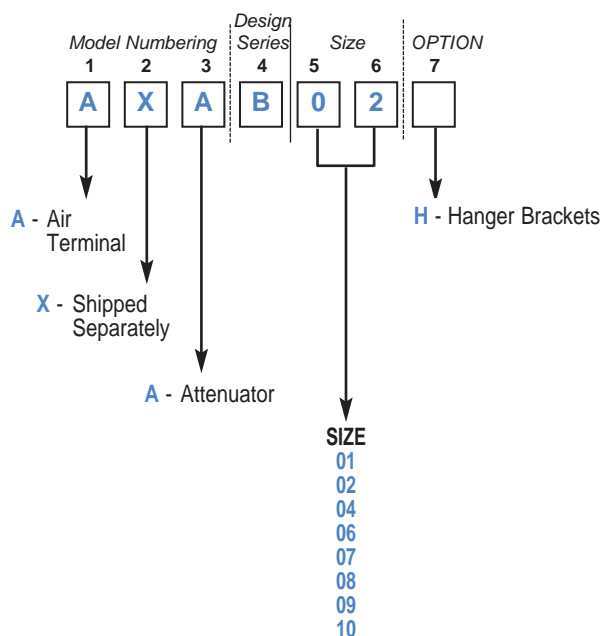


DIMENSIONS (Listed in Inches)						
DISCHARGE SOUND ATTENUATOR						
UNIT SIZE				A	B	C
SIZE	AV	AD	AB			
01	05/06	---	---	12 (305)	8 (203)	34-1/2 (876)
02	07/08	0505/0606/0707/0808	06/07/08	12 (305)	10 (254)	34-1/2 (876)
04	10	1010	10	14 (356)	12-1/2 (318)	34-1/2 (876)
06	12	1212	12	16 (405)	15 (381)	34-1/2 (876)
07	14	1414	14	20 (508)	17-1/2 (445)	22-1/2 (571)
08	---	1616	16	24 (610)	17-1/2 (445)	22-1/2 (571)
09	18/24	---	18/24	32 (813)	17-1/2 (445)	22-1/2 (571)
10	16	---	---	24 (610)	18 (457)	22-1/2 (571)

## MODEL NUMBERING SYSTEM - Model AXA



## FEATURES

- Sturdy 24 gauge galvanized steel construction.
- Convenient Slip and Drive connection on the inlet and outlet.
- Insulation is 1" thick, 1.5 lb./cu. ft. dual density fiberglass material (others available).
- Optional hanger brackets.



[Patent 5,663,535]

### ▼ Model AXPA

The Carnes Model AXPA Clean Air Silencer has been designed and engineered to reduce discharge sound levels of Clean Air Terminal Units. The Model AXPA is a “reactive type” silencer which attenuates discharge noise levels from air terminals and other devices without the use of sound absorptive materials such as fiberglass, mineral wool, etc. This eliminates indoor air quality concerns when using the Model AXPA Silencer.

Most other manufactured sound attenuators require a considerable amount of straight duct upstream to achieve any reduction in sound levels. The straight duct is necessary to allow the air flow to become uniform after being discharged from a VAV terminal unit. Most HVAC systems today have limited space available and additional upstream duct is not permitted or cost effective. The Model AXPA Silencer does not require additional straight duct upstream because it is designed and tuned specifically to straighten the air pattern and attenuate sound directly after the VAV damper.

The Model AXPA Silencer has an integral air flow straightening section upstream of the sound attenuating section. The air flow straightening

section consists of a short piece of straight duct upstream of a long radius elliptical flow nozzle to minimize turbulence (self noise) and to reduce pressure drop of the silencer. This unique feature allows for direct coupling of the Model AXPA Silencer to the Clean Air Terminal Unit without the use of any transitions or flow straightening ducts.

Through extensive acoustic tuning and laboratory testing conducted in accordance with ARI Standard 880, the Model AXPA Silencer has proven to effectively reduce discharge sound levels of air terminals. The testing and rating (per ARI 880) was conducted with the Model AXPA Silencer connected directly to the Clean Air Terminal Unit. This unique testing configuration provides the designer with real world test results, eliminating questions regarding the VAV damper effect on the silencer performance.

