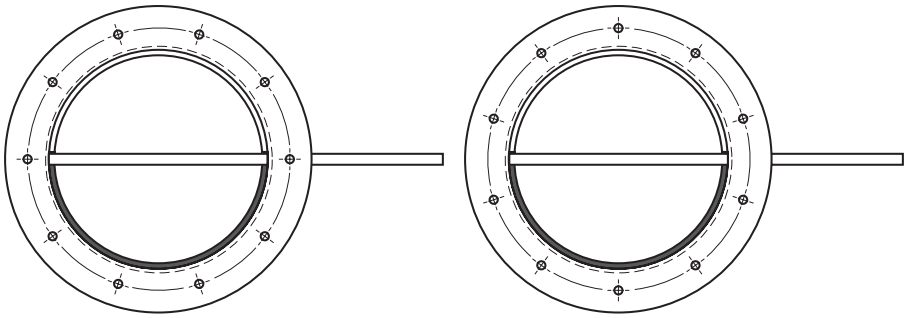
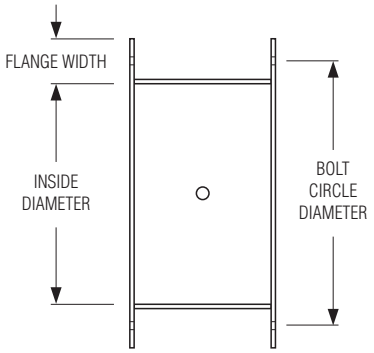
Nailor Industries Inc.

HEAVY DUTY INDUSTRIAL CONTROL DAMPERS
ROUND, SQUARE OR RECTANGULAR
STANDARD BOLT HOLE CONFIGURATIONS
MODEL SERIES: 1900

ROUND DAMPERS:





❑ **BHAA**
Bolt holes aligned with axle

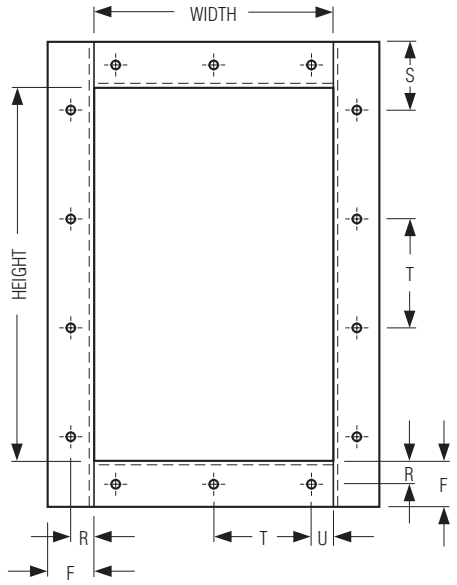
❑ **BHAP**
Bolt holes aligned perpendicular to axle

Standard bolt circle diameter = damper size + flange width + 1/4" (6).

Damper Size (Inside Diameter)	No. of Holes	Degrees Between Holes	Hole/Slot Dimensions
4" (102) thru 6" (152)	4	90	3/8" (10)
> 6" (152) thru 10" (254)	6	60	3/8" (10)
> 10" (254) thru 14" (356)	8	45	3/8" (10)
> 14" (356) thru 20" (508)	10	36	3/8" (10) x 1/2" (13)
> 20" (508) thru 28" (711)	12	30	3/8" (10) x 1/2" (13)
> 28" (711) thru 36" (914)	16	22 1/2	3/8" (10) x 1/2" (13)
> 36" (914) thru 42" (1067)	18	20	9/16" (14) x 11/16" (17)
> 42" (1067) thru 48" (1219)	20	18	9/16" (14) x 11/16" (17)
> 48" (1219) thru 58" (1473)	24	15	9/16" (14) x 11/16" (17)
> 58" (1473) thru 72" (1829)	30	12	9/16" (14) x 11/16" (17)

This chart indicates Nailor's standard bolt hole sizes and configurations for round dampers ordered with Option BH. Non-standard hole sizes and configurations can be provided if required (a clearly detailed drawing of non-standard requirements must be provided to Nailor).

SQUARE AND RECTANGULAR DAMPERS:



Dimension	Standard	Minimum	Maximum
F	2" (51)	1 1/2" (38)	4" (102)
R	1" (25)	F ÷ 2	F – 3/4" (19)
S	1" (25)	F ÷ 2	–
T	6" (152)	2" (51)	12" (305)
U	–	3/4" (19)	–

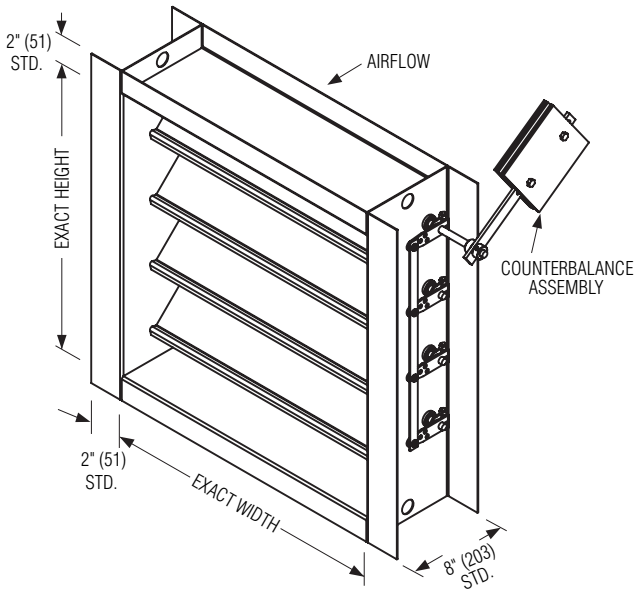
This chart indicates Nailor's standard bolt hole configurations for square and rectangular dampers ordered with Option BH. Standard bolt hole size is 7/16" (11) diameter. Non-standard hole sizes and configurations can be provided if required (a clearly detailed drawing of non-standard requirements must be provided to Nailor).

SCHEDULE TYPE:	Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**9 - 9 - 03**	**1900**	**NEW**	**1900BH-1**

Nailor Industries Inc.

HEAVY DUTY INDUSTRIAL BACKDRAFT DAMPER
COUNTERBALANCED • STEEL • VEE BLADE
MODEL: 1900CB

Model 1900CB is a heavy duty industrial counterbalanced backdraft damper designed to prevent the backflow of air while allowing for automatic air intake or exhaust in industrial HVAC or process air systems. Features include a rugged vee-blade design, heavy duty blade linkage and ball bearings, that provide smooth, rattle-free operation at velocities of up to 3000 fpm. The counterweight is easily adjusted for desired opening pressure and the heavy duty flanged frame, with optional bolt holes, connects easily to flanged duct for fast, secure installation. Durable steel construction and a wide selection of options make Model 1900CB a versatile, solid performer.



