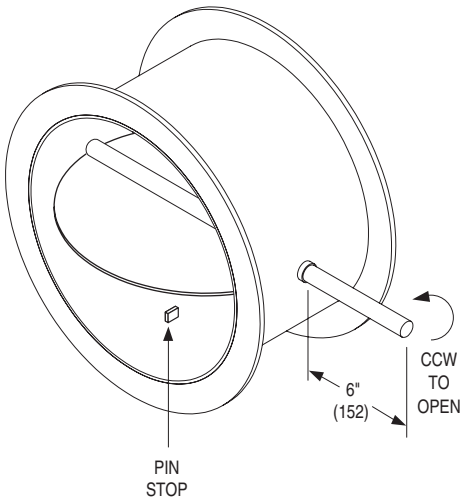
# LIGHT DUTY INDUSTRIAL CONTROL DAMPER
ROUND • STEEL
**MODEL: 1989**

The Nailor Model 1989 is a light 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 up to 6" w.g. (1.5 kPa) pressure for diameters up to 24", and up to 4" w.g. (1.0 kPa) pressure for diameters above 24", and velocities up to 4000 fpm (20 m/s). The flanged frame, with optional bolt holes, connects easily to flanged duct for fast, secure installation. Model 1989 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.

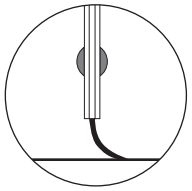



**STANDARD CONSTRUCTION:**

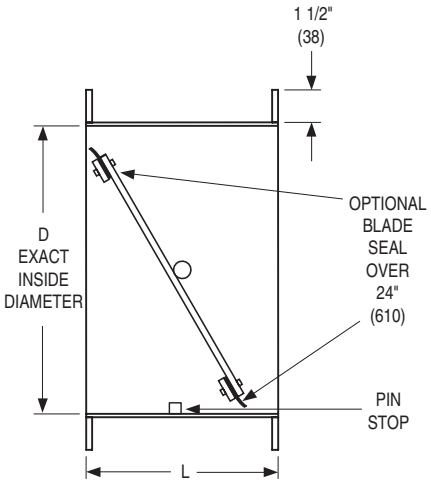
**Frame:** Galvanized steel. See chart below for thickness, depth and flange dimensions.
**Blade:** Steel, reinforced as required. See chart below for thickness.
**Bearings:** Stainless steel sleeve type.
**Axle:** Plated steel, continuous, reinforced as required. See chart below for diameter.
**Drive Shaft:** Continuous axle extends approx. 6" (152) beyond frame.
**Blade Stop:** Pin stop.
**Finish:** Mill galvanized.
**Available Sizes:** 4" (102) through 48" (1219) diameter.

| Model 1989 Maximum Performance Ratings | |
|---|---|
| Maximum Velocity | Up to 4000 fpm (20.3 m/s) |
| Maximum Pressure | Up to 6" w.g. (1.5 kPa) |
| Maximum Temperature | 250°F (121°C) |

**Note:** For higher operating temperatures, contact factory.



Optional blade seal up to 24" (610).




**OPTIONS:**

- ❑ 304 Type 304 Stainless Steel construction
- ❑ 316 Type 316 Stainless Steel construction
- ❑ AS50/75/10 Type 304 Stainless Steel axles only
- ❑ BSN Neoprene blade seal (up to 250°F [121°C])
- ❑ BSS Silicone blade seal (up to 400°F [204°C])
- ❑ BSE EPDM blade seal (up to 250°F [121°C])
- ❑ BH1 Bolt holes in one flange
- ❑ BH2 Bolt holes in both flanges
- ❑ HDLQ Heavy duty hand locking quadrant
- ❑ FMXX Factory mounted actuator. Specify _____.
- ❑ Special Features: _____.

