UNIVERSAL SILENCER

A FLEETGUARD/NELSON COMPANY

Noise Control and Air Filtration

Air Filters and Filter Silencers

Product Catalog No. 241-B

General Information

Note: Care should be exercised in the selection of type and size of Filters and Filter Silencers. Although this product catalog is designed to assist the user in proper selections, it may still be advisable to contact Universal Silencer's engineers for additional assistance. Inquiries are welcome and will be given prompt attention.

Universal Silencer offers a wide range of sizes and types of air Filters and Filter Silencers for application on air moving equipment and internal combustion engines. This catalog covers our standard "shelf" models, many of which are stocked for immediate shipment. Special types and configurations, as well as larger sizes not cataloged, are quoted upon application to meet specific job requirements. In submitting your inquiry for a recommendation or quotation, please give full particulars and conditions, including the following:

- Type of Equipment (rotary blower, centrifugal compressor, etc.)
- Volume of air and barometric conditions (CFM at pressure & temperature)
- Inlet flange size on equipment
- Required efficiency of filter media (% arrestance at particle size in microns)
- Maximum restriction (pressure drop) allowed - including entrance and exit losses
- If silencing is required, give noise specifications to be met
- Special finish requirements
- Other pertinent data which should be considered in the selection

Contents

*Capacity ranges shown are nominal. Specific pressure drop considerations may narrow or broaden the range of capacities.

Sizing Instructions Pressure Drop Data

Note: Pressure drop values indicated by the graphs on this page include pipe entrance pressure drops attributable to the atmospheric end of the inlet pipe. These drops are significant, contributing in some cases as much as 75% of the total pressure drop, and should not be regarded as excess restriction due to the filter. However, adding the filter to the system transfers these pipe drops to within the filter housing and a pressure drop reading taken at the pressure tap on the filter outlet reflects the total - pipe entrance loss, velocity pressure, and housing restriction. Thus for convenience, and to avoid confusion, the graphs are designed to indicate this total.

The Filters and Filter Silencers listed on the following pages are available with a variety of types of filter panels, each having its own restriction characteristics. Consequently, the pressure drop data below are presented in such a way that two components must be added to obtain the total pressure drop for a specific filter application. One component is the restriction attributable to the filter housing exclusive of filter panels. The second component is the restriction through the filter panel media. The housing pressure drop is given in graph form as a function of air flow in CFM versus restriction in inches of water gage. The pressure drop component for the filter panels is charted in tabular form - giving pressure drop in inches of water gage at various flows in CFM. (Pressure drop information for RF Series on page 7 is given on that page.)

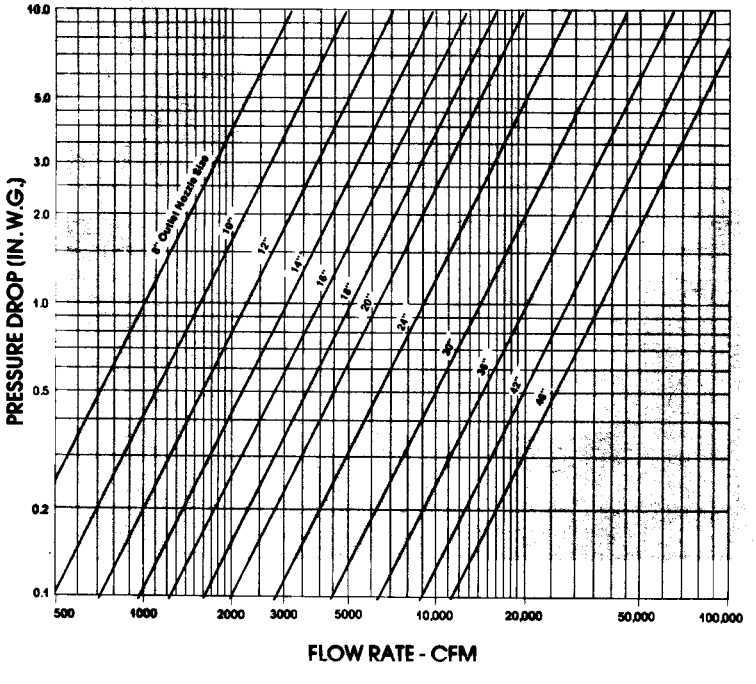
Pressure drop calculation example: FSH type Filter Silencer is required for 2500 CFM air flow. Type P-11 high efficiency filter panels. Pressure drop limitation - 3" water gage. Try FSH10-2 (page 4) with nominal rated capacity of 2750 CFM. Enter graph at 2500 CFM and go vertically to 10" parameter line. Go left to pressure drop scale and read 2.6" w.g. FSH10-2 is equipped with two panels, thus each panel will handle 1250 CFM. Pressure drop chart for filter panels indicates 0.44" w.g. for P-11 type filter panel at 1250 CFM. Add 2.6" and 0.44" for total of 3.04" w.g. pressure drop.

Pressure Drop Values - 20" x 25" Panel Filters (in. w.g.)

