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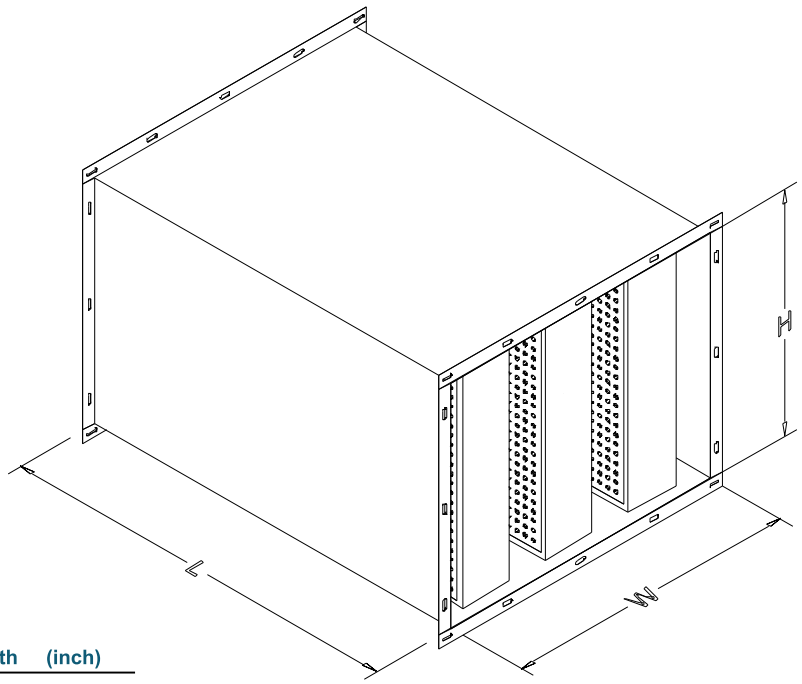
Sound Attenuator

SR Model

Features

TAHVIEH sound attenuators are manufactured in three major models covering a wide range of airflow in different pressure drops and noise cancellations. This allows the designer to select the right and also the most economical size of silencers. The casing of silencers is made of galvanized steel sheet with adequate thickness protected against corrosion with proper painting, and flanged in both sides.
Stainless steel casing and metallic parts would be available for high corrosive conditions upon request.
Sound absorbing baffles contain fireproof mineral wool, with proper density and specification protected with a non-woven layer and perforated galvanized steel sheet.
The characteristic of absorbing media has designed for maximum acoustic performance and noise cancellation.

Model Nomenclature



SR 4 / 72 . 36. 6 L 40

(L) Silencer Length (inch)

Number of Absorbing Baffles

(H) Silencer Height (inch)

(W) Silencer Width (inch)