**Note:** For variations not shown, contact factory.

| Size (Inside Diameter 'D') | Frame Depth (L) x Thickness | Frame Width (F) x Thickness | Blade * Thickness | Axle Diameter |
|---|---|---|---|---|
| 4" (102) to 8" (203) | 6" (152) x 16 ga. | 1 1/2" (38) x 12 ga. | 16 ga. | 1/2" (13) |
| > 8" (203) thru 18" (457) | 8" (203) x 16 ga. | 1 1/2" (38) x 12 ga. | 16 ga. | 1/2" (13) |
| > 18" (457) thru 24" (610) | 8" (203) x 12 ga. | 1 1/2" (38) x 12 ga. | 16 ga. | 1/2" (13) |
| > 24" (610) thru 36" (914) | 8" (203) x 12 ga. | 1 1/2" (38) x 12 ga. | 14 ga. | 34" (19) |
| > 36" (914) thru 48" (1219) | 8" (203) x 12 ga. | 1 1/2" (38) x 12 ga. | 12 ga. | 34" (19) |

* Double skin equivalent (2 x 22 ga.) with optional blade seal up to 24" (610) diameter. Blade seal is a peripheral sandwich gasket.

| | | | | |
|---|---|---|---|---|
| **SCHEDULE TYPE:** | Page 1 of 2<br>Dimensions are in inches (mm). | | | |
| **PROJECT:** | | | | |
| **ENGINEER:** | **DATE** | **B SERIES** | **SUPERSEDES** | **DRAWING NO.** |
| **CONTRACTOR:** | **8 - 18 - 20** | **1989** | **3 - 8 - 18** | **1989** |

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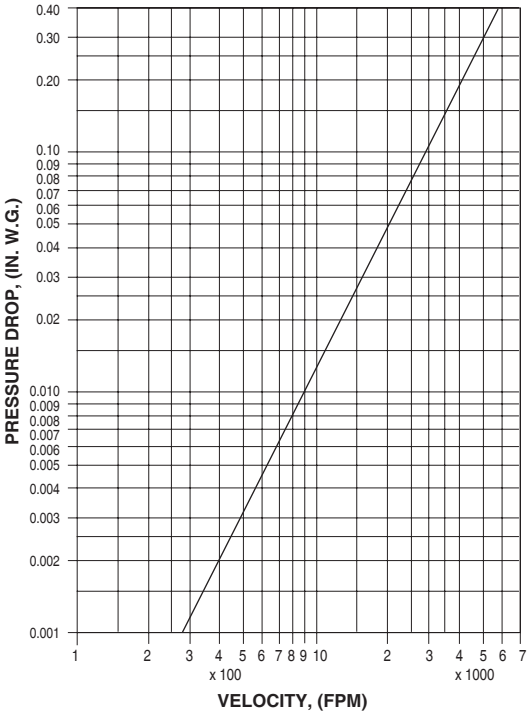
# LIGHT DUTY INDUSTRIAL CONTROL DAMPER
ROUND • STEEL
## PERFORMANCE DATA
## MODEL: 1989

### PERFORMANCE LIMITATIONS:

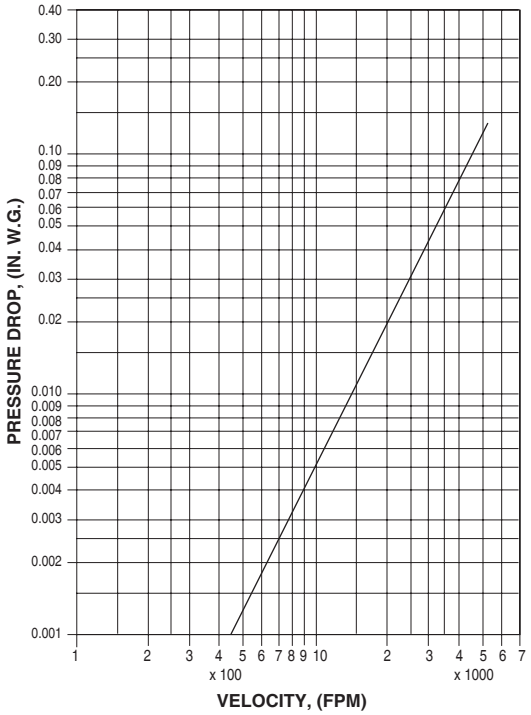
| Diameter | 12" (305) | 24" (610) | 36" (914) | 48" (1219) |
|---|---|---|---|---|
| Maximum System Pressure | 6.0" w.g. | 6.0" w.g. | 4.0" w.g. | 4.0" w.g. |
| Maximum System Velocity | 4000 fpm | 3000 fpm | 2500 fpm | 2500 fpm |