All Model AXPA Silencers include a removable access door. This access door allows for periodic cleaning of the sound attenuating cavity. Model AXPA Clean Air Silencers combined with the Clean Air Terminals are an excellent choice for hospital, clean room and laboratory applications.

#### *Features Include:*

- No insulation or sound absorptive material in the airstream makes this unit an excellent choice for clean-room, hospital and laboratory applications.
- Low pressure drop design.
- Convenient slip and drive connection on inlet and outlet. Sized to match Clean Air Terminal Units.
- Sturdy 22 gauge galvanized steel construction.
- Gasketed access panel to allow for cleaning.
- Tuned for direct connection to air terminals. No need for additional air straightening duct upstream.
- Air flow capacities to 4200 CFM.
- Optional hanger brackets (Unattached).
- Optional 1” external thermally insulated casings must meet **UL** Test 181 for erosion resistance and **NFPA** 90A requirements for 250°F continuous temperature.
- Shipped separately (consult factory for shipping attached).

**Models AVC, AVW and AVE with and without AXPA Clean Air Silencer  
Sound Data (Discharge Noise Criteria)**

**Discharge Sound Power**

Inlet Size (In.)	CFM	Minimum $\Delta P_s$ (Damper Full Open)			Min. $\Delta P_s$		1.0" $\Delta P_s$		1.5" $\Delta P_s$		3.0" $\Delta P_s$	
		AVC AVE	AVW 1-Row	AVW 2-Row	AVC AVE	AVW	AVC AVE	AVW	AVC AVE	AVW	AVC AVE	AVW
		w/AXPA	w/AXPA	w/AXPA	w/AXPA	w/AXPA	w/AXPA	w/AXPA	w/AXPA	w/AXPA	w/AXPA	w/AXPA
5	75	.01	.02	.02	--	--	10	11	10	12	11	14
	100	.02	.04	.04	--	--	11	13	12	13	13	15
	200	.08	.14	.16	--	10	15	16	16	18	18	22
	300	.20	.33	.36	11	12	19	20	21	22	23	27
	350	.29	.45	.49	11	13	19	20	21	22	23	27
6	110	.01	.02	.04	--	--	11	12	12	13	14	16
	200	.03	.07	.10	--	--	13	14	14	15	17	22
	300	.07	.15	.18	10	11	16	16	18	19	21	27
	400	.15	.27	.31	10	12	16	16	18	20	21	27
	500	.25	.42	.46	11	13	18	19	20	21	25	28
7	140	.00	.01	.01	--	--	13	13	13	15	15	22
	200	.01	.02	.04	--	--	14	14	14	16	18	23
	400	.05	.11	.14	--	--	15	16	16	16	19	24
	600	.13	.25	.35	10	11	18	19	19	20	21	27
	700	.19	.35	.48	10	11	18	19	19	21	21	27
8	185	.01	.03	.05	--	--	13	14	14	15	20	20
	400	.04	.14	.20	--	--	14	15	15	16	21	21
	600	.10	.29	.41	10	10	16	16	18	19	23	23
	800	.20	.50	.68	10	11	16	16	18	19	23	23
	1000	.33	.75	1.01	11	12	16	16	18	19	23	24
10	300	.00	.02	.05	--	--	14	14	15	18	22	25
	500	.00	.05	.10	--	--	14	14	15	18	22	25
	800	.00	.11	.22	--	--	15	15	16	18	22	25
	1200	.00	.22	.42	--	10	17	17	19	19	23	26
	1500	.00	.33	.60	--	10	17	18	19	19	23	26
12	430	.01	.03	.05	--	--	13	17	14	19	18	23
	800	.02	.09	.13	--	--	13	17	15	19	19	24
	1200	.05	.20	.29	--	10	14	17	17	20	22	27
	1800	.13	.41	.61	--	11	15	18	17	20	23	27
	2300	.22	.65	.94	10	13	15	18	19	20	25	28
14	600	.00	.01	.03	--	--	14	15	15	18	22	24
	1000	.01	.04	.11	--	--	14	15	15	18	22	24
	1600	.01	.12	.21	--	--	14	16	16	19	22	25
	2400	.03	.29	.41	10	12	15	16	19	20	27	27
	3100	.06	.51	.63	10	13	15	16	19	20	27	27
16	780	.01	.03	.06	--	--	13	13	14	14	19	20
	1600	.04	.12	.18	--	--	14	13	15	15	20	22
	2400	.09	.26	.38	10	11	15	15	18	18	23	25
	3600	.21	.56	.77	12	13	15	15	18	18	23	25
	4200	.29	.74	1.01	13	16	15	16	18	19	25	26

