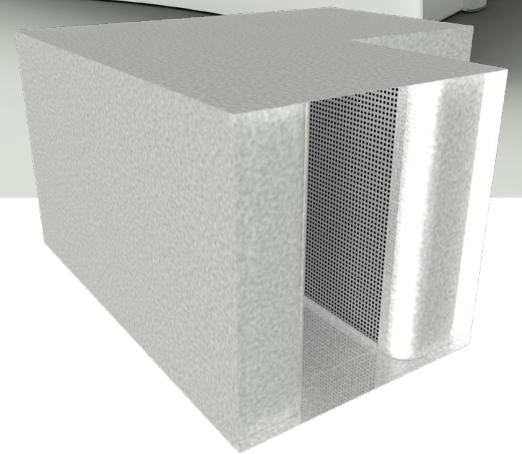


PERM

RECTANGULAR ELBOW SILENCER PACKLESS

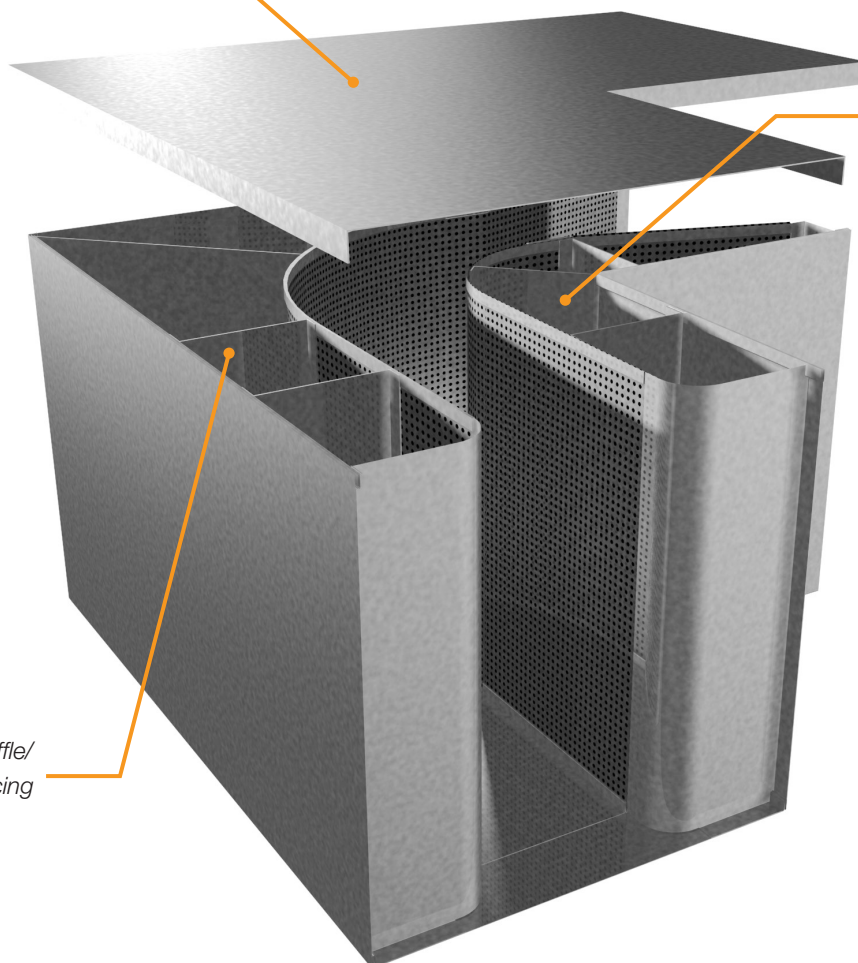


PERM

Rectangular Elbow Silencer Packless

The Rectangular Elbow Silencer Packless (PERM) provides a unique solution for noise control applications where fibrous acoustic material is not permitted in the air stream, and where a 90° elbow is necessary due to space constraints.