### PRESSURE DROP:

**12" (305) Diameter**

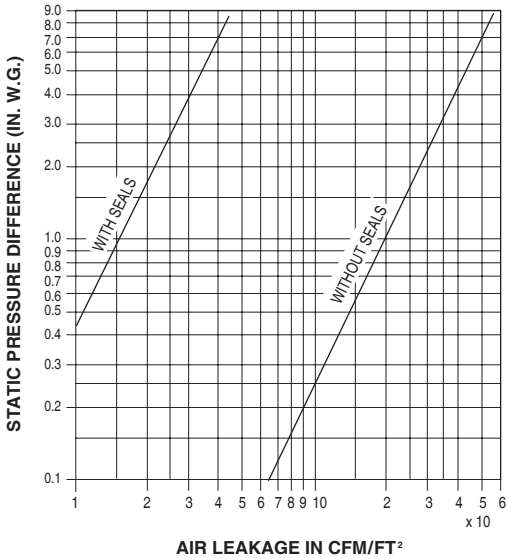



**36" (914) Diameter**

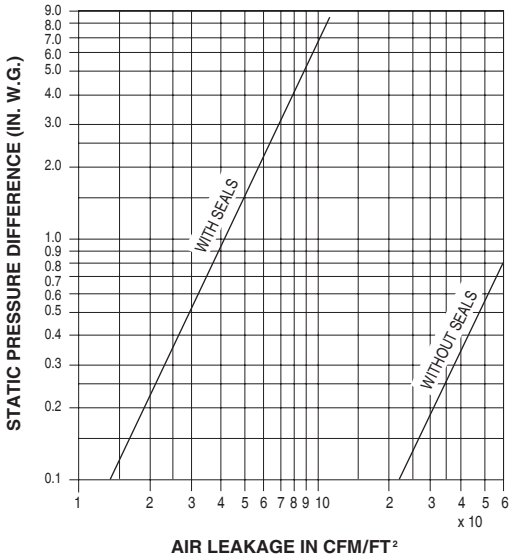



### LEAKAGE:

**12" (305) Diameter Damper**



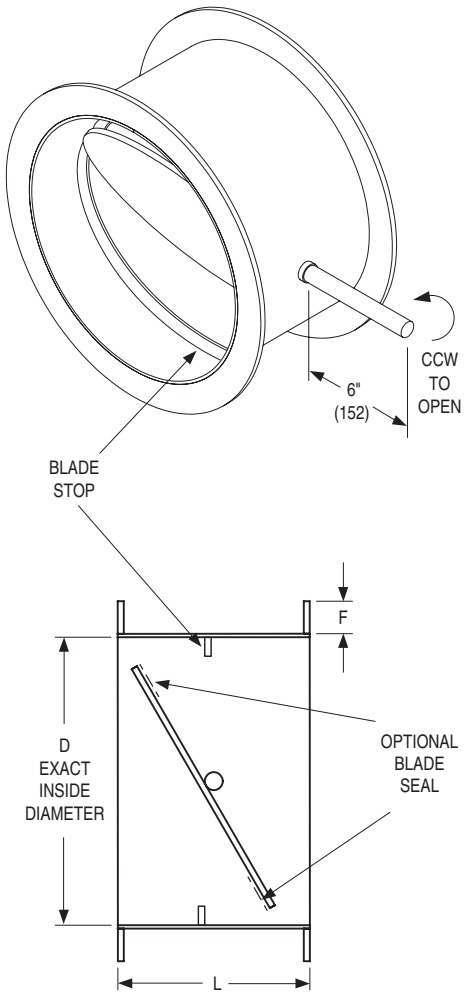

**36" (914) Diameter Damper**




| | | | | |
|---|---|---|---|---|
| **SCHEDULE TYPE:** | Page 2 of 2<br>Dimensions are in inches (mm). | | | |
| **PROJECT:** | | | | |
| **ENGINEER:** | **DATE** | **B SERIES** | **SUPERSEDES** | **DRAWING NO.** |
| **CONTRACTOR:** | **8 - 18 - 20** | **1989** | **3 - 8 - 18** | **1989** |

# 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. (1.5 kPa) or higher pressure differentials and velocities up to 6000 fpm (30 m/s), 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:** Full perimeter steel bar.
**Finish:** Grey epoxy paint.
**Available Sizes:** 4" (102) through 60" (1524) diameter.

| Model 1990 Maximum Performance Ratings | |
|---|---|
| Maximum Velocity | 6000 fpm (30 m/s) |
| Maximum Pressure | 10 in. w.g. (2.5 kPa) |
| Maximum Temperature | 250°F (121°C) |

