Bulletin “C”

Stoddard Silencers

Specialists in Industrial Silencing

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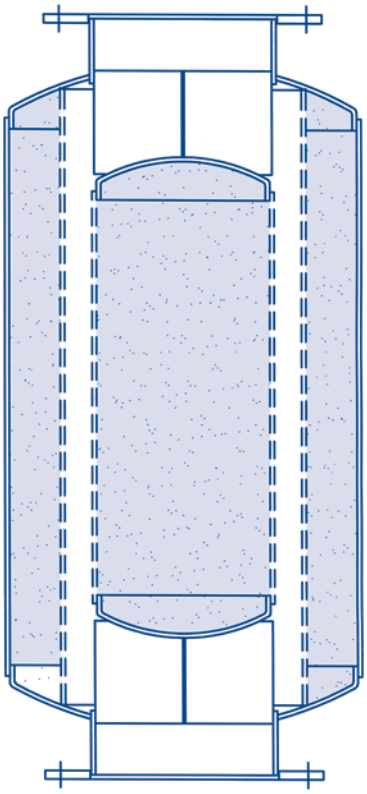
CENTRIFUGAL COMPRESSOR SILENCERS



Stoddard Silencers

Series "C"

Centrifugal Compressor Silencers

The centrifugal compressor compresses air or gas due to the dynamic action of the rotating vanes or impellers importing velocity and pressure to the compressible fluid.

The high speed of the rotary vanes or impellers generate noise that is characteristically high frequency in nature. Normally the frequency with the loudest amount of noise energy is located between the fundamental and second harmonics of the blade passage frequency. Unfortunately the high frequencies generated are in the audible range and can produce a variety of problems with personnel working nearby and/or neighbors some distance away. Centrifugal compressors are normally constructed of heavy cast iron which results in relatively low noise levels radiating from the housing. However, the cast iron construction does not remove the noise contained in the air or gas stream which will ultimately flow through piping and headers that will radiate this noise.

Effective treatment of the intake and discharge noise generated by the centrifugal compressor is accomplished through the use of low pressure-drop absorption-type silencers. All silencers should be located as close as possible to the compressor intake or discharge to minimize the potential noise radiation from piping installed between them. To aid in the installation of these silencers, designs with side connections are available, if so required.

Silencer Size Selection Chart

Silencer Size	Intake Silencer Capacities (ICFM)	Discharge Silencer Capacities (Based on Intake CFM @ 14.7 PSIA and 70°F.)				
		4 PSIG 112°F	6 PSIG 134°F	8 PSIG 156°F	10 PSIG 178°F	12 PSIG 200°F
4	379 - 551	326 - 564	348 - 601	368 - 636	386 - 667	403 - 697
5	552 - 860	565 - 881	602 - 939	637 - 994	668 - 1042	698 - 1090
6	861 - 1235	882 - 1265	940 - 1347	995 - 1426	1043 - 1496	1091 - 1564
8	1236 - 1875	1266 - 2204	1348 - 2349	1427 - 2486	1497 - 2608	1565 - 2726
10	1876 - 2950	2205 - 3474	2350 - 3702	2487 - 3918	2609 - 4110	2727 - 4296
12	2951 - 4250	3475 - 4983	3703 - 5310	3919 - 5619	4111 - 5895	4297 - 6162
14	4251 - 5400	4984 - 6421	5311 - 6842	5620 - 7241	5896 - 7596	6163 - 7941
16	5401 - 7200	6422 - 8452	6843 - 9002	7242 - 9531	7597 - 9998	7942 - 10451
18	7201 - 9150	8453 - 10749	9003 - 11453	9532 - 12121	9999 - 12716	10452 - 13292
20	9151 - 11250	10750 - 13769	11454 - 14671	12122 - 15526	12717 - 16288	13293 - 17026
22	11251 - 13750	13770 - 16186	14672 - 17246	15527 - 18252	16289 - 19147	17027 - 20015
24	13751 - 16500	16187 - 19313	17247 - 20579	18253 - 21779	19148 - 22847	20016 - 23883
26	16501 - 19250	19314 - 22721	20580 - 24210	21780 - 25621	22848 - 26878	23884 - 28097
28	19251 - 22500	22722 - 26408	24211 - 28139	25622 - 29779	26879 - 31240	28098 - 32656
30	22501 - 25750	26409 - 30374	28140 - 32364	29780 - 34251	31241 - 35931	32657 - 37560
32	25751 - 29225	30375 - 35339	32365 - 36590	34252 - 38723	35932 - 40623	37561 - 42464
36	29226 - 37120	35340 - 43616	36591 - 46474	38724 - 49184	40624 - 51597	42465 - 53935
42	37121 - 51950	43617 - 61261	46475 - 65345	49185 - 69027	51598 - 72515	53936 - 75773
48	51951 - 67850	61262 - 80023	65346 - 85358	69028 - 90167	72516 - 94723	75774 - 98978