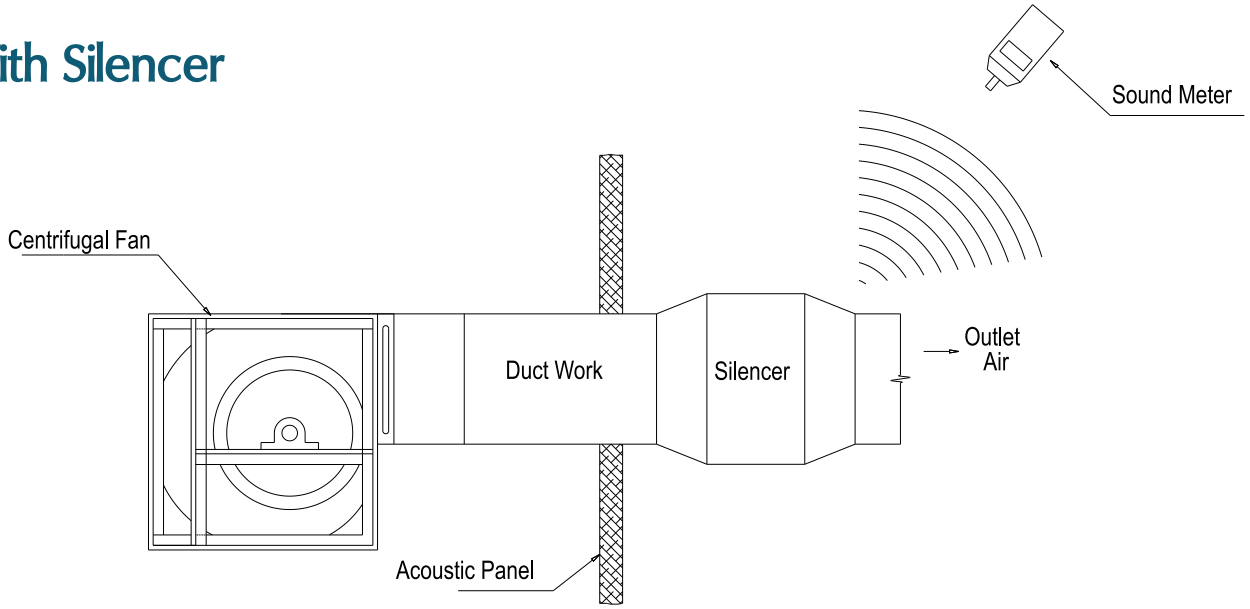
Model Number

Test Method

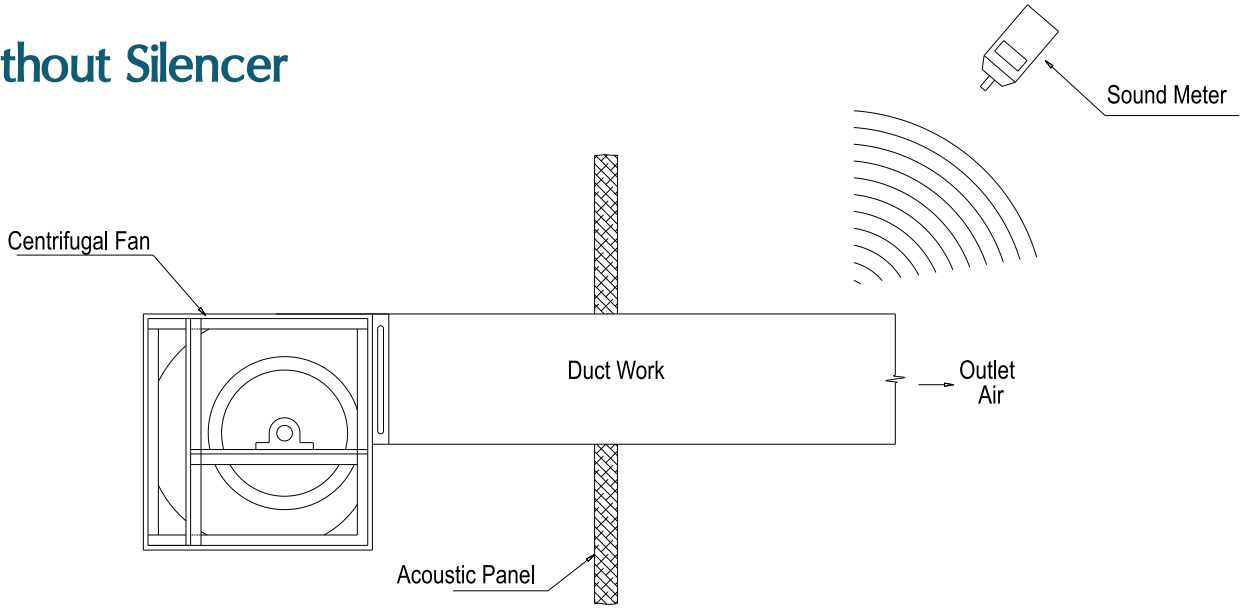
The silencers performance has been measured by the "insertion loss method", which is calculated by the difference between the sound pressure levels measured in the same point of ductwork with and without silencer. This method can be defined as "Static" or "Dynamic".
When there is no airflow through the duct and sound source is a load speaker, the measured noise reduction is called "Static Noise Cancellation".

When the sound source is a fan and there is airflow through the duct and silencer, the noise reduction is called "Dynamic Noise Cancellation ".
It is clear that the difference between dynamic and static noise cancellation, defines the " Self Generation Noise ", which is the noise that silencer generates.
TAHVIEH attenuators have been tested and rated by the dynamic method.