**Note:** For higher operating temperatures, contact factory.

**OPTIONS:**

- ❑ 304 Type 304 Stainless Steel construction
- ❑ 316 Type 316 Stainless Steel construction
- ❑ AS50/75/10 Type 304 Stainless Steel axles only
- ❑ BEB External bolt-on bearings
- ❑ BEBS External bolt-on bearings with seal
- ❑ BOS Outboard bearings with seal
- ❑ BSN Neoprene blade seal (up to 250°F [121°C])
- ❑ BSS Silicone blade seal (up to 400°F [204°C])
- ❑ BH1 Bolt holes in one flange
- ❑ BH2 Bolt holes in both flanges
- ❑ HDLQ Heavy duty hand locking quadrant
- ❑ FMXX Factory mounted actuator. Specify _____.
- ❑ Special Features: _____.

**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:** | Page 1 of 2 | | | |
| **PROJECT:** | Dimensions are in inches (mm). | | | |
| **ENGINEER:** | **DATE** | **B SERIES** | **SUPERSEDES** | **DRAWING NO.** |
| **CONTRACTOR:** | **8 - 18 - 20** | **1990** | **6 - 30 - 14** | **1990** |

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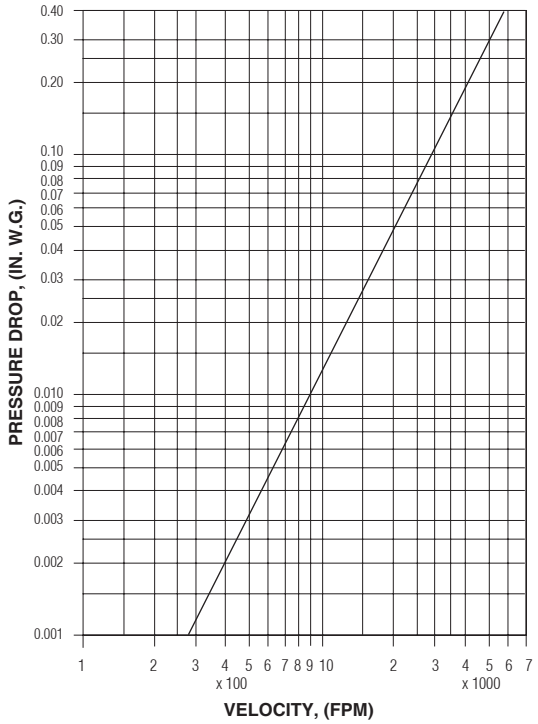
# HEAVY DUTY INDUSTRIAL CONTROL DAMPER
ROUND • STEEL
## PERFORMANCE DATA
## MODEL: 1990