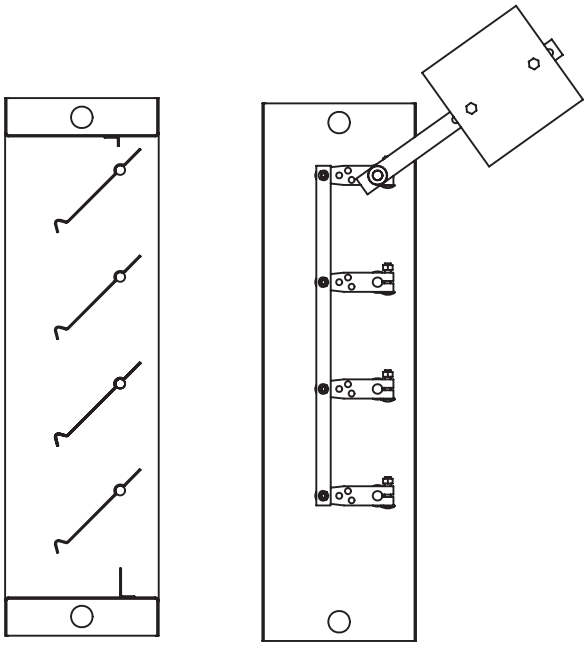
STANDARD CONSTRUCTION:

FRAME: 8" x 2" x 14 ga. (203 x 51 x 2) coated steel channel.
BLADES: 7" (178) wide maximum, 16 ga. (1.6) galvanized steel, vee-blade design.
LINKAGE: Heavy duty linkage arms and plated steel tie bar, concealed out of the airstream.
AXLES: 1/2" (13) dia. plated steel.
BEARINGS: Ball bearing type, pressed into frame.
COUNTER-BALANCE: Adjustable, externally mounted.
MINIMUM SIZE: 6" x 6" (152 x 152).
MAXIMUM SIZE: 48" x 96" (1219 x 2438). For larger sizes, contact factory.
MAXIMUM TEMPERATURE: 250°F (121°C) standard. 400°F (204°C) with HT option.
MAX. PRESSURE: 4 to 10 in. w.g. (see page 2).
MAX. VELOCITY: 3000 fpm (see page 2).

OPTIONS:

- ❑ BH Bolt holes in flanges
- ❑ CBI Internal counterbalance
- ❑ BPV PVC blade seals (up to 180°F (83°C))
- ❑ BSE EPDM blade seals (up to 250°F (121°C))
- ❑ BSS Silicone blade seals (up to 400°F (204°C))
- ❑ JSN Neoprene jamb seals
- ❑ BESS Stainless steel sleeve bearings (pressed in)
- ❑ BEBR Relubricable ball bearings (bolt-on)
- ❑ 304 Stainless steel construction
- ❑ SSA 304 stainless steel axles only
- ❑ HT High temperature construction (up to 400°F (204°C))
- ❑ NSF Non-standard flange width (1 1/2" (38) to 4" (102)) Specify _____.
- ❑ Special _____.

Note: For variations not shown, contact factory.



BLADES **LINKAGE**

SCHEDULE TYPE:	Page 1 of 2 Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**8 - 30 - 07**	**1900**	**3 - 30 - 06**	**1900CB**

Nailor Industries Inc.

HEAVY DUTY INDUSTRIAL BACKDRAFT DAMPER
COUNTERBALANCED • STEEL • VEE BLADE
PERFORMANCE DATA
MODEL: 1900CB

PERFORMANCE LIMITATIONS:

Damper Width	Model 1900CB	
	Max. System Pressure	Max. System Velocity
48" (1219)	4.0 in. w.g.	3000 fpm
36" (914)	6.0 in. w.g.	3000 fpm
24" (610)	8.0 in. w.g.	3000 fpm
12" (305)	10.0 in. w.g.	3000 fpm

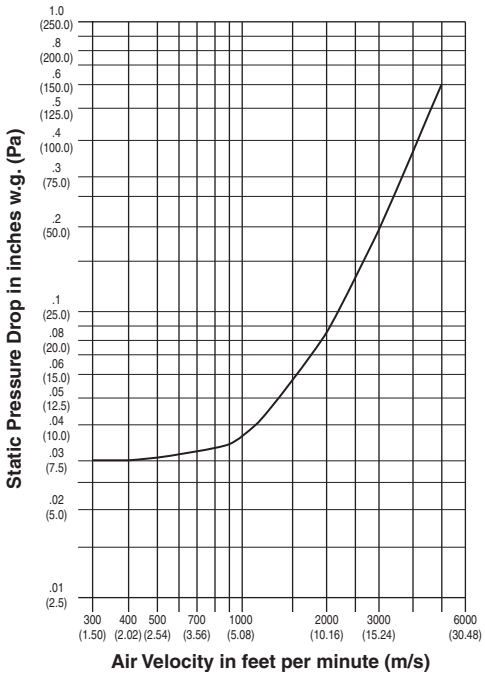
Pressure and velocity limitations shown are guidelines for design purposes. Although ratings are on the conservative side, contact Nailor for requirements beyond limitations shown.

LEAKAGE:

Damper Width	Model 1900CB			
	Leakage w/o Seals		Leakage with Seals	
	CFM per Sq. Ft.	% of Max. Flow	CFM per Sq. Ft.	% of Max. Flow
48" (1219)	39.0	1.30	14.0	0.46
36" (914)	49.0	1.63	15.0	0.50
24" (610)	60.0	2.00	17.0	0.57
12" (305)	99.0	3.30	20.0	0.67

Leakage data is based upon a pressure differential of 1 in. w.g., tested in accordance with AMCA Standard 500-D.

PRESSURE DROP: SIZE: 36" x 36" (914 x 914)



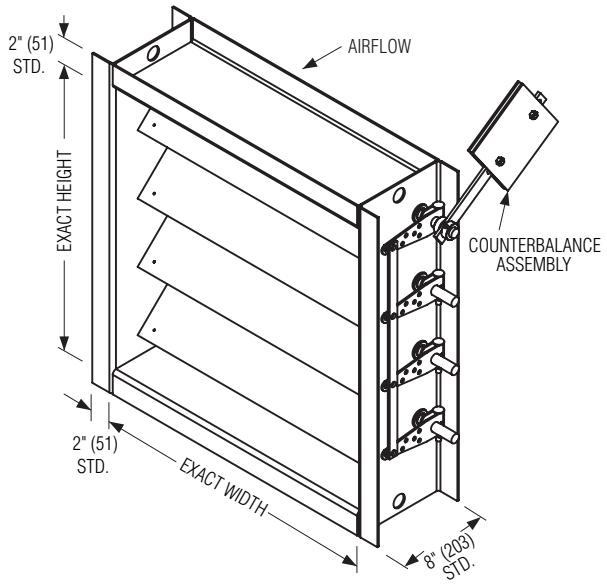
Tested per AMCA Standard 500-D using test set-up figure 5.3, ductwork upstream and downstream.

SCHEDULE TYPE:	Page 2 of 2 Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**8 - 30 - 07**	**1900**	**3 - 30 - 06**	**1900CB**

Nailor Industries Inc.

