RUSKIN

3900 Dr. Greaves Rd. • Kansas City, MO 64030 • (816) 761-7476 • FAX (816) 765-8955

INDUSTRIAL SWARTWOUT FIBERGLASS SERIES

1108AF FIBERGLASS CONTROL DAMPER

Airfoil Blade

STANDARD CONSTRUCTION

FRAME
Vinyl Ester Resin. See table for dimensions.

BLADE
Vinyl Ester Resin, Airfoil Shape, 6 5/8" (168) wide x 1/4" (6) thick.

AXLES
3/4" (19) diameter fiberglass rod.

BEARINGS
Molded PTFE.

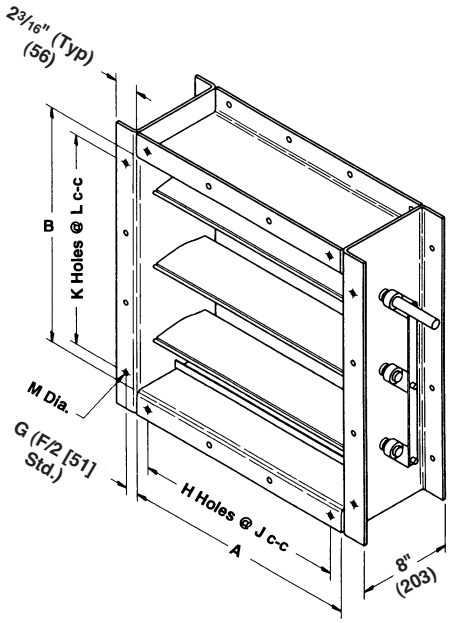
LINKAGE
316SS out of airstream.

MAXIMUM TEMPERATURE
200°F (94°C).

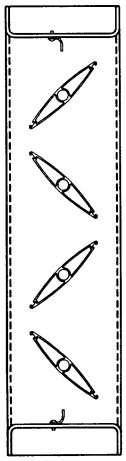
MINIMUM SIZE
Single blade, parallel action 6"w x 8"h (152 x 203).
Two blades, parallel or opposed action 6"w x 12"h (152 x 305).

MAXIMUM SIZE
48"w x 72"h (1219 x 1829).

Dimensions in parenthesis ( ) indicate millimeters.



Illustrated with Optional Bolt Holes



Opposed Blade Action Illustrated

PRESSURE LIMITATIONS

DAMPER WIDTH	MAXIMUM SYSTEM PRESSURE	MAXIMUM SYSTEM VELOCITY
48" (1219)	12" w.g.	4000 fpm
40" (1016)	14" w.g.	4000 fpm
24" (610)	20" w.g.	4000 fpm
12" (305)	28" w.g.	4000 fpm

FRAME	BLADES	SEALS (Optional)	AXLES	BEARINGS	LINKAGE	ACCESSORIES (Optional)
8" x 2 3/16" x 1/4" (203 x 56 x 6) Channel	6 5/8" (168) Airfoil	Silicone Rubber Blade Seal	3/4" (19) Diameter Fiberglass	Molded PTFE	316SS Out of Airstream	Bolt Holes
		EPDM Blade Seal	3/4" (19) Diameter SS			One (1) Flange
		Viton Blade Seal				Both (2) Flanges
		Polycarbonate Jamb Seal				Manual Actuator
		Stainless Steel Jamb Seal				Crank Lever (CL)
		Axle Shaft Seals				Hand Quad (HQ)
						Actuators
						Electric
						Pneumatic

QTY.	BLADE ACTION		DIMENSIONS								VARIATIONS	TAG
	PB	OB	A	B	G	H	J	K	L	M		

PROJECT: **LOCATION:**
ARCH/ENGR: **CONTRACTOR:**
REPRESENTATIVE: **DATE:**

1108AF LEAKAGE DATA

TOTAL CFM LEAKAGE AT ONE INCH WATER GAGE STATIC PRESSURE DIFFERENTIAL

FOR DAMPER EQUIPPED WITH OPTIONAL BLADE AND JAMB SEALS

DAMPER WIDTH	DAMPER HEIGHT										
	12" (305)	**18"** (457)	**24"** (610)	**30"** (762)	**36"** (914)	**42"** (1067)	**48"** (1219)	**54"** (1372)	**60"** (1524)	**66"** (1676)	**72"** (1829)
12" (305)	7.5	11	15	19	23	26	30	34	38	41	45
24" (610)	10	15	20	25	30	35	40	45	50	55	60
36" (914)	12	18	24	30	36	42	48	54	60	66	72
48" (1219)	16	24	32	40	48	56	64	72	80	88	96

FOR DAMPER WITHOUT BLADE AND JAMB SEALS

DAMPER WIDTH	DAMPER HEIGHT										
	12" (305)	**18"** (457)	**24"** (610)	**30"** (762)	**36"** (914)	**42"** (1067)	**48"** (1219)	**54"** (1372)	**60"** (1524)	**66"** (1676)	**72"** (1829)
12" (305)	60	90	120	150	180	210	240	270	300	330	360
24" (610)	80	120	160	200	240	280	320	360	400	440	480
36" (914)	96	144	192	240	288	336	384	432	480	528	576
48" (1219)	128	192	256	320	384	448	512	576	640	704	768

Dimensions in parenthesis ( ) indicate millimeters.