### PERFORMANCE LIMITATIONS:

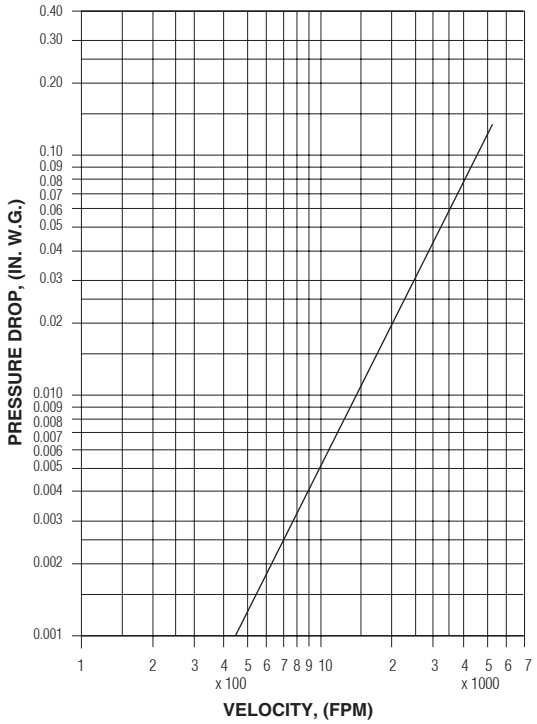
| Diameter | 12" (305) | 24" (610) | 36" (914) | 48" (1219) | 60" (1529) |
|---|---|---|---|---|---|
| Maximum System Pressure | 10.0" w.g. | 8.0" w.g. | 8.0" w.g. | 6.0" w.g. | 6.0" w.g. |
| Maximum System Velocity | 6000 fpm | 6000 fpm | 5000 fpm | 4000 fpm | 4000 fpm |

