



(ENGINEERS)

SUBMITTAL DATA

Industrial Airfoil Blade Control Damper Model NAH-720-4

Design / Application

Model **NAH-720-4** (Opposed Blade Operation) and **NAH-721-4** (Parallel Blade Operation) are Industrial Air Control Damper with Airfoil Shaped Blades. These models consist of a heavy duty flanged frames designed for direct attachment to the ductwork or equipment. **NAH Series** models are ideal for balancing and/or shut off HVAC applications in the industrial systems with many options to meet your needs.

STANDARD CONSTRUCTION:

FRAME:

8" x 2-1/2" x 3/8" H.R.S. channel [203.2 x 63.5 x 9.25mm]

BLADES:

Airfoil-shaped 12 ga H.R.S. double skin construction
5" [127mm] to 8" [203.2mm] wide.

AXLES:

Steel 1-1/2" [38.1mm]

LINKAGE:

9 ga galvanized jamb linkage

BEARINGS:

Cast iron housing 2 hole ball bearings

AVAILABLE FINISHES:

- ☐ Zinc Rich Gray Primer
☐ Special 1000°F Paint (Black Only)

SIZE LIMITATIONS:

Maximum size: 60"w x 96"h [1524 x 2438.4mm]

Minimum size: single blade 6"w x 8"h
[152.4 x 203.2mm]

RATINGS:

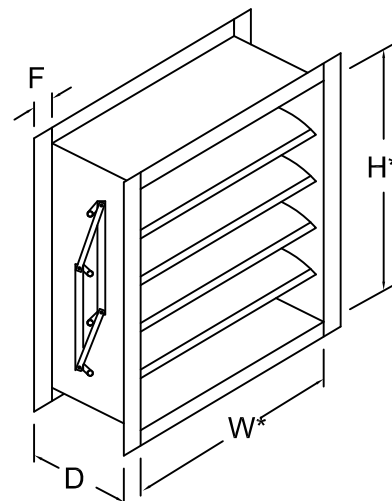
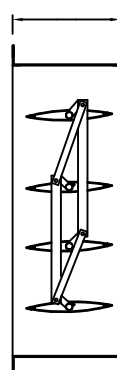
Pressure: 10-40" w.g.- differential pressure

Velocity: 3000-8000 fpm

Temperature: -20°F - 1,000°F (without blade gasket)

Note: Special blade clearances are required when temperatures exceed 250°F (121°C). Consult United Enertech in these cases.

8"
[203.2mm]



NOTE: Damper blades always run horizontal and are always the first dimension (W) when ordering (example: always order W" x H").

***Inside Dimensions are Actual Size(not undersized)**

OPTIONS

- ☐ Stainless steel jamb seals
☐ Flange bolt holes
☐ EPDM blade seals 250° F
☐ Silicone blade seals 450° F
☐ 304 stainless steel construction
☐ 316 stainless steel construction
☐ Bearing Options: (consult factory)
☐ Hand Quadrant (std. #2)
☐ Wheel driven worm gear heavy duty
☐ Chain driven worm gear heavy duty
☐ Stuffing box seal
☐ Outboard bearing with shaft seal
☐ Linkage cover
☐ Central manifold grease system
☐ Actuator
☐ Powder Coated
☐ 1000° F (powder coated) resistance
☐ Insulated (Foam Filled Blades)



Quantity:	Max.Temp. (if higher than 250°F)	"W" Width	"H" Height	Frame Depth "D" 8" std.	Flange Wldth "F" 2-1/2" std.	Bolt Hole Information							REMARKS
						J	N1	L Spacing	M Dia.	K	N2	C	

Job Name:	☐ Model NAH-720-4 (opposed blades)		
Location:	☐ Model NAH-721-4 (parallel blades)		
Architect:	DRAWN BY:	DATE:	REV. DATE:
Engineer:	CLJ	3-12-03	12-8-16
Contractor:	REV.NO.:	APPROVED BY:	DWG NO.:
	21	BGT	C-25

MODEL NAH-720-4 PERFORMANCE DATA

Imperial Units (Forward Flow)

Damper Width X Height	1 in. w.g. Class	4 in. w.g. Class	8 in. wg Class	*Torque (per sq. ft.)
12" x 12"	Class I	Class I	Class I	18 lbs-in
24" X 24"	Class I	Class I	Class I	15 lbs-in
36" X 36"	Class I	Class I	Class I	18 lbs-in
12" X 48"	Class I	Class I	Class I	15 lbs-in
48" X 12"	Class I	Class I	Class I	15 lbs-in
60" X 36"	Class I	Class I	Class I	18 lbs-in

