

## GENERAL PRODUCT OVERVIEW

Since 1971, Nailor Industries, Inc. fire dampers have been a critical component of HVAC systems in commercial and industrial buildings. As an industry leader, Nailor's commitment to quality construction and product development has helped limit property damage and make buildings safer for occupants all over the world by restricting the passage of flame and smoke. Building codes require fire dampers to maintain the fire resistance ratings of walls, partitions and floors which have been penetrated by ducts or other similar openings. Nailor provides a variety of dampers to suit the wide array of structures that require protection, whether a dynamic (fans operate during emergency) or static (fans shut down) type HVAC system is utilized. All Nailor dynamic fire dampers have been tested to a minimum 2000 fpm (10 m/s) @ 4" w.g. (1 kPa) per the latest UL 555 Safety Standard.

### DYNAMIC CURTAIN FIRE DAMPERS

#### MODEL SERIES D0100/D01X4-1X (1 1/2 HR.)

Series D0100 Curtain Fire Dampers, designed for use in dynamic "fans on" systems where the HVAC system remains operational in the event of a fire, are UL approved for use where building codes require protection of HVAC ductwork penetrations in walls, partitions or floors that have a fire resistance rating of 2 hours or less. The D0100 Series features stainless steel closure springs for assured damper closure under airflow. Model Series D01X4-1X includes an integral sleeve to make jobsite installation fast and simple.



Model D0110



Model D0114HY

#### MODEL SERIES D01X4HY (1 1/2 HR.) HYBRID • INTEGRAL SLEEVE

Series D01X4HY Hybrid Integral Sleeve Curtain Type Fire Dampers are UL approved for use where building codes require protection of HVAC ductwork penetrations in walls, partitions or floors that have a fire resistance rating of 2 hours or less, designed and classified for use in dynamic "fans on" systems where the HVAC system remains operational in the event of a fire. Features include stainless steel closure springs for assured damper closure under airflow and cost effective hybrid blade design. Model Series D01X4HY Dynamic Curtain Type Fire Dampers include an integral sleeve to make jobsite installation fast and simple.

#### MODEL SERIES D0500 (3 HR.)

Series D0500 Dynamic Curtain Fire Dampers are UL approved for use where building codes require protection of HVAC ductwork penetrations in walls, partitions or floors that have a fire resistance rating of 4 hours or less. Classified for use in dynamic systems where the HVAC system remains operative in the event of a fire. The D0500 Series features stainless steel closure springs for assured damper closure under airflow, corrosion resistant steel frame and blades for lasting performance, and choice of transition styles and factory installed sleeves to suit duct size, making installation fast and simple.



Model D0510

## CURTAIN FIRE DAMPER BASICS:

### Definition of a Fire Damper (per NFPA Standard 90A):

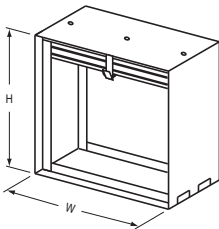
*“A device, installed in an air distribution system, that is designed to close automatically upon detection of heat, to interrupt migratory airflow, and to restrict the passage of flame.”*

Although curtain fire dampers restrict flame and airflow passage as described in the NFPA definition, they are virtually transparent to heat and therefore ineffective for use in openings in fire-rated ceiling assemblies. See Ceiling Damper Basics for more details.

### TYPES OF CURTAIN FIRE DAMPERS

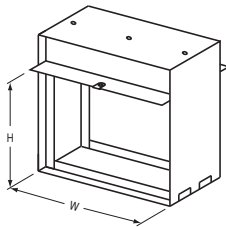
Curtain type fire dampers are generally available in three configuration as follows:

TYPE 'A'



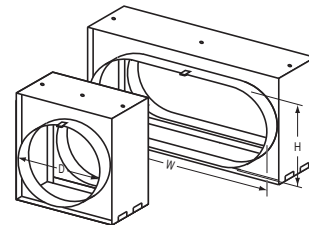
Blades and frame in the airstream.

TYPE 'B'



Blades out of the airstream; With blades out of airstream, provides better free area and resulting pressure drop characteristics than Type 'A', especially on smaller size dampers.

TYPE 'C'



Blades and frame out of the airstream; used mainly for transitioning to round or oval duct. Provides optimum pressure drop characteristics with blades and frame out of airstream.

Openings in vertical fire separations ie: **walls** and **partitions**, require a **vertical mount** fire damper (duct runs horizontally). Gravity causes the blades to drop closed (static rated dampers).

Openings in horizontal fire separations ie: **floors**, require a **horizontal mount** fire damper (duct runs vertically). Horizontal mount fire dampers utilize springs to pull the blades closed.

Dynamic rated fire dampers utilize closure springs in both vertical and horizontal applications to ensure the blades close fully under airflow conditions.

### STATIC RATED VS. DYNAMIC RATED FIRE DAMPERS:

**Static** fire dampers were designed for use in HVAC systems that shut down (fans off) in the event of a fire alarm. They have not been tested to ensure closure while air is moving in the duct.

**Dynamic** fire dampers have been tested under specific airflow and static pressure conditions in order to ensure that the damper will close in today's HVAC designs that utilize 'fans on' smoke management systems. See **Dynamic Fire Damper Selection Procedures** in this section.

Generally, a dynamic rated damper can be used in both static (fans off) or dynamic (fans on) type systems, but a static rated fire damper can only be used in a 'static' system (fans shut down during alarm).

### DID YOU KNOW?....

- Fire dampers must be mounted in a steel sleeve. The damper/sleeve assembly is held in place in the wall, partition or floor by use of retaining angles on each side of the wall etc. Ductwork shall connect to the sleeve on either side, as required, providing a connection that can 'break away' should the ductwork fall during a fire. This allows the damper/sleeve assembly to remain in the wall etc., maintaining the integrity of the fire barrier.
- NFPA 90A requires that fire barriers of less than 3 hours utilize a 1 1/2 hour rated fire damper. Fire barriers of 3 hours or more require a 3 hour rated fire damper.
- All fire dampers must be installed as per manufacturer's UL approved instructions.