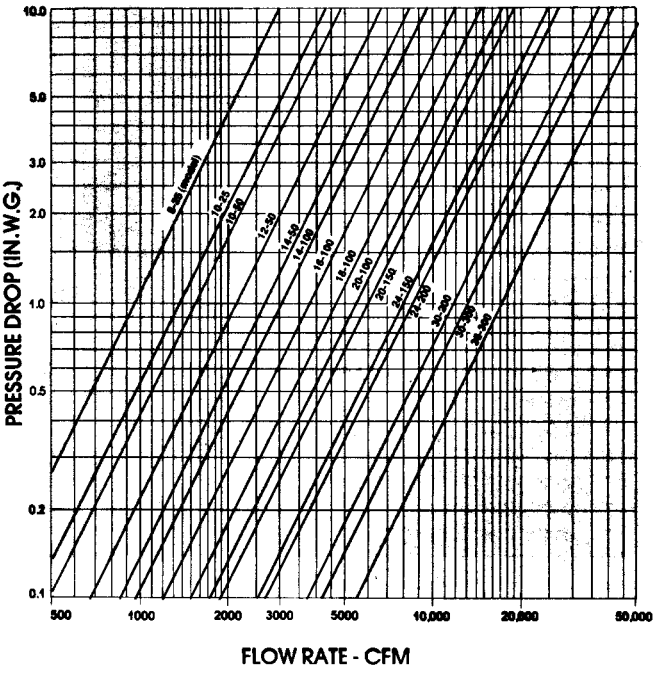
CFM Per Filter	W-2	DD-2	P-11	W-2 & DD-2	W-2 & P-11	P-8 & P-12F	P-5	W-2 & P-5	DD-2 & P-5
500	0.01	0.06	0.09	0.07	0.10	0.80	0.28	0.29	0.34
600	0.02	0.08	0.13	0.10	0.15	0.96	0.35	0.37	0.43
700	0.03	0.11	0.16	0.14	0.19	1.12	0.42	0.45	0.53
800	0.03	0.14	0.21	0.17	0.24	1.28	0.49	0.52	0.63
900	0.04	0.17	0.25	0.21	0.29	1.44	0.56	0.60	0.73
1000	0.05	0.21	0.30	0.26	0.35	1.60	0.64	0.69	0.85
1250	0.08	0.31	0.44	0.39	0.52	2.00	0.83	0.91	1.14
1500	0.12	0.44	0.59	0.56	0.71	2.40	1.04	1.16	1.48

Pressure Drop Curves - Filter Housings

FH, FSH, BFH & FASH Series



FRH & FCRH Series



Specifications

Note: For capacity and pressure drop information refer to page 3. For description of filter elements refer to page 10.

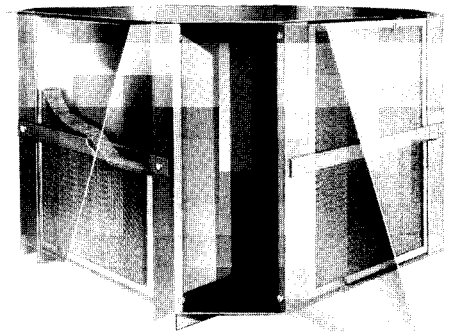
FH Series Filter
FSH Series Filter Silencer

For use on Centrifugal Compressors, Blowers, Engines, Gas Turbines. (For reciprocating compressors, contact factory for recommendations.)

Universal FH Series Filters and FSH Series Filter Silencers are designed to employ standard panel filters, which are available in a variety of types and efficiencies as shown elsewhere in this catalog. The filter holding frames in the housings will accommodate conventional 2" deep single panel filters or, for critical service, the frames will accommodate two 2" deep panels staged in series. In the case of dual stage systems, the usual preference is to use a high efficiency final filter and a lesser efficiency primary filter. The FSH Series features an integral silencing section to provide a moderate degree of noise attenuation. Otherwise, the FH and FSH Series are identical. All units are fabricated of steel sheet and plate, welded throughout to provide a rugged, long-lasting, trouble-free air filtering component. All models are equipped with removable weather-hoods, pressure tap, and flanges drilled to match 125/150 lb. ANSI specifications. Inside and outside surfaces are primed and given a finish coat of enamel paint. Suitable mounting legs may be fitted in the field or will be quoted upon application.

Noise Attenuation - FSH Series

Octave Band Cent. Freq. - Hz	63	125	250	500	1000	2000	4000	8000
Attenuation - dB	2	3	4	5	8	13	14	13



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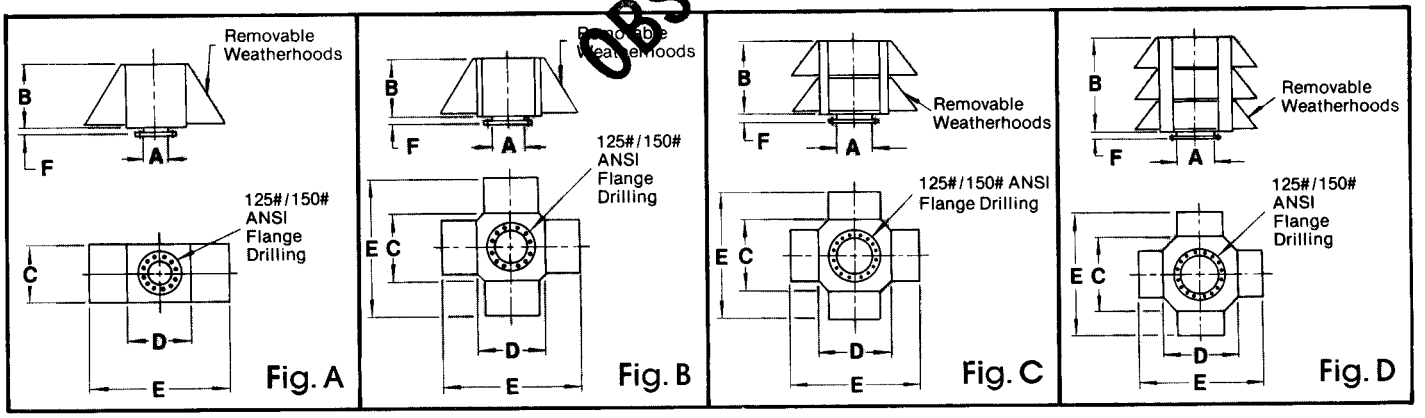