*90° elbow is suitable
for applications with
limited space*



*No acoustic
media is ideal
for critical
environment
applications*

*Optimized baffle/
splitter spacing*

PERM

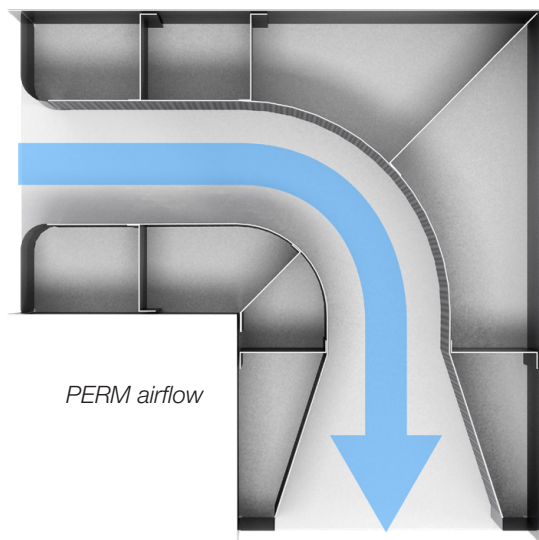
Rectangular Elbow Silencer Packless

IDEAL FOR CRITICAL ENVIRONMENTS

- + Packless elbow silencers do not contain any acoustic media and consist of a solid metal casing and perforated metal liner.
- + The media free, optional stainless steel construction is safe for use in applications where corrosive gasses are present.
- + Lack of fibrous acoustic media eliminates the possibility of fibers entering the airstream and makes sanitation easy by eliminating absorptive material.

ELBOW SHAPE

- + The elbow shape of the PERM silencer makes it extremely versatile and an excellent choice for systems where straight lengths of ductwork are not available.
- + Elbow silencers perform at or above the level of rectangular silencers with a small increase in pressure drop on the system, and can be configured to suit most duct sizes without the use of transitions.



TYPICAL APPLICATIONS

The PERM is an ideal solution for undesirable noise in applications where fibrous acoustic material is not permitted in the air stream, such as washdown and high contaminant areas, including computer rooms, hospitals, cleanrooms and laboratories. The elbow shape of the PERM is ideal for applications with limited space where straight lengths of ductwork are not available.

CONSTRUCTION OPTIONS

- + Construction Type
 - 22 gauge
 - 18 gauge
 - 16 gauge
 - 10 gauge
- + Material
 - Galvanized Steel
 - Aluminum
 - 304 Stainless Steel
 - 316 Stainless Steel
 - Galvanneal
- + Accessories
 - Flanges
 - Slip & drive connections
 - Access doors
 - Transitions
 - Drainage plugs

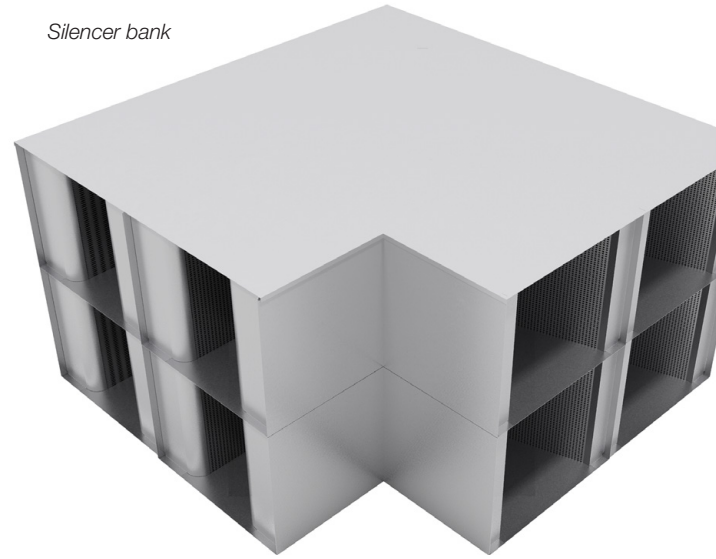
PERM

Rectangular Elbow Silencer Packless

DESIGN FLEXIBILITY

- + Available in a large range of sizes, the PERM offers excellent flexibility to accommodate a variety of ductwork designs. For non-standard sizes, the PERM can be custom built to suit the ductwork and application.
- + Elbow silencers that exceed a width of 59 in. or a height of 48 in. will be built in multiple components, then field assembled (by others) into a bank that matches the duct dimensions.