- STANDARD FRAME
- 3 HOUR RATING
- FOR USE IN DYNAMIC SYSTEMS
- UL 555 CLASSIFIED

**Models:**

- D0510** Type A
- D0520** Type B
- D0530** Type CR/CO/CSR, Round/Oval/Square/Rectangular



Model D0510

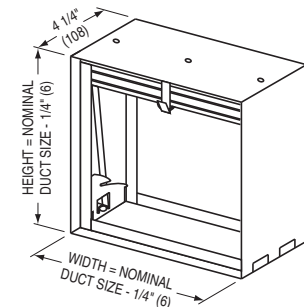
Series D0500 Dynamic Curtain Fire Dampers are UL approved for use where building codes require protection of HVAC ductwork penetrations in walls, partitions or floors that have a fire resistance rating of 4 hours or less. Classified for use in dynamic systems where the HVAC system remains operative in the event of a fire, the D0500 Series features stainless steel closure springs for assured damper closure under airflow, corrosion resistant roll formed steel frame and blades for lasting performance, and choice of transition styles and factory installed sleeves to suit duct size, making installation fast and simple.

**QUALIFICATIONS:**

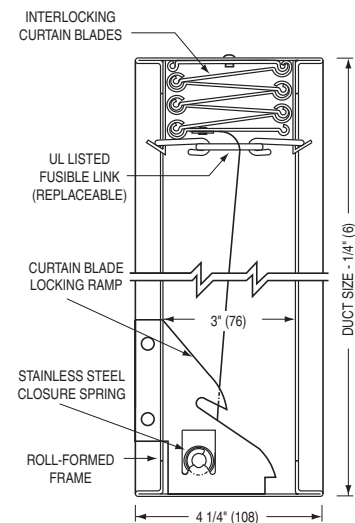
- UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER. 3 hr. label (File # R9492).
- Meets all the requirements of UL and NFPA 80, 90A and 101 for fire dampers in dynamic HVAC systems, as well as IBC and NBC (Canada) Building Code requirements.
- City of New York Board of Standards and Appeals. Cal. No. 460-88-SA.
- California State Fire Marshal: Fire Damper Listing No. 3225-0935:0113.
- Maximum velocity: 4000 fpm @ 4" w.g. (20 m/s @ 1 kPa).

**STANDARD CONSTRUCTION:**

	D0510 (Type A)	D0520 (Type B)	D0530 (Type CR/CO)	D0530 (Type CSR)
<b>Frame:</b>	4 1/4" (108) wide, 22 ga. (0.85) roll-formed galv. steel	4 1/4" (108) wide, 22 ga. (0.85) roll-formed galv. steel	4 1/4" (108) wide, 22 ga. (0.85) roll-formed galv. steel; out of airstream	4 1/4" (108) wide, 22 ga. (0.85) roll-formed galv. steel; out of airstream
<b>Blades:</b>	Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel	Out of airstream, curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel	Out of airstream, curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel	Out of airstream, curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel
<b>Enclosure:</b>	n/a	Type B 22 ga. (0.85) galvanized steel	Type C Round or Oval 22 ga. (0.85) galvanized steel	Type C Square or Rect. 22 ga. (0.85) galvanized steel
<b>Fusible Link: (UL Listed)</b>	165°F (74°C) std. 212°F (100°C) available	165°F (74°C) std. 212°F (100°C) available	165°F (74°C) std. 212°F (100°C) available	165°F (74°C) std. 212°F (100°C) available
<b>Blade Closure:</b>	Stainless steel closure springs and galvanized steel locking ramps	Stainless steel closure springs and galvanized steel locking ramps	Stainless steel closure springs and galvanized steel locking ramps	Stainless steel closure springs and galvanized steel locking ramps
<b>Mounting:</b>	Vertical or Horiz.	Vertical or Horiz.	Vertical or Horiz.	Vertical or Horiz.
<b>Available Sleeve:</b>	Galvanized steel; Specify SL option	Galvanized steel; Specify SL option	Galvanized steel; Specify SL option	Galvanized steel; Specify SL option



MODEL D0510: TYPE A

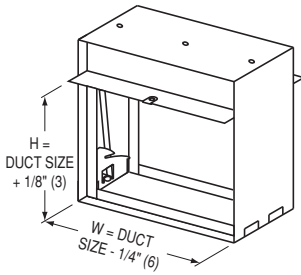


VERTICAL MOUNT

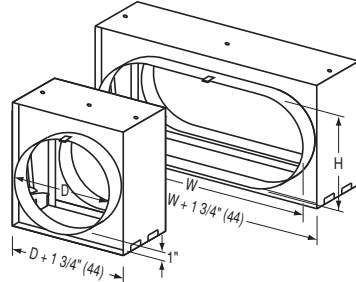
For MIN./MAX. UL SIZES see chart on page D9.

D  
CURTAIN FIRE DAMPERS

## DIMENSIONAL DATA:

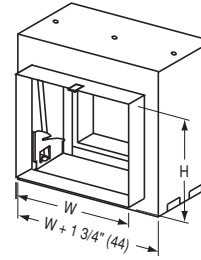


**MODEL D0520:  
TYPE B**

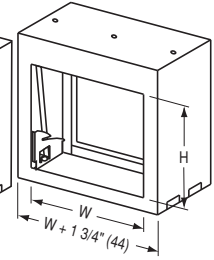


**MODEL D0530:  
TYPE CR**

**MODEL D0530:  
TYPE CO**



**MODEL D0530:  
TYPE CSR  
WITH COLLAR  
(STANDARD)**



**MODEL D0530:  
TYPE CSR  
WITHOUT COLLAR**

For overall damper dimensions see sizing chart on page D53.

## PERFORMANCE DATA:

### MODEL SERIES: D0500 - 3 HOUR LABEL

Curtain type fire dampers impose minimal resistance to air flow in the system. The following charts indicate both free area for the different damper types and static pressure losses for various velocities.

#### Type A Damper Free Area – sq. ft.

		Duct Width in inches (mm)									
		6" (152)	12" (305)	18" (457)	24" (610)	30" (762)	36" (914)	42" (1067)	48" (1219)	54" (1372)	60" (1524)
Duct Height in inches (mm)	6" (152)	.14	.33	.52	.70	.89	1.1	1.3	1.5	1.7	1.8
	12" (305)	.31	.72	1.1	1.5	1.9	2.4	2.8	3.2	3.6	4.0
	18" (457)	.48	1.1	1.7	2.4	3.0	3.7	4.3	4.9	5.6	6.2
	24" (610)	.65	1.5	2.4	3.2	4.1	5.0	5.8	6.7	7.5	8.4
	30" (762)	.82	1.9	3.0	4.1	5.2	6.3	7.3	8.4	9.5	10.6
	36" (914)	.99	2.3	3.6	4.9	6.3	7.6	8.9	10.2	11.5	12.8
	42" (1067)	1.2	2.7	4.2	5.8	7.3	8.8	10.4	11.9	13.4	15.0
	48" (1219)	1.3	3.1	4.9	6.6	8.4	10.2	11.9	13.7	15.5	17.2
	54" (1372)	1.5	3.5	5.5	7.5	9.5	11.5	13.5	15.5	17.5	19.4
	60" (1524)	1.7	3.9	6.1	8.3	10.6	12.8	15.0	17.2	19.4	21.7