To convert ICFM to velocity

(A) Intake velocity $= \frac{\text{Intake CFM} \times 186.4}{(\text{Silencer size})^2} = \text{FPM}$

(B) Discharge velocity $= \frac{5.17 \times \text{ICFM} \times (460 + \text{Disch. Temp. °F})}{(\text{Silencer size})^2 \times (14.7 + \text{Disch. Press. PSIG})} = \text{FPM}$

Intake and Discharge Silencer Pressure Drop - Inches of Water for Silencer Model C26 (Based on Inlet CFM at 14.7 PSIA and 70°F) Model L21 Pressure Drop is One-Third of Model C26.

Intake or Discharge Velocity - FPM	Intake Silencer Pressure Drop — Inches of Water	Discharge Silencer Pressure Drop — Inches of Water								
		4 PSIG 112°F	5 PSIG 123°F	6 PSIG 134°F	7 PSIG 145°F	8 PSIG 156°F	9 PSIG 167°F	10 PSIG 178°F	11 PSIG 189°F	12 PSIG 200°F
1000	.05	.07	.08	.08	.08	.08	.08	.09	.09	.09
1500	.11	.16	.17	.18	.18	.19	.19	.20	.20	.20
2000	.19	.29	.30	.31	.32	.33	.34	.35	.36	.36
2500	.29	.46	.47	.49	.50	.52	.53	.54	.56	.57
3000	.42	.66	.68	.70	.72	.74	.76	.78	.80	.82
3500	.57	.90	.93	.96	.99	1.01	1.04	1.06	1.09	1.11
4000	.75	1.20	1.22	1.26	1.29	1.33	1.36	1.40	1.43	1.46
4500	.94	1.48	1.54	1.58	1.63	1.67	1.72	1.76	1.80	1.84
5000	1.17	1.83	1.90	1.96	2.01	2.07	2.12	2.17	2.22	2.27
5500	1.41	2.22	2.29	2.37	2.43	2.50	2.57	2.63	2.69	2.75
6000	1.68	2.64	2.73	2.82	2.89	2.98	3.05	3.13	3.20	3.27
6500	1.97	3.10	3.20	3.30	3.40	3.47	3.58	3.67	3.76	3.84

Absorption Silencers

L21

Application

Silencing of intake and discharge of centrifugal compressors in areas requiring standard silencing. Silencing of small atmospheric discharge vents and intake of small rotary positive displacement blowers.

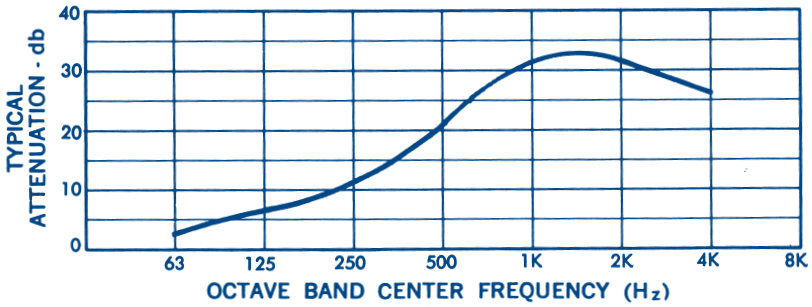
Design

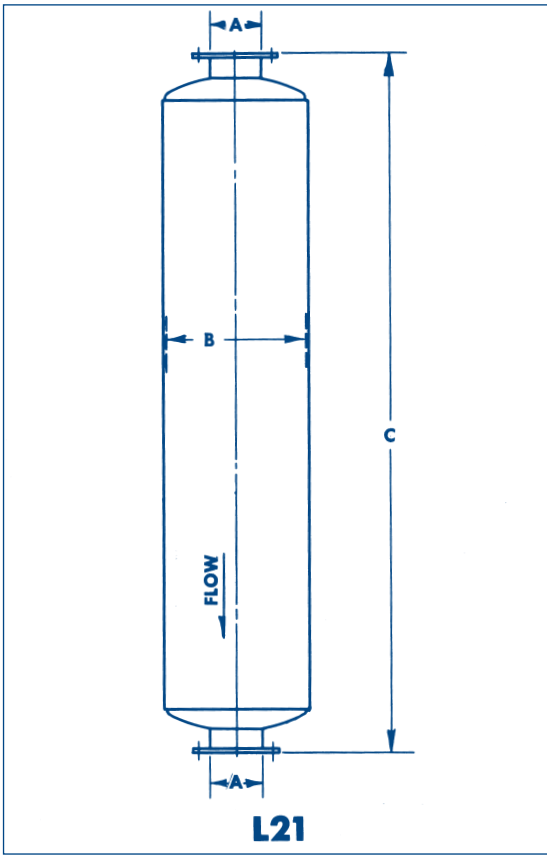
This silencer employs a perforated tube surrounded by acoustic absorption material at a controlled density to achieve silencing. Exterior shell retains acoustical pack and reflects noise back into pack to achieve maximum noise reduction. Designed for very low pressure drop and long service life. They can be installed either in vertical or horizontal position.