With Silencer



Without Silencer



Available Sizes and Models

Model	Dimension (In)	No. of Baffles							
		1	2	3	4	5	6	7	8
SR 4	W	12	24	36	48	60	72	84	96
	H	12	---		---	---	---	---	---
		24	24	---	---	---	---	---	---
		---	36	36	---	---	---	---	---
		---	48	48	48	48	48	48	48
		---	---	60	60	60	60	60	60
		---	---	72	72	72	72	72	72
		---	---	---	84	84	84	84	84
		---	---	---	96	96	96	96	96
SR 6	W	14	28	42	56	70	84	---	---
	H	12	12	12	12	---	---	---	---
		24	24	24	24	24	---	---	---
		---	36	36	36	36	---	---	---
		---	48	48	48	48	48	---	---
		---	60	60	60	60	60	---	---
		---	72	72	72	72	72	---	---
		---	---	84	84	84	84	---	---
		---	---	96	96	96	96	---	---
SR 8	W	16	32	48	64	80	96	---	---
	H	12	12	12	---	---	---	---	---
		24	24	24	24	24	---	---	---
		36	36	36	36	36	---	---	---
		48	48	48	48	48	48	---	---
		---	60	60	60	60	60	---	---
		---	72	72	72	72	72	---	---
		---	---	84	84	84	84	---	---
		---	---	96	96	96	96	---	---

Selection Procedure

The following steps are recommended for unit selection:

1) Determine requested noise reduction:
An exact calculation can be made keeping count of full octave band of sound pressure levles.
If it is unknown, the noise reduction will be assumed to be at the frequency of 250 HZ. This is because in most cases the frequency that shows the most critical noise value is 250 HZ. From table on page 5, obtain the SR model and size and the required length of silencer.

2) Determine the airflow and admissible pressure drop (see "Self-Generation Noise "). table on page 3 indicates the right size of silencer.

3) The pressure drops reported in table on pages 6 and 7 are referred to 40 inch silencer length. Correction factors against length are listed in a table on page 7.

Example

Select a sound attenuator with following conditions:

-Airflow: 14500 cfm.
-Required noise cancellation: 14 dB(A).
-Permitted noise level: 50dB(A).
-Admissible pressure drop: 0.4 in.w.g

Table on page 5 shows that a SR4 with 30 inch length has 15 dB(A) noise cancellation, at 250 hz frequency.

Table on this page indicates that for 0.4 in.w.g the self generation noise (35 dB) is 15 dB less than permitted noise level. therefore from table on page 6 a SR4 / 48.48.4L 30 or SR4 / 36. 72.3L 30 with 14465 cfm capacity can be selected.

Corrected Pressure Drop = 0.95 x 0.4 in.w.g = 0.38 in.w.g

Self-Generation Noise

Pressure Drop (in.w.g)	0.2	0.4	0.6	0.8
Self Generation Noise (dB)	25	35	45	50

When the air flows through a silencer, generates a noise which is proportional to its speed and therefore to pressure drop. If a maximum admissible sound pressure level in an ambient is required, it is necessary to verify that the level of self-generation is 5 to 7dB less than permitted level.

Self-generated noise from the silencers against pressure drops are listed in the table above.

Noise Reduction

The silencers noise reduction is a function of its lengths. The following table indicates the noise reduction against the length of silencer.

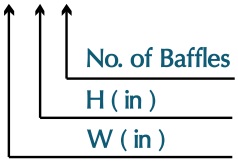
Noise Reduction (dB)

Model	L (In)	Octave Band (Hz)							
		63	125	250	500	1K	2K	4K	8K
SR 4	20	5	7	8	16	21	23	15	12
	30	6	8	15	24	33	36	24	18
	40	7	10	21	31	45	46	32	24
	50	8	12	25	38	49	48	40	31
	60	10	14	30	45	50	49	44	32
	70	10	15	34	48	50	50	47	37
	80	11	17	38	50	50	50	48	41
SR 6	20	4	5	8	13	19	15	9	7
	30	4	6	10	16	27	19	13	10
	40	5	6	14	21	34	25	17	13
	50	6	8	17	25	40	31	21	16
	60	7	10	20	29	46	36	25	19
	70	8	10	22	33	49	41	29	22
	80	8	11	25	36	50	46	33	24
	100	10	14	30	45	50	50	43	29
SR 8	20	4	5	7	11	15	12	8	7
	30	4	5	8	14	21	14	9	8
	40	4	5	10	17	23	15	10	9
	50	5	7	13	21	29	18	12	10
	60	6	9	16	25	34	22	14	12
	70	7	9	18	29	40	26	17	14
	80	7	9	20	33	45	30	20	16
	100	8	12	24	41	49	38	25	19

