Nailor®
Industries Inc.

AIR CONTROL PRODUCTS

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Nailor®

Nailor® Industries Inc.

Today, most people involved in the HVAC industry around the world are familiar with Nailor Industries Inc. and our comprehensive line of Air Distribution, Air Control and Air Terminal Unit products. However, many may not know that the company had humble beginnings.

The company commenced operations at a small facility in Toronto, Canada manufacturing a single air control device. Michael T. Nailor (President and CEO) started with the founding principle that the company would be customer focused and service orientated, dedicated to fulfilling the need for high quality, competitively priced products, delivered to our customers on schedule.

Nailor management has maintained strict adherence to the 'Superior Customer Service' philosophy for over 40 years and as a result, the company has been rewarded with a continually increasing demand for our products. An ever expanding product offering includes air control and fire/smoke dampers, a complete line of grilles, registers and diffusers as well as fan coil units, fan powered terminal units, silencers, and electric duct heaters that exceed industry standard design and performance specifications.

Nailor International Group has expanded their already outstanding repertoire of companies with Advanced Air, Nailor GTA, Engineered Acoustics, Engineered Comfort, Thermal Corporation, Heatmasters and Manufactured Air Products – a complete line of top quality air distribution and air control products that are available through stocking wholesalers across North America.

Today, with Group International Headquarters in Houston, Texas, the company has manufacturing plants strategically located in three countries to service the North American, European, Middle Eastern and Asian Pacific markets. An international distribution network of representatives in most major cities work together to not only meet but exceed the expectations of clients, engineers and customers around the world.

As a private company, employing a staff of dedicated professionals, Nailor Industries Inc. is prepared to set new benchmarks for service and quality as the company continues to grow and remain the source for your . . .

"Complete Air Control and Distribution Solutions."

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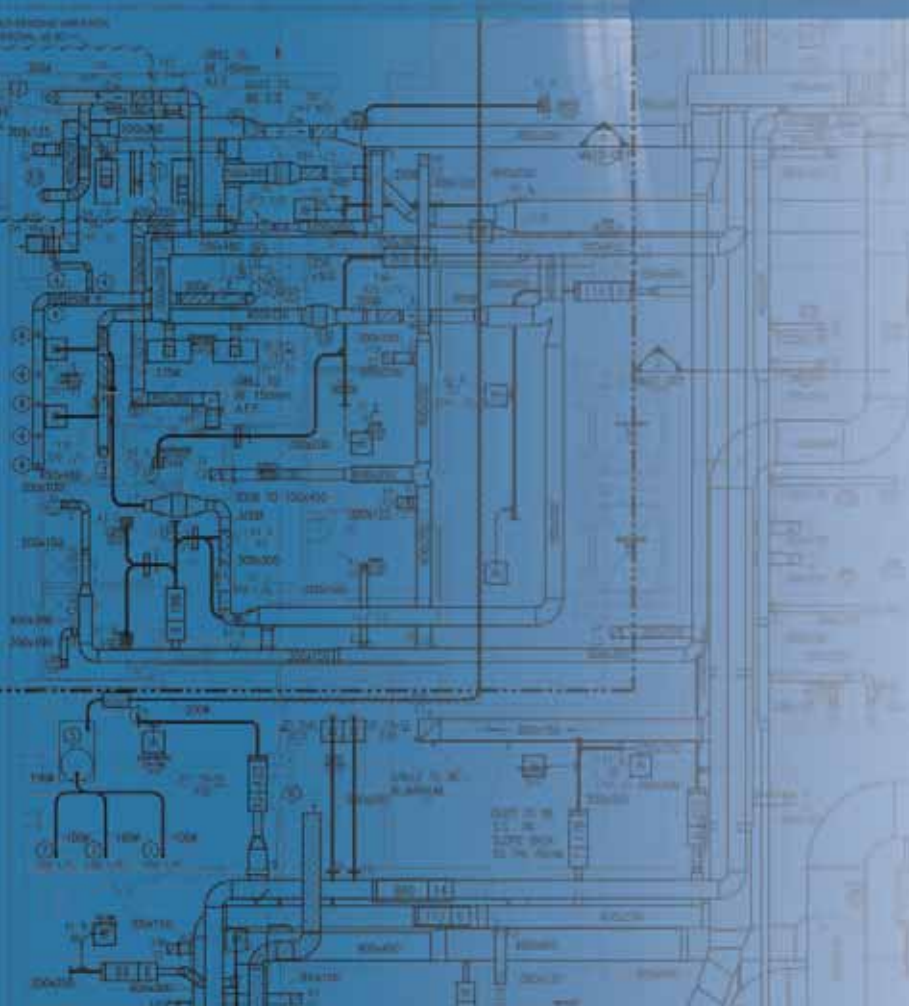
Nailor® Industries Inc.

LOUVERS



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GENERAL PRODUCT OVERVIEW

At Nailor Industries, we've been manufacturing premium quality air control products for over 40 years. We've learned a lot since producing our first device and have incorporated that knowledge into the latest designs and production techniques that are offered today. Designed and engineered to meet the most demanding specifications, Nailor's louver products combine architecturally enhancing aesthetics with excellent performance characteristics. So go ahead and take advantage of our experience and dedication to quality engineering and customer satisfaction.

FEATURES AND BENEFITS OF NAILOR LOUVERS

- Nailor offers a wide variety of blade styles to meet mechanical system requirements and architectural design criteria.
- Extruded Aluminum, Galvanized or Stainless Steel construction for high durability and quality fit and finish.
- Reinforcing bosses run the full length of extruded aluminum blades for superior strength.
- All Nailor louvers are precision assembled using zinc plated fasteners. Optional fully welded construction is available.
- Low pressure drop characteristics require less fan energy and contribute to efficient system operation.
- Drainable head is standard on many models for maximum protection against water running down the building face.
- Integral caulking slots on all frames help ensure a tight and tidy installation.
- Vast selection of finishes and colors.
- Largest selection of specialty shapes and custom louver manufacturing.

AMCA INTERNATIONAL MEMBER

Nailor Industries is an active member of the Air Movement and Control Association International (AMCA) which provides standardized test criteria for air control devices. In addition, AMCA also offers a Certified Ratings Program which provides assurance that cataloged performance ratings are reliable and accurate. Only products whose ratings are based on tests performed in accordance with AMCA recognized test methods, at the AMCA Testing Laboratory or an AMCA Accredited Laboratory, and adhere to the Certified Ratings Program criteria, can be licensed to use the Certified Ratings Seal.

Nailor Industries Inc. certifies the Models 1602D, 1604JD, 1606JD, 1604KD, 1606KD, 1604D, 1606D, 1604DD, 1606DD, 1604AD, 1606AD, 1606CDAF and 1706D shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Air Performance and Water Penetration ratings.

Nailor Industries Inc. certifies the Model 1605WD shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Air Performance, Water Penetration and Wind-Driven Rain ratings.

Nailor Industries Inc. certifies the Model 1612QS shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Air Performance, Water Penetration and Sound.

MODELS 1602J, 1602K & 1602D
EXTRUDED ALUMINUM LOUVERS
THINLINE FRAME

Nailor Models 1602J, 1602K and 1602D Thinline Louvers combine performance with aesthetics. Nailor Model 1602J is an architecturally styled thinline louver incorporating J style blades, designed with smooth, continuous clean lines that enhance any structure's exterior styling. Model 1602K thinline louver utilizes K style blades, blending weather protection and low pressure drop with a look that augments any architecture. Model 1602D provides good rain protection, utilizing drainable blades that augment any architectural style. Nailor Thinline Louvers are suitable for use in ventilation, exhaust and low to medium velocity intake applications, ideal for use in thin wall applications or A/C units where a full depth louver cannot be used.