Silencer bank



OPTIMIZED PERFORMANCE

- + Ideal for low to medium velocity applications, the PERM provides high levels of insertion loss across the targeted range of frequencies, and makes use of a tapered tail baffle arrangement to allow for static regain and minimize pressure drop.

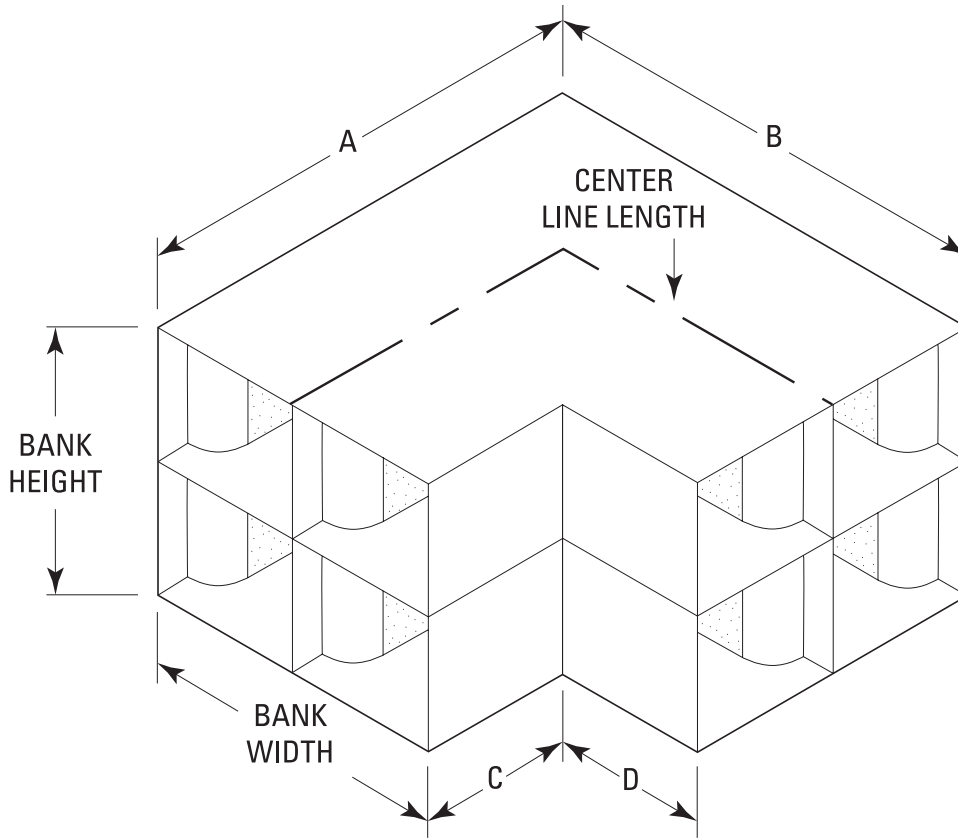


PERM

Rectangular Elbow Silencer Packless

DIMENSIONAL DATA

The PERM is built to match the duct dimensions, therefore the width, height and length dimensions for the silencer must always be specified.



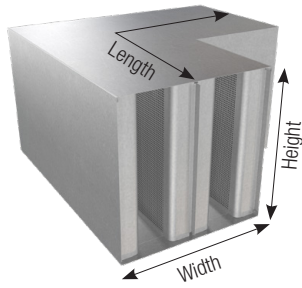
*Bank width & height typically equal the duct dimensions.

Standard Dimension Limits

Bank Width		Bank Height		Center Line Length		Component Width		Component Height	
Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
12	118	6	480	36	144	12	59	6	48

Leg A		Leg B		Leg C		Leg D	
Min	Max	Min	Max	Min	Max	Min	Max
19	101	19	101	7	94	7	94

1. All dimensions are in inches.
2. Standard sizes are based on raw material sizes and acceptable structural engineering practices.
3. Bank Width greater than 59" requires two components.
4. When multiple components are required, components will be identical, and configuration type nested.
5. For sizes outside the standard range, please contact your local sales representative.



