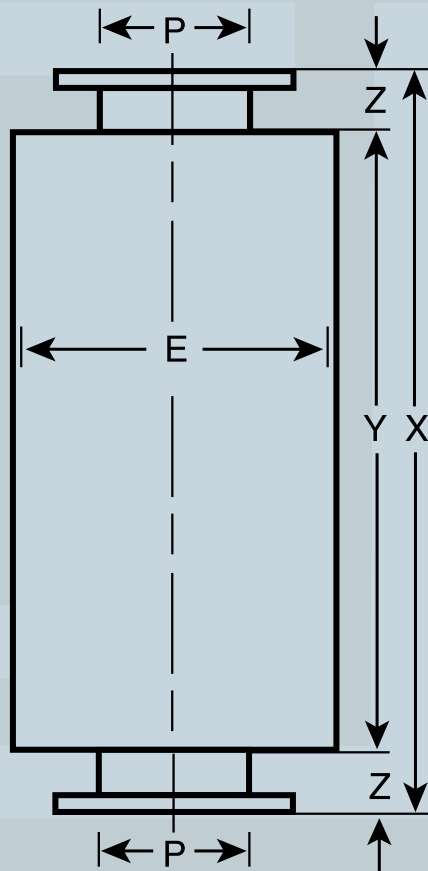


FAN SILENCERS



INFORMATION ON FAN SILENCERS

Industrial fan installations, small or large, produce noise. This fan noise is one of the most predominant noise sources in an industrial plant. The magnitude and intensity of noise will vary depending on fan size, horse power, air flow, type and number of blades, static pressure, rotational speed, etc.

Fans normally deliver a large volume of air at relatively low static pressures usually measured in inches of water. The rotating action of vanes produce a broad band noise spectrum however, the noise in mid to high frequency range is heard to be louder and requires to be treated for achieving noise control.

Generally, silencers are used at intake and discharge of fan installations for treating air borne noise. Fan silencers usually require absorptive type design as they are well known for better attenuation in mid and high frequency range (500-8000 Hz). The effectiveness of absorption material progressively reduces at frequencies above and below this range.

The noise control is achieved by means of absorption. The acoustic energy propagating through the silencer is effectively absorbed into the fibrous absorption material and converted into heat energy. These silencers generally employ straight thru design and has a low pressure drop as it imposes very little restriction to the flow.

SILENCER SELECTION

The fan silencers are normally selected on the basis of maximum allowable pressure drop at rated flow and the silencing criteria. These silencers are usually sized for around 5000 to 5500 FPM velocity but not exceeding 7500 FPM velocity to prevent excessive self generated noise and aerodynamic noise generation.

While selecting the fan silencer, it must be ensured that the flow area throughout the silencer is sufficient to accommodate the air flow without imposing excessive restriction.

The following table indicates the maximum recommended air flow in CFM for respective silencer size in accordance with the above guidelines.

SILENCER SIZE	MAXIMUM CFM	SILENCER SIZE	MAXIMUM CFM
8	1800	26	20000
10	2900	28	23500
12	4200	30	25750
14	5600	32	29500
16	7500	36	37000
18	9500	42	52000
20	11500	48	68000
22	14000	54	86000
24	16500	60	105000

Select the silencer size based on the air flow from the above table.

Refer to the formulas given here for calculating the pressure drop for the silencer size selected. Check this pressure drop against the maximum allowable pressure drop. If the pressure drop is too high, select the next larger size and recalculate.

PRESSURE DROP

(These calculations assume air as the flowing gas. For other gases, density and other corrections may be required. Contact our engineers for assistance)

Data Required:

- Air Flow Rate (Actual CFM)
- Temperature (°F)
- Pressure (PSIG)
- Maximum allowable pressure drop (inches of water)

1. Calculate air velocity, ft./min.

$$V = \frac{Q}{A}$$

V = Air Velocity FT./MIN.

A = Flow area in sq. ft. for silencer size selected

Q = Air Flow Rate (Actual CFM)

$$\text{Actual CFM} = \text{Standard CFM} \left(\frac{14.7}{P + 14.7} \right) \left(\frac{T + 460}{530} \right)$$

P = Operating pressure, PSIG (if at atmospheric pressure then pressure ratio is unity and may be omitted from above equation)

T = Air Temperature (°F)

2. Calculate pressure drop

$$\Delta P = C \left(\frac{V}{4005} \right)^2 \left(\frac{530}{T + 460} \right) \left(\frac{P + 14.7}{14.7} \right)$$

ΔP = Pressure drop

C = Silencer pressure drop coefficient (0.85)

If this pressure drop is higher than the maximum allowable pressure drop, then select next larger size and recalculate.