- NOTES:**
1.  $\Delta P_s$  static pressure difference from inlet to discharge.
  2.  $\Delta P_s$  is the minimum pressure required to deliver CFM shown with the primary damper in wide open position.
  3. Dash (-) indicates NC level less than 10.

NC levels are derived from tests conducted in accordance with ARI Standard 880-2008 and are calculated in accordance with ARI Standard 885-2008 as application data. NC is not part of the ARI certification program.

- Discharge NC levels are based on —
- a) 5 foot rectangular duct.
  - b) 5 foot lined flex duct (8" diameter).
  - c) Space effect factor (2400 ft<sup>3</sup>) at 5 feet from outlet.
  - d) End reflection.
  - e) Environmental adjustment factor.

**Models AVC, AVE with AXPA Clean Air Silencer**  
**Sound Data (Sound Power by Octave Band)**

**Discharge Sound Power**

Inlet Unit Size (In.)	CFM	Minimum $\Delta P_s$							1.0" $\Delta P_s$							1.5" $\Delta P_s$							3.0" $\Delta P_s$						
		Sound Power (db) by Octave Band							Sound Power (db) by Octave Band							Sound Power (db) by Octave Band							Sound Power (db) by Octave Band						
		(2)	(3)	(4)	(5)	(6)	(7)	(7)	(2)	(3)	(4)	(5)	(6)	(7)	(7)	(2)	(3)	(4)	(5)	(6)	(7)	(7)	(2)	(3)	(4)	(5)	(6)	(7)	(7)
5	75	.01	33	24	18	18	16	19	45	34	30	34	38	37	46	36	33	38	42	41	48	40	38	43	48	47			
	100	.02	36	27	22	22	20	22	49	37	33	36	39	37	50	40	35	39	43	41	52	44	40	45	49	48			
	200	.08	44	34	30	32	32	29	57	46	39	40	42	39	59	48	42	43	46	43	61	52	46	48	52	49			
	300	.20	48	38	36	37	38	33	62	51	43	42	43	40	64	53	45	45	47	44	66	57	50	51	53	50			
	350	.29	50	40	38	39	41	34	64	52	44	42	44	40	66	55	47	46	48	44	68	58	51	51	54	51			
6	110	.01	32	21	18	17	15	18	48	37	31	35	36	33	50	41	35	39	40	37	53	47	41	45	47	43			
	200	.03	40	30	26	25	25	24	54	42	36	39	40	37	56	46	40	42	43	41	60	52	46	48	50	47			
	300	.07	45	35	31	31	32	28	59	46	40	41	42	39	61	49	43	45	46	43	64	55	50	51	52	49			
	400	.15	49	40	34	35	37	31	62	48	42	43	43	41	64	52	46	46	47	44	67	58	52	52	54	51			
	500	.25	51	43	37	38	41	33	64	50	44	44	45	42	66	54	48	48	48	46	70	60	54	54	55	52			
7	140	.00	33	21	18	17	16	20	52	42	38	38	38	37	53	45	43	41	42	41	55	51	50	48	48	47			
	200	.01	37	26	22	23	22	24	55	44	39	39	40	38	56	47	44	42	44	42	58	53	52	49	50	48			
	400	.05	44	34	32	33	33	31	61	48	42	40	43	41	62	51	46	44	47	45	64	57	54	51	53	51			
	600	.13	49	38	37	39	40	35	64	50	43	42	45	43	65	53	48	45	49	47	67	59	55	52	55	53			