PERFORMANCE DATA

Width (in.): 24

Pressure Attenuation (PA) Code: B

Modules: 2

Dynamic Insertion Loss (DIL)

Length (in.)	Weight (lbs)	Face Velocity (FPM)	Pressure Drop (in. w.g.)	Octave Band Dynamic Insertion Loss (dB)							
				63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
38	75	+1250	0.14	5	6	15	20	19	13	9	7
		+750	0.05	5	5	13	18	16	11	9	7
		0	0	5	3	10	16	14	10	8	7
		-750	0.05	6	5	13	19	16	11	9	8
		-1250	0.14	6	6	15	21	19	12	9	8
60	118	+1250	0.16	6	6	15	21	21	14	10	8
		+750	0.06	6	5	14	20	18	12	10	8
		0	0	5	4	11	17	15	11	9	8
		-750	0.06	7	5	14	20	18	13	10	8
		-1250	0.16	7	7	16	22	20	14	10	8
84	166	+1250	0.18	8	8	17	25	24	17	13	10
		+750	0.06	7	7	16	22	21	15	12	10
		0	0	6	5	13	19	19	14	12	10
		-750	0.06	8	7	16	23	21	15	12	10
		-1250	0.18	8	8	19	26	22	16	12	10
108	213	+1250	0.2	9	8	17	25	24	17	15	12
		+750	0.07	9	8	17	25	24	17	15	12
		0	0	7	5	15	21	23	17	14	12
		-750	0.07	10	9	18	26	25	17	14	11
		-1250	0.2	10	10	21	30	24	19	14	11

Generated Noise (GN)

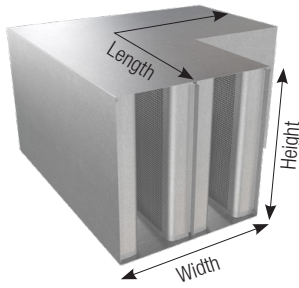
Length (in.)	Face Velocity (fpm)	Octave Band Generated Noise (dB)							
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
All Lengths	+1250	59	44	41	44	46	50	50	40
	+750	42	26	27	34	37	34	34	20
	0	30	25	20	15	10	10	10	10
	-750	44	26	30	35	36	33	33	21
	-1250	56	42	40	43	46	47	49	40

Generated Noise Correction Factors

Face Area (sq. ft.)	0.5	1	2	4	8	16	32	64	128
dB	-9	-6	-3	0	+3	+6	+9	+12	+15

Performance Notes:

1. Data tables are derived from test data in conformance with ASTM E477-20.
2. "+" indicates performance data for forward flow (supply) applications.
3. "-" indicates performance data for reverse flow (return) applications.
4. Dynamic Insertion Loss is limited to 55 dB due to flanking.
5. For performance data specific to a configuration not cataloged, please use Price AIO Selection Software.
6. The performance data above is based on a 24 x 24 component.



PERFORMANCE DATA

Width (in.): 24

Pressure Attenuation (PA) Code: D

Modules: 2

Dynamic Insertion Loss (DIL)

Length (in.)	Weight (lbs)	Face Velocity (FPM)	Pressure Drop (in. w.g.)	Octave Band Dynamic Insertion Loss (dB)							
				63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
38	77	+1250	0.21	7	7	17	22	23	15	11	9
		+750	0.08	7	6	15	21	19	13	10	9
		0	0	7	4	12	18	16	12	10	9
		-750	0.08	8	6	15	21	19	13	10	9
		-1250	0.21	9	8	17	23	23	15	10	9
60	122	+1250	0.25	9	8	18	24	24	17	0	10
		+750	0.09	8	7	16	22	21	15	11	10
		0	0	8	5	13	19	18	13	11	10
		-750	0.09	9	7	16	23	21	15	11	10
		-1250	0.25	10	9	19	25	24	16	11	10
84	170	+1250	0.29	11	10	20	28	28	20	15	13
		+750	0.11	10	9	18	25	25	18	14	12
		0	0	9	6	15	21	22	17	14	12
		-750	0.11	12	10	19	26	25	18	14	12
		-1250	0.29	12	11	22	29	26	19	14	12
108	219	+1250	0.34	14	12	23	32	31	23	17	15
		+750	0.12	13	10	20	28	29	20	17	15
		0	0	10	7	18	24	27	20	16	14
		-750	0.12	14	12	21	29	30	20	16	14
		-1250	0.34	14	13	24	34	28	22	16	14