#### Type B Damper Free Area – sq. ft.

		Duct Width in inches (mm)									
		6" (152)	12" (305)	18" (457)	24" (610)	30" (762)	36" (914)	42" (1067)	48" (1219)	54" (1372)	60" (1524)
Duct Height in inches (mm)	6" (152)	.17	.39	.62	.84	1.1	1.3	1.5	1.7	2.0	2.2
	12" (305)	.36	.83	1.3	1.8	2.3	2.7	3.2	3.7	4.1	4.6
	18" (457)	.54	1.3	2.0	2.7	3.4	4.2	4.9	5.6	6.3	7.1
	24" (610)	.73	1.7	2.7	3.7	4.6	5.6	6.6	7.5	8.5	9.5
	30" (762)	.92	2.1	3.4	4.6	5.8	7.0	8.3	9.5	10.7	11.9
	36" (914)	1.1	2.6	4.1	5.5	7.0	8.5	9.9	11.4	12.9	14.4
	42" (1067)	1.3	3.0	4.7	6.5	8.2	9.9	11.6	13.4	15.1	16.8
	48" (1219)	1.5	3.5	5.4	7.4	9.4	11.4	13.3	15.3	17.3	19.2
	54" (1372)	1.7	3.9	6.1	8.3	10.6	12.8	15.0	17.2	19.5	21.7

Type C Dampers have Free Area equal to Nominal Duct Area.

To calculate Free Area of round duct: Diameter<sup>2</sup> x .00545 = Free Area (sq. ft.)

D0500 Series - Maximum Performance Ratings	
UL 555 Fire Resistance Rating	3 Hour
Maximum Velocity	4000 fpm (20 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)

To determine pressure drop across open damper, calculate **free area velocity** as shown, find velocity on curve and read across for s.p. differential.

$$\text{Free Area Velocity (fpm)} = \frac{\text{cfm}}{\text{Free Area}}$$

Example:

1 – 36" x 24" Damper required for 8,500 cfm. (Type A)

$$\text{FAV} = \frac{8500}{5 \text{ sq. ft.}} = 1700 \text{ fpm}$$

1700 fpm located on the 'A' curve shows a pressure drop of .07 in. wg.

cfm = cubic feet per minute

fpm = feet per minute velocity

S.P. = static pressure in inches water gauge

FAV = Free Area Velocity

Imperial System Shown

To convert to SI (metric) system:

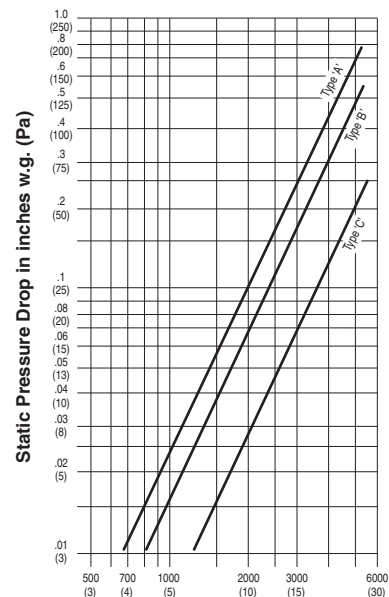
Multiply cfm by .4719 for liters per second

Multiply fpm by .00508 for meters per second

Multiply in. wg. by .2486 for kilopascals

Multiply sq. ft. by .0929 for square meters.

#### Pressure Drop



Free Air Velocity in feet per minute (m/s)

## OPTIONS & ACCESSORIES:

	CODE	DESCRIPTION
PULL TAB RELEASE	PT	Pull Tab Release for Simple Testing and Maintenance
QUICK-SET ANGLE	QS1/QS2	Single set or Pair of "Quick-Set" Retaining Angles
HEMMED SLEEVE	HM1/HM2	One or Both Sleeve Ends Hemmed for Slip and Drive Connection
FLANGED SLEEVE	TDF1/TDF2	One or Both Sleeve Ends Flanged for Breakaway Connection
MICROSWITCH	MS	24V Microswitch
	MSE	120/24V Microswitch with Enclosure

## HOW TO SPECIFY

### MODEL SERIES: D0500 - 3 HOUR LABEL

### DYNAMIC CURTAIN FIRE DAMPERS

#### SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Dynamic Curtain Fire Dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Fire dampers shall meet the requirements of NFPA 80, 90A and 101 and shall be manufactured, tested and labeled in accordance with UL 555, including a Dynamic Closure Test. Each damper shall bear a UL 3 hour fire resistance rating label and in addition, a label verifying the airflow and closure pressure ratings as established by the Dynamic Closure Test. Dampers shall be classified for dynamic closure against a minimum airflow velocity of 2000 at 4" w.g. (10 m/s @ 1 kPa) static pressure differential and shall be marked with the words "For use in dynamic systems". Dampers marked "For use in static systems only" are not acceptable. Damper shall be tested and approved for either vertical or horizontal mounting as required for each specific location.

Frame shall be constructed of 22 ga. (0.85) roll formed G60 galvanized steel and include sleeve of appropriate length/gauge with Nailor 'Quick-Set' retaining angles supplied by damper manufacturer to ensure proper installation in accordance with damper manufacturer's instructions. Blades shall be curtain type interlocking blades constructed of 22 ga. (0.85) roll formed G60 galvanized steel. Damper shall be complete with stainless steel closure springs, galvanized steel locking ramps and a (**specifier select temperature**) 165°F (74°C) or 212°F (100°C) UL Listed fusible link. Contractor shall provide and install an access door at each fire damper of appropriate size to allow for inspection, testing and fusible link replacement Data submitted for approval shall include confirmation of UL qualifications in addition to manufacturer's installation instructions. Each shipment of fire dampers shall include same installation instructions. Standard of acceptance shall be Nailor Model Series D0500 Dynamic Curtain Fire Dampers.

D  
CURTAIN FIRE DAMPERS

## SELECTION PROCEDURE FOR DYNAMIC FIRE DAMPERS

Underwriters Laboratories Inc. Standard for Safety UL 555 evaluates fire dampers for use as either: (A) Fire dampers for static systems – for HVAC systems that are automatically shut down in the event of a fire or for air transfer openings in walls or partitions; (B) Fire dampers for dynamic systems – for HVAC systems that are operated in the event of a fire.