Construction

All welded sheet and plate steel. Absorption material appropriate for operating conditions. Exterior surfaces are prime coated. Flanges are drilled to match 125 lb. American Standard Flanges. Side connections, mounting brackets, or special paint available at extra cost.

Typical Attenuation Curve

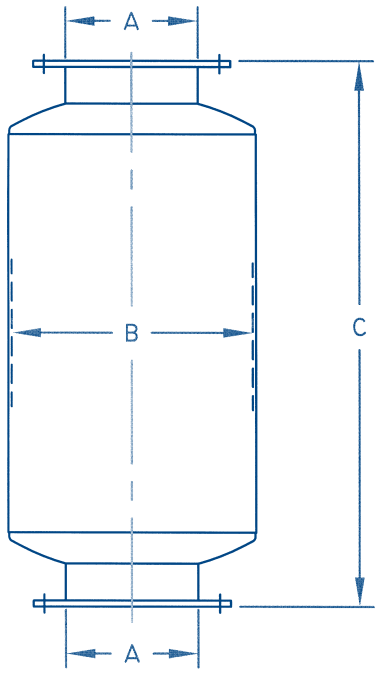




Model	A	B	C	Wt.
L21-½	½*	3¼	10	2
L21-¾	¾*	3¼	13	3
L21-1	1 *	3¼	16	4
L21-1½	1½*	4½	23	8
L21-2	2 *	5	34½	13
L21-2½	2½*	6	35½	18
L21-3	3 *	6½	43½	28
L21-3½	3½*	8	44	27
L21-4	4	10	53	55
L21-5	5	12	56	70
L21-6	6	12	66	90
L21-8	8	14	58	138
L21-10	10	16	70	160
L21-12	12	18	80	250
L21-14	14	20	92	300
L21-16	16	22	107	340
L21-18	18	24	116	650
L21-20	20	26	128	705
L21-22	22	28	147	885
L21-24	24	30	152	1026

*NPT Connections

C26 Absorption Silencers



C26

Application

For silencing intake and discharge of centrifugal compressors in areas requiring maximum silencing.

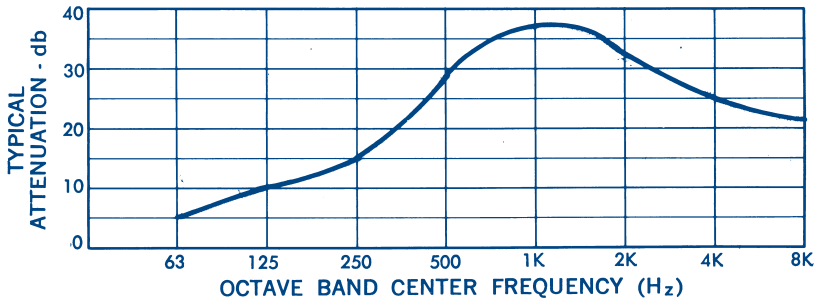
Design

Gas flows through annular passage lined with appropriate acoustic material to produce the desired noise reduction. Internal design provides minimum pressure drop. The C26 may be installed vertically or horizontally.

Construction

All welded sheet and plate steel. Absorption material appropriate for operating conditions. Exterior surfaces are prime coated. Flanges are drilled to match 125 lb. American Standard Flanges. Side connections, mounting brackets, or special paint available at extra cost.

Typical Attenuation Curve



Model	A	B	C	Weight
C26-4	4	10	21-1/2	40
C26-5	5	12	26	50
C26-6	6	12	26	60
C26-8	8	18	36	115
C26-10	10	20	44-1/2	175
C26-12	12	24	53	305
C26-14	14	26	61-1/2	400
C26-16	16	28	68	495
C26-18	18	30	74	640
C26-20	20	36	78	855
C26-22	22	36	89	1000
C26-24	24	42	91	1205
C26-26	26	42	102	1385
C26-28	28	48	104	2120
C26-30	30	48	115	2360
C26-36	36	60	145	3805
C26-42	42	66	170	5655
C26-48	48	78	186	7845

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