HEAVY DUTY INDUSTRIAL BACKDRAFT DAMPER
COUNTERBALANCED • STEEL • AIRFOIL BLADE
MODEL: 1905CB

Model 1905CB is an extra heavy duty industrial counterbalanced backdraft damper designed to prevent the backflow of air while allowing for automatic air intake or exhaust in industrial HVAC or process air systems. Featuring an airfoil blade design, heavy duty blade linkage and ball bearings, Model 1905CB provides smooth, rattle-free operation at velocities of up to 4000 fpm. The counterweight is easily adjusted for desired opening pressure and the extra heavy duty flanged frame, with optional bolt holes, connects easily to flanged duct for fast, secure installation. Rugged steel construction and a wide selection of options make Model 1905CB a versatile performer for the most demanding applications.



STANDARD CONSTRUCTION:

FRAME: 8" x 2" x 10 ga. (203 x 51 x 3.5) coated steel channel.

BLADES: 7" (178) wide maximum, 2 x 18 ga. (1.3) galvanized steel, formed and welded into an airfoil cross-section.

LINKAGE: Heavy duty linkage arms and plated steel tie bar, concealed out of the airstream.

AXLES: 3/4" (19) dia. plated steel.

BEARINGS: Ball bearing type, pressed into frame.

COUNTER-BALANCE: Adjustable, externally mounted.

MINIMUM SIZE: 6" x 6" (152 x 152).

MAXIMUM SIZE: 60" x 96" (1524 x 2438). For larger sizes, contact factory.

MAXIMUM TEMPERATURE: 250°F (121°C) standard. 400°F (204°C) with HT option.

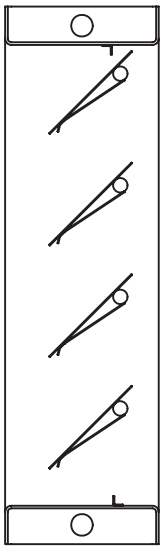
MAX. PRESSURE: 8 to 15 in. w.g. (see page 2).

MAX. VELOCITY: 4000 fpm (see page 2).

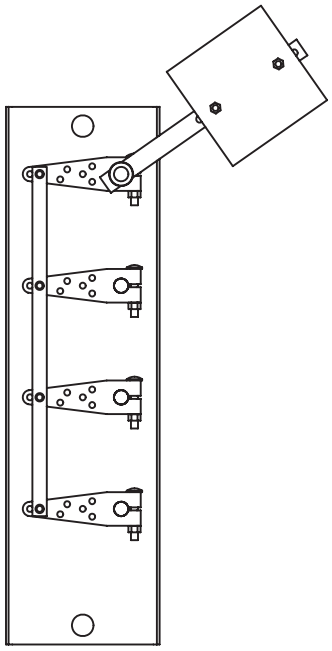
OPTIONS:

- ❑ BH Bolt holes in flanges
- ❑ CBI Internal counterbalance
- ❑ BSE EPDM blade seals (up to 250°F (121°C))
- ❑ BSS Silicone blade seals (up to 400°F (204°C))
- ❑ JSS Stainless steel jamb seals
- ❑ BESS Stainless steel sleeve bearings (pressed in)
- ❑ BEBR Relubricable ball bearings (bolt-on)
- ❑ 304 Stainless steel construction
- ❑ SSA 304 stainless steel axles only
- ❑ HT High temperature construction (up to 400°F (204°C))
- ❑ NSF Non-standard flange width (1 1/2" (38) to 4" (102)) Specify _____.
- ❑ Special _____.

Note: For variations not shown, contact factory.



BLADES



LINKAGE

SCHEDULE TYPE:	Page 1 of 2 Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**8 - 30 - 07**	**1900**	**3 - 30 - 06**	**1905CB**

Nailor Industries Inc.

HEAVY DUTY INDUSTRIAL BACKDRAFT DAMPER
COUNTERBALANCED • STEEL • AIRFOIL BLADE
PERFORMANCE DATA
MODEL: 1905CB

PERFORMANCE LIMITATIONS:

Damper Width	Model 1905CB	
	Max. System Pressure	Max. System Velocity
60" (1524)	8.0 in. w.g.	4000 fpm
48" (1219)	9.0 in. w.g.	4000 fpm
36" (914)	10.0 in. w.g.	4000 fpm
24" (610)	12.0 in. w.g.	4000 fpm
12" (305)	15.0 in. w.g.	4000 fpm

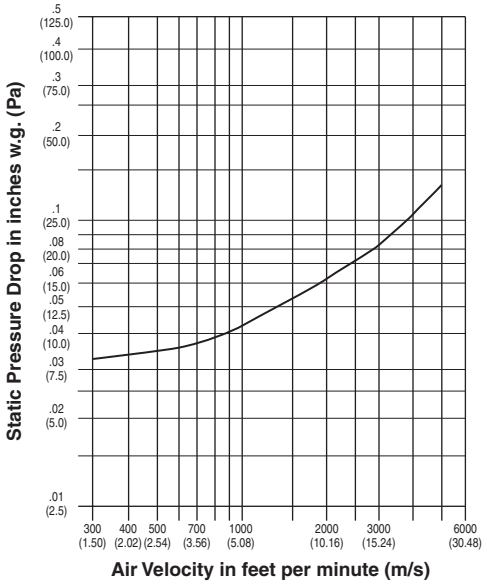
Pressure and velocity limitations shown are guidelines for design purposes. Although ratings are on the conservative side, contact Nailor for requirements beyond limitations shown.

LEAKAGE:

Damper Width	Model 1905CB			
	Leakage w/o Seals		Leakage with Seals	
	CFM per Sq. Ft.	% of Max. Flow	CFM per Sq. Ft.	% of Max. Flow
60" (1524)	39.0	0.98	14.0	0.35
48" (1219)	39.0	0.98	14.0	0.35
36" (914)	49.0	1.25	15.0	0.38
24" (610)	60.0	1.50	17.0	0.43
12" (305)	99.0	2.48	20.0	0.50

Leakage data is based upon a pressure differential of 1 in. w.g., tested in accordance with AMCA Standard 500-D.

PRESSURE DROP: SIZE: 36" x 36" (914 x 914)



Tested per AMCA Standard 500-D using test set-up figure 5.3, ductwork upstream and downstream.

SCHEDULE TYPE:	Page 2 of 2 Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**8 - 30 - 07**	**1900**	**3 - 30 - 06**	**1905CB**

Nailor Industries Inc.

HEAVY DUTY INDUSTRIAL CONTROL DAMPERS

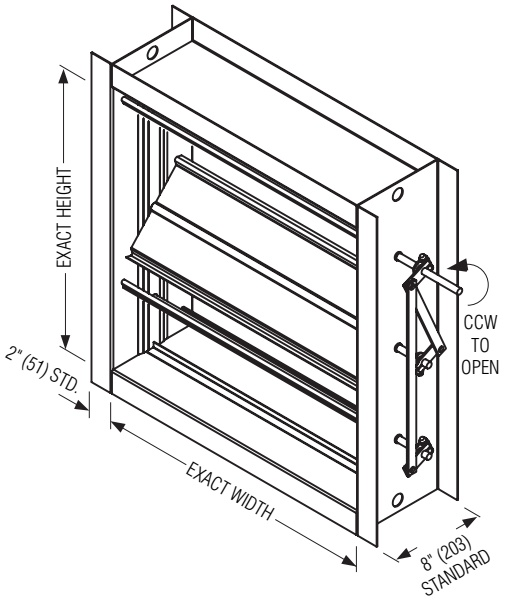
STEEL • VEE BLADE

MODELS: 1910 & 1920
1917 & 1927

The Nailor Model Series 1910/1920 is a heavy duty industrial control damper designed for use in medium to high pressure industrial HVAC or process air systems. Features include a vee-blade design that offers precise airflow control or shut-off in applications involving pressure differentials of up to 8.5" w.g. depending on width, and velocities up to 3000 fpm.