Models 1602J and 1602K

Models 1604J and 1606J

MODELS 1604J & 1606J
EXTRUDED ALUMINUM LOUVERS
ARCHITECTURAL BLADE

Nailor Models 1604J and 1606J are architecturally styled louvers utilizing J style blades, crafted with a clean continuous architectural appearance that will visually compliment any structure's exterior. The blade design provides protection against general weather conditions, with low pressure drop characteristics and a high free area. Reinforcing bosses run the full length of each blade for superior strength. Suitable for use in ventilation, exhaust and low to medium velocity intake applications, well suited for use in specialty shape architectural applications. Available in channel, flanged, or glazing adapter type, the 4" (102) or 6" (152) deep frame installs easily in most common wall configurations. Nailor's architectural louvers are engineered to be aesthetically appealing as well as mechanically enduring.

MODELS 1604JD & 1606JD
EXTRUDED ALUMINUM LOUVERS
DRAINABLE HEAD, ARCHITECTURAL BLADE

Nailor Models 1604JD and 1606JD are architecturally styled louvers combining J style blades with a drainable head feature that utilizes a top rain gutter to prevent cascading water from entering into the building. The blade design features a rear water baffle and provides good protection against general weather conditions, with low pressure drop characteristics and a high free area. Reinforcing bosses run the full length of each blade for superior strength. Suitable for use in ventilation, exhaust and low to medium velocity intake applications where water penetration is a concern. Available in channel, flanged, or glazing adapter type, the 4" (102) or 6" (152) deep frame installs easily in most common wall configurations. Nailor Models 1604JD and 1606JD are AMCA Licensed for Water Penetration and Air Performance.

Models 1604JD and 1606JD

MODELS 1604KD & 1606KD
EXTRUDED ALUMINUM LOUVERS
DRAINABLE HEAD, K BLADE

Nailor Models 1604KD and 1606KD combine K style blades with a drainable head feature that utilizes a top rain gutter to prevent cascading water from entering into the building. The blade design features a rear water baffle plus an additional center rain hook, providing adequate protection against more forbidding weather conditions. Reinforcing bosses run the full length of each blade for superior strength. Suitable for use in exhaust and low to medium velocity intake applications. Available in channel, flanged, or glazing adapter type, the 4" (102) or 6" (152) deep frame installs easily in most common wall configurations. Nailor Models 1604KD and 1606KD are AMCA Licensed for Water Penetration and Air Performance.

Models 1604KD and 1606KD

Models 1604D and 1606D

MODELS 1604D & 1606D
EXTRUDED ALUMINUM LOUVERS
DRAINABLE HEAD, DRAINABLE BLADE

Nailor Models 1604D and 1606D combine excellent weather protection with air performance and pleasing aesthetics that compliment any structure's exterior styling. The drainable head feature is enhanced by the drainable blade design, which utilizes additional rain gutters that divert collected water down concealed side downspouts and out through the sill. Blades are reinforced with full length integral bosses for superior strength. Suitable for use in exhaust and low to medium velocity intake applications where water penetration concerns are a priority. Available in channel, flanged, or glazing adapter type, the 4" (102) or 6" (152) deep frame installs easily in most common wall configurations. Nailor Models 1604D and 1606D are AMCA Licensed for Water Penetration and Air Performance.

MODELS 1604DD & 1606DD
EXTRUDED ALUMINUM LOUVERS
DRAINABLE HEAD, DUAL DRAINABLE BLADE

Nailor Models 1604DD and 1606DD combine exceptional weather protection during the most enduring rain conditions, great air performance through a large free area and pleasing aesthetics that enhance any structure's exterior design. Complemented by a drainable head, the dual drainable blade design utilizes double rain gutters that divert collected water down concealed side downspouts and out through the sill preventing water from infiltrating the space. Blades are reinforced with full length integral bosses for superior strength. Suitable for use in exhaust and medium to high velocity intake applications where water penetration concerns are a major priority. Available in channel, flanged, or glazing adapter type, the 4" (102) or 6" (152) deep frame installs easily in most common wall configurations. Nailor Models 1604DD and 1606DD are AMCA Licensed for Water Penetration and Air Performance.

Models 1604DD and 1606DD

MODEL 1605WD
EXTRUDED ALUMINUM LOUVER
WIND-DRIVEN RAIN RESISTANT

Nailor Model 1605WD Wind-Driven Rain Horizontal Drainable Blade Louver provides superior weather protection in severe weather design conditions. The drainable "Inverted Y" blade design, combined with a drainable head, diverts collected water down concealed side downspouts and out through the sill, effectively preventing water infiltration. Blades are reinforced with full length integral bosses for superior strength. Suitable for use in exhaust and medium to high velocity intake applications in extreme weather. Available in channel, flanged, or glazing adapter type, the 5" (127) deep frame installs easily in most common wall configurations. Nailor Model 1605WD is AMCA Licensed for Wind-Driven Rain, Water Penetration and Air Performance.

Model 1605WD

Model 1604Y

MODEL 1604Y
EXTRUDED ALUMINUM LOUVER
SIGHTPROOF, Y BLADE

Nailor Model 1604Y utilizes "Inverted Y" style blades to achieve an architecturally styled sightproof louver that provides protection against general weather conditions. The sightproof blade design features a center water baffle that performs under the most enduring conditions. Reinforcing bosses run the full length of each blade for superior strength. Available in channel, flanged, or glazing adapter type, the 4" (102) deep frame installs easily in most common wall configurations. Suitable for use in exhaust and low to medium velocity intake applications, providing additional protection against vandalism in ground level applications.

MODELS 1604AD, 1606AD & 1606CDAF
EXTRUDED ALUMINUM LOUVERS
ADJUSTABLE BLADE & COMBINATION LOUVERS

Nailor Models 1604AD and 1606AD Adjustable Drainable Blade Louvers combine superior weather protection and pleasing aesthetics with airflow control. Nailor Model 1606CDAF is a combination louver and damper that incorporates front stationary drainable blades and rear adjustable airfoil blades, all within a single frame. Low torque, concealed linkage blade control can be operated manually or with an actuator to provide tight shut-off when desired. Suitable for use in exhaust and low to medium velocity intake applications. Available in channel or flanged type, the 4" (102) or 6" (152) deep frame installs easily in most common wall configurations. Nailor Models 1604AD, 1606AD and 1606CDAF are AMCA Licensed for Water Penetration and Air Performance.

Models 1604AD, 1606AD (w/ Concealed Actuator) and 1606CDAF

MODEL 1612QS
FORMED ALUMINUM (OR STEEL) LOUVERS
ACOUSTICAL, SIGHTPROOF

Nailor Model 1612QS Acoustical Louver combines effective sound attenuation and good airflow performance with protection from the elements in an architecturally pleasing design. Acoustical blade insulation provides outstanding sound absorption qualities and the closely centered multiple formed J blade design is sight-proof, providing additional protection from vandalism in ground level applications. Available in channel or flanged type, the 12" (305) deep frame installs easily in most common wall configurations. Suitable for either intake or exhaust applications. Nailor Model 1612QS is AMCA Licensed for Water Penetration, Sound and Air Performance.