*Torque applied to hold damper in closed position

Air leakage is based on operation between 50°F to 104°F. All data corrected to represent air density of 0.075 lbs/ft.³

Imperial Units (Back Flow)

Damper Width X Height	1 in. w.g. Class	4 in. w.g. Class	8 in. wg Class	*Torque (per sq. ft.)
12" x 12"	Class I	Class I	Class I	18 lbs-in
24" X 24"	Class I	Class I	Class I	15 lbs-in
36" X 36"	Class I	Class I	Class I	18 lbs-in
12" X 48"	Class II	Class II	Class II	15 lbs-in
48" X 12"	Class I	Class I	Class I	15 lbs-in
60" X 36"	Class I	Class II	Class I	18 lbs-in

*Torque applied to hold damper in closed position

		Leakage, ft ³ /min ² /ft			
		Required Rating		Extended Ranges (optional)	
Class	Pressure	1"	4"	8"	12"
I		4	8	11	14
II		10	20	28	35
III		40	80	112	140

All data corrected to represent standard air at a density of 0.075 lbs/ft.

NAH-720 SOUND RATINGS								
Damper Size	Damper Full Open		Damper 75% Open		Damper 50% Open		Damper 25% Open	
	CFM	NC	CFM	NC	CFM	NC	CFM	NC
12 x 12	2000	16	1500	11	1000	11	500	*
	3000	28	2250	21	1500	18	750	*
	4000	36	3000	29	2000	24	1000	*
18 x 18	2250	17	1688	10	1125	21	563	*
	4500	33	3375	26	2250	31	1125	*
	6750	43	5063	37	3375	40	1688	15
24 x 24	4000	11	3000	10	2000	26	1000	*
	8000	33	6000	29	4000	37	2000	21
	12000	43	9000	42	6000	46	3000	31

NC = Noise criteria in Decibels is based on room effect and 10db of room attenuation.
* = Less than 10 NC

AMCA Test Figures

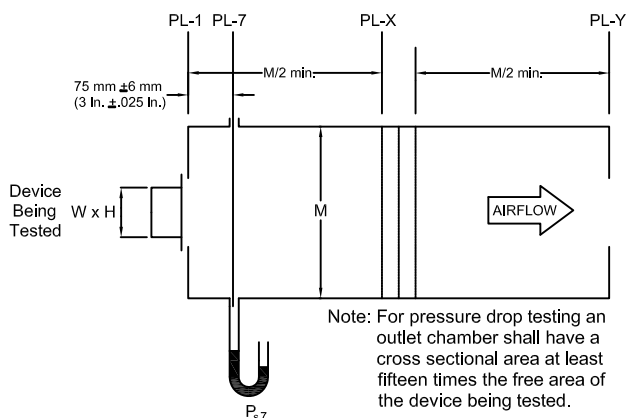


Figure 5.4- Test Device Setup with Outlet Chamber

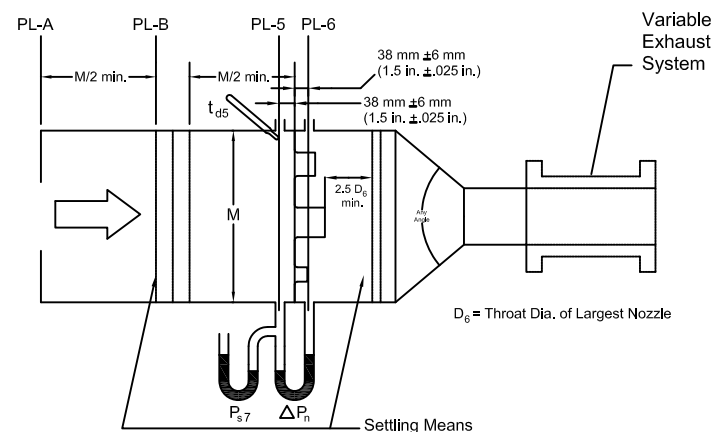


Figure 6.3- Airflow Rate Measurement Setup- Multiple Nozzle Chamber on Fan Inlet

MODEL NAH-720-4 PERFORMANCE DATA

Standard International Units (Forward Flow)

Damper Width X Height (mm)	250 Pa Class	1 KPa Class	2 KPa Class	*Torque
305 x 305	Class I	Class I	Class I	3,214 grams-cm
610 X 610	Class I	Class I	Class I	2,679 grams-cm
915 X 915	Class I	Class I	Class I	3,214 grams-cm
305 X 1220	Class I	Class I	Class I	2,679 grams-cm
1220 X 305	Class I	Class I	Class I	2,679 grams-cm
1525 X 915	Class I	Class I	Class I	3,214 grams-cm

*Torque applied to hold damper in closed position

Air leakage is based on operation between 10°C to 40°C. All data corrected to represent air density of 1.201 kg/m³.