Air Flow Capacity & Pressure Drops

(SR4)

Dimensions	Air Passage Area (sq.ft)	Pressure Drop (in. w.g)			
		0.2	0.4	0.6	0.8
		Air Flow (cfm)			
12.12.1	0.32	568	803	985	1135
12.24.1	0.65	1135	1606	1968	2274
24.24.2	1.29	2274	3215	3938	4547
24.36.2	1.94	3409	4822	5906	6818
24.48.2	2.58	4547	6429	7874	9091
36.36.3	2.91	5115	7232	8859	10229
36.48.3	3.87	6818	9644	11812	13638
36.60.3	4.84	8524	12053	14765	17047
48.48.4	5.16	9091	12859	15747	18182
36.72.3	5.81	10229	14465	17715	20459
72.36.6	5.81	10229	14465	17715	20459
48.60.4	6.46	11365	16071	19682	22729
60.48.5	6.46	11365	16071	19682	22729
48.72.4	7.75	13638	19285	23621	27276
72.48.6	7.75	13638	19285	23621	27276
60.60.5	8.07	14206	20091	24606	28412
48.84.4	9.04	15912	22500	27559	31821
60.72.5	9.68	17047	24109	29526	34094
72.60.6	9.68	17047	24109	29526	34094
48.96.4	10.33	18182	25715	31494	36368
96.48.8	10.33	18182	25715	31494	36368
60.84.5	11.30	19888	28126	34447	39565
84.60.7	11.30	19888	28126	34447	39565
72.72.6	11.62	20456	28929	35429	40912
60.96.5	12.91	22729	32144	39368	45459
96.60.8	12.91	22729	32144	39368	45459
72.84.6	13.56	23865	33753	41335	47732
84.72.7	13.56	23865	33753	41335	47732
72.96.6	15.49	27276	38574	47241	54550
96.72.8	15.49	27276	38574	47241	54550
84.84.7	15.82	27844	39376	48224	55688
84.96.7	18.08	31821	45000	55115	63641
96.84.8	18.08	31821	45000	55115	63641
96.96.8	20.66	36368	51429	62988	72735



(SR6)

Dimensions	Air Passage Area (sq.ft)	Pressure Drop (in. w.g)			
		0.2	0.4	0.6	0.8
		Air Flow (cfm)			
14.12.1	0.48	853	1206	1476	1706
14.24.1	0.97	1706	2412	2953	3409
28.12.2	0.97	1706	2412	2953	3409
42.12.3	1.45	2559	3618	4429	5115
28.24.2	1.94	3409	4821	5906	6818
56.12.4	1.94	3409	4821	5906	6818
28.36.2	2.91	5115	7232	8859	10229
42.24.3	2.91	5115	7232	8859	10229
28.48.2	3.87	6818	9644	11812	13638
56.24.4	3.87	6818	9644	11812	13638
42.36.3	4.36	7671	10847	13288	15341
28.60.2	4.84	8524	12053	14762	17047
70.24.5	4.84	8524	12053	14762	17047
28.72.2	5.81	10229	14465	17715	20456
42.48.3	5.81	10229	14465	17715	20456
56.36.4	5.81	10229	14465	17715	20456
42.60.3	7.26	12785	18082	22144	25571
70.36.5	7.26	12785	18082	22144	25571
56.48.4	7.75	13638	19285	23621	27276
42.72.3	8.72	15341	21697	26574	30685
56.60.4	9.68	17047	24109	29526	34094
70.48.5	9.68	17047	25312	29526	34094
42.84.3	10.17	17900	28929	31000	35800
42.96.3	11.62	20456	28929	35429	40912
56.72.4	11.62	20456	28929	35429	40912
84.48.6	11.62	20456	30135	35429	40912
70.60.5	12.11	21309	33750	36906	42618
56.84.4	13.56	23865	36162	41335	47732
70.72.5	14.53	25571	38574	44288	52906
84.60.6	14.53	25571	42188	44288	52906
56.96.4	15.49	27276	43394	47241	54550
70.84.5	16.95	29832	48215	51671	59665
84.72.6	17.43	30685	50626	53147	61371
70.96.5	19.37	34094	42188	59050	68188
84.84.6	20.34	35800	43394	62003	71597
84.96.6	23.24	40912	48215	70862	81826