TEMPERATURE LIMITS

Various options for acoustical absorption materials are available with temperature limits ranging from 325°F to 1000°F. Please consult our engineers for your specific applications for selecting suitable absorption material suiting to your requirements.

PRESSURE RATING

The silencers described herein are designed to a maximum operating pressure of 15 PSIG. For applications where pressure exceeds 15 PSIG, the silencers can be designed to ASME Code, Section 8, Div. 1 for pressure vessel construction. The dimensions are similar to standard models, but the material type and thicknesses are selected to meet code requirements. Consult our engineers for pricing and design information.

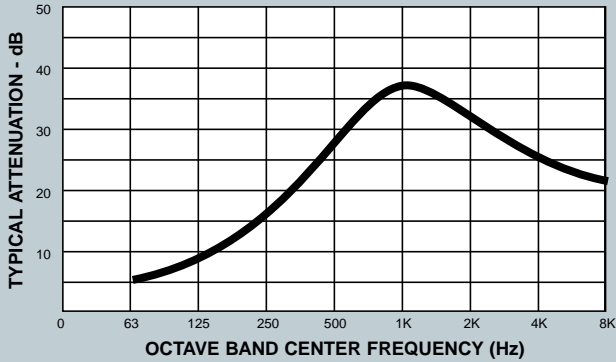
ATTENUATION CURVES

Noise attenuation curve showing insertion loss at each frequency is shown here. This represents the insertion loss for airborne noise under average conditions. The resultant silenced noise level will depend on a number of other factors therefore this curve should be used with discretion and can be used as a guideline for evaluating the noise levels after the silencer installation.

SPECIFICATIONS

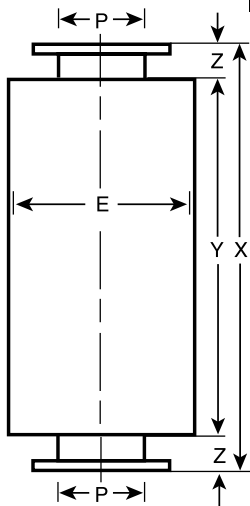
CFS SERIES FAN SILENCERS

TYPICAL ATTENUATION CURVE



The CFS Series fan silencers are recommended for use on intake and discharge of industrial fans and some low pressure vents (< 15 PSIG). The design consists of two concentric perforated cylinders lined with acoustical absorption material. An acoustically packed center bullet is provided for achieving desired noise reduction. The absorptive packing media is held in place with an adequate layer of protective facing. The silencer can be installed in horizontal or vertical position. The standard construction is heavy duty all welded carbon steel sheets and plates. The units are provided with plain pipe connections or flanged connections drilled to 125 lbs. ANSI specifications. The external surfaces are rust inhibitive primer coated. Custom designs are available to suit specific nozzle orientations. The optional features include side connections, mounting brackets, special paint, special material or ASME code construction.

CFS



MODEL	PIPE SIZE P	E	X	Y	Z	WT.
CFS-8	8	14	36	30	3	85
CFS-10	10	16	36	30	3	120
CFS-12	12	18	38	32	3	150
CFS-14	14	20	40	32	4	180
CFS-16	16	24	44	36	4	250
CFS-18	18	26	44	36	4	280
CFS-20	20	28	50	42	4	350
CFS-22	22	30	53	45	4	470
CFS-24	24	32	57	49	4	550
CFS-26	26	34	62	54	4	630
CFS-28	28	36	65	57	4	725
CFS-30	30	38	70	60	5	800
CFS-36	36	42	82	72	5	1200
CFS-42	42	48	91	81	5	1800
CFS-48	48	54	107	97	5	2400
CFS-54	54	60	120	110	5	3200
CFS-60	60	66	132	122	5	4000

- Dimensions and weights are approximate and may change slightly with production models.
- Dimension in inches.
- Weight in lbs.

We specialize in custom designs and also provide various nozzle orientations to suit your specific requirements.

OTHER PRODUCTS AVAILABLE:

- **ROTARY POSITIVE BLOWER INTAKE AND DISCHARGE SILENCERS**
reference catalogue 1
- **BASE SILENCERS FOR ROTARY POSITIVE BLOWERS**
reference catalogue 2
- **COMBINATION SILENCERS FOR ROTARY POSITIVE BLOWERS**
reference catalogue 3
- **FAN SILENCERS**
reference catalogue 4
- **CENTRIFUGAL COMPRESSOR SILENCERS**
reference catalogue 5
- **VENT SILENCERS**
reference catalogue 6
- **ENGINE SILENCERS**
reference catalogue 7
- **NOISE ENCLOSURES**
reference catalogue 8

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