Generated Noise (GN)

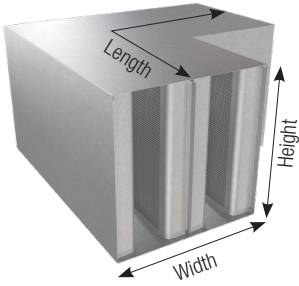
Length (in.)	Face Velocity (fpm)	Octave Band Generated Noise (dB)							
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
All Lengths	+1250	68	54	49	49	51	59	59	52
	+750	51	36	35	39	42	43	43	32
	0	30	25	20	15	10	10	10	10
	-750	51	35	36	40	41	41	42	31
	-1250	63	50	46	48	51	55	58	50

Generated Noise Correction Factors

Face Area (sq. ft.)	0.5	1	2	4	8	16	32	64	128
dB	-9	-6	-3	0	+3	+6	+9	+12	+15

Performance Notes:

1. Data tables are derived from test data in conformance with ASTM E477-20.
2. "+" indicates performance data for forward flow (supply) applications.
3. "-" indicates performance data for reverse flow (return) applications.
4. Dynamic Insertion Loss is limited to 55 dB due to flanking.
5. For performance data specific to a configuration not cataloged, please use Price AIO Selection Software.
6. The performance data above is based on a 24 x 24 component.



PERFORMANCE DATA

Width (in.): 24

Pressure Attenuation (PA) Code: F

Modules: 2

Dynamic Insertion Loss (DIL)

Length (in.)	Weight (lbs)	Face Velocity (FPM)	Pressure Drop (in. w.g.)	Octave Band Dynamic Insertion Loss (dB)							
				63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
38	77	+1250	0.61	7	9	19	24	27	20	16	14
		+750	0.22	7	9	19	22	23	17	16	14
		0	0	9	7	16	19	19	16	15	13
		-750	0.22	9	10	19	23	22	17	16	13
		-1250	0.61	10	12	22	24	26	17	15	13
60	122	+1250	0.63	9	10	20	26	28	21	18	15
		+750	0.23	8	9	20	23	25	19	17	15
		0	0	9	8	17	21	21	17	16	14
		-750	0.23	10	11	20	25	24	18	17	14
		-1250	0.63	11	13	23	26	27	19	16	14
84	170	+1250	0.66	11	12	23	30	32	25	20	18
		+750	0.24	10	11	22	27	29	22	20	18
		0	0	10	9	20	23	26	20	19	16
		-750	0.24	12	14	23	28	28	21	19	16
		-1250	0.66	13	15	26	30	29	22	19	16
108	219	+1250	0.69	14	14	25	34	35	28	23	20
		+750	0.25	13	13	24	30	33	25	23	20
		0	0	12	10	22	25	30	23	21	18
		-750	0.25	15	16	25	31	33	24	22	18
		-1250	0.69	15	17	29	35	32	25	22	17

Generated Noise (GN)

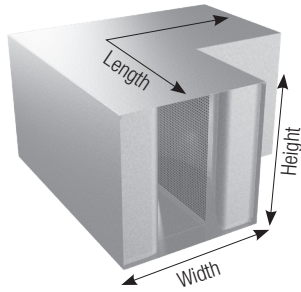
Length (in.)	Face Velocity (fpm)	Octave Band Generated Noise (dB)							
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
All Lengths	+1250	82	68	60	57	59	73	71	67
	+750	65	50	46	47	50	56	55	47
	0	30	25	20	15	10	10	10	10
	-750	61	47	44	46	49	52	55	46
	-1250	73	63	55	55	59	67	70	65

Generated Noise Correction Factors

Face Area (sq. ft.)	0.5	1	2	4	8	16	32	64	128
dB	-9	-6	-3	0	+3	+6	+9	+12	+15

Performance Notes:

1. Data tables are derived from test data in conformance with ASTM E477-20.
2. "+" indicates performance data for forward flow (supply) applications.
3. "-" indicates performance data for reverse flow (return) applications.
4. Dynamic Insertion Loss is limited to 55 dB due to flanking.
5. For performance data specific to a configuration not cataloged, please use Price AIO Selection Software.
6. The performance data above is based on a 24 x 24 component.