Air Flow Capacity & Pressure Drops

(SR8)

Dimensions	Air Passage Area (sq.ft)	Pressure Drop (in. w.g)			
		0.2	0.4	0.6	0.8
		Air Flow (cfm)			
16.12.1	0.65	1135	1606	1968	2274
16.24.1	1.29	2274	3215	3935	4547
32.12.2	1.29	2274	3215	3935	4547
16.36.1	1.94	3409	4821	5906	6818
48.12.3	1.94	3409	4821	5906	6818
16.48.1	2.58	4547	6429	7874	9091
32.24.2	2.58	4547	6429	7874	9091
32.36.2	3.87	6818	9644	11812	13638
48.24.3	3.87	6818	9644	11812	13638
32.48.2	5.16	9091	12859	15747	18182
64.24.4	5.16	9091	12859	15747	18182
48.36.3	5.81	10229	14465	17715	20456
32.60.2	6.46	11365	16071	19682	22729
80.24.5	6.46	11365	16071	19682	22729
32.72.2	7.75	13638	19285	23621	27276
48.48.3	7.75	13638	19285	23621	27276
64.36.4	7.75	13638	19285	23621	27276
48.60.3	9.68	17047	24109	29526	34094
80.36.5	9.68	17047	24109	29526	34094
64.48.4	10.33	18182	25715	31494	36368
48.72.3	11.62	20456	28929	35429	40912
64.60.4	12.91	22729	32144	39368	45459
80.48.5	12.91	22729	32144	39368	45459
48.84.3	13.56	23865	33753	41335	47732
48.96.3	15.49	27276	38574	47241	54550
64.72.4	15.49	27276	38574	47241	54550
96.48.6	15.49	27276	38574	47241	54550
80.60.5	16.14	28412	40179	49209	56824
64.84.4	18.08	31821	45000	55115	63641
80.72.5	19.37	34094	48215	59050	68188
96.60.6	19.37	34094	48215	59050	68188
64.96.4	20.66	36368	51429	62988	72735
80.84.5	22.60	39776	56253	68892	79553
96.72.6	23.24	40912	57859	70862	81826
80.96.5	25.82	45459	64288	78735	90918
96.84.6	27.12	47732	67503	82671	95465
96.96.6	30.99	54550	77144	94482	109276

Pressure drops are based on 40 inch silencer length. To obtain pressure drop for other lengths use the following correction factors :

Lenght (in)	20	30	40	50	60	70	80	100
Correction Factor	0.90	0.95	1.00	1.07	1.13	1.20	1.25	1.4

Weights

Silencer weights listed below based on SR6 model. For SR4 and SR8 use the weight of the closest size of SR6.

Weights (lb)

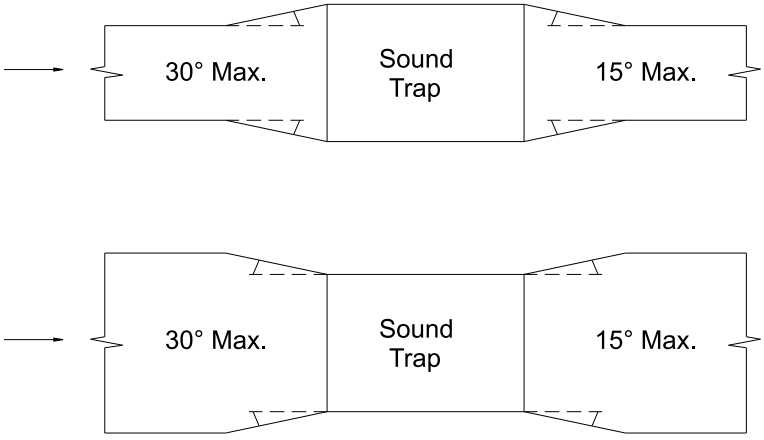
L(in)	H(in)	No. of Baffles					
		1	2	3	4	5	6
20	12	31	54	77	100	--	--
	24	53	89	125	161	197	--
	36	--	123	173	222	272	--
	48	--	158	221	283	346	409
	60	--	193	269	345	421	497
	72	--	228	317	406	495	585
	84	--	--	365	467	570	673
	96	--	--	413	529	645	761
30	12	46	79	112	145	--	--
	24	77	128	180	232	284	--
	36	--	178	249	320	391	--
	48	--	228	318	408	498	587
	60	--	278	387	496	604	713
	72	--	328	456	583	711	838
	84	--	--	525	671	817	963
	96	--	--	593	759	924	1089
40	12	60	103	147	190	--	--
	24	101	168	236	304	372	--
	36	--	234	326	418	510	--
	48	--	300	415	532	649	766
	60	--	364	505	646	787	929
	72	--	--	595	760	926	1091
	84	--	--	684	874	1064	1254
	96	--	--	774	988	1203	1417
50	12	75	128	182	236	--	--
	24	125	208	292	376	460	--
	36	--	289	402	516	630	--
	48	--	369	513	657	800	944
	60	--	449	623	797	971	1144
	72	--	530	734	937	1141	1345
	84	--	--	844	1078	1311	1545
	96	--	--	954	1218	1482	1745