Standard International Units (Back Flow)

Damper Width X Height (mm)	250 Pa Class	1 KPa Class	2 KPa Class	*Torque
305 x 305	Class I	Class I	Class I	3,214 grams-cm
610 X 610	Class I	Class I	Class I	2,679 grams-cm
915 X 915	Class I	Class I	Class I	3,214 grams-cm
305 X 1220	Class II	Class II	Class II	2,679 grams-cm
1220 X 305	Class I	Class I	Class I	2,679 grams-cm
1525 X 915	Class I	Class II	Class I	3,214 grams-cm

*Torque applied to hold damper in closed position

Leakage, L/s /m ²				
Class \ Pressure	Required Rating		Extended Ranges (optional)	
	0.25 kPa	1.0 kPa	2.0 kPa	3.0 kPa
I	20.3	40.6	55.9	71.1
II	50.8	102	142	178
III	203	406	569	711

FRAME CONSTRUCTION OPTIONS

Flange (F Dim): Standard- 2-1/2"
Optional - 3" to 4"

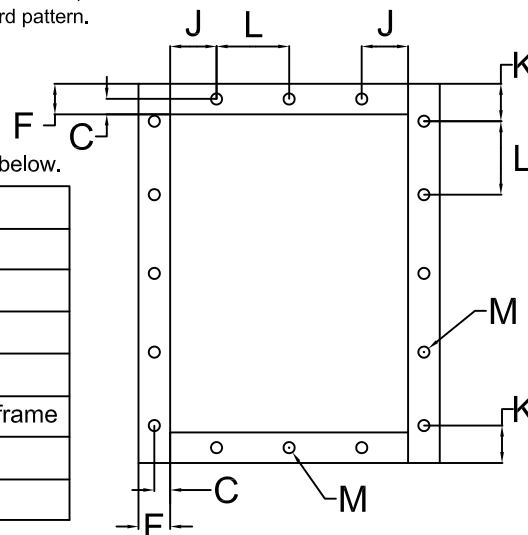
Bolt holes: (Standard construction is **no** bolt holes)
Optional- United Enertech recommended standard pattern.

Dim. "M": 7/16" dia. hole
Dim. "L": 6" Center to Center

Web (D Dim): Standard - 8"
Optional - 8" to 12"

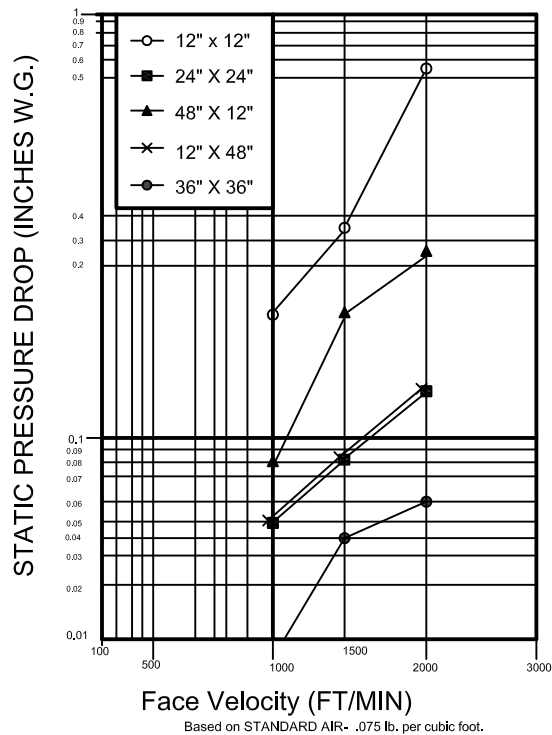
Note: Customer must be within Min. or Max limits on table below.

Dim.	Min or Max	Standard	Description
J	min. 3/4"		First/Last Space in Head/Sill
N1	min. 1.0"		No. of holes in Head/Sill
K	min. F/2"		First/Last Space in Jamb
N2	min. 1.0"		No. of holes in Jamb
C	.75*D" to 3/4"	F/(2*M)"	Centerline of bolt hole from inside edge of frame
L	2" to 12"	6.0"	Hole Spacing
M	1/4" to 11/16"	7/16"	Mounting hole Diameter



MODEL NAH-720-4 PERFORMANCE DATA

PRESSURE DROP



NAH-720-4 sizes: 12x12, 24x24, 48x12, 12x48, 36x36
(305x305, 610x610, 1219x305, 305x1219, 914x914)

NAH-720-4

PRESSURE LIMITATIONS

The chart at the right shows conservative pressure limitations based on a maximum blade deflection of $w/360$.