Model		Config-uration	Nominal Capacity C.F.M.(1.)	A	B	C	D	E	F	Weight (2.)		No. & Size of Filter Openings
Filter	Filter Silencer									FH	FSH	
FH-8-2	FSH-8-2	Fig. A	1750	8	25½	24	28	58½	3½	190	230	2-20x25x4
FH-10-2	FSH-10-2	Fig. A	2750	10	25½	24	28	58½	3½	190	250	2-20x25x4
FH-10-4	FSH-10-4	Fig. B	2750	10	25½	32	32	62½	3½	280	330	4-20x25x4
FH-12-4	FSH-12-4	Fig. B	4000	12	25½	32	32	62½	3½	280	340	4-20x25x4
FH-14-4	FSH-14-4	Fig. B	5400	14	25½	32	32	62½	3½	280	350	4-20x25x4
FH-14-8	FSH-14-8	Fig. C	5400	14	40¾	42	42	72½	4½	510	620	8-20x25x4
FH-16-8	FSH-16-8	Fig. C	7000	16	40¾	42	42	72½	4½	520	630	8-20x25x4
FH-18-8	FSH-18-8	Fig. C	8900	18	40¾	42	42	72½	4½	520	640	8-20x25x4
FH-20-8	FSH-20-8	Fig. C	11,000	20	40¾	42	42	72½	4½	530	660	8-20x25x4
FH-20-12	FSH-20-12	Fig. D	11,000	20	61	50	50	80½	4½	840	1050	12-20x25x4
FH-24-12	FSH-24-12	Fig. D	16,000	24	61	50	50	80½	4½	850	1090	12-20x25x4
FH-24-16	FSH-24-16	Fig. C	16,000	24	50¾	52	52	82½	4½	800	1030	16-20x25x4
FH-30-16	FSH-30-16	Fig. C	20,500	30	50¾	52	52	82½	4½	820	1070	16-20x25x4
FH-30-24	FSH-30-24	Fig. D	20,500	30	76	62	62	92½	4½	1250	1610	24-20x25x4
FH-36-24	FSH-36-24	Fig. D	35,500	36	76	62	62	92½	4½	1320	1730	24-20x25x4
FH-42-36	FSH-42-36	Fig. D	48,000	42	76	72	72	102½	6	2320	2740	36-20x25x4
FH-48-48	FSH-48-48	Fig. D	63,000	48	101¼	78	78	108½	6	3030	3760	48-20x25x4

Dimensions In Inches, Weight In Lbs.

(1.) Nominal capacity is based on exit velocity of approximately 5000 ft./min. (Filter element capacity may be greater, but this is unrelated to actual unit capacity, which is primarily a function of the outlet size.) For specific sizing and pressure drop data, refer to page 3.

(2.) Weights do not include filter elements.

Specifications

Note: For capacity and pressure drop information refer to page 3. For description of filter elements refer to page 10.

FRH Series Filter FCRH Series Filter Silencer

For use on Centrifugal Compressors, Blowers, Engines, Gas Turbines. (For reciprocating compressors, contact factory for recommendations.)

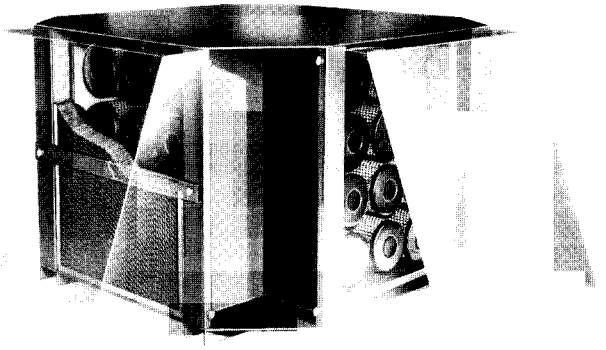
Universal FRH Filters and FCRH Filter Silencers are similar in scope and application to the FS and FSH Series described on page 4, with the fundamental distinction that the FR and FRH Series are specifically designed as two-stage filters, with the second stage consisting of one battery of (12) cartridge type filters for each 20" x 25" x 2" panel type primary filter. The high efficiency type P-5 cartridge filters are equipped with threaded ends which are screwed into individual receptacles, such that as each P-5 is removed and replaced, only a small area (1.5 sq. in.) is exposed to the flow of unfiltered air, permitting change-out of filters while the system is in operation. Usually, a moderate-efficiency filter panel is used as the first stage element. The FCRH Series features an integral silencing section to provide a moderate degree of noise attenuation - otherwise, the FRH and FCRH are identical. All units are fabricated of steel sheet and plate, welded throughout to provide a rugged, long-lasting, trouble-free air filtering component. All models are equipped with removable weatherhoods, pressure tap, and flanges drilled to match 125/150 lb. ANSI specifications. Inside and outside surfaces are primed and given a finish coat of enamel paint.

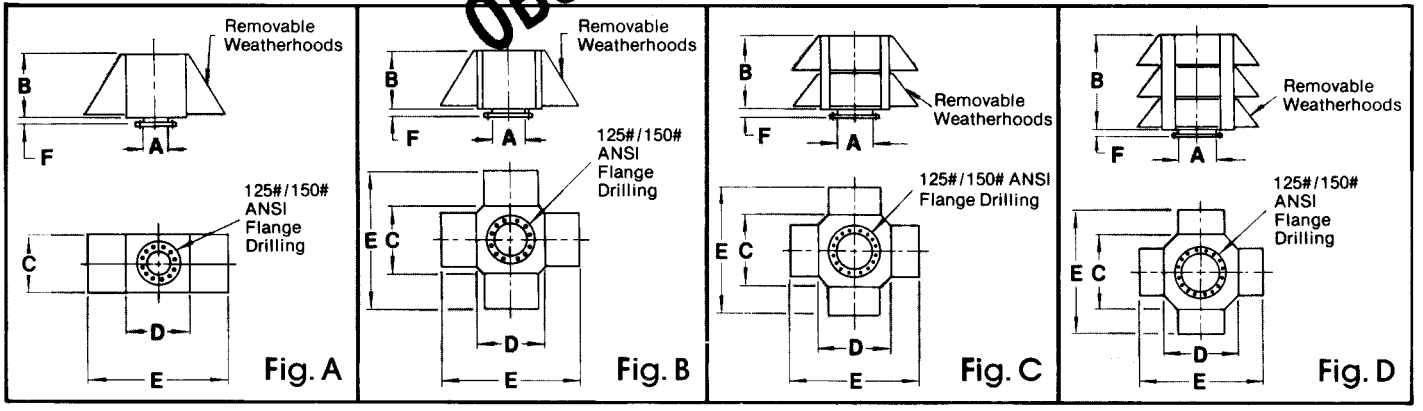
OBSOLETE

Suitable mounting legs may be fitted in the field or will be quoted upon application.