LEAKAGE CORRECTION FACTOR

Static Pressure (in. w.g.)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Correction Factor	1.0	1.4	1.7	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.3	3.5	3.6	3.7	3.9	4.0	4.1	4.2	4.4	4.5

DETERMINING LEAKAGE:

To determine leakage at static pressure differentials higher than one inch water gage, multiply leakage at one inch (determined from appropriate table above) by correction factor for higher static pressure (determined from the Leakage Correction Factor Table).

Example:
Find leakage for a 36" wide x 24" high (914 x 610) damper equipped with optional blade and jamb seals at 3 inches water gage: 24 CFM x 1.7 = 40.8 CFM leakage at 3 inches water gage.

Leakage ratings are based on AMCA Standard 500 using Test Setup Apparatus Figure 5.5. Torque applied holding damper closed at 10 in. lbs. per sq. ft. of damper with minimum of 20 in. lbs.

INSTALLATION:

For proper operation, damper must be installed square and free from racking. Opposed blade dampers must be operated from a power blade or drive axle.

NOTE:
Dampers are designed for operation with blades running horizontally. Dampers to be installed with vertical blades require thrust collars be added at time of damper manufacture and at additional cost. Some standard features are not available with vertical bladed dampers.

1108AF PRESSURE DROP DATA

AREA FACTOR TABLE

B Dimension Height in Inches	A Dimension – Width in Inches														
	6" (152)	9" (229)	12" (305)	15" (381)	18" (457)	21" (533)	24" (610)	27" (686)	30" (762)	33" (838)	36" (914)	39" (991)	42" (1067)	45" (1143)	48" (1219)
6" (152)	7.05	4.70	3.53	2.82	2.35	2.01	1.76	1.57	1.41	1.28	1.18	1.08	1.01	0.94	0.88
9" (229)	4.17	2.78	2.08	1.66	1.39	1.19	1.04	0.92	0.84	0.75	0.69	0.64	0.59	0.55	0.52
12" (305)	2.92	1.95	1.46	1.17	0.98	0.84	0.73	0.65	0.58	0.53	0.49	0.45	0.41	0.39	0.36
15" (381)	2.17	1.45	1.08	0.87	0.72	0.63	0.54	0.49	0.43	0.39	0.36	0.34	0.31	0.24	0.28
18" (457)	1.84	1.23	0.92	0.73	0.61	0.53	0.46	0.41	0.37	0.34	0.31	0.29	0.27	0.29	0.23
24" (610)	1.35	0.90	0.67	0.54	0.45	0.38	0.34	0.30	0.27	0.24	0.22	0.21	0.19	0.18	0.17
30" (762)	1.02	0.68	0.51	0.41	0.34	0.30	0.25	0.22	0.20	0.19	0.17	0.16	0.15	0.14	0.13
36" (914)	0.85	0.56	0.42	0.34	0.24	0.21	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.12	0.11
42" (1067)	0.72	0.49	0.36	0.29	0.24	0.21	0.18	0.16	0.15	0.13	0.12	0.12	0.11	0.10	0.10
48" (1219)	0.64	0.42	0.32	0.25	0.21	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.10	0.08	0.07
54" (1372)	0.56	0.37	0.28	0.22	0.19	0.16	0.14	0.13	0.12	0.11	0.10	0.08	0.08	0.07	0.07
60" (1524)	0.50	0.33	0.24	0.20	0.17	0.14	0.13	0.11	0.10	0.08	0.08	0.07	0.07	0.06	0.06
66" (1676)	0.45	0.30	0.22	0.18	0.15	0.13	0.12	0.10	0.08	0.08	0.07	0.07	0.06	0.06	0.05
72" (1829)	0.41	0.28	0.20	0.17	0.14	0.12	0.11	0.10	0.08	0.07	0.06	0.06	0.06	0.05	0.05

Dimensions in parenthesis ( ) indicate millimeters.

DETERMINING PRESSURE DROP

Use the Area Factor Table and Pressure Drop Chart to determine pressure drop through 1108AF Dampers.

1. Determine area factor for damper by entering the Area Factor Table through duct width and height.
2. Find the conversion velocity (CV) by multiplying the selected size damper's area factor by the flow rate in CFM:

   CV = Area Factor x CFM
3. Enter the Pressure Drop Chart at the determined area factor and proceed up to appropriate conversion velocity (CV) line. Then, read across to static pressure drop at left side of chart.