Model 1612QS

Models 1704J and 1706J

MODELS 1704J & 1706J
FORMED STEEL LOUVERS
ARCHITECTURAL BLADE

Nailor Models 1704J and 1706J are architecturally styled louvers utilizing J style blades, designed with smooth, clean lines that visually compliment any structure's exterior styling. Galvanized steel construction is economical, durable and can withstand the most demanding conditions. The blade design features a rear water baffle and provides good protection against general weather conditions, with low pressure drop characteristics and a high free area. Suitable for use in ventilation, exhaust and low to medium velocity intake applications. Available in channel or flanged type, the 4" (102) or 6" (152) deep frame installs easily in most common wall configurations.

MODELS 1704JD & 1706JD
FORMED STEEL LOUVERS
DRAINABLE HEAD, DRAINABLE BLADE

Nailor Models 1704JD and 1706JD are architecturally styled louvers combining J style blades with a drainable head feature that utilizes a top rain gutter to collect cascading water and channel it out through concealed downspouts in the side frame, preventing it from entering into the building. Durable galvanized steel construction, good weather protection and great air performance result in an outstanding functional louver at an affordable cost. Suitable for use in ventilation, exhaust and low to medium velocity intake applications where water penetration is a concern. Available in channel or flanged type, the 4" (102) or 6" (152) deep frame installs easily in most common wall configurations.

Models 1704JD and 1706JD

MODELS 1704D & 1706D
FORMED STEEL LOUVERS
DRAINABLE BLADE

Nailor Models 1704D and 1706D provide extraordinary weather protection with great air performance and pleasing aesthetics that compliment any structure's exterior styling. The drainable blade design features a rain gutter that diverts collected water down concealed side downspouts and out through the sill. Suitable for use in exhaust and low to medium velocity intake applications where water penetration concerns are a priority. Nailor Model 1706D is AMCA Licensed for Water Penetration and Air Performance.

Models 1704D and 1706D

Models 1704DHP and 1706DHP

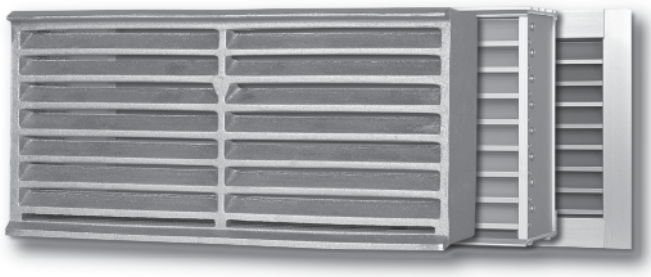
MODELS 1704DHP & 1706DHP
FORMED STEEL LOUVERS
HIGH PERFORMANCE, DRAINABLE BLADE

Nailor Models 1704DHP and 1706DHP combine exceptional air performance and excellent weather protection with smooth, clean lines that visually compliment any structure's exterior styling. The drainable blade design, constructed of durable galvanized steel, utilizes a rain gutter that prevent water from cascading from blade to blade and entering the air stream. Suitable for use in exhaust and low to medium velocity intake applications where water infiltration is a concern, the design also provides excellent air performance at higher velocities through its large free area. Nailor's high performance steel louvers are engineered to be durable, architecturally pleasing and cost effective.

MODELS 1704AD & 1706AD
FORMED STEEL LOUVERS
ADJUSTABLE DRAINABLE BLADE

Nailor Models 1704AD and 1706AD offer exceptional air performance and weather protection, architecturally pleasing aesthetics, and airflow control in one single unit. The economical and durable galvanized steel adjustable drainable blade design utilizes a rain gutter that diverts collected water down concealed side downspouts and out through the sill. Low torque concealed linkage blade control can be operated manually or with an actuator to provide tight shut-off when desired. Suitable for use in exhaust and low to medium velocity intake applications. Nailor's adjustable steel louvers are engineered to be aesthetically appealing as well as mechanically enduring.

Models 1704AD and 1706AD



Models 16BVC, 16BVE and 16BVF

MODELS 16BVC, 16BVE & 16BVF
CAST & EXTRUDED ALUMINUM • BRICK VENTS

Nailor 16BV Series Brick Vents provide a permanent, secure means of ventilating foundations, crawl spaces and other utility areas. All models, designed with a louvered face, incorporate a rear water stop and full width weepage openings for minimal water penetration during severe weather. High corrosion resistant alloy cast or quality extruded aluminum construction resists potential damage due to vandalism, allowing for installation in accessible exterior areas. Suitable for load bearing applications, ideal for new construction. Standard insect screen prevents unwanted pests from entering through the vent.

APPLICATIONS AND SIZING GUIDE

Selection of a louver for a specific application is determined by many variables including: aesthetic requirements, wall type/depth, pressure loss criteria and water penetration criteria. After determining the relative importance of each variable, a louver style and model can be selected by comparing individual design details and performance data, all included within this catalog. Use the following Applications Guide to assist in determining the appropriate louver type for your application:

Louver Application	Louver Type	Model
EXTRUDED ALUMINUM - 1600 Series Louvers by Application		
Decorative, A/C units, Curtain wall, Ventilation, Exhaust, Low to medium velocity intake	Thinline Frame Louver	1602J, 1602K
Decorative, Specialty Shapes, Ventilation, Exhaust, Low to medium velocity intake	Architectural Blade Louver	1604J, 1606J
Light to moderate rain, Ventilation, Exhaust, Low to medium velocity intake	Drainable Head, Architectural J Blade Louver	1604JD, 1606JD
Light to moderate rain w/ light wind, Exhaust, Low to medium velocity intake	Drainable Head, K Blade Louver	1604KD, 1606KD
Light to moderate rain, Exhaust, Low to medium velocity intake, Low pressure loss	Drainable Blade Louver	1602D, 1604D, 1606D
Moderate to heavy rain, Exhaust, Medium to high velocity intake, Low pressure loss	Dual Drainable Blade Louver	1604DD, 1606DD
Moderate to high winds w/ moderate to heavy rain, Exhaust, Higher velocity intake	Wind Driven Rain Louver	1605WD
Air Control & Shut-off, Light to moderate rain, Exhaust, Low to medium velocity intake	Combination & Adjustable, Drainable Blade Louver	1606CDAF, 1604AD, 1606AD
Sound control, Ventilation, Exhaust, Low to medium velocity intake	Acoustical Louver	1612QS
Visual screen, Vandalism concerns, Ventilation, Exhaust, Low to medium velocity intake	Sightproof Louver	1604Y
Foundation, Crawl space & utility area ventilation, Exhaust, Low to medium velocity intake	Brick Vent	16BVC, 16BVE, 16BVF
FORMED STEEL - 1700 Series Louvers by Application		
Decorative, General weather conditions, Ventilation, Exhaust, Low to medium velocity intake	Architectural Blade Louver	1704J, 1706J
Decorative, Light to moderate rain, Exhaust, Low to medium velocity intake	Drainable Head, Architectural Blade Louver	1704JD, 1706JD
Light to moderate rain, Exhaust, Low to medium velocity intake	Drainable Blade Louver	1704D, 1706D
Light to moderate rain, Exhaust, High velocity intake	Drainable Blade High Performance Louver	1704DHP, 1706DHP
Air Control, Ventilation, Exhaust, Intake	Adjustable, Drainable Blade Louver	1704AD, 1706AD

HOW TO SIZE LOUVERS

The prime factor involved in sizing a louver is the velocity of the air through its free area. The free area is the actual unobstructed area of a louver through which air can travel. Other factors such as pressure drop and amount of water penetration are dependent upon the free area velocity and can be determined by using the respective performance charts provided for each specific louver model.