Noise Attenuation - FCRH Series

Octave Band Cent. Freq. - Hz	63	125	250	500	1000	2000	4000	8000
Attenuation - dB	2	3	4	5	8	13	14	13





Model		Config-uration	Nominal Capacity C.F.M.(1.)	A	B	C	D	E	F	Weight (2.)		No. & Size of Filter Openings	No. Final Filters
Filter	Filter Silencer									FRH	FCRH		
FRH-8-25	FCRH-8-25	Fig. A	1750	8	25½	24	40	70½	3½	310	360	2-20x25x2	24
FRH-10-25	FCRH-10-25	Fig. A	2750	10	25½	24	40	70½	3½	320	370	2-20x25x2	24
FRH-10-50	FCRH-10-50	Fig. B	2750	10	25½	42	42	72½	3½	500	560	4-20x25x2	48
FRH-12-50	FCRH-12-50	Fig. B	5000	12	25½	42	42	72½	3½	510	570	4-20x25x2	48
FRH-14-50	FCRH-14-50	Fig. B	5400	14	25½	42	42	72½	3½	510	580	4-20x25x2	48
FRH-14-100	FCRH-14-100	Fig. C	5400	14	40¾	52	52	82½	4½	910	1020	8-20x25x2	96
FRH-16-100	FCRH-16-100	Fig. C	7000	16	40¾	52	52	82½	4½	920	1040	8-20x25x2	96
FRH-18-100	FCRH-18-100	Fig. C	8900	18	40¾	52	52	82½	4½	920	1050	8-20x25x2	96
FRH-20-100	FCRH-20-100	Fig. C	11,000	20	40¾	52	52	82½	4½	930	1070	8-20x25x2	96
FRH-20-150	FCRH-20-150	Fig. D	11,000	20	61	60	60	90½	4½	1370	1600	12-20x25x2	144
FRH-24-150	FCRH-24-150	Fig. D	16,000	24	61	60	60	90½	4½	1380	1640	12-20x25x2	144
FRH-24-200	FCRH-24-200	Fig. C	16,000	24	50¾	62	62	92½	4½	1540	1770	16-20x25x2	192
FRH-30-200	FCRH-30-200	Fig. C	20,500	30	50¾	62	62	92½	4½	1550	1820	16-20x25x2	192
FRH-30-300	FCRH-30-300	Fig. D	20,500	30	76	72	72	102½	4½	2320	2670	24-20x25x2	288
FRH-36-300	FCRH-36-300	Fig. D	35,500	36	76	72	72	102½	4½	2380	2800	24-20x25x2	288

Dimensions In Inches, Weight In Lbs.

(1.) Nominal capacity is based on exit velocity of approximately 5000 ft./min. (Filter element capacity may be greater, but this is unrelated to actual unit capacity, which is primarily a function of outlet size.) For specific sizing and pressure drop data, refer to page 3.

(2.) Weights include filter elements (W2 & P5).

Specifications

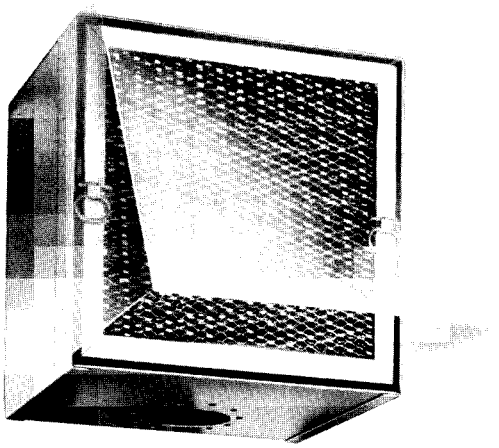
Note: For capacity and pressure drop information refer to page 3. For description of filter elements refer to page 10.

