0	3.5	4.0	5.0	5.5	6.0	6.5	7.0	8.5	10.0	12.0	12.5	16.0
1250	2.0	2.5	3.0	3.5	4.5	5.0	5.5	6.0	6.5	7.5	9.0	11.0	11.5	13.5
1500	1.5	2.0	3.0	3.0	4.0	4.5	5.0	5.5	6.0	7.0	8.5	9.5	10.5	12.5
1750	1.0	2.0	2.5	2.5	3.5	4.0	4.5	5.0	5.5	6.5	8.0	9.0	10.0	11.5
2000	1.0	1.5	2.5	2.5	3.5	4.0	4.0	4.5	5.0	6.0	7.5	8.5	9.5	10.5

TOTAL AIR DROP

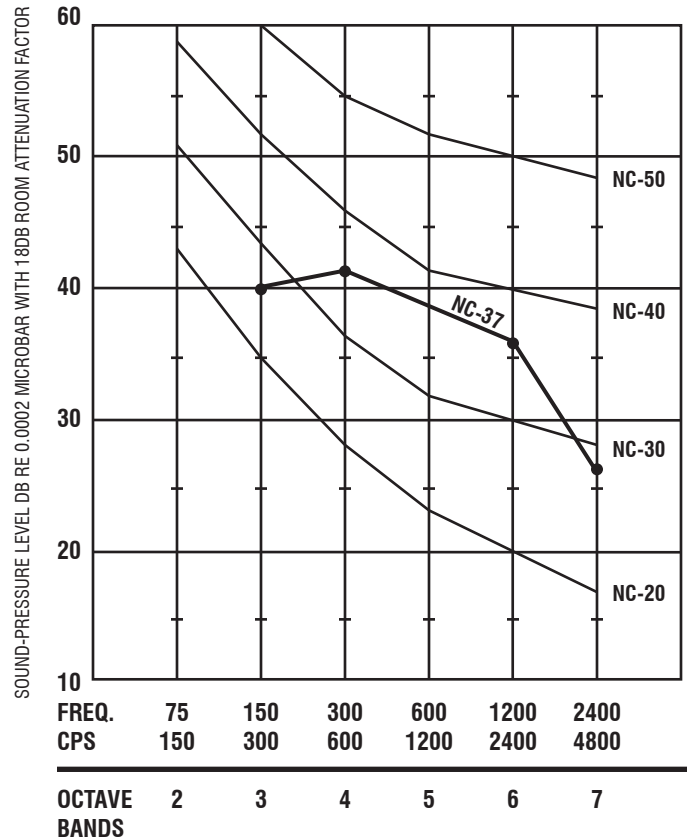
DROP DUE TO SPREAD + DROP DUE TO COOLING TEMPERATURE DIFFERENTIAL

RECOMMENDED NC CRITERIA

NC Curve	Communication Environment	Typical Occupancy
Below 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.	Resistances, theatres, libraries, executive offices, directors' rooms.
NC 35	Quiet office; satisfactory for conference at a 15 ft. table; normal voice 10-30 ft.; telephone use satisfactory.	Private offices, schools, hotel rooms, courtrooms, churches, hospital rooms.
NC 40	Satisfactory for conferences at a 6-8 ft. table; normal voice 6-12 ft.; telephone use satisfactory.	General offices, labs, dining rooms.
NC 45	Satisfactory for conferences at a 4-5 ft. table; normal voice 3-6 ft.; raised voice 6-12 ft.; telephone use occasionally difficult.	Retail store cafeterias, lobby areas, large drafting & engineering offices, reception areas.
Above NC 50	Unsatisfactory for conferences of more than two or three persons; normal voice 1-2 ft.; raised voice 3-6 ft.; telephone use slightly difficult.	IBM rooms, stenographic pools, print machine rooms, process areas.

TYPICAL NC SPECTRUM T64

24" x 6" 22° DEFLECTION
(975 CFM) V_k (1400 FPM)