	700	.19	51	40	39	41	42	37	65	51	44	42	46	44	66	54	48	46	50	47	68	60	56	52	56	54			
8	185	.01	35	22	18	17	15	17	53	46	40	41	41	40	55	49	45	45	44	43	59	55	53	51	50	49			
	400	.04	43	32	30	29	30	29	59	49	42	42	45	44	61	53	47	46	48	47	64	59	55	52	54	53			
	600	.10	47	38	37	36	38	35	62	51	43	42	47	46	64	55	48	46	50	49	67	61	55	53	56	55			
	800	.20	49	41	42	40	43	39	64	52	44	43	48	47	66	56	48	46	51	51	69	62	56	53	57	56			
	1000	.33	52	44	45	44	48	42	65	53	44	43	49	48	67	57	49	47	52	52	70	63	57	53	58	58			
10	300	-.00	33	19	16	15	15	17	55	46	45	53	48	45	57	50	49	57	52	49	60	57	57	65	59	56			
	500	-.00	37	26	24	24	23	23	59	49	46	53	50	48	61	53	50	57	54	52	64	60	58	65	61	58			
	800	-.00	41	31	31	32	31	27	63	51	46	53	51	50	65	55	51	57	55	54	68	62	59	64	62	61			
	1200	-.00	45	37	37	39	38	32	66	53	47	53	52	52	68	57	52	57	56	56	71	64	60	64	63	63			
	1500	-.00	46	39	41	43	42	34	68	54	48	53	53	53	70	58	52	57	57	57	73	65	60	64	64	64			
12	430	.01	35	20	16	17	13	14	55	45	42	51	46	43	58	49	46	55	50	46	64	56	53	62	56	52			
	800	.02	41	29	28	29	27	26	59	49	44	51	50	47	63	53	48	55	53	51	68	60	55	62	59	57			
	1200	.05	46	35	36	36	36	34	62	51	46	51	52	51	66	55	50	55	55	54	71	62	57	62	61	60			
	1800	.13	50	42	44	44	46	41	66	54	48	51	54	54	69	58	52	55	58	57	75	65	59	62	63	63			
	2300	.22	53	45	49	48	52	46	67	55	49	51	56	56	71	59	53	55	59	59	76	66	60	62	65	65			
14	600	.00	33	20	15	16	13	15	57	50	47	53	49	47	61	54	52	57	52	50	67	60	59	64	58	56			
	1000	.01	41	29	26	26	24	24	61	52	48	53	51	51	64	56	53	57	55	54	70	62	60	64	61	60			
	1600	.01	47	37	35	36	35	32	64	54	49	53	54	54	68	58	53	58	57	58	74	64	61	65	63	63			
	2400	.03	53	44	44	44	44	39	67	55	50	54	56	57	71	59	54	58	59	61	77	66	62	65	65	66			
	3100	.06	57	48	49	49	49	44	69	56	50	54	57	59	73	60	55	58	61	63	79	67	62	65	67	68			
16	780	.01	38	23	14	17	12	14	59	49	44	52	50	49	62	53	47	56	53	52	68	59	53	63	58	57			
	1600	.04	49	36	31	32	31	31	64	53	48	53	54	54	67	57	52	57	57	57	72	63	58	64	61	62			
	2400	.09	55	44	41	41	42	41	66	56	50	53	56	57	70	59	54	58	59	60	75	66	60	65	63	65			
	3600	.21	62	51	50	50	52	51	69	58	53	54	58	60	72	62	56	58	61	63	78	68	62	65	66	68			
	4200	.29	64	54	54	53	56	54	70	59	54	54	59	61	73	63	57	58	62	64	79	69	63	65	66	69			

- NOTES:**
1. Based on tests conducted in accordance with ARI Standard 880-2008.
  2.  $\Delta P_s$  static pressure difference from inlet to discharge.
  3.  $\Delta P_s$  is the minimum pressure required to deliver CFM shown with primary damper in wide open position.