Dynamic Fire Dampers are therefore required to close under airflow.

All fire dampers must be labeled to indicate if they are to be used in static or dynamic systems. For dynamic rated dampers, this label must also indicate the maximum rated velocity through the open damper, and the maximum pressure differential across the closed damper.

To attain approval for use in a dynamic system, UL Standard 555 requires that test dampers close three times (manually released) against their rated flow and shut-off pressure at ambient air temperature before heat is introduced to cause the fusible link to melt and close the damper one final time.

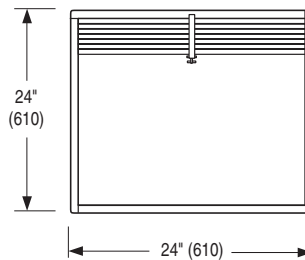
All Nailor dynamic curtain type fire dampers have been tested to a minimum of 2000 fpm (10 m/s) and 4" w.g. (1 kPa) static pressure. Extended velocity/pressure ratings up to 4000 fpm @ 4" w.g. (20 m/s @ 1 kPa) are available on certain models, with size limitations. See pages D8 - D10 for model and size restrictions.

### EXAMPLE #1: SINGLE SECTION FIRE DAMPER

To determine the maximum allowable airflow through the following damper:

Type A damper 36" x 36". The maximum rated velocity is 2000 fpm. 36" x 36" is 9 sq. ft. (Width in inches x Height in inches divided by 144 = sq. ft.), therefore, maximum allowable airflow is 2000 fpm x 9 sq. ft. = 18,000 cfm.

Check the maximum system pressure that could occur against a closed damper. Nailor dynamic fire dampers have been tested and are rated to close against 4" w.g.

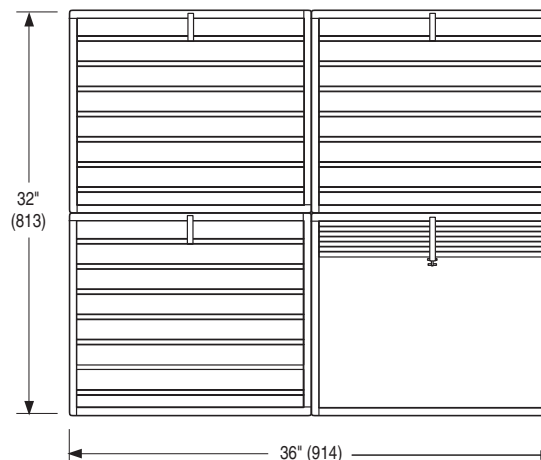


### EXAMPLE #2: MULTIPLE SECTION FIRE DAMPER

To determine the maximum allowable airflow through the following multi-section damper assembly:

Type A damper 36" x 32" opening (the assembly will consist of four 18" x 16" dampers); The maximum rated velocity is 2000 fpm. 36" x 32" is 8 sq. ft., therefore, 2000 fpm x 8 sq. ft. = 16,000 cfm. This is the maximum allowable airflow that may be passed through the 36" x 32" opening.

Check the maximum system pressure that could occur against a closed damper. Nailor dynamic fire dampers have been tested and are rated to close against 4" w.g.





## HOW TO ORDER

### MODEL SERIES: D0100 – D0500

### DYNAMIC CURTAIN FIRE DAMPERS

EXAMPLE: D0130 - 8" - H - CR - LP - FL - 165 - SL = 12" - 20G - QS2

#### 1a. Models

Dynamic or Static Applications

##### Non-Integral Sleeve

- D0110 Type A, 1 1/2 Hr. Label
- D0120 Type B, 1 1/2 Hr. Label
- D0130 Type C, 1 1/2 Hr. Label
- D0140 Type C, Square/Rectangular, 1 1/2 Hr. Label
- D0510 Type A, 3 Hr. Label
- D0520 Type B, 3 Hr. Label
- D0530 Type C, 3 Hr. Label

##### Integral Sleeve

- D0114 Type A, 1 1/2 Hr. Label
- D0124 Type B, 1 1/2 Hr. Label
- D0134 Type C, 1 1/2 Hr. Label
- D0114HY Hybrid, Type A, 1 1/2 Hr. Label
- D0124HY Hybrid, Type B, 1 1/2 Hr. Label
- D0134HY Hybrid, Type C, 1 1/2 Hr. Label
- D0110G Grille Mount, Type A, 1 1/2 Hr. Label
- D0120G Grille Mount, Type B, 1 1/2 Hr. Label
- D0130G Grille Mount, Type C, 1 1/2 Hr. Label
- D0110GOW Out of Wall, Grille Mount, Type A, 1 1/2 Hr. Label

#### 1b. Integral Sleeve Length (D01X4 Series only)

- Add Suffix to Model Number
- 12 12" (305) x 22 GA.
  - 14 14" (356) x 22 GA.
  - 16 16" (406) x 22 GA.

#### 2. Duct Size

Width x Height  
inches (mm's)

#### 3a. Mounting

H Horizontal  
V Vertical

#### 3b. Transition:

(Non-Integral Sleeve Type C only)

CO Oval  
CR Round  
CSR Square/Rectangular

#### 3c. Pressure (Type C only)

LP Low Pressure (unsealed)  
HP High Pressure (sealed)

#### 3d. Collar (Type CSR only)

WC With Collar (default)  
NC No Collar

#### 4. Maximum Velocity Pressure Rating

24 2000 fpm @ 4" w.g. (default)  
34 3000 fpm @ 4" w.g.  
44 4000 fpm @ 4" w.g.

#### 5. Closure Device

FL Fusible Link (default)  
EML Easy Maintenance Link  
ETL Electrothermal Link

#### 6. Closure Temperature

165 165°F (74°C) (default)  
212 212°F (100°C)

#### 7. Sleeve Length

- None (default)

##### SL = Specify

8" - 28" (203 - 700)

#### 8a. Sleeve Gauge

- None (default)  
20G 20 Ga. Standard  
22G 22 Ga.  
18G 18 Ga.  
16G 16 Ga.  
14G 14 Ga.  
10G 10 Ga.

#### 8b. \*Sleeve Style (D0120 only)

STY2 Type 2 Standard (default)  
STY1 Type 1 Optional

#### OPTIONS & ACCESSORIES:

#### 9. Pull Tab Release

- None (default)  
PT Pull Tab Release

#### 10. Micro Switch

- None (default)  
MS 24 VAC Micro-Switch  
MSE 24/120 VAC Micro-Switch w/Enc.