Models 1917/1927 feature 3/4" (19) dia. axles and are suitable for applications of up to 20" w.g. pressure differential depending on damper width, and velocities up to 3500 fpm.

The heavy duty flanged frame, with optional bolt holes, connects easily to flanged duct for fast, secure installation. Model Series 1910/1920 may be used for two-position or modulating control utilizing a selection of electric or pneumatic actuators, or can be operated manually with the optional locking hand quadrant.



STANDARD CONSTRUCTION:

FRAME: 8" x 2" x 14 ga. (203 x 51 x 2) coated steel channel.

BLADES: Approx. 6" (152) wide on 5 1/2" (140) centers, up to 8 5/8" (219) wide maximum depending on size. 16 ga. (1.6) galvanized steel vee-blade design. Parallel or opposed action.

LINKAGE: Heavy duty side linkage, concealed out of the airstream.

AXLES: Models 1910/1920: 1/2" (13) dia. plated steel. Models 1917/1927: 3/4" (19) dia. plated steel. Axles are double bolted to blades.

BEARINGS: Stainless steel sleeve type.

DRIVE SHAFT: 1/2" (13) or 3/4" (19) dia. (see AXLES above) plated steel. Extends 6" (152) beyond frame.

MINIMUM SIZE: Single blade: 6" x 6" (152 x 152). Two blades (parallel or opposed): 6" x 10" (152 x 254).

MAXIMUM SIZE: 48" x 96" (1220 x 2438). For larger sizes, contact factory.

MAXIMUM TEMPERATURE: 250°F (121°C) standard. 400°F (204°C) with increased blade/frame clearance (Option code HT).

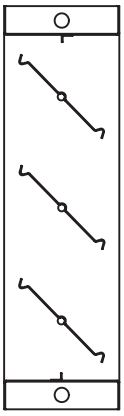
MAX. PRESSURE: Models 1910/1920: 2.5 to 8.5" w.g. (see page 2). Models 1917/1927: 6.5 to 20" w.g. (see page 2).

MAX. VELOCITY: Models 1910/1920: 3000 fpm (see page 2). Models 1917/1927: 3500 fpm (see page 2).

PARALLEL BLADE

❑ **MODEL 1910** (1/2" (13) dia. axles)

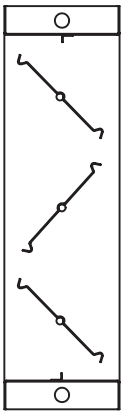
❑ **MODEL 1917** (3/4" (19) dia. axles)



OPPOSED BLADE

❑ **MODEL 1920** (1/2" (13) dia. axles)

❑ **MODEL 1927** (3/4" (19) dia. axles)



OPTIONS:

- ❑ BH Bolt holes in flanges
- ❑ BPV PVC blade seals (up to 180°F (83°C))
- ❑ BSS Silicone blade seals (up to 400°F (204°C))
- ❑ JSS Stainless steel jamb seals
- ❑ BEB External bolt-on bearings
- ❑ BEBS External bolt-on bearings with seal
- ❑ BOS Outboard bearings with seal
- ❑ 12GF 12 ga. frame
- ❑ 14GB 14 ga. blades
- ❑ 304 Stainless steel construction

OPTIONS (continued):

- ❑ SSA 304 stainless steel axles only
- ❑ HT High temp. (up to 400°F (204°C)) blade/frame clearance
- ❑ NSF Non-standard flange width (1 1/2" (38) to 4" (102)). Specify _____.
- ❑ HDLQ Locking hand quadrant
- ❑ FMA Factory mounted actuator. Specify _____.
- ❑ Special _____.

Note: For variations not shown, contact factory.

SCHEDULE TYPE:	Page 1 of 2 Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**3 - 30 - 06**	**1900**	**7 - 29 - 04**	**1910**

Nailor Industries Inc.

HEAVY DUTY INDUSTRIAL CONTROL DAMPERS
STEEL • VEE BLADE
PERFORMANCE DATA
MODELS: 1910/1920 & 1917/1927

PERFORMANCE LIMITATIONS:

Damper Width	Models 1910/1920		Models 1917/1927	
	Max. System Pressure	Max. System Velocity	Max. System Pressure	Max. System Velocity
48" (1219)	2.5 in. w.g.	3000 fpm	6.5 in. w.g.	3500 fpm
36" (914)	4.0 in. w.g.	3000 fpm	9.0 in. w.g.	3500 fpm
24" (610)	6.0 in. w.g.	3000 fpm	15.0 in. w.g.	3500 fpm
12" (305)	8.5 in. w.g.	3000 fpm	20.0 in. w.g.	3500 fpm

Pressure and velocity limitations shown are guidelines for design purposes. Although ratings are on the conservative side, contact Nailor for requirements beyond limitations shown.

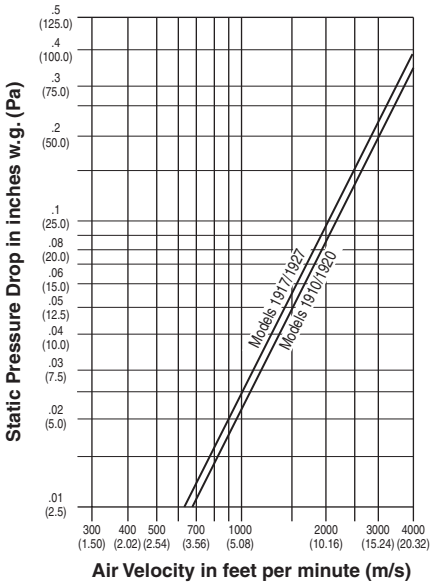
LEAKAGE:

Damper Width	Models 1910/1920				Models 1917/1927			
	Leakage w/o Seals		Leakage with Seals		Leakage w/o Seals		Leakage with Seals	
	CFM per Sq. Ft.	% of Max. Flow	CFM per Sq. Ft.	% of Max. Flow	CFM per Sq. Ft.	% of Max. Flow	CFM per Sq. Ft.	% of Max. Flow
48" (1219)	31.5	1.05	4.2	0.14	31.5	0.90	4.2	0.12
36" (914)	31.5	1.05	4.2	0.14	31.5	0.90	4.2	0.12
24" (610)	39.0	1.30	8.5	0.28	39.0	1.12	8.5	0.24
12" (305)	59.0	1.97	13.0	0.43	59.0	1.69	13.0	0.37

Leakage data is based upon a pressure differential of 1 in. w.g., tested in accordance with AMCA Standard 500-D, Figure 5.5. For pressure differentials greater than 1 in. w.g. apply the appropriate leakage correction factor from the following chart:

Static Pressure (in. w.g.)	2	3	4	5	6	7	8	9	10	12	14	16	18	20
Correction Factor	x 1.4	x 1.7	x 2.0	x 2.2	x 2.4	x 2.6	x 2.8	x 3.0	x 3.2	x 3.5	x 3.7	x 4.0	x 4.2	x 4.5

PRESSURE DROP: SIZE: 36" x 36" (914 x 914)



Tested per AMCA Standard 500-D using test set-up figure 5.3, ductwork upstream and downstream.