TEMPERATURE LIMITATIONS

Blade Seals: EPDM -40° to +250°F
Silicone Rubber -40° to +450°F
Jamb Seals: Flexible stainless steel -40° to +400°F

VELOCITY LIMITATIONS

The chart at the right shows conservative velocity limitations based on damper size.

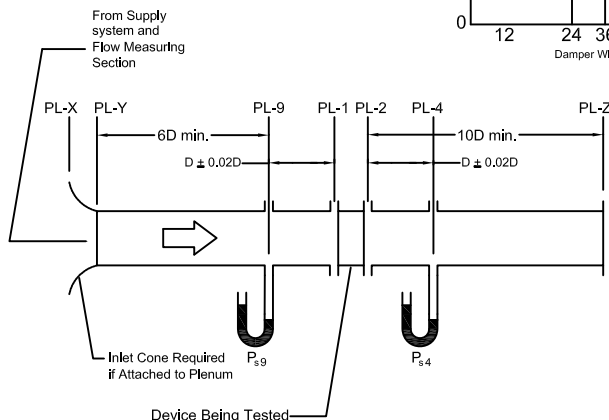
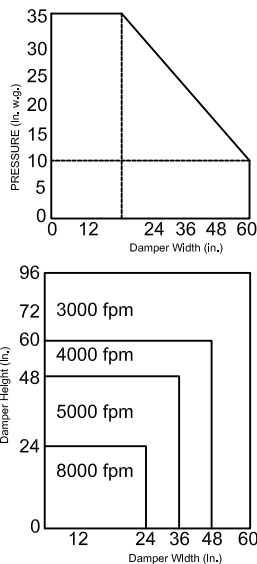


Figure 5.3- Test Device Setup with Inlet and Outlet Ducts

AMCA Test Figure 5.3

Figure 5.3 illustrates a fully ducted damper. This configuration has low pressure drop because entrance and exit losses are minimized by straight duct runs upstream and downstream of the damper.

Pressure Drop Data

This pressure drop data was conducted in accordance with AMCA Standard 500 using Test Figure 5.3. All data has been corrected to represent standard air at a density of .075 lb/cu.ft.

Actual pressure drop found in any HVAC system is a combination of many factors. This pressure drop information along with an analysis of other system influences should be used to estimate actual pressure losses for a damper installed in a given HVAC system.

12 x 12	
Face Velocity ft/min (m/s)	Pressure Drop in. w.g. (Pa)
1000 (5.08)	0.18 (45)
1500 (7.62)	0.35 (88)
2000 (10.16)	0.57 (144)

24 x 24	
Face Velocity ft/min (m/s)	Pressure Drop in. w.g. (Pa)
1000 (5.08)	0.05 (12)
1500 (7.62)	0.08 (20)
2000 (10.16)	0.13 (33)

48 x 12	
Face Velocity ft/min (m/s)	Pressure Drop in. w.g. (Pa)
1000 (5.08)	0.08 (20)
1500 (7.62)	0.18 (45)
2000 (10.16)	0.26 (66)

12 x 48	
Face Velocity ft/min (m/s)	Pressure Drop in. w.g. (Pa)
1000 (5.08)	0.05 (12)
1500 (7.62)	0.08 (20)
2000 (10.16)	0.13 (33)

36 x 36	
Face Velocity ft/min (m/s)	Pressure Drop in. w.g. (Pa)
1000 (5.08)	0.011 (3)
1500 (7.62)	0.04 (10)
2000 (10.16)	0.06 (15)

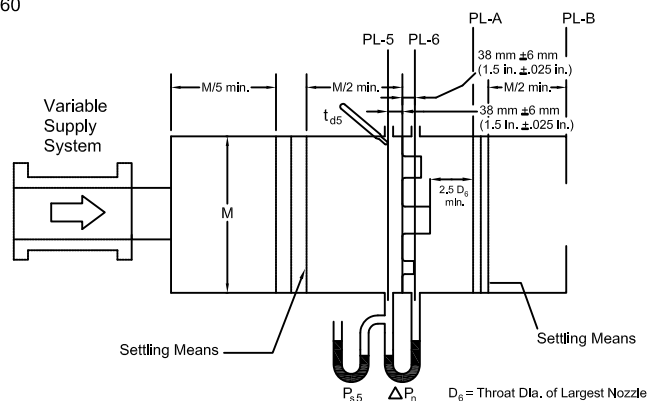


Figure 6.5- Airflow Rate Measurement Setup- Multiple Nozzle Chamber on Fan Outlet