#### 11. Retaining Angles

- None (default)  
QS1 One Side  
QS2 Two Sides (pair)

#### 12. Sleeve Accessory

- None (default)  
HM1 One End and G Type  
HM2 Both Ends  
TDF1 One End  
TDF2 Both Ends

#### Notes:

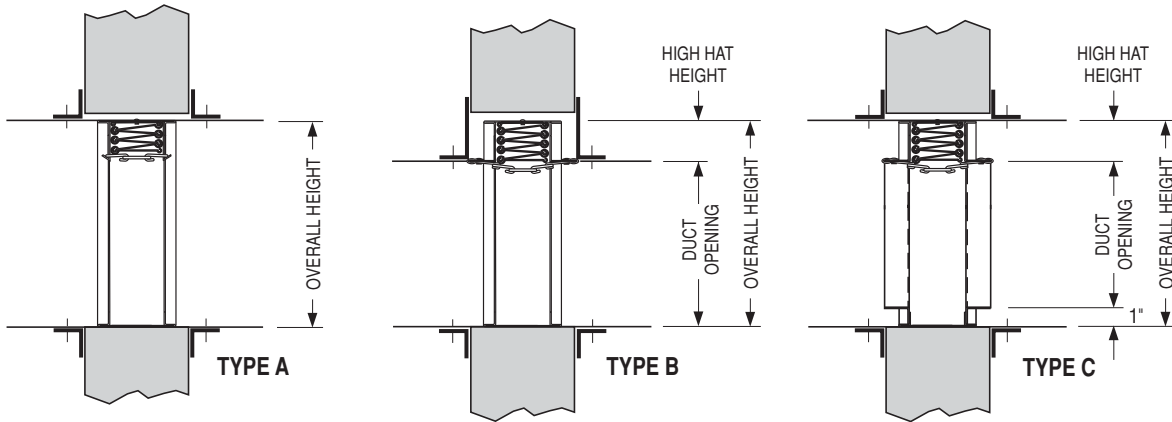
1. Not all variants and options are available on all models. Refer to individual model for selection availability.

2. \* Refer to "Options and Accessories" page D64 for details on Sleeve B types.

## STANDARD 4 1/4" (108) FRAME FIRE DAMPERS:

SERIES/MODELS: D0100, D0500, 0100, 0510, 0520, 0530

Use the following chart to determine overall dimensions for Type A, B, and C curtain type fire dampers:



	Duct Opening Height		Overall Height	
	Imperial	Metric	Imperial	Metric
<b>Type A</b>	4" → 60"	102 mm → 1524 mm	Duct Height – 1/4"	Duct Height – 6 mm
	Note: Type A Damper Overall Width = Duct Opening – 1/4" (6 mm)			
<b>Type B</b>	3" → 17"	76 → 432 mm	Duct Height + 2 1/8"	Duct Height + 54 mm
	18" → 27"	457 → 656 mm	" + 3 1/8"	" + 79 mm
	28" → 36"	711 → 914 mm	" + 4 1/8"	" + 105 mm
	37" → 45"	940 → 1143 mm	" + 5 1/8"	" + 130 mm
	46" → 54"	1168 → 1372 mm	" + 6 1/8"	" + 156 mm
Note: Type B Damper Overall Width = Duct Opening – 1/4" (6 mm)				
<b>Type C</b>	3" → 17"	76 → 432 mm	Duct Height + 2 3/4"	Duct Height + 70 mm
	18" → 27"	457 → 656 mm	" + 3 3/4"	" + 95 mm
	28" → 36"	711 → 914 mm	" + 4 3/4"	" + 121 mm
	37" → 45"	940 → 1143 mm	" + 5 3/4"	" + 146 mm
	46" → 53"	1168 → 1346 mm	" + 6 3/4"	" + 172 mm
Note: Type C Damper Overall Width = Duct Opening + 1 3/4" (44 mm)				

**Important Note:** Type "B" and "C" overall height dimensions only apply to sizes that are **single section high**. For overall height dimensions for sizes that are multi-section in height, please contact factory. Refer to individual model submittal drawings for maximum single section heights.



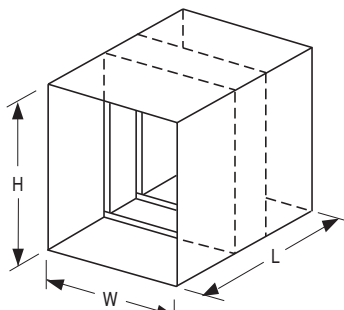
## Options and Accessories

Nailor curtain type fire dampers are tested by and listed with Underwriters Laboratories Inc. and are manufactured within UL procedural requirements.

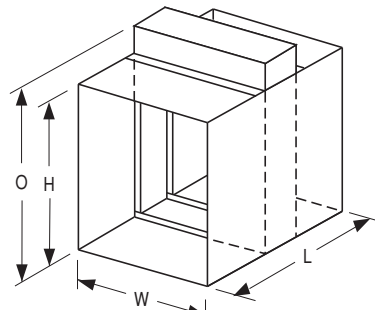
### SLEEVE OPTIONS:

#### CUSTOM SLEEVES FOR NON-INTEGRAL SLEEVE MODELS

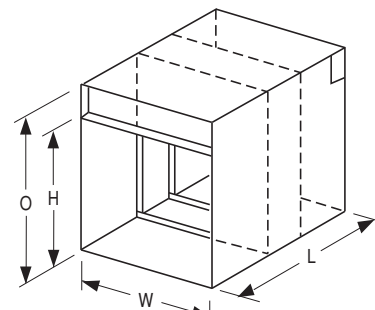
Fire dampers, in most cases, must be mounted in a steel sleeve and the damper/sleeve assembly is to be held in place in the wall, partition or floor by use of steel retaining angles. This allows for the ductwork to 'break-away' from the sleeve should the ductwork fall during a fire, thus leaving the sleeve/fire damper intact in the opening to maintain the integrity of the fire separation. Nailor factory furnished sleeves ensure proper fit to UL standards, allow for direct shipment of dampers to jobsite eliminating the need for costly shop handling and provide for convenient, fast installation.