SCHEDULE TYPE:	Page 2 of 2 Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	DATE	B SERIES	SUPERSEDES	DRAWING NO.
CONTRACTOR:	3 - 30 - 06	1900	7 - 29 - 04	1910

Nailor Industries Inc.

HEAVY DUTY INDUSTRIAL CONTROL DAMPERS

STEEL • AIRFOIL BLADE

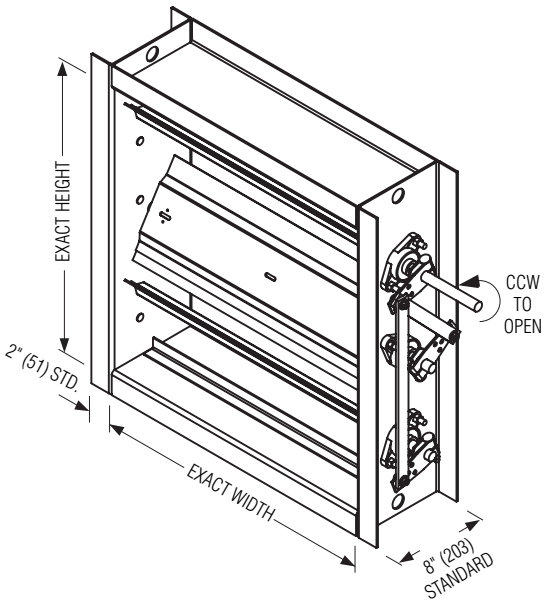
MODELS: 1970 & 1980

1975 & 1985

The Nailor Model Series 1970/1980 is an extra heavy duty/industrial control damper designed for use in high pressure industrial HVAC or process air systems. Features include a heavy-duty airfoil blade design that offers precise airflow control or shut-off in applications involving pressure differentials of up to 34" w.g. and velocities up to 6000 fpm, depending on damper width.

Models 1975/1985 feature an ultra heavy-duty 10 ga. frame and 2 x 12 ga. blades and are suitable for applications of up to 44" w.g. and velocities up to 6000 fpm, depending on damper width.

The heavy duty flanged frame, with optional bolt holes, connects easily to flanged duct for fast, secure installation. Model Series 1970/1980 may be used for two-position or modulating control utilizing a selection of electric or pneumatic actuators, or can be operated manually with the optional locking hand quadrant.



STANDARD CONSTRUCTION:

FRAME: Models 1970/1980: 8" x 2" x 12 ga. (203 x 51 x 2.8) coated steel channel.
Models 1975/1985: 8" x 2" x 10 ga. (203 x 51 x 3.5) coated steel channel.

BLADES: Approx. 6" (152) wide on 5 1/2" (140) centers, up to 8 5/8" (219) wide maximum depending on size. Parallel or opposed action.
Models 1970/1980: 2 x 16 ga. (1.6) galvanized steel (2 x 14 ga. (2) for blade lengths of 48" (1219) and up) formed and welded into an airfoil cross-section.
Models 1975/1985: 2 x 12 ga. (2.8) galvanized steel (2 x 10 ga. (3.5) for blade lengths of 48" (1219) and up) formed and welded into an airfoil cross-section.

LINKAGE: Heavy duty side linkage, concealed out of the airstream.

AXLES: Models 1970/1980: 3/4" (19) dia. plated steel.
Models 1975/1985: 3/4" (19) dia. plated steel (1" (25) dia. plated steel for blade lengths of 48" (1219) and up).
All axles are double bolted to blades.

BEARINGS: Stainless steel sleeve in housing, externally bolted to frame.

DRIVE SHAFT: 3/4" (19) or 1" (25) dia. (see AXLES above) plated steel. Extends 6" (152) beyond frame.

MINIMUM SIZE: Single blade: 6" x 6" (152 x 152).
Two blades (parallel or opposed): 6" x 12" (152 x 305).

MAXIMUM SIZE: 60" x 96" (1524 x 2438). For larger sizes, contact factory.

MAXIMUM TEMPERATURE: 250°F (121°C) standard. 400°F (204°C) with increased blade/frame clearance (Option code HT).

MAX. PRESSURE: Models 1970/1980: 14 to 34" w.g.
Models 1975/1985: 20 to 44" w.g.
(see page 2).

MAX. VELOCITY: 5000 to 6000 fpm (see page 2).

PARALLEL BLADE

❑ **MODEL 1970**

❑ **MODEL 1975**

OPPOSED BLADE

❑ **MODEL 1980**

❑ **MODEL 1985**

OPTIONS:

- ❑ BH Bolt holes in flanges
- ❑ BSE EPDM blade seals (up to 250°F (121°C))
- ❑ BSS Silicone blade seals (up to 400°F (204°C))
- ❑ JSS Stainless steel jamb seals
- ❑ BEBS External bolt-on bearings with seal
- ❑ BOS Outboard bearings with seal
- ❑ 304 Stainless steel construction
- ❑ SSA 304 Stainless steel axles only
- ❑ HT High temp. (up to 400°F (204°C)) blade/frame clearance
- ❑ NSF Non-standard flange width (1 1/2" (38) to 4" (102)). Specify _____.
- ❑ HDLQ Locking hand quadrant
- ❑ FMA Factory mounted actuator. Specify _____.
- ❑ Special _____.

Note: For variations not shown, contact factory.

SCHEDULE TYPE:	Page 1 of 2 Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**3 - 30 - 06**	**1900**	**7 - 29 - 04**	**1970**

Nailor Industries Inc.

HEAVY DUTY INDUSTRIAL CONTROL DAMPERS
STEEL • AIRFOIL BLADE
PERFORMANCE DATA
MODELS: 1970/1980 & 1975/1985

PERFORMANCE LIMITATIONS:

Damper Width	Models 1970/1980		Models 1975/1985	
	Max. System Pressure	Max. System Velocity	Max. System Pressure	Max. System Velocity
60" (1529)	14 in. w.g.	5000 fpm	20 in. w.g.	5000 fpm
48" (1219)	19 in. w.g.	5000 fpm	26 in. w.g.	5000 fpm
36" (914)	24 in. w.g.	5000 fpm	32 in. w.g.	5000 fpm
24" (610)	29 in. w.g.	6000 fpm	35 in. w.g.	6000 fpm
12" (305)	34 in. w.g.	6000 fpm	44 in. w.g.	6000 fpm

Pressure and velocity limitations shown are guidelines for design purposes. Although ratings are on the conservative side, contact Nailor for requirements beyond limitations shown.