### PRESSURE DROP:

12" (305) Diameter

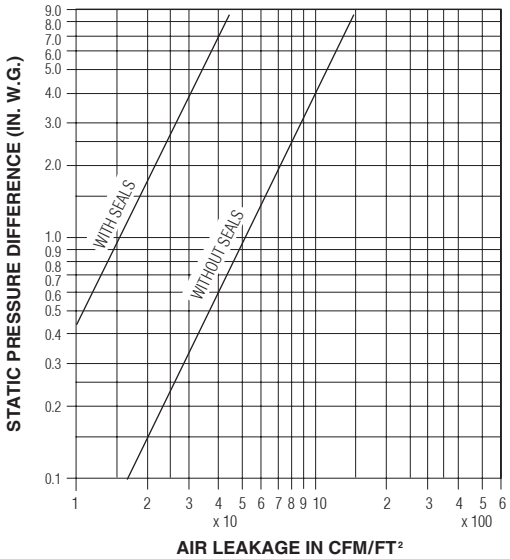



36" (914) Diameter

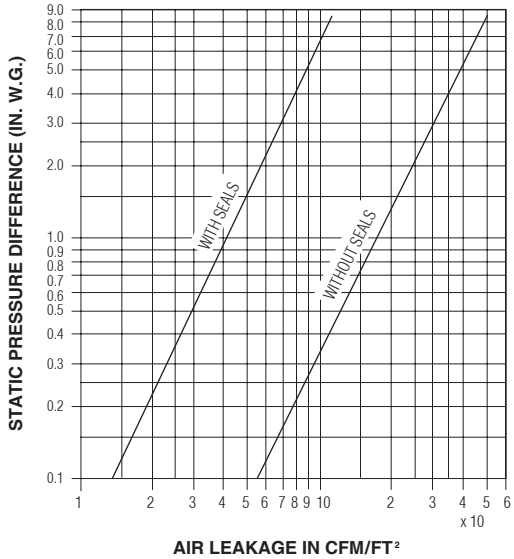



### LEAKAGE:

12" (305) Diameter Damper




36" (914) Diameter Damper



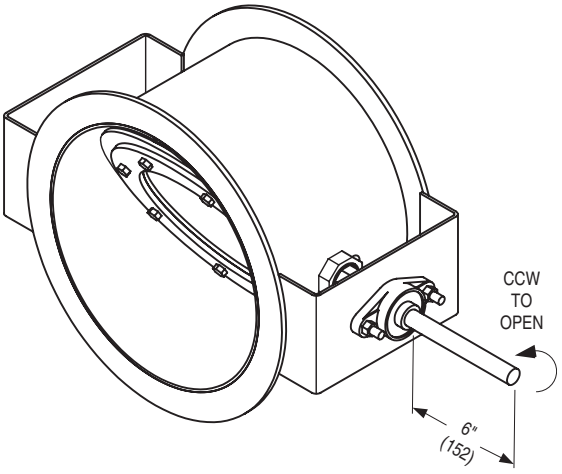

| | | | | |
|---|---|---|---|---|
| SCHEDULE TYPE: | Page 2 of 2 | | | |
| PROJECT: | Dimensions are in inches (mm). | | | |
| ENGINEER: | DATE | B SERIES | SUPERSEDES | DRAWING NO. |
| CONTRACTOR: | 8 - 18 - 20 | 1990 | 6 - 30 - 14 | 1990 |

# 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. (5 kPa) and velocities up to 7000 fpm (36 m/s), 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.

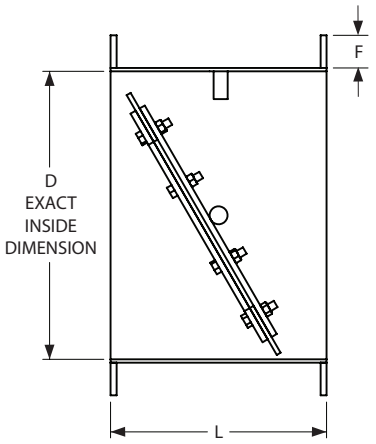



**STANDARD CONSTRUCTION:**

**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 60" (1524) diameter.

| Model 1995 Maximum Performance Ratings | |
|---|---|
| Maximum Velocity | 7000 fpm (36 m/s) |
| Maximum Pressure | 20 in. w.g. (5 kPa) |
| Maximum Temperature | 250°F (121°C) |

**Note:** For higher operating temperatures, contact factory.




**OPTIONS:**

- ❑ 304 Type 304 Stainless Steel construction
- ❑ 316 Type 316 Stainless Steel construction
- ❑ AS50/75/10 Type 304 Stainless Steel axles only
- ❑ BSS Silicone blade seal (up to 400°F [204°C])
- ❑ BH1 Bolt holes in one flange
- ❑ BH2 Bolt holes in both flanges
- ❑ HDLQ Heavy duty hand locking quadrant
- ❑ FMXX Factory mounted actuator. Specify _____.
- ❑ Special Features: _____.

**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 | | | |
| **PROJECT:** | Dimensions are in inches (mm). | | | |
| **ENGINEER:** | **DATE** | **B SERIES** | **SUPERSEDES** | **DRAWING NO.** |
| **CONTRACTOR:** | **8 - 18 - 20** | **1990** | **6 - 30 - 14** | **1995** |

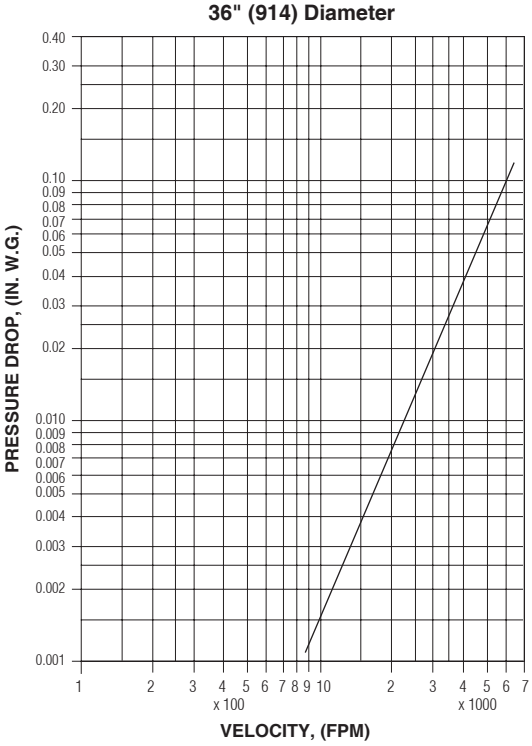
# HEAVY DUTY INDUSTRIAL ISOLATION DAMPER
ROUND • STEEL
**PERFORMANCE DATA**
**MODEL: 1995**