1. Select Model:

Choose the louver model that is the best suited for the specific application. Use the Applications Guide and 'Quick-Select' Model Guide to assist in making a selection, if so desired.

2. Select Free area Velocity:

Select optimum free area velocity for the specific application, checking Pressure Drop and Water Penetration charts for acceptable performance. For 'exhaust only' applications, water penetration data generally does not need to be considered. For extra weather protection, select a free air velocity that is below the beginning point of water penetration.

As a rule of thumb, ASHRAE suggests 400 fpm (122 m/min.) for intake applications and 500 fpm (152 m/min.) for exhaust applications.

3. Determine Required Louver Free Area:

Divide given AIRFLOW (cfm) by the selected FREE AREA VELOCITY (fpm) to determine the required louver free area. Using the Free Area Chart for the specific louver model chosen, select a louver size that provides the required Free Area. If, in the application, the louver size is given, the maximum practical airflow can be determined by working backwards from the free area chart.

SIZING EXAMPLES:

Example A:

AIRFLOW GIVEN: DETERMINE LOUVER SIZE

1. Determine required louver free area by dividing AIRFLOW by acceptable FREE AREA VELOCITY. (Use performance charts to assist in selecting Free Area Velocity):
   _____ cfm ÷ _____ fpm = _____ sq. ft. Free Area.
2. Using the Free Area Chart for chosen model; select a louver size with at least the required free area:
   _____ wide x _____ high _____ sq. ft. Free Area.

Example B:

LOUVER SIZE GIVEN: DETERMINE MAXIMUM AIRFLOW

1. Given louver size: _____ W x _____ H. Use the Free Area Chart for chosen model to determine the area.
2. Multiply FREE AREA x acceptable FREE AREA VELOCITY to determine maximum airflow:
   _____ sq. ft. x _____ fpm = _____ cfm maximum airflow.
3. Using the Pressure Drop Chart for chosen model; check the pressure drop at the determined airflow rate and resulting free area velocity.

Note: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is below the point of beginning water penetration.

'QUICK-SELECT' MODEL GUIDE

Model	Depth	Blade Style/Angle	Free Area Sq. Ft. (Sq. Meters)	Free Area %	Beginning Point of Water Penetration
Extruded Aluminum • Stationary • Non-Drainable • Thinline Frame					
1602J	2" (51)	J/30°	7.14 (0.66)	45%	549 fpm (167 m/min.)
1602K	2" (51)	K/30°	7.55 (0.70)	47%	401 fpm (122 m/min.)
Extruded Aluminum • Stationary • Architectural Blade					
1604J	4" (102)	J/37°	8.62 (0.80)	54%	722 fpm (220 m/min.)
1606J	6" (152)	J/37°	8.13 (0.76)	51%	1029 fpm (314 m/min.)
Extruded Aluminum • Stationary • Drainable Head					
1604JD	4" (102)	J/37°	8.57 (0.80)	54%	961 fpm (293 m/min.)
1606JD	6" (152)	J/37°	7.45 (0.69)	47%	1250 fpm (381 m/min.)
1604KD	4" (102)	K/37°	7.51 (0.70)	47%	892 fpm (272 m/min.)
1606KD	6" (152)	K/37°	7.93 (0.74)	50%	1017 fpm (310 m/min.)
Extruded Aluminum • Stationary • Drainable Head & Drainable Blade					
1602D	2" (51)	Drainable/45°	6.91 (0.64)	43%	1123 fpm (342 m/min.)
1604D	4" (102)	Drainable/37°	8.26 (0.77)	52%	906 fpm (272 m/min.)
1606D	6" (152)	Drainable/37°/45°	7.99 (0.74)	50%	1195 fpm (364 m/min.)
1604DD	4" (102)	Dual Drainable/37°	8.14 (0.76)	51%	1000 fpm (305 m/min.)
1606DD	6" (152)	Dual Drainable/37°	7.92 (0.74)	50%	1193 fpm (364 m/min.)
Extruded Aluminum • Stationary • Wind-Driven Rain Resistant					
1605WD	5" (127)	Drainable/30°	8.64 (0.80)	54%	1025 fpm (313 m/min.)
Extruded Aluminum • Adjustable • Drainable Blade					
1604AD	4" (102)	Adjustable, Drainable/37 1/2°	7.10 (0.66)	44%	953 fpm (290 m/min.)
1606AD	6" (152)	Adjustable, Drainable/37 1/2°	8.15 (0.76)	51%	970 fpm (296 m/min.)
Extruded Aluminum • Combination Louver/Damper • Drainable Blade					
1606CDAF	6" (152)	Airfoil, Drainable/45°	6.89 (0.64)	43%	1142 fpm (348 m/min.)
Extruded Aluminum • Stationary • Sightproof					
1604Y	4" (102)	Inverted Y/45°	4.67 (0.43)	29%	—
Formed Aluminum (or Steel) • Acoustical					
1612QS	12" (305)	Insulated, J Sightproof/45°	4.72 (0.44)	30%	826 fpm (252 m/min.)
Formed Steel • Stationary • Architectural Blade					
1704J	4" (102)	J/45°	8.53 (0.79)	53%	869 fpm (265 m/min.)
1706J	6" (152)	J/45°	8.53 (0.79)	53%	938 fpm (286 m/min.)
Formed Steel • Stationary • Drainable Head					
1704JD	4" (102)	J/45°	8.38 (0.78)	52%	1123 fpm (342 m/min.)
1706JD	6" (152)	J/45°	7.85 (0.73)	49%	1250 fpm (381 m/min.)
Formed Steel • Stationary • Drainable Blade					
1704D	4" (102)	Drainable/45°	8.44 (0.78)	53%	976 fpm (298 m/min.)
1706D	6" (152)	Drainable/45°	8.02 (0.75)	50%	1250 fpm (381 m/min.)
1704DHP	4" (102)	Drainable/37 1/2°	8.55 (0.79)	53%	896 fpm (273 m/min.)
1706DHP	6" (152)	Drainable/37 1/2°	9.05 (0.84)	56%	988 fpm (301 m/min.)
Formed Steel • Adjustable • Drainable Blade					
1704AD	4" (102)	Adjustable, Drainable/37 1/2°	8.03 (0.75)	50%	991 fpm (302 m/min.)
1706AD	6" (152)	Adjustable, Drainable/37 1/2°	8.80 (0.82)	55%	977 fpm (298 m/min.)

- Dimensions are in inches (mm).
- Free Area shown are for 48" x 48" (1219 x 1219).
- Beginning point of Water Penetration: 0.01 oz./sq. ft. (3 ml/sq. m), 15 minute test duration.