L(in)	H(in)	No. of Baffles					
		1	2	3	4	5	6
60	12	89	153	217	281	--	--
	24	149	248	348	448	547	--
	36	--	344	479	614	749	--
	48	--	439	610	781	952	1122
	60	--	535	741	948	1154	1360
	72	--	631	872	1114	1356	1598
	84	--	–	1004	1281	1558	1836
	96	--	–	1135	1448	1761	2074
70	12	103	177	252	326	--	--
	24	173	288	404	519	635	--
	36	--	399	556	712	869	--
	48	--	510	708	905	1103	1301
	60	--	621	859	1098	1337	1576
	72	--	731	1011	1291	1571	1851
	84	--	–	1163	1484	1805	2127
	96	--	–	1315	1677	2040	2402
80	12	117	202	287	372	--	--
	24	197	328	460	591	722	--
	36	--	454	632	810	988	--
	48	--	580	805	1030	1254	1479
	60	--	706	978	1249	1520	1792
	72	--	832	1150	1468	1786	2105
	84	--	–	1323	1688	2053	2417
	96	--	–	1496	1907	2319	2730
100	12	146	252	357	462	--	--
	24	245	408	571	721	898	--
	36	--	564	785	1006	1227	--
	48	--	721	1000	1278	1557	1836
	60	--	877	1214	1550	1887	2224
	72	--	1034	1428	1822	2217	2611
	84	--	–	1642	2094	2547	3000
	96	--	–	1856	2366	2876	3386

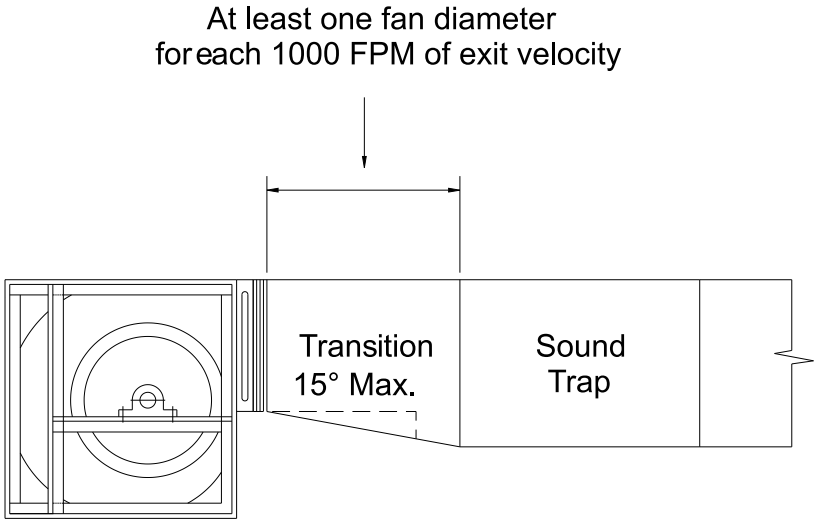
Recommended Installation & Application

To perform at or near the ratings given in this catalog, silencers should be installed in accordance with the guidelines given in this section.

Closer spacing to fans or fittings will cause excess turbulence that leads to higher pressure drop and self-generation noise.