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**Model AVW with AXPA Clean Air Silencer**  
**Sound Data (Sound Power by Octave Band)**

**Discharge Sound Power**

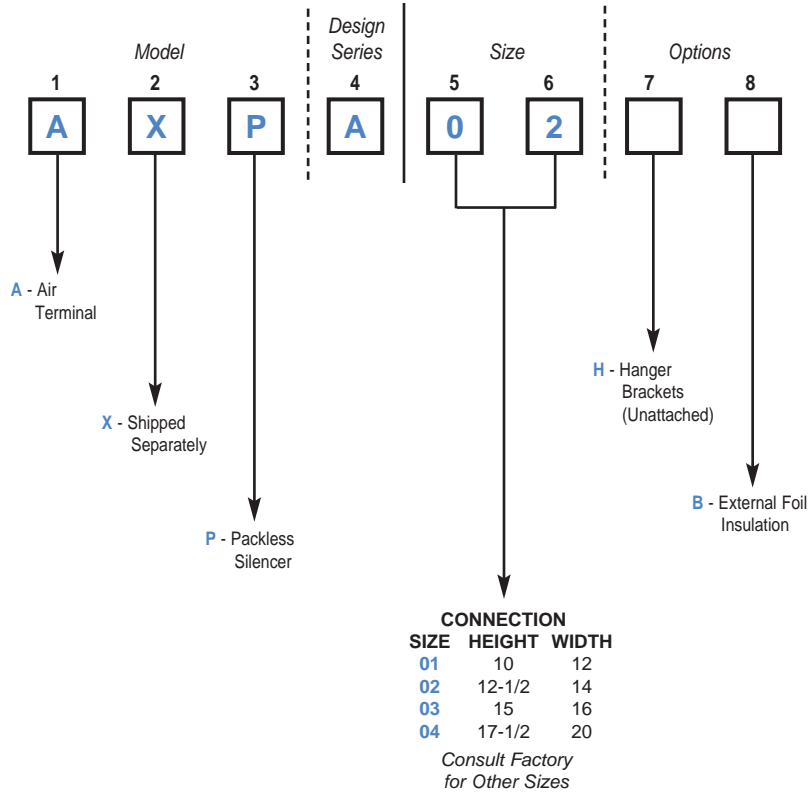
Inlet Unit Size (In.)	CFM	Minimum $\Delta P_s$							1.0" $\Delta P_s$							1.5" $\Delta P_s$							3.0" $\Delta P_s$							
		$\Delta P_s$	Sound Power (db) by Octave Band							Sound Power (db) by Octave Band							Sound Power (db) by Octave Band							Sound Power (db) by Octave Band						
			(2)	(3)	(4)	(5)	(6)	(7)	(2)	(3)	(4)	(5)	(6)	(7)	(2)	(3)	(4)	(5)	(6)	(7)	(2)	(3)	(4)	(5)	(6)	(7)				
5	75	.02	34	22	16	19	15	17	49	40	32	37	37	38	49	43	35	41	42	42	50	47	41	47	49	49				
	100	.04	37	25	20	22	20	21	52	43	34	39	40	39	52	46	38	43	44	44	53	50	44	49	51	51				
	200	.14	46	35	29	31	31	29	59	50	41	44	45	44	60	53	44	47	50	48	60	57	50	54	57	55				
	300	.33	50	40	35	36	38	34	63	54	44	46	48	46	64	57	48	50	53	50	65	61	54	56	60	57				
	350	.45	52	42	37	38	40	36	65	56	46	47	50	47	65	58	49	51	54	51	66	62	56	57	61	58				
6	110	.02	33	21	15	15	16	19	49	41	33	39	42	39	51	45	38	43	46	43	54	52	45	50	52	49				
	200	.07	41	32	26	26	30	30	55	46	40	43	46	43	57	50	44	47	50	47	60	57	51	54	56	53				
	300	.15	46	39	33	34	39	37	59	49	44	46	49	47	61	54	48	50	52	50	64	61	55	56	59	56				
	400	.27	50	44	38	40	46	42	62	52	47	48	51	49	64	56	51	52	54	52	67	63	58	58	60	58				
	500	.42	52	48	42	44	51	46	65	54	49	49	52	50	67	58	54	53	56	54	70	65	61	60	62	60				
7	140	.01	30	22	18	16	18	20	52	46	43	43	45	44	53	50	47	47	49	48	55	57	55	54	56	55				
	200	.02	35	27	23	22	24	26	55	48	44	44	47	46	56	52	49	48	51	50	58	58	56	55	58	57				
	400	.11	44	36	35	35	37	37	62	51	47	46	51	50	62	55	51	50	55	54	64	62	59	57	62	61				
	600	.25	50	41	41	42	44	43	65	53	48	48	53	52	66	57	53	52	57	56	67	64	60	58	64	63				
	700	.35	52	43	44	45	47	46	66	54	49	48	54	52	67	58	53	52	58	56	69	65	61	59	65	63				
8	185	.03	34	21	16	19	14	14	49	49	38	43	46	44	51	51	43	47	49	48	53	55	51	54	55	56				
	400	.14	43	33	29	31	30	28	56	53	41	45	48	46	57	55	46	49	51	51	60	59	54	56	57	58				