- THINLINE FRAME
- PLEASING AESTHETICS
- EXCELLENT PERFORMANCE
- LOW PRESSURE DROP

Models:

1602J 2" (51) Deep, J Blade
1602K 2" (51) Deep, K Blade
1602D 2" (51) Deep, Drainable Blade

Model 1602J

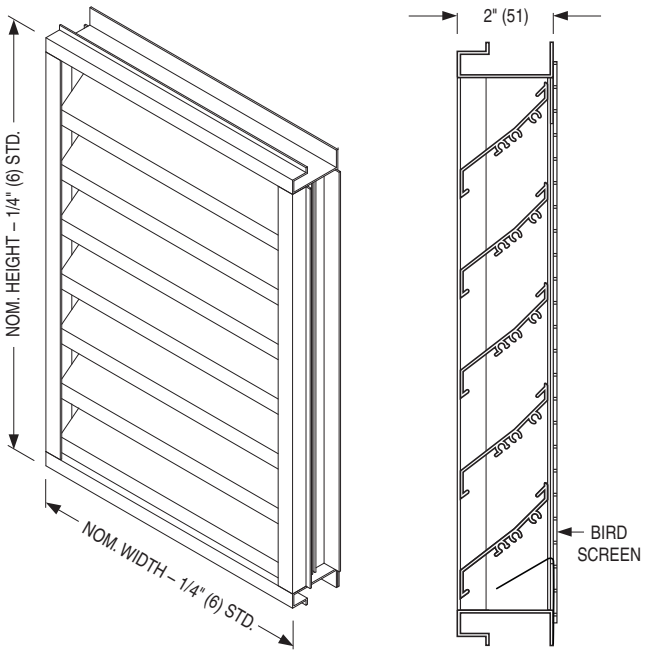
Model 1602K

Model 1602J

Model 1602J Thinline Frame Louvers combine performance with pleasing aesthetics, incorporating stationary J style architectural blades, designed with smooth lines that enhance any structure's exterior styling. Blending weather protection, air performance and low pressure drop, this architecturally styled louver delivers outstanding performance when a standard 4" (102) or 6" (152) louver is not practical. Standard concealed architectural mullions allow for a continuous look. Reinforcing bosses run the full length of each blade for superior strength. Suitable for use in ventilation, exhaust and low to medium velocity intake applications, ideal for use in thin wall and curtain wall applications or A/C units where a full depth louver cannot be used. Available in channel, flanged, or glazing adapter type, the 2" (51) deep frame installs easily in most common wall and mechanical configurations. Nailor's thinline frame louvers are engineered to be aesthetically appealing as well as mechanically enduring.

STANDARD CONSTRUCTION:

Frame:	2" (51) deep, Type 6063-T5 extruded aluminum, .060" (1.5) nominal wall thickness. Integral caulking slot provided.
Blades:	Type 6063-T5 extruded aluminum, .060" (1.5) nominal wall thickness, with reinforcing bosses. J style.
Blade Angle:	Fixed at 30 degrees.
Blade Spacing:	Approximately 2" (51) on centers.
Blade Support Brackets:	Concealed type, factory installed on rear of louver on maximum 48" (1219) centers. Reinforced with 1" x 1" (25 x 25) angle (adds approx. 1" [25] to overall louver depth).
Mullions:	Concealed architectural style allowing continuous line appearance.
Screen:	3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen in removable frame, inside (rear) mount (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	8" W x 8" H (203 x 203).
Maximum Single Section Size:	120" W x 84" H (3048 x 2134) or 84" W x 120" H (2134 x 3048). 70 sq. ft. (6.5 m^2). Larger louvers will require field assembly of smaller sections.



MODEL 1602J

COMMON OPTIONS:

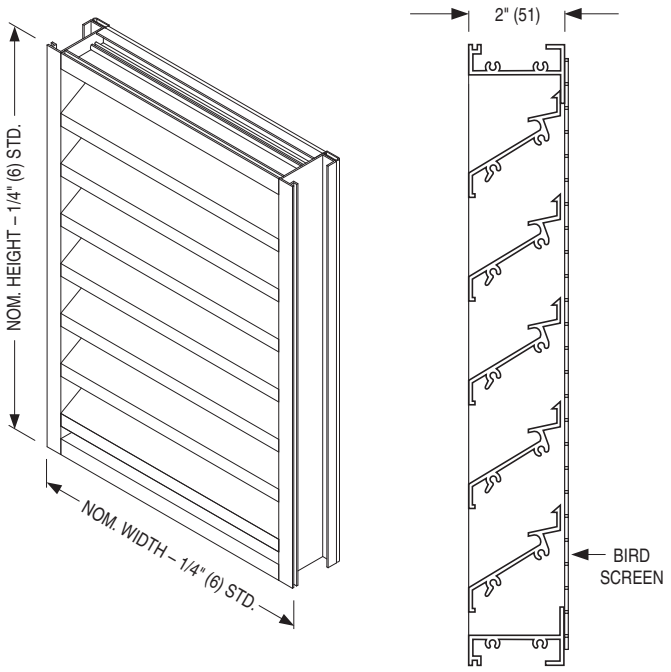
- Flanged or Glazing Adaptor Frame styles.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Aluminum Installation Clips or Continuous Angles.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.
- Clear or Color Anodized finishes.

Model 1602K

Model 1602K Thinline Frame Louvers utilize stationary K style blades, integrating great weather protection, air performance and low pressure drop with a look that augments any architecture. The blade design features a rear water baffle plus an additional center rain hook, providing additional protection against more forbidding weather conditions. Standard concealed architectural mullions allow for a continuous look. Reinforcing bosses run the full length of each blade for superior strength. Suitable for use in ventilation, exhaust and low to medium velocity intake applications, ideal for use in thin wall and curtain wall applications or A/C units where a full depth louver cannot be used, delivering remarkable performance when a standard 4" (102) or 6" (152) louver is not practical. Available in channel, flanged, or glazing adapter type, the 2" (51) deep frame installs easily in most common wall and mechanical configurations. Nailor's thinline frame louvers are engineered to be aesthetically appealing as well as mechanically enduring.

STANDARD CONSTRUCTION:

Frame:	2" (51) deep, Type 6063-T5 extruded aluminum, .060" (1.5) nominal wall thickness. Integral caulking slot provided.
Blades:	Type 6063-T5 extruded aluminum, .060" (1.5) nominal wall thickness, with reinforcing bosses. K style.
Blade Angle:	Fixed at 30 degrees.
Blade Spacing:	Approximately 2" (51) on centers.
Blade Support Brackets:	Concealed type, factory installed on rear of louver on maximum 48" (1219) centers. Reinforced with 1" x 1" (25 x 25) angle (adds approx. 1" [25] to overall louver depth).
Mullions:	Concealed architectural style allowing continuous line appearance.
Screen:	3/4" x .051 (19 x 1.3) expanded, flattened alum. bird screen in removable frame, inside (rear) mount (adds approx. 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	8" W x 8" H (203 x 203).
Maximum Single Section Size:	120" W x 84" H (3048 x 2134) or 84" W x 120" H (2134 x 3048). 70 sq. ft. (6.5 m^2). Larger louvers will require field assembly of smaller sections.