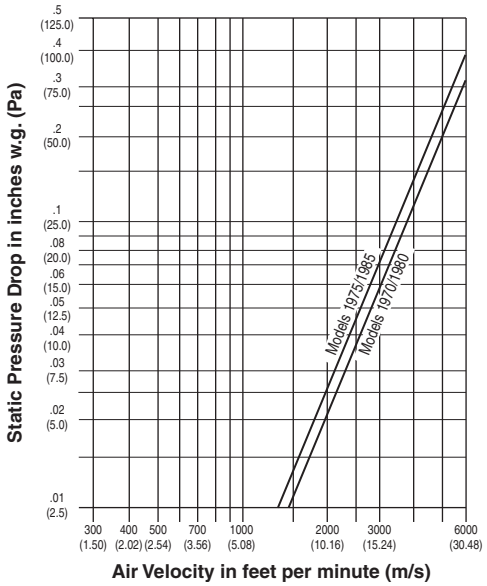
LEAKAGE:

Damper Width	Models 1970/1980				Models 1975/1985			
	Leakage w/o Seals		Leakage with Seals		Leakage w/o Seals		Leakage with Seals	
	CFM per Sq. Ft.	% of Max. Flow	CFM per Sq. Ft.	% of Max. Flow	CFM per Sq. Ft.	% of Max. Flow	CFM per Sq. Ft.	% of Max. Flow
60" (1529)	31.0	0.62	4.0	0.08	31.0	0.62	4.0	0.08
48" (1219)	31.0	0.62	4.0	0.08	31.0	0.62	4.0	0.08
36" (914)	31.0	0.62	4.0	0.08	31.0	0.62	4.0	0.08
24" (610)	39.0	0.65	8.0	0.13	39.0	0.65	8.0	0.13
12" (305)	58.0	0.98	13.0	0.22	58.0	0.98	13.0	0.22

Leakage data is based upon a pressure differential of 1 in. w.g., tested in accordance with AMCA Standard 500-D, Figure 5.5. For pressure differentials greater than 1 in. w.g. apply the appropriate leakage correction factor from the following chart:

Static Pressure (in. w.g.)	2	3	4	5	6	7	8	9	10	12	14	16	18	20	22	24
Correction Factor	x 1.4	x 1.7	x 2.0	x 2.2	x 2.4	x 2.6	x 2.8	x 3.0	x 3.2	x 3.5	x 3.7	x 4.0	x 4.2	x 4.5	x 4.7	x 5.0

PRESSURE DROP: SIZE: 36" x 36" (914 x 914)



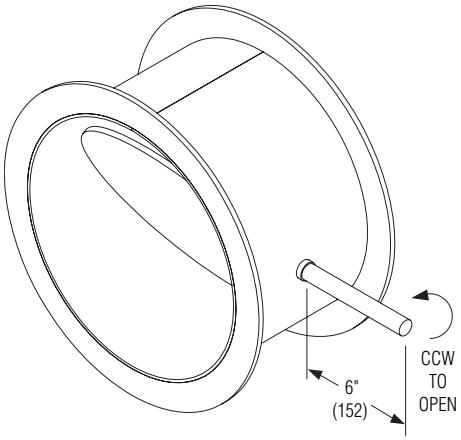
Tested per AMCA Standard 500-D using test set-up figure 5.3, ductwork upstream and downstream.

SCHEDULE TYPE:	Page 2 of 2 Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	DATE	B SERIES	SUPERSEDES	DRAWING NO.
CONTRACTOR:	3 - 30 - 06	1900	7 - 29 - 04	1970

Nailor Industries Inc.

HEAVY DUTY INDUSTRIAL CONTROL DAMPER
ROUND • STEEL
MODEL: 1990

The Nailor Model 1990 is a heavy duty, butterfly type damper designed for use in medium pressure industrial HVAC or process air systems. The model offers precise airflow control or shut-off in applications involving 6" w.g. or higher pressure differentials and velocities up to 6000 fpm, depending on unit size. The heavy duty flanged frame, with optional bolt holes, connects easily to flanged duct for fast, secure installation. Model 1990 may be used for two-position or modulating control utilizing a variety of electric or pneumatic actuators, or can be operated manually with the optional locking hand quadrant.



STANDARD CONSTRUCTION:

FRAME: Steel channel. See chart below for thickness, depth and flange dimensions.

BLADE: Steel, reinforced as required. See chart below for thickness.

BEARINGS: Stainless steel sleeve type.

AXLE: Plated steel, continuous, reinforced as required. See chart below for diameter.

DRIVE SHAFT: Continuous axle extends approx. 6" (152) beyond frame.

BLADE STOP: Single tab, welded to frame.

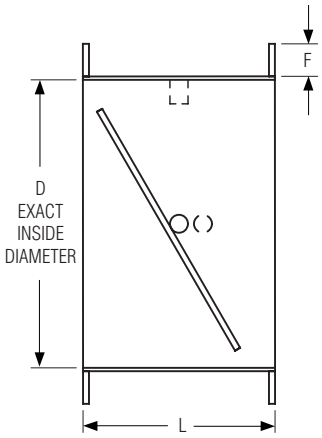
FINISH: Grey epoxy paint.

AVAILABLE SIZES: 4" (102) through 60" (1524) diameter.

MAXIMUM TEMPERATURE: 250°F (121°C) standard. 400°F (204°C) with increased blade/frame clearance (Option code HT).

MAX. PRESSURE: 6 to 10" w.g. (see page 2).

MAX. VELOCITY: 4000 to 6000 fpm (see page 2).



OPTIONS:

- ❑ BH Bolt holes in flanges
- ❑ BEB External bolt-on bearings
- ❑ BEBS External bolt-on bearings with seal
- ❑ BOS Outboard bearings with seal
- ❑ PBS Perimeter blade stop
- ❑ BSN Neoprene blade seal (up to 250°F (121°C))
- ❑ BSS Silicone blade seal (up to 400°F (204°C))
- ❑ 304 Stainless steel construction
- ❑ SSA 304 stainless steel axles only
- ❑ HT High temp. (up to 400°F (204°C)) blade/frame clearance
- ❑ HDLQ Locking hand quadrant
- ❑ FMA Factory mounted actuator. Specify _____.
- ❑ Special _____.

Note: For variations not shown, contact factory.