## 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:

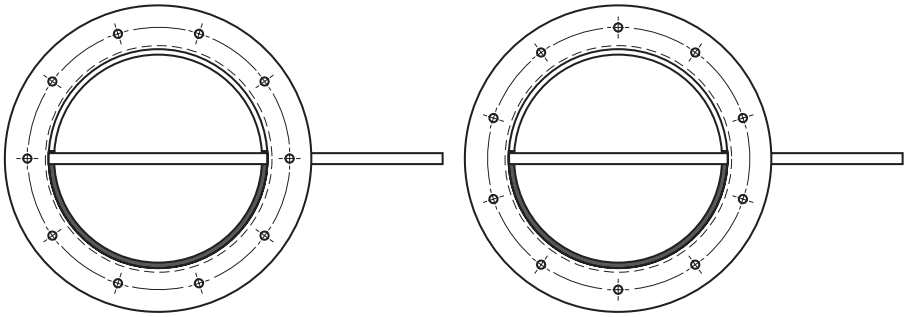
| Damper Diameter | Leakage in CFM (L/S) |
|---|---|
| 72" (1829) | 6.56 (3.10) |
| 60" (1529) | 5.47 (2.58) |
| 48" (1219) | 4.37 (2.06) |
| 36" (914) | 3.28 (1.55) |
| 24" (610) | 2.19 (1.03) |
| 12" (305) | 1.09 (0.51) |

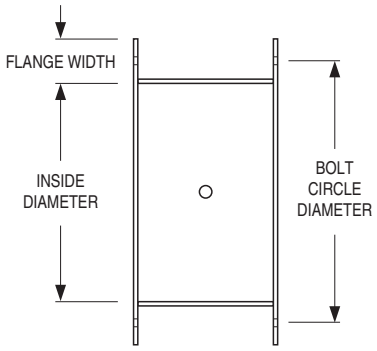
Leakage based on 10" w.g. pressure differential.
Tested per AMCA Standard 500-D, Figure 5.5.

| | | | | |
|---|---|---|---|---|
| **SCHEDULE TYPE:** | Page 2 of 2 | | | |
| **PROJECT:** | Dimensions are in inches (mm). | | | |
| **ENGINEER:** | **DATE** | **B SERIES** | **SUPERSEDES** | **DRAWING NO.** |
| **CONTRACTOR:** | **8 - 18 - 20** | **1990** | **6 - 30 - 14** | **1995** |

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

### ROUND DAMPERS:






☐ **BHAA**
Bolt holes aligned with axle

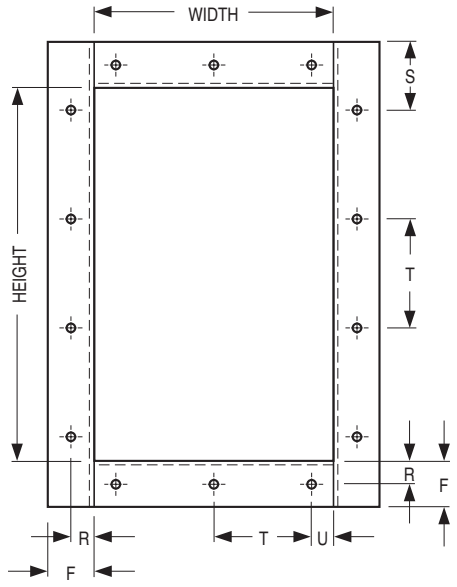
☐ **BHAP**
Bolt holes aligned perpendicular to axle

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:** | **8 - 18 - 20** | **1900** | **9 - 9 - 03** | **1900BH-1** |