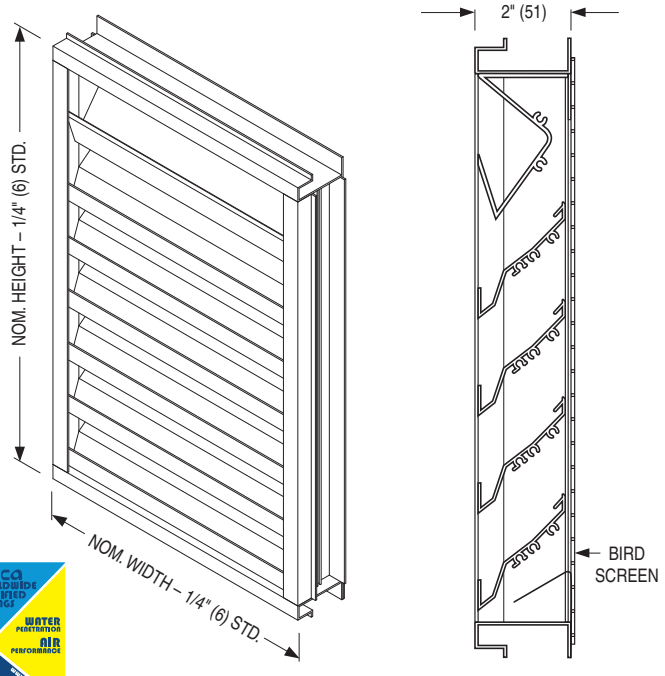
MODEL 1602K

Model 1602D

Model 1602D Thinline Frame Drainable Blade Louvers combine excellent weather protection with pleasing aesthetics. The drainable blade design is enhanced by the drainable head feature, which utilizes a large rain gutter that diverts collected water down concealed side downspouts and out through the sill. This drainable louver delivers outstanding performance where a 4" (102) or 6" (152) louver is not practical. Suitable for use in ventilation, exhaust and low to medium velocity intake applications where water penetration is a concern, ideal for use in thin wall and curtain wall applications or A/C units where a full depth louver cannot be used. Available in channel, flanged, or glazing adapter type, the 2" (51) deep frame installs easily in most common wall and mechanical configurations.

STANDARD CONSTRUCTION:

Frame:	2" (51) deep, Type 6063-T5 extruded alum., .060" (1.5) nominal wall thickness. Integral downspouts and caulking slot provided.
Blades:	Type 6063-T5 extruded aluminum, .060" (1.5) nominal wall thickness, with reinforcing bosses.
Blade Angle:	Fixed at 45 degrees.
Blade Spacing:	Approximately 2 1/4" (57) on centers.
Blade Support Brackets:	Concealed type, factory installed on rear of louver on maximum 48" (1219) centers. Reinforced with 1" x 1" (25 x 25) angle (adds approx. 1" [25] to overall louver depth).
Mullions:	Concealed type allowing continuous line appearance up to 120" (3048) wide. Larger assemblies require separate visible frames with downspouts.
Screen:	3/4" x .051 (19 x 1.3) expanded, flattened alum. bird screen in removable frame, inside (rear) mount (adds approx. 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	8" W x 8" H (203 x 203).
Maximum Single Section Size:	120" W x 84" H (3048 x 2134) or 84" W x 120" H (2134 x 3048). 70 sq. ft. (6.5 m^2). Larger louvers will require field assembly of smaller sections.