PERFORMANCE DATA

Width (in.): 24

Pressure Attenuation (PA) Code: B

Modules: 1

Dynamic Insertion Loss (DIL)

Length (in.)	Weight (lbs)	Face Velocity (FPM)	Pressure Drop (in. w.g.)	Octave Band Dynamic Insertion Loss (dB)							
				63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
38	61	+1250	0.09	3	6	14	16	10	8	6	4
		+750	0.03	2	5	14	15	9	8	5	4
		0	0	2	4	14	12	9	6	3	4
		-750	0.03	6	5	14	13	9	6	3	3
		-1250	0.09	4	5	14	14	10	6	4	4
60	97	+1250	0.1	6	7	16	21	13	11	8	6
		+750	0.04	6	6	16	20	11	10	7	6
		0	0	6	5	16	17	10	8	5	5
		-750	0.04	8	7	16	18	10	8	5	5
		-1250	0.1	7	7	16	19	12	9	6	5
84	135	+1250	0.11	9	9	19	26	15	13	10	8
		+750	0.04	10	8	18	25	13	12	10	7
		0	0	10	7	17	22	11	10	8	7
		-750	0.04	10	8	18	23	12	11	8	6
		-1250	0.11	11	9	19	25	14	12	8	7
108	174	+1250	0.12	12	10	22	32	17	16	13	9
		+750	0.04	13	9	20	30	14	15	13	9
		0	0	14	9	19	28	13	13	10	8
		-750	0.04	13	9	20	29	14	13	10	8
		-1250	0.12	14	11	22	31	17	14	10	8

Generated Noise (GN)

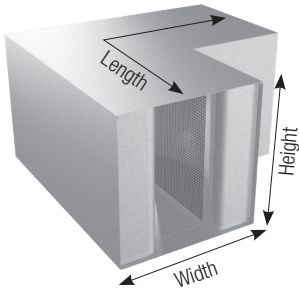
Length (in.)	Face Velocity (fpm)	Octave Band Generated Noise (dB)							
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
All Lengths	+1250	59	44	41	44	46	50	50	40
	+750	42	26	27	34	37	34	34	20
	0	30	25	20	15	10	10	10	10
	-750	44	26	30	35	36	33	33	21
	-1250	56	42	40	43	46	47	49	40

Generated Noise Correction Factors

Face Area (sq. ft.)	0.5	1	2	4	8	16	32	64	128
dB	-9	-6	-3	0	+3	+6	+9	+12	+15

Performance Notes:

1. Data tables are derived from test data in conformance with ASTM E477-20.
2. "+" indicates performance data for forward flow (supply) applications.
3. "-" indicates performance data for reverse flow (return) applications.
4. Dynamic Insertion Loss is limited to 55 dB due to flanking.
5. For performance data specific to a configuration not cataloged, please use Price AIO Selection Software.
6. The performance data above is based on a 24 x 24 component.



PERFORMANCE DATA

Width (in.): 24

Pressure Attenuation (PA) Code: D

Modules: 1

Dynamic Insertion Loss (DIL)

Length (in.)	Weight (lbs)	Face Velocity (FPM)	Pressure Drop (in. w.g.)	Octave Band Dynamic Insertion Loss (dB)							
				63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
38	63	+1250	0.33	6	9	16	18	13	9	5	5
		+750	0.12	5	7	15	17	11	8	5	5
		0	0	4	5	16	15	11	8	5	6
		-750	0.12	7	8	18	16	11	8	5	5
		-1250	0.33	7	8	17	17	12	8	5	5
60	100	+1250	0.3	9	10	18	23	15	11	7	6
		+750	0.11	8	8	17	22	13	11	7	6
		0	0	7	7	18	19	12	10	7	7
		-750	0.11	10	9	19	21	12	10	7	6
		-1250	0.3	11	10	20	23	14	11	7	7
84	140	+1250	0.28	12	11	21	29	17	14	10	8
		+750	0.1	12	10	20	27	15	13	10	8
		0	0	11	8	19	25	13	12	10	8
		-750	0.1	12	11	21	26	14	13	10	8
		-1250	0.28	14	12	23	29	16	13	10	8
108	180	+1250	0.25	15	12	24	34	19	17	12	10
		+750	0.09	16	11	22	32	16	16	12	10
		0	0	15	10	21	30	15	15	12	10
		-750	0.09	15	12	23	31	16	15	12	10
		-1250	0.25	17	14	26	35	18	16	12	10