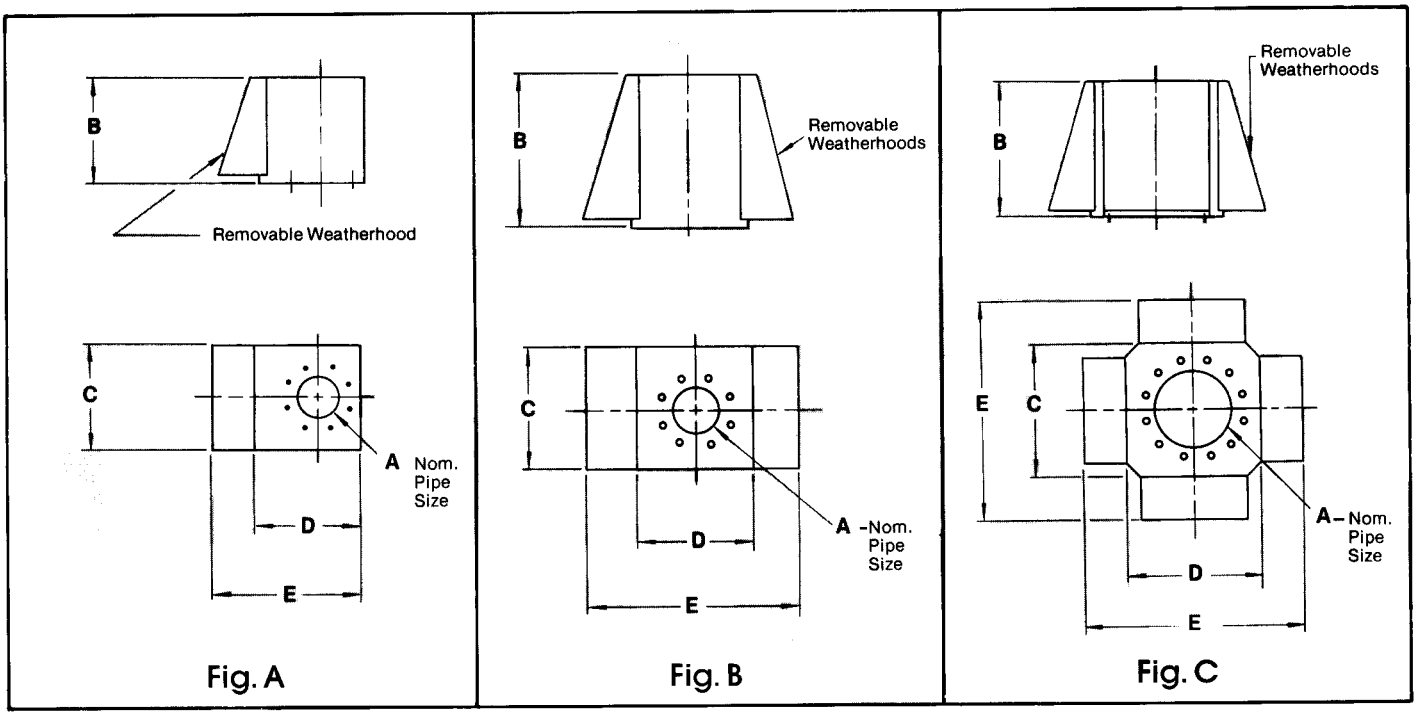
BFH Series Filter

(Previously Designated "F" Series)

For use on Centrifugal Compressors, Blowers, Engines, Gas Turbines. (For reciprocating compressors, contact factory for recommendations.)

Universal BFH Series Air Filter is a compact, inexpensive unit designed to employ standard panel filters which are available in a variety of types and efficiencies as shown elsewhere in this catalog. In cases where noise is a consideration, the BFH is commonly used in series with a separate inlet silencer. The filter holding frames in the housing accommodate conventional 2" deep panel filter elements - single stage only. These units are fabricated of steel sheet and plate, welded throughout to provide a rugged, long-lasting trouble-free air filtering component. The filter is equipped with removable weather-hoods and for convenience of mounting, the bottom plate contains an opening and bolting pattern which match 125/150# ANSI flange specifications. Inside and outside surfaces are primed with a rust inhibitor and may be finish painted in the field if desirable.





Model	Config-uration	Nominal Capacity C.F.M.(1.)	A	B	C	D	E	Weight (2.)	No. & Size of Filter Openings
BFH-4-50	Fig. A	450	4	12¼	12¼	13	21½	30	1-12x12x2
BFH-5-50	Fig. B	700	5	12¼	12¼	16	23¼	40	2-12x12x2
BFH-6-10	Fig. B	1000	6	20¼	16¼	17	28½	50	2-16x20x2
BFH-8-30	Fig. B	1750	8	20¼	20¼	20	31½	70	2-20x20x2
BFH-10-40	Fig. B	2750	10	25¼	20¼	23	37	80	2-20x25x2
BFH-10-30	Fig. C	2750	10	20¼	26¼	26¼	37¾	100	4-20x20x2
BFH-12-30	Fig. C	4000	12	20¼	27¼	27¼	38¾	100	4-20x20x2
BFH-12-40	Fig. C	5000	12	25¼	27¼	27¼	41¼	110	4-20x25x2
BFH-14-40	Fig. C	5000	14	25¼	27¼	27¼	41¼	110	4-20x25x2

Dimensions In Inches, Weight In Lbs.

(1.) Nominal capacity is based on exit velocity of approximately 5000 ft./min. (Capacity of filter elements may be greater, but this is unrelated to actual unit capacity, which is primarily a function of outlet size.) For specific sizing and pressure drop data, refer to page 3.

(2.) Weights do not include filter elements.

Specifications

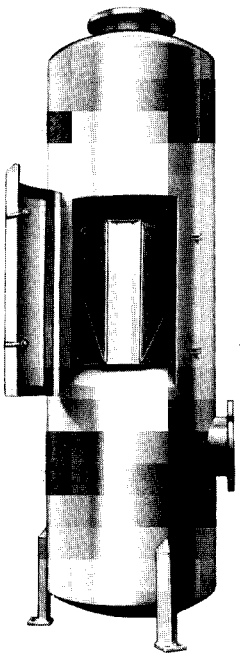
RF Series Filter Silencer

For use on intermediate and large size Positive Displacement Blowers, Reciprocating Engines and Compressors.

Universal RF Series Filter Silencer is intended primarily as a high degree reactive (chamber) type silencer of very rugged construction as normally required on large slow-speed reciprocating or positive displacement machinery, where broad-band noise attenuation and inherent vibration-resistant structural strength is required. Standard panel filters, as described elsewhere in this catalog, are employed in the filter section. Four configurations are available, as shown in the outline drawings below. RF Series are fabricated of steel sheet and plate, welded throughout. Filter panels are serviced and replaced through hinged access doors. Flanged connections are drilled to match 125/150 lb. ANSI specifications. Inside and outside surfaces are given a shop coat of rust inhibitive primer. The exterior may be finish painted in the field if desirable.

Noise Attenuation

Octave Band Cent. Freq. - Hz	63	125	250	500	1000	2000	4000	8000
Attenuation - dB	28	29	29	28	26	25	24	23



PRESSURE DROP
The following formula is used to determine pressure drop:

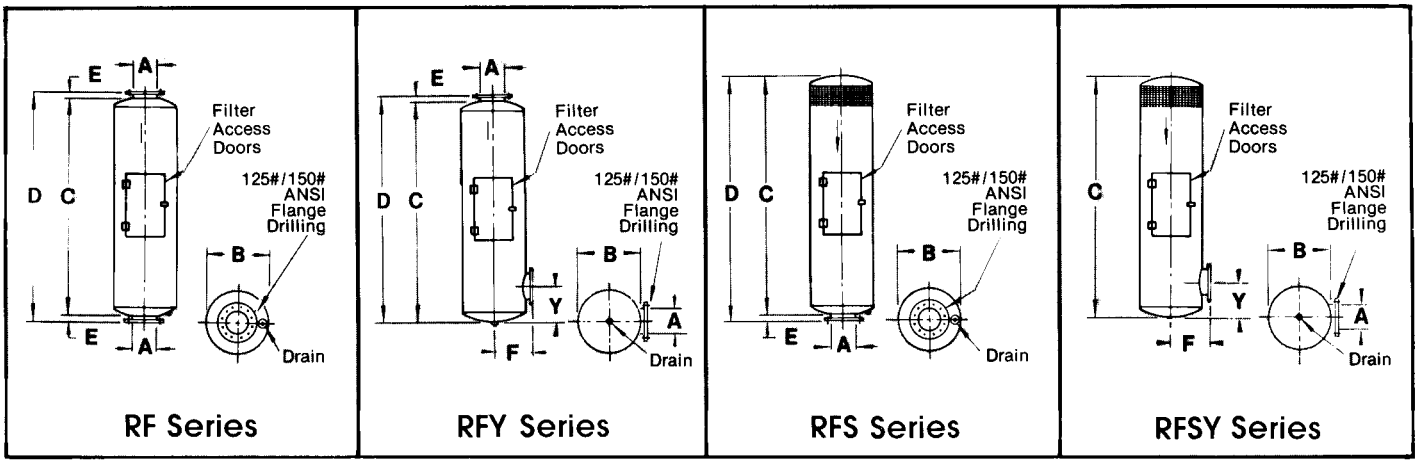
$$\Delta P = C\left(\frac{V}{4005}\right)^2$$