Size (Inside Diameter 'D')	Frame Depth (L) x Thickness	Flange Width (F) x Thickness	Blade Thickness	Axle Diameter
4" (102) to < 8" (203)	6" (152) x 10 ga.	1 1/4" (32) x 10 ga.	10 ga.	1/2" (13)
8" (203) to < 12" (305)	8" (203) x 10 ga.	1 1/4" (32) x 10 ga.	10 ga.	1/2" (13)
12" (305) to < 16" (406)	8" (203) x 10 ga.	1 1/2" (38) x 10 ga.	10 ga.	1/2" (13)
16" (406) to < 24" (610)	8" (203) x 10 ga.	1 1/2" (38) x 1/4" (6)	10 ga.	3/4" (19)
24" (610) to < 42" (1067)	8" (203) x 10 ga.	2" (51) x 1/4" (6)	3/16" (5)	3/4" (19)
42" (1067) to < 48" (1219)	8" (203) x 10 ga.	2" (51) x 1/4" (6)	3/16" (5)	1" (25)
48" (1219) to 60" (1524)	8" (203) x 3/16" (5)	2 1/2" (64) x 5/16" (8)	1/4" (6)	1" (25)

SCHEDULE TYPE:

PROJECT:

ENGINEER:

CONTRACTOR:

Dimensions are in inches (mm).

DATE	B SERIES	SUPERSEDES	DRAWING NO.
10 - 4 - 07	1990	3 - 30 - 06	1990

Nailor Industries Inc.

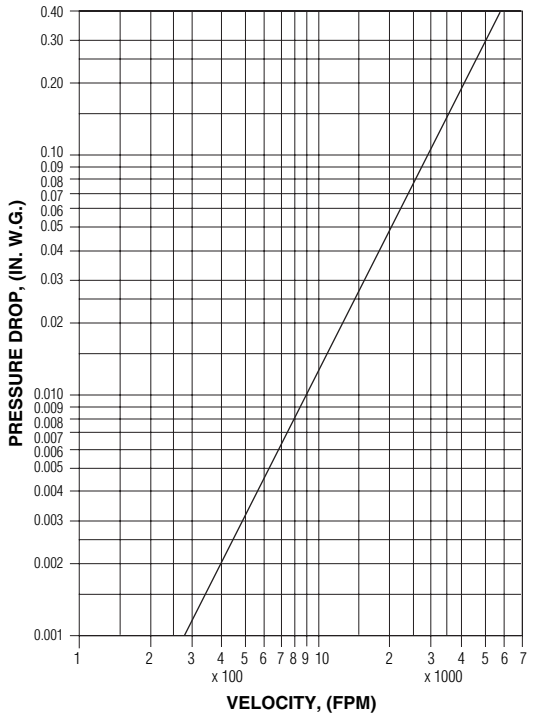
HEAVY DUTY INDUSTRIAL CONTROL DAMPER
ROUND • STEEL
MODEL: 1990

PERFORMANCE LIMITATIONS:

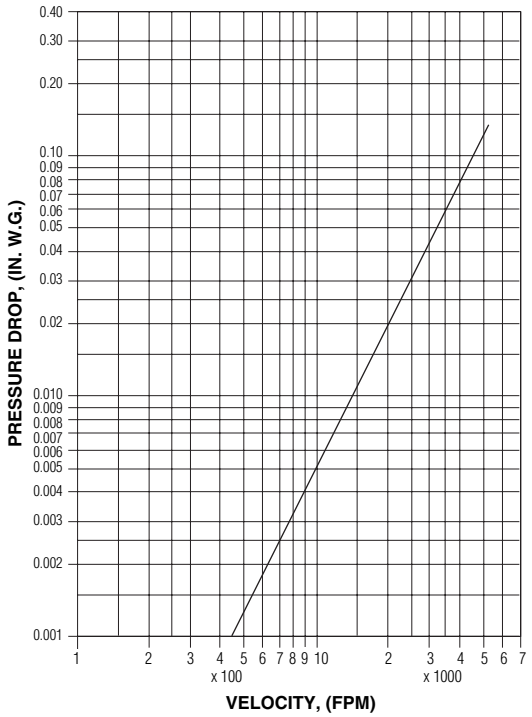
Diameter	12" (305)	24" (610)	36" (914)	48" (1219)	60" (1529)
Maximum System Pressure	10.0" w.g.	8.0" w.g.	8.0" w.g.	6.0" w.g.	6.0" w.g.
Maximum System Velocity	6000 fpm	6000 fpm	5000 fpm	4000 fpm	4000 fpm

PRESSURE DROP:

12" (305) Diameter

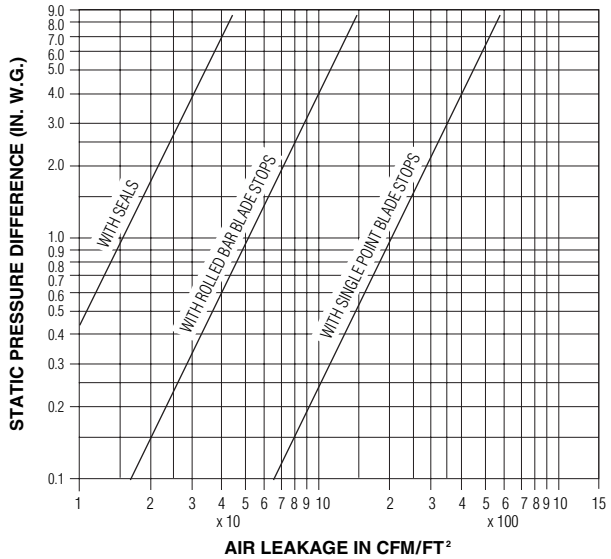


36" (914) Diameter

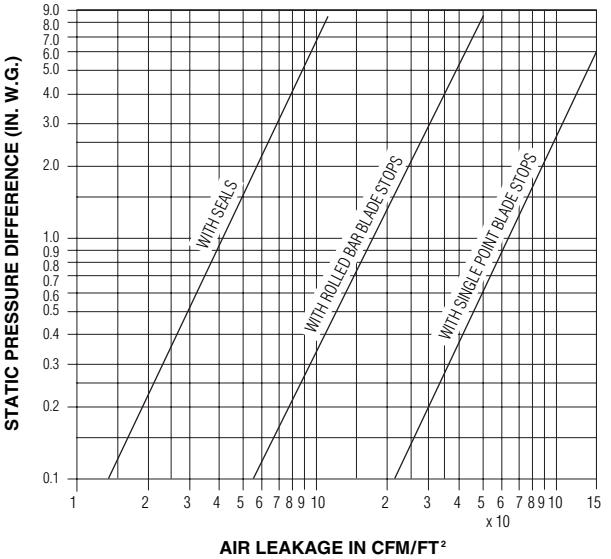


LEAKAGE:

12" (305) Diameter Damper



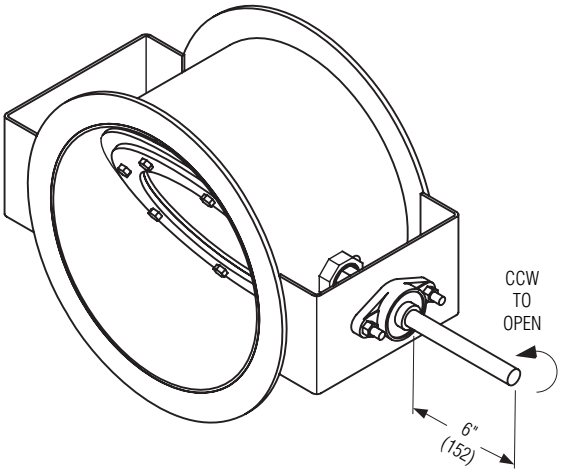
36" (914) Diameter Damper



SCHEDULE TYPE:	Page 2 of 2 Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**10 - 4 - 07**	**1990**	**3 - 30 - 06**	**1990**

HEAVY DUTY INDUSTRIAL ISOLATION DAMPER
ROUND • STEEL
MODEL: 1995

The Nailor Model 1995 is an extra heavy duty, industrial butterfly type isolation damper designed for use in high pressure industrial HVAC or process air systems. The model offers precise airflow control or shut-off in applications involving pressure differentials of up to 20" w.g. and velocities up to 7000 fpm, depending on unit size. The extra heavy duty flanged frame, with optional bolt holes, connects easily to flanged duct for fast, secure installation. Model 1995 may be used for two-position or modulating control utilizing a selection of electric or pneumatic actuators, or can be operated manually with the optional locking hand quadrant.