	600	.29	47	39	36	37	38	35	59	55	43	46	49	47	60	57	48	50	52	52	63	61	56	57	58	59				
	800	.50	50	44	41	42	44	40	61	56	45	46	50	48	63	59	49	50	53	53	65	63	57	58	59	60				
	1000	.75	52	47	44	45	49	44	63	58	46	47	50	49	65	60	50	51	54	53	67	64	58	58	60	61				
10	300	.02	41	21	17	16	18	21	55	49	47	54	52	51	57	53	52	59	56	54	59	60	60	66	63	61				
	500	.05	44	28	26	26	28	29	58	51	49	55	54	54	60	55	53	59	58	58	62	62	61	66	65	64				
	800	.11	47	36	34	36	38	37	61	53	50	55	56	57	62	57	55	60	60	61	65	64	63	67	67	67				
	1200	.22	49	42	42	44	47	43	63	55	51	56	58	60	65	59	56	60	62	63	67	66	64	67	69	70				
	1500	.33	50	45	45	48	52	47	64	56	52	56	59	61	66	60	56	60	63	65	69	67	64	68	70	71				
12	430	.03	32	21	19	20	16	17	63	51	44	53	51	48	64	55	49	57	55	51	67	61	56	64	61	56				
	800	.09	42	33	30	33	32	34	64	54	48	54	56	54	66	58	52	58	59	57	69	65	60	65	65	63				
	1200	.20	49	41	38	41	43	44	65	57	50	54	59	58	68	61	54	58	62	62	70	67	62	65	68	67				
	1800	.41	55	49	46	49	54	55	67	59	52	55	62	63	69	63	57	59	65	66	72	69	64	66	71	71				
	2300	.65	59	54	50	54	61	61	68	61	53	55	63	65	69	64	58	59	67	68	72	71	65	66	73	74				
14	600	.01	38	24	17	17	15	16	61	53	53	50	53	53	64	56	55	56	57	57	68	62	58	67	65	63				
	1000	.04	45	34	27	31	30	32	63	56	55	51	55	57	66	59	57	58	60	61	70	65	60	69	68	68				
	1600	.12	51	43	37	43	44	46	65	58	56	53	58	61	68	61	58	59	62	65	72	67	61	70	70	72				
	2400	.29	57	51	45	54	56	58	67	60	57	54	60	65	70	63	59	60	64	69	74	69	63	71	72	75				
	3100	.51	60	56	50	61	64	65	68	61	58	55	61	67	71	64	60	61	66	71	75	70	64	72	74	77				
16	780	.03	37	22	14	15	13	16	59	49	43	51	54	54	62	54	47	56	57	57	67	61	54	64	62	61				
	1600	.12	49	37	31	32	34	38	63	54	48	53	58	60	66	58	52	57	61	63	71	66	58	65	66	67				
	2400	.26	56	45	40	42	47	50	66	57	50	53	60	63	68	61	54	58	63	66	73	69	61	66	68	70				
	3600	.56	64	53	50	52	59	62	68	60	53	54	62	67	71	64	57	59	66	69	76	71	63	67	71	74				
	4200	.74	66	57	54	55	63	66	69	61	54	54	63	68	72	65	57	59	66	71	77	72	64	67	72	75				