**TYPE 'A'**  
BLADES AND FRAME IN AIRSTREAM

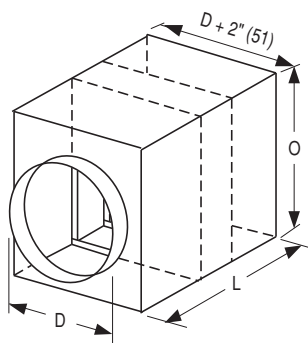


STYLE 1 (OPTIONAL)

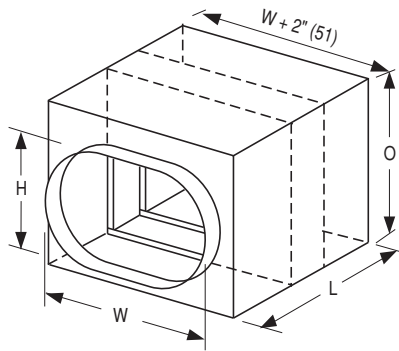


STYLE 2 (STANDARD)

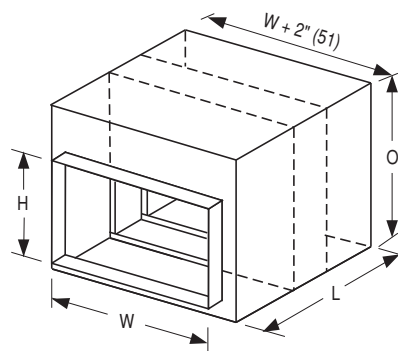
**TYPE 'B' BLADES OUT OF AIRSTREAM**



**TYPE 'CR'**  
ROUND TRANSITION COLLARS/DUCT.  
100% FREE AREA.



**TYPE 'CO'**  
FLAT OVAL TRANSITION COLLARS/DUCT.  
100% FREE AREA.



**TYPE 'CSR'**  
RECTANGULAR TRANSITION COLLARS/DUCT.  
100% FREE AREA.

#### Dimensional Data:

- W = Nominal duct width
  - H = Nominal duct height
  - D = Nominal duct diameter
  - L = Sleeve length
  - O = Overall damper height
- For 'O' dimension and relationship to duct height, refer to the particular damper model sizing chart.

#### Notes:

1. Type CR duct collars are furnished 1/8" (3) undersize for duct dimensions up to 36" dia. (914) and 1/4" (6) undersize on larger sizes. Type CO and CSR duct collars are furnished 1/8" (3) undersize for duct dimensions up to 36" x 24" (914 x 610) and 1/4" (6) undersize on larger sizes. Collars are 1 1/4" (32) minimum length.
2. For size limitations see MIN/MAX. UL SIZES charts beginning on page D8.
3. Dampers are centered in sleeve unless specified otherwise.

## SLEEVE OPTIONS:

### CUSTOM SLEEVES FOR NON-INTEGRAL SLEEVE MODELS

OPTION CODE **SL**  
SLEEVE LENGTH

**When selecting sleeve option SL please specify sleeve length.**

Fire damper sleeves are required to extend out beyond the wall or floor opening an adequate amount in order to allow for fastening of perimeter angles to sleeve and connection to duct. UL 555 requires that the length of the sleeve extending beyond the wall or floor opening shall not exceed 6" (152) on each side for fire dampers intended for use without an actuator or factory installed access door in the sleeve.

However, the sleeve may extend up to a maximum of 16" (406) beyond the wall or floor on either side provided the extended side(s) is used to accommodate an actuator or a factory mounted access door (See UL 555 Sixth Edition June 1999, Section 6.4).

Sleeves are available in lengths from 8" (203) minimum up to 36" (914). Standard sleeve is 12" (305) long x 20 ga. (1.0).

OPTION CODES  
**10G, 14G, 16G, 18G, 20G, 22G**  
SLEEVE GAUGE

**When selecting sleeve option SL please specify sleeve gauge if other than standard.**

Nailor factory-fitted sleeves are constructed from quality galvanized steel and are available in 22 ga. through 10 ga. (0.85 through 3.5) as required for application. Standard sleeve is 12" (305) long x 20 ga. (1.0). Sleeves over 84" (2134) in width are minimum 18 ga. (1.3) to meet SMACNA minimum requirements. Sleeve gauge must conform to SMACNA Duct Construction Standards and shall not be less than the gauge of the duct to which it is attached, for sleeves exposed to the airstream.

OPTION CODES **HM1, HM2**  
HEMMED SLEEVE END(S)



Sleeve with Option Code HM2 shown.

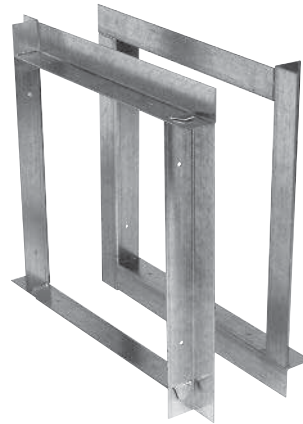
In order to more easily facilitate connection to square or rectangular ducts, Nailor offers hemmed sleeve ends suitable for use as a 'breakaway' connection on sleeves of up to a maximum 20" (508) in height, in accordance with UL requirements. This allows "S" slips and flat drive slips to be used. Option Code **HM1** will provide only one end hemmed, suitable for use on sleeves that terminate flush with a wall to facilitate grille mounting for example. Option Code **HM2** will provide both ends hemmed for connection of ductwork to both ends of sleeve.

## RETAINING ANGLES:

### FOR USE WITH ALL SLEEVED FIRE DAMPERS

- Maximum size: 90" x 48" (2286 x 1219) or 48" x 90" (1219 x 2286).

OPTION CODES  
**QS2** TWO SIDES (PAIR)  
**QS1** ONE SIDE  
 'QUICK-SET' RETAINING ANGLES



#### BENEFITS:

- Factory fabricated by the manufacturer to suit the individual fire damper.
- Dampers can ship directly to the job site complete with all necessary installation sheet metal hardware (saves on double handling at contractor's shop).
- Reduced cost when compared to conventional retaining angles.
- Only two sets of angles to handle per damper (rather than eight).
- Angles ship with individual damper - no sorting or matching.
- Pre-drilled holes on 8" (203) centers to ensure correct angle/sleeve attachment.
- Help ensure a correct installation as per U.L. approved installation instructions.