ΔP = pressure drop, inches H_2O
C = restriction coefficient - 4.5 for RF Series
V = air velocity through outlet, ft/min (1.)

The nominal capacities listed below are based on outlet velocity of approximately 5400 ft/min. This will result in a pressure drop of

$$4.5\left(\frac{5400}{4005}\right)^2 = 8.2" H_2O$$

(1.) To determine outlet velocity in ft/min divide air flow (CFM) by cross-sectional area of outlet ($ft.^2$)



Size	Nominal Capacity C.F.M.(1.)	A	B	C				D			E	F	Y		No. & Size of Filter Openings	Weight (2.)	
				RF	RFY	RFS	RFSY	RF	RFY	RFS			Min.	Max.		RF, RFY	RFS, RFSY
8	1875	8	24	79¼	79½	91¾	92	86¼	83	95¼	3½	15½	9	23	2-16x20x2	510	530
10	2950	10	30	105	105½	117½	118	112	109	121	3½	18½	11	34½	2-20x25x2	850	920
12	4250	12	36	125	125½	137½	138	132	129	141	3½	21½	13	40	4-16x25x2	1220	1260
14	5600	14	36	124½	125½	143½	144	131½	129	147	3½	21½	14	39	4-20x25x2	1280	1340
16	7500	16	42	143	144½	163	164	150	148	166½	3½	24½	16	45	6-16x25x2	1950	2070
18	9500	18	42	167½	168½	192½	194	174½	172	196	3½	24½	17	56	8-20x20x2	2170	2290
20	11,500	20	48	181	182½	206½	207½	190	187	211	4½	28½	19	56	8-20x25x2	2900	3000
22	14,000	22	48	198½	200	230½	232	207½	204½	235	4½	28½	20	60	12-16x25x2	3090	3360
24	16,500	24	54	218½	220	250½	252	227½	224½	255	4½	31½	22	66	12-20x25x2	3900	4190
26	20,000	26	54	231	232½	268½	270	240	237	273	4½	31½	24	72	12-20x25x2	4160	4470
28	23,000	28	60	250	251½	288	289½	259	256	292½	4½	34½	26	78	18-20x20x2	5360	5760
30	26,000	30	66	269½	271½	307½	309	278½	276	312	4½	37½	27	77	18-20x25x2	5460	6970

Dimensions In Inches, Weight In Lbs.

(1.) Nominal capacity is based on exit velocity of approximately 5400 ft./min. Refer to pressure drop data above for specific sizing information.
(2.) Weights include filter elements.

Specifications

Note: For capacity and pressure drop information, refer to page 3. For description and specifications of filter elements, refer to page 9.

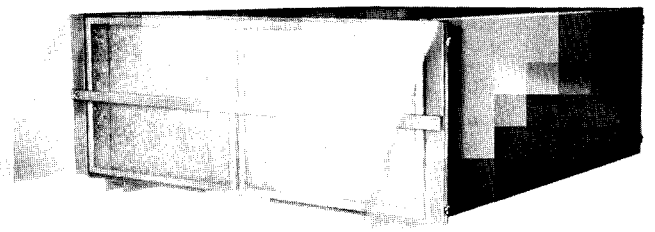
FASH Series Absolute Filter Silencer

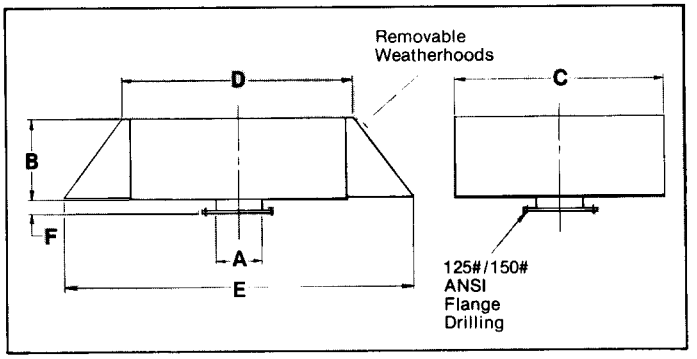
For use on Centrifugal Compressors, Blowers and Gas Turbines.

Universal FASH Series Absolute Filter Silencer represents the ultimate in high efficiency air filtration for industrial application. The unit employs first and second stage elements having a combined depth of 20", to provide unsurpassed efficiency on ultra-fine particulates and a very large surface area for low flow resistance and extra large dirt retention capacity. Filtration efficiency is 99.9+% on particles 0.3 microns and larger in size. A unique feature on this line is a fluid seal means of sealing the final filter rather than the conventional gasket seal. A tongue projection from the filter holding frame is immersed in a stable silicon jell fluid contained in a channel on the downstream side of the P-12F final filter, affecting a 100% by-pass free system. Staging the filters permits changeout of the less expensive pre-filter "roughing" pad and primary filter more frequently than the final filter for economy. Under typical conditions, the pre-filter will require replacment about once per year while the final filter may provide 2-3 years service (Filter specifications and service instructions for the P-8 pre-filter and P-12F final filter are given on page 9). The FASH features an integral silencing section for a moderate degree of noise attenuation. The unit is constructed of heavy duty steel sheet and plate, welded throughout, making it a rugged, long-lasting trouble-free air filtering component. All models are equipped with removable weatherhoods, pressure tap and flanges drilled to match 125/150# ANSI specifications. Inside and outside surfaces are primed and given a finish coat of enamel paint. Suitable mounting legs may be fitted in the field or will be quoted upon application.