- NOTES:**
1. Based on tests conducted in accordance with ARI Standard 880-2008.
  2.  $\Delta P_s$  static pressure difference from inlet to discharge.
  3.  $\Delta P_s$  is the minimum pressure required to deliver CFM shown with primary damper in wide open position.



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Certification Program

[Patent 5,663,535]



**RECOMMENDED SPECIFICATION - Model AXPA Clean Air Silencer**

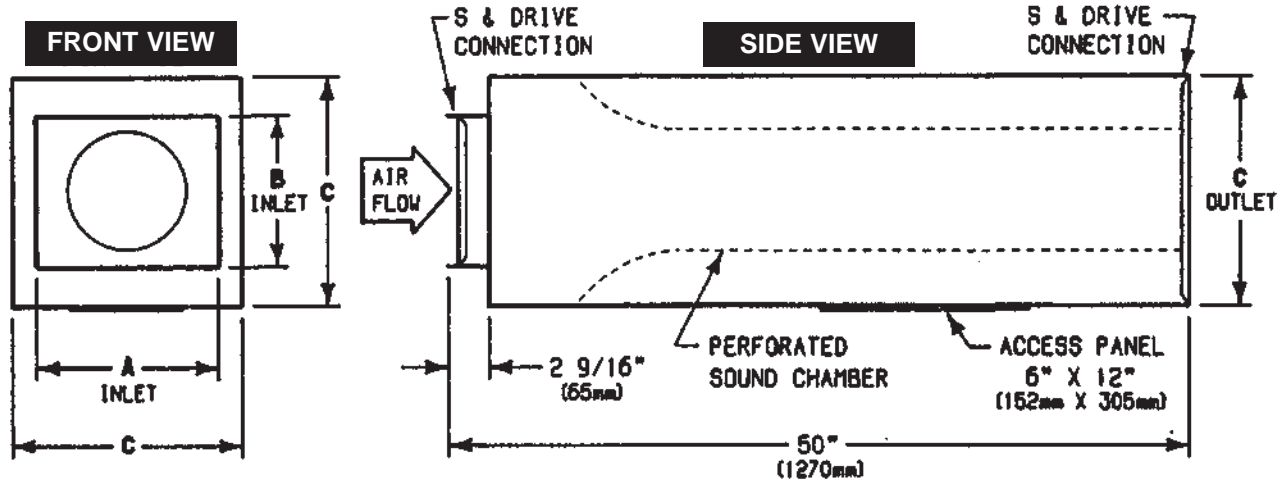
**GENERAL**

Furnish and install Carnes Clean Air Silencers Model AXPA of the size, capacity and performance as shown on plans. The air pressure drop and sound levels for the silencers and terminal units shall not exceed the values shown on plans. All units shall be tested in accordance with ARI Standard 880, and will provide catalog performance without the need for additional duct to straighten air flow.

Provide gasketed access door to allow cleaning of internal chambers. **No sound absorptive or fill material** shall be used inside the silencer. Optional external insulation shall be a minimum 1" thick with a continuous 4 lb./cu. ft. density. The external face of insulation shall be fiber reinforced foil. The insulation must meet **UL Test 181** for erosion resistance and **NFPA 90A** requirements for 250°F continuous temperature. There shall be **NO INSULATION** in the airstream.

**CONSTRUCTION**

The silencer casing shall be constructed of 22 gauge galvanized steel, with slip and drive duct connections. The AXPA Silencer shall be designed for direct connection to Clean Air Terminal Units without using upstream transitions or flow straightening ducts.



CLEAN AIR SILENCER					
DIMENSIONS LISTED IN INCHES (Millimeters)					
UNIT SIZE		INLET		OUTLET	WEIGHT LBS. [Kg.]
AXPA	AV	A	B	C x C	
01	07 - 08	12 (305)	10 (254)	15-1/8 (384)	40 [18]
02	10	14 (356)	12-1/2 (318)	20-1/8 (511)	55 [25]
03	12	16 (405)	15 (381)	20-1/8 (511)	55 [25]
04	14	20 (508)	17-1/2 (445)	24-1/8 (613)	70 [32]

Consult factory for other sizes.