ENGINEERING PERFORMANCE DATA

RETURN AIR GRILLES AND REGISTERS

Fixed Bar Type 45° Deflected Bars



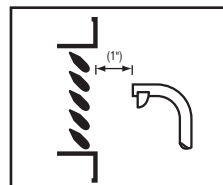
Listed Size W x H	A _K	NC 20-25 Application Non-Ducted		NC 25-30 Application Ducted		NC 30-40 Application Ducted	
		P _S		P _S		P _S	
		- .02"	- .03"	- .08"	- .10"	- .15"	- .20"
		CFM	CFM	CFM	CFM	CFM	CFM
8 x 4	.26	55	65	105	115	140	160
8 x 6	.34	75	90	145	160	195	225
10 x 6	.42	90	110	180	200	245	280
12 x 6	.50	110	135	220	245	300	345
10 x 8	.53	125	150	245	275	335	385
12 x 8	.63	155	190	310	345	420	485
10 x 10	.64	160	195	315	350	425	490
18 x 6	.75	170	205	335	375	455	525
12 x 12	.89	240	290	470	525	640	735
18 x 12	1.3	370	450	735	825	1005	1155
22 x 10	1.4	380	465	755	845	1030	1185
24 x 12	1.7	505	615	1000	1120	1365	1570
18 x 18	1.9	575	700	1140	1275	1555	1790
34 x 10	2.1	600	732	1195	1340	1635	1880
30 x 12	2.2	630	770	1255	1405	1715	1970
24 x 18	2.5	770	940	1530	1715	2090	2405
22 x 22	2.8	880	1075	1750	1960	2390	2750
30 x 18	3.2	970	1185	1930	2160	2635	3030
24 x 24	3.3	1040	1270	2070	2320	2830	3255
36 x 18	3.8	1170	1425	2320	2600	3170	3645
30 x 24	4.1	1320	1610	2625	2940	3585	4120
34 x 22	4.3	1355	1655	2695	3020	3685	4235
36 x 24	4.9	1580	1925	3135	3510	4280	4920
46 x 22	5.9	1940	2365	3855	4315	5265	6055
36 x 30	6.1	2010	2450	3995	4475	5460	6280
48 x 24	6.6	2130	2600	4240	4750	5795	6665
48 x 30	8.1	2700	3295	5370	6015	7340	8440
48 x 36	9.7	3220	3930	6405	7175	8755	10065

Performance of any size not shown in the tables will be the same as for the size shown with the same listed size area.

EXAMPLE:

A 36 x 16 size (not shown) has a listed area of 576 sq. in. Its performance will be identical to a 24 x 24 size (shown) which has the same listed size area of 576 sq. in.

AIR MEASUREMENT



SYMBOLS P_S Static Pressure Inches H₂O
 A_K Outlet Area, 1" Out from Face
 NC Re 10 db Room attenuation

2220A Velometer Jet for V_K velocity measurement.

$$CFM = A_K \times V_K$$

HOW TO SPECIFY GRILLES AND REGISTERS



Single Deflection Aluminum Supply Register

Supply and mounting of single deflection register with opposed blade damper, series **GAA17**. 2/3 inch blade spacing, constructed from powder coated aluminum, manufactured by Airvector.

Single Deflection Aluminum Return Grille

Supply and mounting of single deflection return grille, series **GAA10**. 2/3 inch blade spacing, constructed from powder coated aluminum, manufactured by Airvector.

Single Deflection Steel Supply Register

Supply and mounting of single deflection register with opposed blade damper, series **GSA17**. 2/3 inch blade spacing, constructed from powder coated aluminum frame and steel blades, manufactured by Airvector.

Single Deflection Steel Return Grille

Supply and mounting of single deflection return grille, series **GSA10**. 2/3 inch blade spacing, constructed from powder coated aluminum frame and steel blades, manufactured by Airvector.

Double Deflection Aluminum Supply Register

Supply and mounting of double deflection register with opposed blade damper, series **GAA27**. 2/3 inch blade spacing, constructed from powder coated aluminum, manufactured by Airvector.

Double Deflection Aluminum Return Grille

Supply and mounting of double deflection return grille, series **GAA20**. 2/3 inch blade spacing, constructed from powder coated aluminum, manufactured by Airvector.

Double Deflection Steel Supply Register

Supply and mounting of double deflection register with opposed blade damper, series **GSA27**. 2/3 inch blade spacing, constructed from powder coated aluminum frame and steel blades, manufactured by Airvector.

Double Deflection Steel Return Grille

Supply and mounting of double deflection return grille, series **GSA20**. 2/3 inch blade spacing, constructed from powder coated aluminum frame and steel blades, manufactured by Airvector.

Fixed 45° Aluminum Supply Register

Supply and mounting of 45 degree fixed blade register with opposed blade damper, series **GAA47**. 2/3 inch blade spacing, constructed from powder coated aluminum, manufactured by Airvector.

Fixed 45° Aluminum Return Grille

Supply and mounting of 45 degree fixed blade return grille, series **GAA40**. 2/3 inch blade spacing, constructed from powder coated aluminum, manufactured by Airvector.

Fixed 45° Steel Supply Register

Supply and mounting of 45 degree fixed blade register with opposed blade damper, series **GSA47**. 2/3 inch blade spacing, constructed from powder coated aluminum frame and steel blades, manufactured by Airvector.

Fixed 45° Steel Return Grille

Supply and mounting of 45 degree fixed blade return grille, series **GSA40**. 2/3 inch blade spacing, constructed from powder coated aluminum frame and steel blades, manufactured by Airvector.