Upstream and Downstream of Transitions

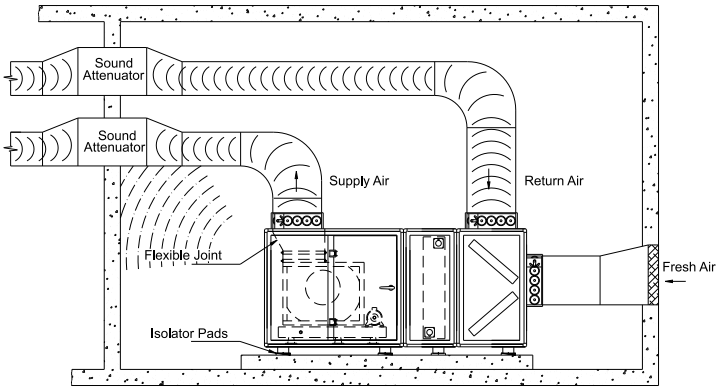


At centrifugal Fan Discharge

Note : Sound trap baffles should be perpendicular to fan shaft.

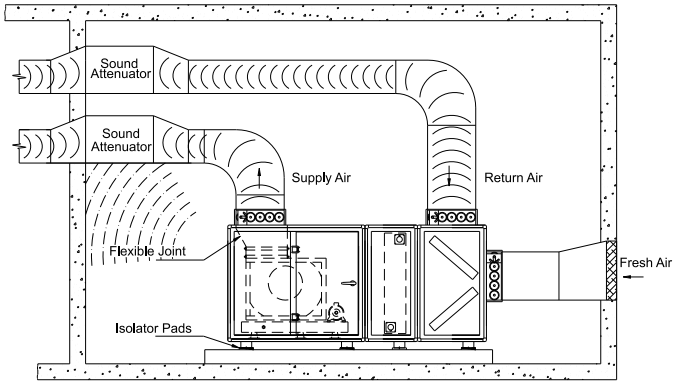
Best

Controls ductbone noise and mechanical room noise that “ break into " duct.



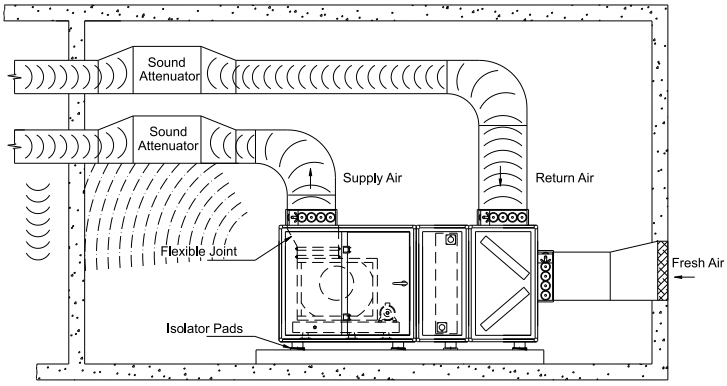
Very Good

Practical alternate fire damper is required at wall



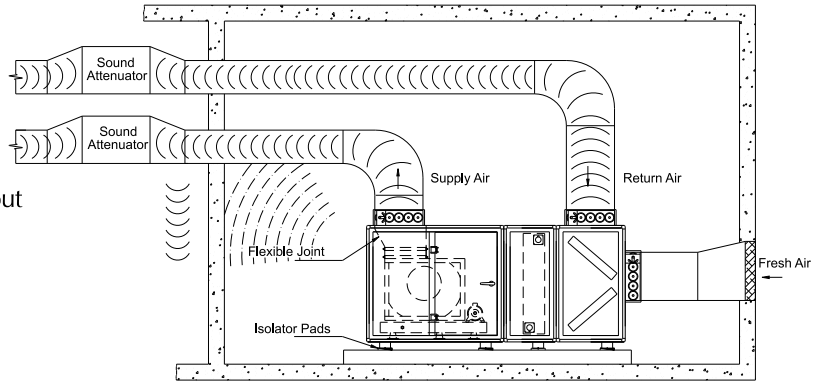
Fair

All noise in duct " breaks out " over occupied space before being reduced by sound trap .



Poor

Mechanical room noise " breaks into " duct without reduction through sound trap.



Guide Specifications

Casing… Casing shall be constructed from galvanized steel sheet of adequate thickness, flanged at both ends.

Sound absorbing baffles… Sound absorbing baffles shall consist of fireproof acoustic material resistant to humidity, covered by a synthetic protective screed. The frame shall be constructed from galvanized steel sheet.

Painting… Silencer is coated with zinc-rich epoxy.