EXAMPLE

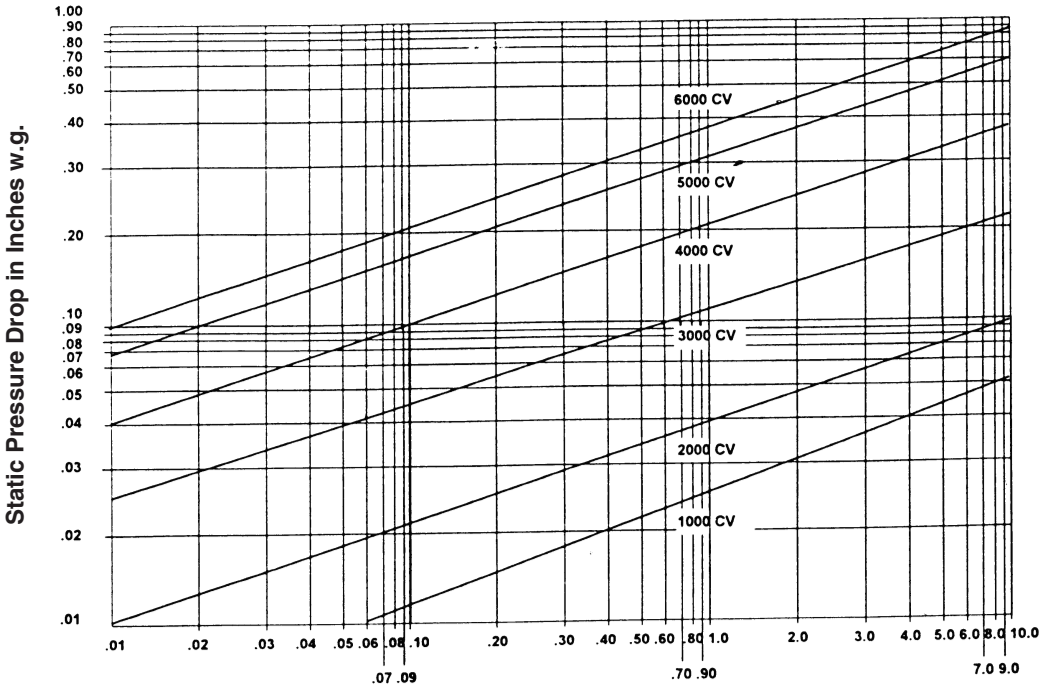
1. Find the pressure drop across an 18" wide x 18" high (457 x 457) Model 1108AF Damper handling 8570 CFM. From the Area Factor Table, area factor is determined to be .61.

   CFM X AREA FACTOR EQUALS CONVERSION VELOCITY
2. Therefore, CV (Conversion Velocity) = 8570 CFM x .61 = 5300. Using the Pressure Drop Chart, pressure drop = .30 inches water gage.

NOTES:

1. Ratings are based on AMCA Standard 500 using Test Setup Apparatus Figure 5.3 (damper is installed with duct upstream and downstream).
2. Static Pressure and Conversion Velocities are corrected to .075 lb./cu. ft. air density.

1108AF PRESSURE DROP CHART



Dimensions in parenthesis ( ) indicate millimeters.

1108AF SUGGESTED SPECIFICATION

Furnish and install, at locations shown on plans or in accordance with schedules, Fiberglass airfoil design multiblade control dampers. Dampers shall be of pultruded construction and comply with ASTM D4385-84A, ASTM E-84, and ASME/ANSI RTP1-1989. Material used in construction shall be a flame retardant vinyl ester based substance. All material in airstream must meet or exceed required contamination concentration. Bearing design shall be based on system pressure and shall be of a teflon based material. All exposed glass shall be coated with resin compatible with that used in the pultrusion process and covered with surfacing veil. No exposed cut edges are acceptable. Damper blades shall be minimum 1/4" (6) thick of a hollow airfoil shape and contain pultruded slot for insertion of optional blade seal. Adhesive type seals are not acceptable. Frame shall be 8 inch deep X 2 3/16" inch flanged style, minimum 1/4" thick (203 x 56 x 6). The fiberglass axles shall be minimum 3/4" (19) diameter constructed of a vinyl ester based material, combined with continuous strand roving, and complete with surfacing veil. Damper design shall withstand minimum 14" W.G. and 4000 FPM velocity based on minimum 40" (1016) blade length. Submittal information shall include published performance data based on AMCA Standard 500 testing illustrating damper leakage, pressure drop, and static pressure design characteristics for a full range of damper sizes. Data from one size sample test is not acceptable. Damper shall be Ruskin Swartwout Series model 1108AF.

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