STANDARD CONSTRUCTION:

FRAME: Steel channel. See chart below for thickness, depth and flange dimensions.

BLADE: Steel, reinforced as required. See chart below for thickness.

SEAL: Full circumference elastomer type. Secured to blade with bolted retaining ring.

BEARINGS: Sealed ball bearings, relubricable, outboard mounted with adjustable shaft seals.

AXLE: Plated steel, continuous, reinforced as required. See chart below for diameter.

DRIVE SHAFT: Continuous axle extends approx. 6" (152) beyond outboard bearing.

BLADE STOP: Single tab, welded to frame.

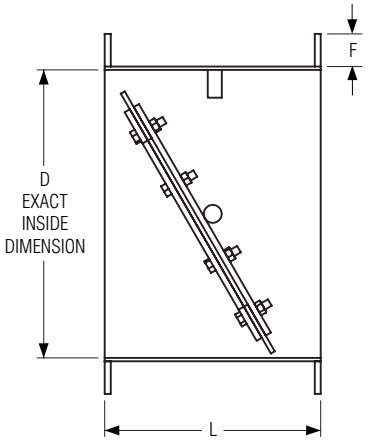
FINISH: Grey epoxy paint.

AVAILABLE SIZES: 4" (102) through 72" (1829) diameter.

MAXIMUM TEMPERATURE: 250°F (121°C) standard. 400°F (204°C) with increased blade/frame clearance (Option code HT).

MAX. PRESSURE: 15 to 20" w.g. (see page 2).

MAX. VELOCITY: 7000 fpm (see page 2).



OPTIONS:

- ❑ BH Bolt holes in flanges
- ❑ BSS Silicone blade seal (up to 400°F (204°C))
- ❑ 304 Stainless steel construction
- ❑ SSA 304 stainless steel axles only
- ❑ HT High temp. (up to 400°F (204°C)) blade/frame clearance
- ❑ HDLQ Locking hand quadrant
- ❑ FMA Factory mounted actuator. Specify _____.
- ❑ Special _____.

Note: For variations not shown, contact factory.

Size (Inside Diameter 'D')	Frame Depth (L) x Thickness	Flange Width (F) x Thickness	Blade Thickness	Axle Diameter
4" (102) to < 9" (229)	6" (152) x 10 ga.	1 1/4" (32) x 10 ga.	1/4" (6)	1/2" (13)
9" (229) to < 12" (305)	9" (229) x 10 ga.	1 1/4" (32) x 10 ga.	1/4" (6)	3/4" (19)
12" (305) to < 14" (356)	9" (229) x 10 ga.	1 1/2" (38) x 10 ga.	1/4" (6)	3/4" (19)
14" (356) to < 24" (610)	9" (229) x 10 ga.	1 1/2" (38) x 1/4" (6)	1/4" (6)	3/4" (19)
24" (610) to < 32" (813)	12" (305) x 1/4" (8)	2" (51) x 1/4" (6)	1/4" (6)	3/4" (19)
32" (813) to < 44" (1118)	12" (305) x 1/4" (8)	2" (51) x 1/4" (6)	1/4" (6)	1" (25)
44" (1118) to < 48" (1219)	12" (305) x 1/4" (8)	2" (51) x 1/4" (6)	1/4" (6)	1 1/2" (38)

SCHEDULE TYPE:	Page 1 of 2 Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**10 - 4 - 07**	**1990**	**3 - 30 - 06**	**1995**

Nailor Industries Inc.

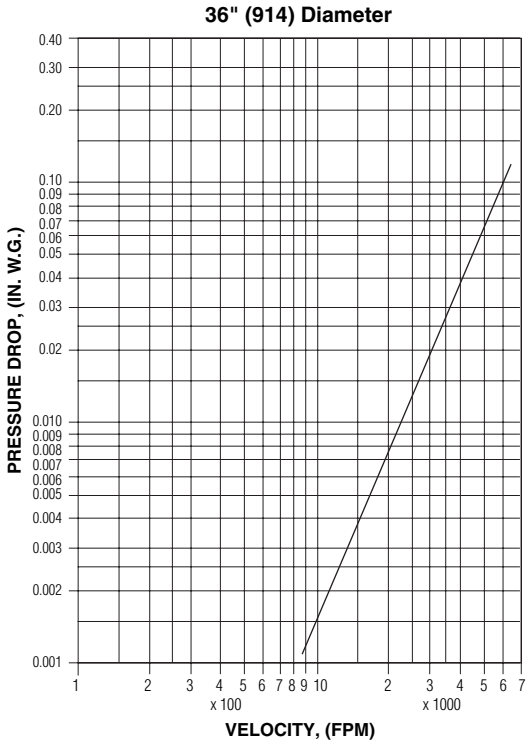
HEAVY DUTY INDUSTRIAL ISOLATION DAMPER
ROUND • STEEL
PERFORMANCE DATA
MODEL: 1995

PERFORMANCE LIMITATIONS:

Damper Diameter	Maximum System Pressure	Maximum Velocity
72" (1829)	15.0" w.g.	7000 fpm
60" (1529)	15.0" w.g.	7000 fpm
48" (1219)	15.0" w.g.	7000 fpm
36" (914)	16.0" w.g.	7000 fpm
24" (610)	17.0" w.g.	7000 fpm
12" (305)	20.0" w.g.	7000 fpm

Pressure and velocity limitations shown are guidelines for design purposes. Although ratings are on the conservative side, contact Nailor for requirements beyond limitations shown.

PRESSURE DROP:



Tested per AMCA Standard 500-D, Figure 5.3.

LEAKAGE:

Damper Diameter	Leakage in CFM (L/S)
72" (1829)	6.56 (3.10)
60" (1529)	5.47 (2.58)
48" (1219)	4.37 (2.06)
36" (914)	3.28 (1.55)
24" (610)	2.19 (1.03)
12" (305)	1.09 (0.51)

Leakage based on 10" w.g. pressure differential.
Tested per AMCA Standard 500-D, Figure 5.5.

SCHEDULE TYPE:	Page 2 of 2 Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**10 - 4 - 07**	**1990**	**3 - 30 - 06**	**1995**