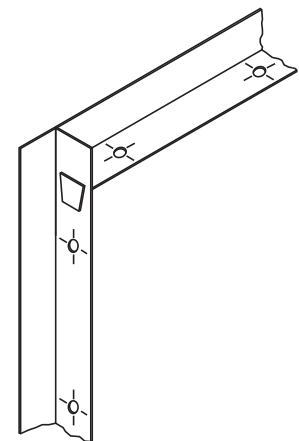
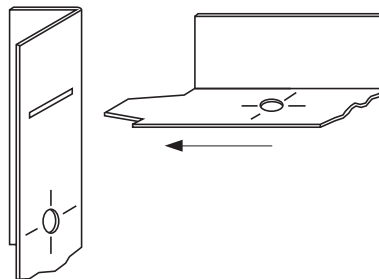
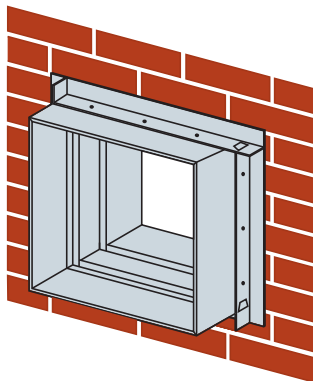
The majority of installing contractors view fire damper installation as a costly time consuming and troublesome procedure. Eight conventional angles must be custom fabricated for each damper either in a sheet metal shop or at the job site and sized to suit each individual damper. Invariably, they are mislaid or lost and must be matched to each factory supplied damper. The Nailor "Quick-Set" solution solves the majority of problems. They are pre-formed to fit each damper and shipped with the individual damper units for ultimate convenience.

Nailor "Quick-Set" retaining angles are an accessory option for all dampers ordered with factory sleeves.

**QS2:** Two sides (pair). For standard installations where angles are installed on both sides of the fire partition.

**QS1:** One side (single set). For use in a single side retaining angle installations and with grille mount and "out of wall" damper models. "Quick-Set" angles are supplied with correctly spaced pre-drilled screw-holes to ensure a quick, easy and accurate installation for all Nailor fire dampers - no measuring required.

"Quick-Set" retaining angles when specified and supplied with Nailor integral sleeve fire dampers provide the "complete" installation package. Simple, fast, convenient.



**Style 1:** 1 1/2" x 1 1/2" x 20 ga. (38 x 38 x 1.0) Four sides are connected together with rivets in three corners. Standard for the majority of applications with the following limitations:

- 1 1/2 hour label fire dampers.
- Maximum Size: 36" x 36" (914 x 914).
- Two sided installation only.

**Style 2:** 1 1/2" x 1 1/2" x 16 ga. (38 x 38 x 1.6) Slot and tab design. The retaining angle assembly for each side has four angles, each with a tab end and a slot end (Detail A). The tabs are to be inserted into the slots and knocked down either before or after fastening to the sleeve (Detail B).

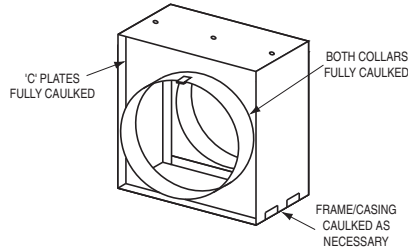
- 1 1/2 or 3 hour label fire dampers.
- Maximum Size: 90" x 48" (2286 x 1219) or 48" x 90" (1219 x 2286).
- Single side (1 1/2 hour only. Refer to Single Side Retaining Angles Supplementary Installation Instructions for size limitations) or two sided installation.

## SEALING OPTIONS FOR TYPE C TRANSITIONS:

**OPTION CODE LP**  
LOW PRESSURE (UNSEALED)

Standard construction on Type C fire dampers. Transition casing and collars are unsealed. Suitable for use in most low pressure applications involving static pressures up to 2" w.g. (5 kPa).

**OPTION CODE HP**  
HIGH PRESSURE (SEALED)



Sealed for use in medium and high pressure applications up to 6" w.g. (1.5 kPa), Type C fire dampers with HP option are externally caulked to minimize leakage through casing and collars.

## CLOSURE DEVICES:

**OPTION CODE FL**  
FUSIBLE LINK



All Nailor curtain type fire dampers are equipped as standard with a UL Listed fusible link that will melt, or 'fuse', when it is subjected to its rated melting temperature, allowing the damper to close. 165°F (74°C) fusible link is provided as standard. 212°F (100°C) is also available (See Closure Temperature Options).

## CLOSURE DEVICES:

OPTION CODE **EML**  
EASY MAINTENANCE LINK

**Nailor's Easy Maintenance Link provides a simple solution for the awkward task of manually testing curtain type fire dampers.**

NFPA 80, *Standard for Fire Doors and Other Opening Protectives*, requires periodic inspection and testing of fire dampers 1 year after installation and then every 4 years, except for hospitals, where the frequency is every 6 years. Nailor's EML allows you to release, test and reload a standard 4 1/4" (108) deep frame fire damper quickly and easily with one hand, even through the smallest access door. This saves time and money, and even encourages fire damper maintenance, ensuring the protection of building occupants. 165°F (74°C) temperature rating is standard. 212°F (100°C) is also available. The EML is accessible from either side of the damper, providing safe and reliable convenience. EML must be factory installed and cannot be added in the field.



### SUGGESTED SPECIFICATION:

(Add to standard frame fire damper specifications):

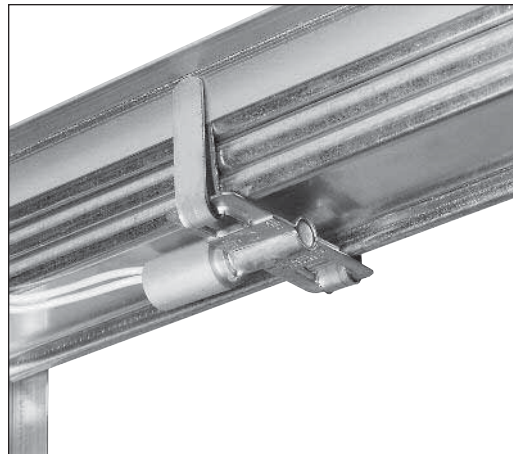
Curtain type fire dampers shall each be equipped with factory installed Easy Maintenance Link (EML), as manufactured by Nailor Industries. EML shall be accessible from either side of damper and shall allow for releasing, testing and relatching of blades with one hand.

## CLOSURE DEVICES:

**OPTION CODE ETL**  
ELECTRO-THERMAL LINK

Nailor's Electro-Thermal Link (ETL<sup>®</sup>) is a dual responsive fusible link that melts when either the link is subjected to local heat (165°F (74°C)) exactly the same as an ordinary fusible link, or when an electrical impulse from an external source such as a smoke detector is sent to it. The ETL<sup>®</sup> can be substituted for ordinary fusible links in existing or new installations of fire dampers where it is desirable to improve life safety by making the fire damper respond to smoke in the early form of invisible products of combustion through ionization smoke detectors for example.