Generated Noise (GN)

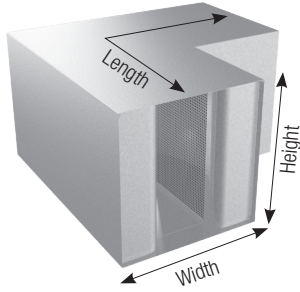
Length (in.)	Face Velocity (fpm)	Octave Band Generated Noise (dB)							
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
All Lengths	+1250	68	54	49	49	51	59	59	52
	+750	51	36	35	39	42	43	43	32
	0	30	25	20	15	10	10	10	10
	-750	51	35	36	40	41	41	42	31
	-1250	63	50	46	48	51	55	58	50

Generated Noise Correction Factors

Face Area (sq. ft.)	0.5	1	2	4	8	16	32	64	128
dB	-9	-6	-3	0	+3	+6	+9	+12	+15

Performance Notes:

1. Data tables are derived from test data in conformance with ASTM E477-20.
2. "+" indicates performance data for forward flow (supply) applications.
3. "-" indicates performance data for reverse flow (return) applications.
4. Dynamic Insertion Loss is limited to 55 dB due to flanking.
5. For performance data specific to a configuration not cataloged, please use Price AIO Selection Software.
6. The performance data above is based on a 24 x 24 component.



PERFORMANCE DATA

Width (in.): 24

Pressure Attenuation (PA) Code: F

Modules: 1

Dynamic Insertion Loss (DIL)

Length (in.)	Weight (lbs)	Face Velocity (FPM)	Pressure Drop (in. w.g.)	Octave Band Dynamic Insertion Loss (dB)							
				63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
38	64	+1250	0.79	6	13	26	23	12	12	8	9
		+750	0.28	5	11	29	20	10	11	9	9
		0	0	5	10	30	16	9	11	9	8
		-750	0.28	8	12	22	18	14	11	10	9
		-1250	0.79	8	12	22	18	15	11	10	9
60	102	+1250	0.75	9	9	12	21	25	19	16	13
		+750	0.27	8	8	11	22	23	17	15	13
		0	0	9	9	10	22	21	15	14	12
		-750	0.27	10	13	23	22	15	13	12	10
		-1250	0.75	11	13	24	23	17	13	12	10
84	142	+1250	0.71	12	13	24	30	21	19	16	13
		+750	0.26	12	12	24	29	19	17	16	13
		0	0	12	12	23	26	17	16	15	12
		-750	0.26	13	15	25	28	17	16	15	12
		-1250	0.71	15	15	27	30	20	16	15	12
108	183	+1250	0.68	15	14	26	36	23	22	18	15
		+750	0.24	16	13	26	34	20	20	18	15
		0	0	16	13	25	32	18	18	17	14
		-750	0.24	15	16	27	33	19	19	17	14
		-1250	0.68	18	17	30	36	22	19	17	14

Generated Noise (GN)

Length (in.)	Face Velocity (fpm)	Octave Band Generated Noise (dB)							
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
All Lengths	+1250	82	68	60	57	59	73	71	67
	+750	65	50	46	47	50	56	55	47
	0	30	25	20	15	10	10	10	10
	-750	61	47	44	46	49	52	55	46
	-1250	73	63	55	55	59	67	70	65

Generated Noise Correction Factors

Face Area (sq. ft.)	0.5	1	2	4	8	16	32	64	128
dB	-9	-6	-3	0	+3	+6	+9	+12	+15

Performance Notes:

1. Data tables are derived from test data in conformance with ASTM E477-20.
2. "+" indicates performance data for forward flow (supply) applications.
3. "-" indicates performance data for reverse flow (return) applications.
4. Dynamic Insertion Loss is limited to 55 dB due to flanking.
5. For performance data specific to a configuration not cataloged, please use Price AIO Selection Software.
6. The performance data above is based on a 24 x 24 component.



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