Noise Attenuation

Octave Band Cent. Freq. - Hz	63	125	250	500	1000	2000	4000	8000
Attenuation - dB	2	3	4	5	8	13	14	13





Model	Nominal Capacity C.F.M. (1.)	A	B	C	D	E	F	Weight (2.)	No. of Elements	
									P-8	P-12F
FASH-8-2	1750	8	20¾	28¾	58	88	3½	550	2	2
FASH-10-2	2750	10	20¾	28¾	58	88	3½	560	2	2
FASH-10-4	2750	10	20¾	54	60	90	3½	960	4	4
FASH-12-4	4000	12	20¾	54	60	90	3½	980	4	4
FASH-14-4	5400	14	20¾	54	60	90	3½	990	4	4
FASH-14-8	5400	14	41	54	66	96	4½	1730	8	8
FASH-16-8	7000	16	41	54	66	96	4½	1740	8	8
FASH-18-8	8900	18	41	54	66	96	4½	1750	8	8
FASH-20-8	11,000	20	41	54	66	96	4½	1760	8	8
FASH-20-12	11,000	20	61¼	54	72	102	4½	2630	12	12
FASH-24-12	16,000	24	61¼	54	72	102	4½	2670	12	12
FASH-24-16	16,000	24	81½	54	80	110	4½	3480	16	16
FASH-30-16	20,500	30	81½	54	80	110	4½	3490	16	16
FASH-30-24	20,500	30	121¾	54	84	114	4½	5220	24	24
FASH-36-24	35,500	36	121¾	54	84	114	4½	5430	24	24

Dimensions In Inches, Weight In Lbs.

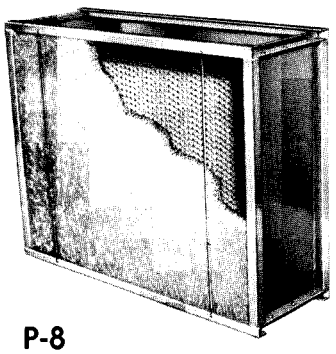
(1.) Nominal capacity is based on exit velocity of approximately 5000 ft./min. (Filter element capacity may be greater but this is unrelated to actual unit capacity, which is primarily a function of outlet size.) For specific sizing and pressure drop data, refer to page 3.
(2.) Weights include filter elements.

Specifications/ Service Instructions

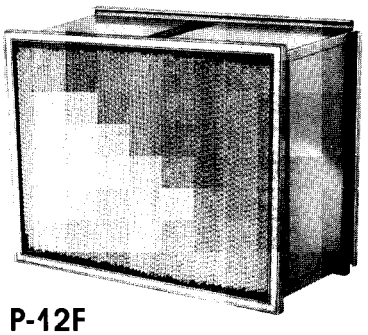
For Absolute Filter Elements Used in FASH Series Filter Silencers

P-8 Pre-Filter P-12F Final Filter

FILTER SPECIFICATIONS



P-8 Pre-Filter



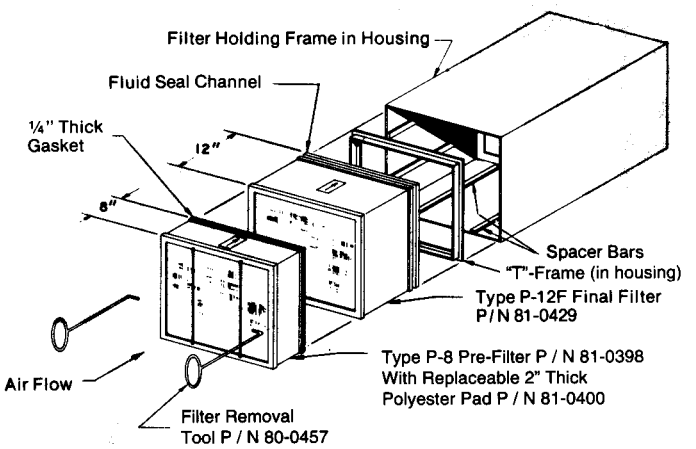
P-12F Final Filter

Model	P-8 Pre-Filter	P-12F Final Filter
Part Number	81-0398 [includes #81-0400 polyester pad (1.)]	81-0429
Weight	27 lbs.	47 lbs.
Size	19½" x 24½" x 8"	19½" x 24½" x 11½"
Efficiency	Individually tested and certified 85% efficient by N.B.S. Test	Individually tested and certified 99.97% efficient by D.O.P. test for particle size 0.3 Micron and larger
Pressure Drop (Clean)	0.6" H_2O at 1250 CFM	1.4" H_2O at 1250 CFM
Seal	Sponge Neoprene Gasket	Silicon Fluid Seal
Filter Media	Waterproof Glass	
Separators	Aluminum	
Frame	16 Ga. Galvanealed Steel	
Construction	Pleated Media Over Corrugated Separators	
Tools Required For Removal	P / N 80-0457 Removal Tools (2 Required)	

(1.) #81-0400 polyester pad is a 2" thick "roughing" filter which fits on the face of the P-8 Pre-Filter. It may be purchased separately in cartons of 12 and should be replaced when visually dirty. (See Service Instructions elsewhere on this page.)

Note: P-8 and P-12F absolute filter elements are not cleanable; they must be replaced with new elements per service instructions.

SERVICE INSTRUCTIONS



CAUTION
Filter panels are fragile — handle very carefully by metal frame. Do not touch media. When inserting filters, push on metal frame around edge, not on face of media.

REMOVAL

1. After removing weatherhoods and retainer bar in front of filters, insert filter removal tools in space on either side of Type P-8 Pre-Filter, turning handles 90° so that hook is positioned behind metal flange on front of filter.
2. Pull evenly on both handles, easing pre-filter out of holding frame.
3. Repeat steps 1 and 2 for removal of final filter.