The ETL<sup>®</sup>'s electro-response is the unique feature. It in itself is not smoke responsive, but it's power requirement is so low that it can be released by an electrical impulse from any smoke detector's power source. It is compatible with every smoke detector on the market in the United States today. The operating range is 6 to 30 volts AC or DC, less than 0.2 amperes of trip current required (for 50 millisecond duration). The electrical response is a trigger for the chemical heating of the center element which is a self-contained exo-thermic reactor,



yielding no noise, smoke or gas... just quick heat to open the link in about seven seconds. The ETL<sup>®</sup>'s thermal response is the same as that of ordinary fusible links that have a 165°F (74°C) and 40 lbs. rating.

With it's dual responsiveness the ETL<sup>®</sup> can be substituted for two other devices at a savings in initial cost as well as operating cost and maintenance. It is built to zero defect standards and to last at least fifty years and then still react properly, only on fire or smoke emergency.

It is totally independent of power failures since it draws power from the detector standby source if needed. The ETL<sup>®</sup> is listed by UL as a Fusible Link, however, with the ongoing development of dynamic smoke control systems and building code changes, application and use should be governed by acceptance of the local authority having jurisdiction.

### SUGGESTED SPECIFICATION:

(Add to standard frame fire damper specifications)

Curtain type fire dampers, where indicated on plans and/or schedules, shall each be equipped with factory installed Electro-Thermal Links (ETL<sup>®</sup>), as supplied by Nailor Industries. Operating range shall be 6 to 30 volts AC or DC, less than 0.2 amperes of trip current required (for 50 millisecond duration). Link shall open within seven seconds and shall have a temperature rating of 165°F (74°C) and a 40 lbs. strength rating.



## CLOSURE TEMPERATURES:

OPTION CODES **165 & 212**  
165 or 212°F FUSIBLE LINKS

Fusible links for curtain type fire dampers are available with a choice of several melting temperature ratings. Nailor fire dampers are provided as standard with 165°F (74°C) fusible link. Available 212°F (100°C) link can be installed on damper at time of manufacturing, or can be ordered separately as a replacement part for field installation as part of a regular maintenance program or after a fire emergency (providing damper is still functional).

The National Fire Protection Association Standard 90A states that "fusible links shall have a temperature rating approximately 50°F (28°C) above the maximum temperature that normally is encountered when the system is in operation or shut down, but not less than 160°F (71°C)." Adhering to this guideline helps prevent 'nuisance trips' resulting in unnecessary replacement costs and labor time.

## OPTIONAL PULL-TAB RELEASE

OPTION CODE **PT**  
PULL-TAB RELEASE



**To release locked blades simply tug Pull-Tab downward!**

**Nailor's Pull-Tab release permits easy resetting of horizontal fire dampers from either side of damper.**

Horizontal curtain type fire dampers for use in static systems and all dynamic dampers utilize stainless steel springs and locking ramps to draw the curtain closed in the event of a fire or upon manual release.

Horizontally installed dampers are designed and tested to be mounted with the locking ramps on the top side. When periodic testing (as well as maintenance and inspection) is required, access doors should be located above the damper, so that the damper blade pack can be "pushed down" and released off the locking ramp for reset.

When access from above is not possible or convenient, the Pull-Tab release option permits simple resetting from beneath the damper.

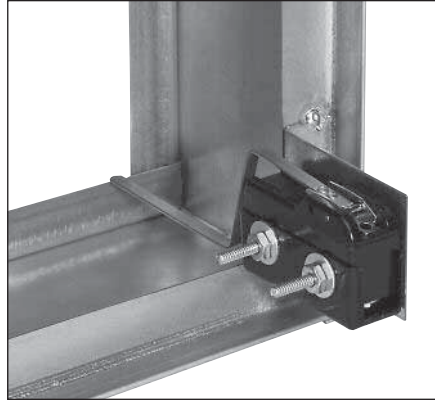
A 1 1/4" (32) dia. nickel plated steel pull ring is fastened to the locking blade on the downward facing side allowing for unlocking and resetting of the blades from below the fire damper, as well as from above. The PT option is available on all Type A and Type B horizontal mount curtain fire dampers.



## OPTIONAL MICROSWITCHES:

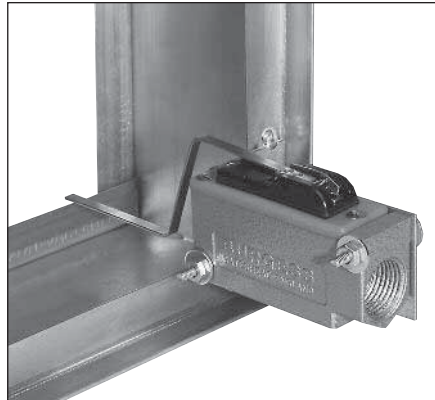
### FOR DAMPER STATUS INDICATION OR HVAC FAN SHUT-DOWN

**OPTION CODE MS**  
24V MICROSWITCH



Option Code MS provides any Nailor fire damper with a factory mounted micro switch suitable for use in low voltage (24V) applications. Activated when the damper blades are closed, the switch can be used for status indication of damper when wired into a control panel or can be utilized to shut a fan off upon closure of damper. UL and CSA approved single pole, double throw switch is rated up to 15 amps. and can be wired up as normally closed or normally open, depending upon application.

**OPTION CODE MSE**  
120/24V MICROSWITCH WITH  
ENCLOSURE



Option Code MSE, microswitch with enclosure, provides a factory mounted micro switch similar to Option MS, except the MSE with its safety enclosure is suitable for use in line voltage (120V) applications. Similarly, the MSE can be used for status indication or fan shut down and also can be wired for normally closed or normally open applications. Enclosure is tapped with 1/2 inch NPS threads for conduit connection and is also provided with an internal earthing (ground) screw.

## FLANGED SLEEVE

OPTION CODES  
 TDF FLANGE  
**TDF2** BOTH ENDS  
**TDF1** ONE END



**TDF** (by Engle) and **TDC** (by Lockformer) proprietary flange systems are approved as breakaway connections for connecting a factory sleeved (22 or 20 gauge) Type A or B curtain type fire damper to ductwork. They may be used in place of the approved slip joints shown in standard installation instructions.

For Option **TDF1** the sleeve is factory flanged on one end only.

For Option **TDF2** the sleeve is factory flanged on both ends.

Note that the maximum wall/floor opening size permitted by UL, relative to the damper size, may not physically allow the flange to fit through the opening. Consultation and co-ordination with the wall/floor contractor is recommended. **TDF1**, flange on one end only, will permit the non-flanged end of the sleeve to fit through the opening.

### Maximum TDF1/TDF2 Sleeve Size Allowed:

For Curtain Type Fire Damper: 60" wide x 60" high (1524 x 1524).

For Multi-Blade Type Fire Damper: 36" wide x 48" high (914 x 1219).