REPLACEMENT

1. Be certain inside of filter holding frame is perfectly clean and free of any loose debris.
2. With fluid-seal-channel end forward, position final filter carefully on spacer bars inside holding frame, pushing it all the way to the back of holding frame. This places fluid seal in contact with "T" frame on rear flange of holding frame.
3. Push pre-filter into place, seating gasket against metal frame of Final Filter.
4. Replace retainer bars and tighten wing screws, replace weatherhoods.

SERVICING INSTRUCTIONS

P-8 Pre-Filter and P-12F Final Filter are not cleanable; they must be replaced as prescribed below:

1. P / N 81-0400 2" thick polyester pad is to be replaced when visually dirty.
*2. P-8 Pre-Filter should be replaced when pressure drop across it increases 2" H_2O over initial clean pressure drop.
*3. P-12F Final Filter should be replaced when pressure drop across it increases 2" H_2O over initial clean pressure drop.

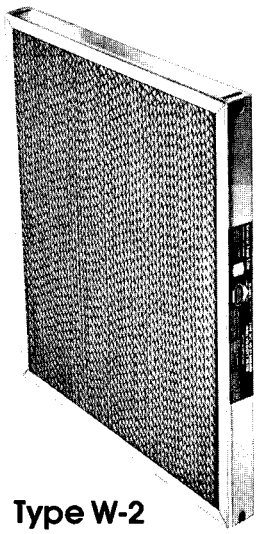
***Pressure drop increase is determined across P-8 Pre-Filter and P-12F Final Filter individually as follows:**

a. When unit is **initially installed** (filters new), make two pressure drop measurements and record results for future reference.
   1. With all filters installed
   2. With P-8 Pre-Filters removed, but with P-12F Final Filters installed.

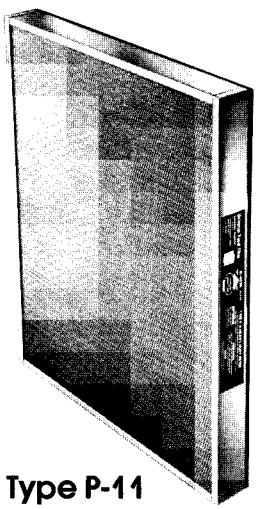
b. After unit has been in prolonged service and it is necessary to measure pressure drop increases, repeat steps 1 and 2 from (a.) above. Individual increases can then be determined by subtracting the clean pressure drops from (a.) from the corresponding pressure drops measured after filters are loaded.

Specifications

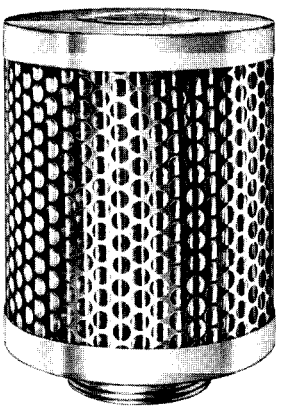
Filter Elements



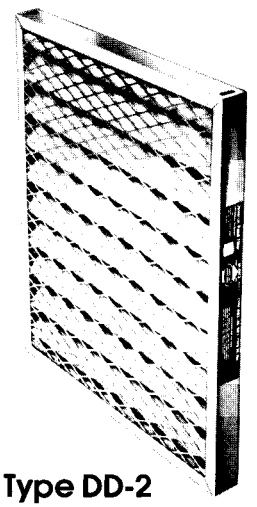
Type W-2



Type P-11



Type P-5



Type DD-2

Type	Available Sizes (in.)	Part No.	Weight (lb.)	Rated Flow (CFM)	Frame Material	Media	Dry or Oil Wet	Cleaning (1.)	Media Surface Area ($Ft.^2$)	Efficiency	Initial Resistance at Rated Flow (Inches H_2O)
W-2	12x12x2	81-0410	5	360	Galvanized Steel	Crimped Galvanized Steel Wire Mesh	Oil Wet	Solvent Wash	1.0	93% on 10 Micron	0.08
	16x20x2	81-0162	9	800					2.2		
	16x25x2	81-0163	10	1000					2.8		
	20x20x2	81-0164	10	1000					2.8		
	20x25x2	81-0165	12.5	1250					3.5		
DD-2	12x12x2	81-0411	4	360	Galvanized Steel	Felted Synthetic (Polyester)	Dry	Soak in warm water and mild detergent. Rinse under low pressure water – Air dry only.	1.7	99% on 10 Micron	0.31
	16x20x2	81-0170	7	800					3.7		
	16x25x2	81-0171	8.5	1000					4.6		
	20x20x2	81-0172	8.5	1000					4.6		
	20x25x2	81-0173	10	1250					5.8		
P-11	20x25x2	81-0326	8	1250	Aluminized	Paper	Dry	Compressed Air or Soap Wash	82.5	97%, 1 Micron 99.5%, 2 Micron	0.44
P-5	5 Dia. x 6 Long	81-0317	0.7	105	Steel Plated Steel	Paper	Dry	Compressed Air	8.3	97%, 1 Micron 99.5%, 2 Micron	0.83
P-5EC		81-0421			Epoxy Coated Steel						

(1.) Detailed cleaning instructions are given on each element.

Note: Types DD-2 and W-2 are available with stainless steel or aluminum frames. Type W-2 is available with stainless steel or aluminum media. These special material elements are quoted on application.

Universal Oil Free Adhesive

Universal oil free adhesive is an oil-free product developed for use on viscous impingement type filters. It is a substitute for oil for applications which do not permit oil wetting of the elements, such as oil-free compressors.

New filters* should be treated on each side by applying a thorough coat of the adhesive and allowing to dry about ten minutes before placing into service. Used filters must be cleaned and dried according to instructions prior to application of the adhesive.

Universal Oil-Free Filter adhesive is available in 16 ounce aerosol spray cans, packaged 6 cans per carton. Order by part number 81-0323.

*Universal type W-2 filters are treated at factory prior to shipment.

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