MODEL 1602D

PERFORMANCE DATA:
MODEL: 1602J

FREE AREA in Square Feet and Square Meters

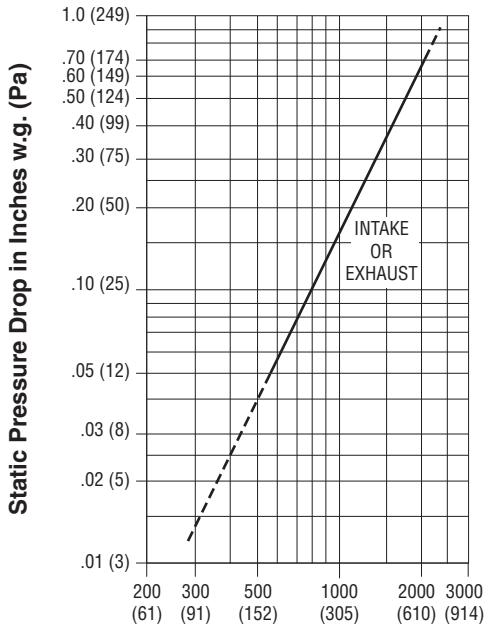
Height in Inches and Meters	Width in Inches and Meters																				
	8	**12**	**18**	**24**	**30**	**36**	**42**	**48**	**54**	**60**	**66**	**72**	**78**	**84**	**90**	**96**	**102**	**108**	**114**	**120**
	0.20	0.30	0.46	0.61	0.76	0.91	1.07	1.22	1.37	1.52	1.68	1.83	1.98	2.13	2.29	2.44	2.59	2.74	2.90	3.05
8	**0.07**	**0.12**	**0.19**	**0.26**	**0.33**	**0.40**	**0.47**	**0.54**	**0.61**	**0.69**	**0.76**	**0.83**	**0.90**	**0.97**	**1.04**	**1.11**	**1.18**	**1.25**	**1.32**	**1.39**
0.20	0.01	0.01	0.02	0.02	0.03	0.04	0.04	0.05	0.06	0.06	0.07	0.08	0.08	0.09	0.10	0.10	0.11	0.12	0.12	0.13
12	**0.15**	**0.26**	**0.41**	**0.56**	**0.72**	**0.87**	**1.02**	**1.18**	**1.33**	**1.48**	**1.63**	**1.79**	**1.94**	**2.09**	**2.25**	**2.40**	**2.55**	**2.71**	**2.86**	**3.01**
0.30	0.01	0.02	0.04	0.05	0.07	0.08	0.09	0.11	0.12	0.14	0.15	0.17	0.18	0.19	0.21	0.22	0.24	0.25	0.27	0.28
18	**0.30**	**0.50**	**0.80**	**1.10**	**1.39**	**1.69**	**1.99**	**2.29**	**2.59**	**2.89**	**3.18**	**3.48**	**3.78**	**4.08**	**4.38**	**4.67**	**4.97**	**5.27**	**5.57**	**5.87**
0.46	0.03	0.05	0.07	0.10	0.13	0.16	0.18	0.21	0.24	0.27	0.30	0.32	0.35	0.38	0.41	0.43	0.46	0.49	0.52	0.55
24	**0.42**	**0.70**	**1.12**	**1.54**	**1.96**	**2.38**	**2.79**	**3.21**	**3.63**	**4.05**	**4.47**	**4.89**	**5.30**	**5.72**	**6.14**	**6.56**	**6.98**	**7.40**	**7.81**	**8.23**
0.61	0.04	0.07	0.10	0.14	0.18	0.22	0.26	0.30	0.34	0.38	0.42	0.45	0.49	0.53	0.57	0.61	0.65	0.69	0.73	0.76
30	**0.55**	**0.90**	**1.44**	**1.98**	**2.52**	**3.06**	**3.60**	**4.14**	**4.68**	**5.22**	**5.76**	**6.30**	**6.84**	**7.38**	**7.92**	**8.46**	**9.00**	**9.54**	**10.07**	**10.61**
0.76	0.05	0.08	0.13	0.18	0.23	0.28	0.33	0.38	0.43	0.48	0.54	0.59	0.64	0.69	0.74	0.79	0.84	0.89	0.94	0.99
36	**0.69**	**1.15**	**1.84**	**2.53**	**3.21**	**3.90**	**4.59**	**5.27**	**5.96**	**6.65**	**7.34**	**8.02**	**8.71**	**9.40**	**10.08**	**10.77**	**11.46**	**12.15**	**12.83**	**13.52**
0.36	0.06	0.11	0.17	0.23	0.30	0.36	0.43	0.49	0.55	0.62	0.68	0.75	0.81	0.87	0.94	1.00	1.06	1.13	1.19	1.26
42	**0.82**	**1.35**	**2.16**	**2.97**	**3.78**	**4.58**	**5.39**	**6.20**	**7.01**	**7.81**	**8.62**	**9.43**	**10.23**	**11.04**	**11.85**	**12.66**	**13.46**	**14.27**	**15.08**	**15.89**
1.07	0.08	0.13	0.20	0.28	0.35	0.43	0.50	0.58	0.65	0.73	0.80	0.88	0.95	1.03	1.10	1.18	1.25	1.33	1.40	1.48
48	**0.94**	**1.56**	**2.48**	**3.41**	**4.34**	**5.27**	**6.20**	**7.14**	**8.05**	**8.98**	**9.91**	**10.84**	**11.76**	**12.69**	**13.62**	**14.55**	**15.48**	**16.40**	**17.33**	**18.26**
1.22	0.09	0.14	0.23	0.32	0.40	0.49	0.58	0.66	0.75	0.83	0.92	1.01	1.09	1.18	1.27	1.35	1.44	1.52	1.61	1.70
54	**1.04**	**1.73**	**2.75**	**3.78**	**4.81**	**5.84**	**6.87**	**7.90**	**8.93**	**9.96**	**10.99**	**12.02**	**13.04**	**14.07**	**15.10**	**16.13**	**17.16**	**18.19**	**19.22**	**20.25**
1.37	0.10	0.16	0.26	0.35	0.45	0.54	0.64	0.73	0.83	0.93	1.02	1.12	1.21	1.31	1.40	1.50	1.59	1.69	1.79	1.88
60	**1.14**	**1.90**	**3.03**	**4.16**	**5.29**	**6.42**	**7.55**	**8.68**	**9.81**	**10.94**	**12.07**	**13.20**	**14.33**	**15.46**	**16.59**	**17.72**	**18.85**	**19.98**	**21.11**	**22.24**
1.52	0.11	0.18	0.28	0.39	0.49	0.60	0.70	0.81	0.91	1.02	1.12	1.23	1.33	1.44	1.54	1.65	1.75	1.86	1.96	2.07
66	**1.28**	**2.13**	**3.40**	**4.67**	**5.94**	**7.21**	**8.48**	**9.75**	**11.02**	**12.29**	**13.56**	**14.84**	**16.11**	**17.38**	**18.65**	**19.92**	**21.19**	**22.46**	**23.73**	**25.00**
1.68	0.12	0.20	0.32	0.43	0.55	0.67	0.79	0.91	1.02	1.14	1.26	1.38	1.50	1.61	1.73	1.85	1.97	2.09	2.20	2.32
72	**1.48**	**2.46**	**3.93**	**5.39**	**6.86**	**8.33**	**9.79**	**11.26**	**12.73**	**14.19**	**15.66**	**17.13**	**18.59**	**20.06**	**21.53**	**22.99**	**24.46**	**25.93**	**27.39**	**28.86**
1.83	0.14	0.23	0.36	0.50	0.64	0.77	0.91	1.05	1.18	1.32	1.45	1.59	1.73	1.86	2.00	2.14	2.27	2.41	2.54	2.68
78	**1.60**	**2.66**	**4.25**	**5.83**	**7.42**	**9.01**	**10.59**	**12.18**	**13.76**	**15.35**	**16.94**	**18.52**	**20.11**	**21.69**	**23.28**	**24.87**	**26.45**	**28.04**	**29.63**	**31.21**
1.98	0.15	0.25	0.39	0.54	0.69	0.84	0.98	1.13	1.28	1.43	1.57	1.72	1.87	2.02	2.16	2.31	2.46	2.60	2.75	2.90
84	**1.72**	**2.86**	**4.57**	**6.27**	**7.98**	**9.68**	**11.39**	**13.09**	**14.80**	**16.50**	**18.21**	**19.91**	**21.62**	**23.33**	**25.03**	**26.74**	**28.44**	**30.15**	**31.85**	**33.56**
2.13	0.16	0.27	0.42	0.58	0.74	0.90	1.06	1.22	1.37	1.53	1.69	1.85	2.01	2.17	2.33	2.48	2.64	2.80	2.96	3.12
90	**1.87**	**3.11**	**4.97**	**6.82**	**8.68**	**10.53**	**12.39**	**14.24**	**16.10**	**17.95**	**19.81**	**21.66**	**23.52**	**25.37**	**27.23**	**29.08**	**30.94**	**32.79**	**34.65**	**36.50**
2.29	0.17	0.29	0.46	0.63	0.81	0.98	1.15	1.32	1.50	1.67	1.84	2.01	2.18	2.36	2.53	2.70	2.87	3.05	3.22	3.39
96	**2.00**	**3.31**	**5.29**	**7.26**	**9.24**	**11.21**	**13.19**	**15.16**	**17.14**	**19.11**	**21.09**	**23.06**	**25.04**	**27.01**	**28.99**	**30.96**	**32.94**	**34.91**	**36.89**	**38.86**
2.44	0.19	0.31	0.49	0.67	0.86	1.04	1.23	1.41	1.59	1.78	1.96	2.14	2.33	2.51	2.69	2.88	3.06	3.24	3.43	3.61

AIRFLOW/ WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1602J
	Free Area %	45%
	Free Area sq. ft. (sq. m.)	7.14 (0.66)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	549 fpm (167 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	3920 cfm (1850 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.05 in. w.g. (12 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

MODEL 1602J PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

PERFORMANCE DATA:

MODEL: 1602K

FREE AREA in Square Feet and Square Meters

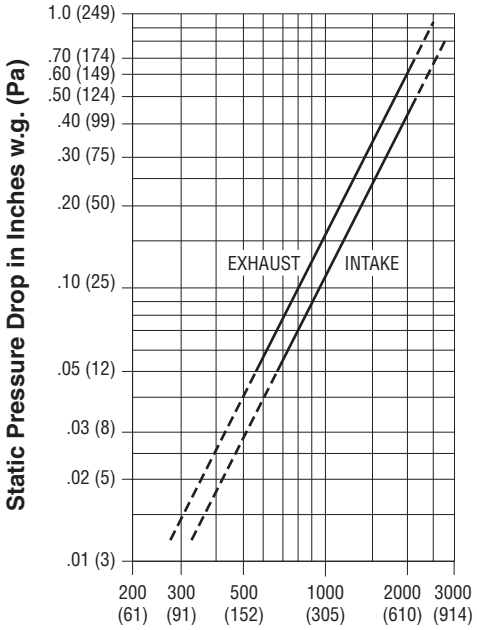
Height in Inches and Meters	Width in Inches and Meters																				
	8	**12**	**18**	**24**	**30**	**36**	**42**	**48**	**54**	**60**	**66**	**72**	**78**	**84**	**90**	**96**	**102**	**108**	**114**	**120**
	0.20	0.30	0.46	0.61	0.76	0.91	1.07	1.22	1.37	1.52	1.68	1.83	1.98	2.13	2.29	2.44	2.59	2.74	2.90	3.05
8	**0.12**	**0.19**	**0.30**	**0.41**	**0.53**	**0.64**	**0.75**	**0.86**	**0.97**	**1.08**	**1.19**	**1.30**	**1.42**	**1.53**	**1.64**	**1.75**	**1.86**	**1.97**	**2.09**	**2.20**
0.20	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20
12	**0.21**	**0.33**	**0.52**	**0.71**	**0.90**	**1.09**	**1.28**	**1.47**	**1.66**	**1.85**	**2.03**	**2.22**	**2.41**	**2.60**	**2.79**	**2.98**	**3.16**	**3.35**	**3.54**	**3.73**
.30	0.02	0.03	0.04	0.06	0.84	0.10	0.11	0.13	0.15	0.17	0.18	0.20	0.22	0.24	0.26	0.27	0.29	0.31	0.33	0.35
18	**0.34**	**0.54**	**0.85**	**1.16**	**1.48**	**1.79**	**2.10**	**2.41**	**2.72**	**3.04**	**3.35**	**3.66**	**3.97**	**4.28**	**4.59**	**4.91**	**5.22**	**5.53**	**5.84**	**6.15**
.46	0.03	0.05	0.08	0.10	0.13	0.16	0.19	0.22	0.25	0.28	0.31	0.34	0.36	0.39	0.42	0.45	0.48	0.51	0.54	0.57
24	**0.49**	**0.79**	**1.24**	**1.69**	**2.14**	**2.59**	**3.05**	**3.50**	**3.95**	**4.40**	**4.85**	**5.31**	**5.76**	**6.21**	**6.66**	**7.11**	**7.56**	**8.02**	**8.47**	**8.92**
.61	0.05	0.07	0.11	0.15	0.19	0.24	0.28	0.32	0.36	0.40	0.45	0.49	0.53	0.57	0.61	0.66	0.70	0.75	0.79	0.83
30	**0.64**	**1.03**	**1.62**	**2.21**	**2.80**	**3.39**	**3.98**	**4.57**	**5.16**	**5.75**	**6.33**	**6.92**	**7.51**	**8.10**	**8.69**	**9.28**	**9.87**	**10.45**	**11.04**	**11.63**
.76	0.06	0.09	0.15	0.20	0.26	0.31	0.37	0.42	0.47	0.53	0.58	0.64	0.69	0.75	0.80	0.86	0.92	0.97	1.03	1.08
36	**0.77**	**1.24**	**1.94**	**2.65**	**3.36**	**4.07**	**4.78**	**5.49**	**6.19**	**6.90**	**7.61**	**8.32**	**9.03**	**9.74**	**10.45**	**11.15**	**11.86**	**12.57**	**13.28**	**13.99**
.91	0.07	0.11	0.18	0.24	0.31	0.37	0.44	0.51	0.57	0.64	0.70	0.77	0.83	0.90	0.97	1.03	1.10	1.17	1.23	1.30
42	**0.90**	**1.44**	**2.27**	**3.10**	**3.92**	**4.75**	**5.58**	**6.41**	**7.23**	**8.06**	**8.89**	**9.72**	**10.54**	**11.37**	**12.20**	**13.02**	**13.85**	**14.68**	**15.51**	**16.33**
1.07	0.08	0.13	0.21	0.28	0.36	0.44	0.51	0.59	0.67	0.74	0.82	0.90	0.98	1.05	1.13	1.21	1.29	1.36	1.44	1.52
48	**1.05**	**1.69**	**2.65**	**3.62**	**4.59**	**5.55**	**6.52**	**7.55**	**8.45**	**9.42**	**10.38**	**11.35**	**12.32**	**13.28**	**14.25**	**15.21**	**16.18**	**17.14**	**18.11**	**19.08**
1.22	0.10	0.15	0.24	0.33	0.42	0.51	0.60	0.70	0.78	0.87	0.96	1.05	1.14	1.23	1.32	1.41	1.50	1.59	1.68	1.77
54	**1.20**	**1.94**	**3.04**	**4.15**	**5.26**	**6.37**	**7.48**	**8.59**	**9.69**	**10.80**	**11.91**	**13.02**	**14.13**	**15.24**	**16.35**	**17.45**	**18.56**	**19.67**	**20.78**	**21.89**
1.37	0.11	0.18	0.28	0.38	0.48	0.59	0.69	0.79	0.90	1.00	1.10	1.21	1.31	1.41	1.51	1.62	1.72	1.83	1.93	2.03
60	**1.33**	**2.14**	**3.37**	**4.60**	**5.82**	**7.05**	**8.28**	**9.51**	**10.73**	**11.96**	**13.19**	**14.42**	**15.64**	**16.87**	**18.10**	**19.32**	**20.55**	**21.78**	**23.00**	**24.23**
1.52	0.12	0.20	0.31	0.42	0.54	0.65	0.77	0.88	0.99	1.11	1.22	1.34	1.45	1.56	1.68	1.79	1.91	2.02	2.14	2.25
66	**1.46**	**2.35**	**3.70**	**5.04**	**6.39**	**7.73**	**9.08**	**10.43**	**11.77**	**13.12**	**14.46**	**15.81**	**17.16**	**18.50**	**19.85**	**21.19**	**22.54**	**23.88**	**25.23**	**26.58**
1.68	0.14	0.21	0.34	0.46	0.59	0.71	0.84	0.96	1.09	1.21	1.34	1.46	1.59	1.71	1.84	1.96	2.09	2.22	2.34	2.47
72	**1.60**	**2.59**	**4.07**	**5.55**	**7.03**	**8.51**	**9.99**	**11.47**	**12.95**	**14.43**	**15.91**	**17.39**	**18.87**	**20.35**	**21.83**	**23.31**	**24.79**	**26.27**	**27.75**	**29.23**
1.83	0.15	0.24	0.37	0.51	0.65	0.79	0.92	1.06	1.20	1.34	1.47	1.61	1.75	1.89	2.02	2.16	2.30	2.44	2.58	2.72
78	**1.76**	**2.84**	**4.47**	**6.10**	**7.72**	**9.35**	**10.98**	**12.61**	**14.23**	**15.86**	**17.49**	**19.12**	**20.74**	**22.37**	**24.00**	**25.62**	**27.25**	**28.88**	**30.50**	**32.13**
1.98	0.16	0.26	0.41	0.56	0.71	0.86	1.02	1.17	1.32	1.47	1.62	1.77	1.92	2.07	2.23	2.38	2.53	2.68	2.83	2.98
84	**1.89**	**3.05**	**4.80**	**6.54**	**8.29**	**10.03**	**11.78**	**13.53**	**15.27**	**17.02**	**18.76**	**20.51**	**22.26**	**24.00**	**25.75**	**27.49**	**29.24**	**30.98**	**32.72**	**34.47**
2.13	0.18	0.28	0.44	0.60	0.77	0.93	1.09	1.25	1.41	1.58	1.74	1.90	2.06	2.23	2.39	2.55	2.72	2.88	3.04	3.20
90	**2.02**	**3.26**	**5.12**	**6.99**	**8.85**	**10.72**	**12.58**	**14.45**	**16.31**	**18.18**	**20.04**	**21.91**	**23.77**	**25.64**	**27.50**	**29.36**	**31.22**	**33.09**	**34.95**	**36.82**
2.29	0.19	0.30	0.47	0.65	0.82	0.99	1.16	1.34	1.51	1.68	1.86	2.03	2.20	2.38	2.55	2.72	2.90	3.07	3.25	3.42
96	**2.16**	**3.49**	**5.48**	**7.48**	**9.47**	**11.47**	**13.46**	**15.45**	**17.45**	**19.44**	**21.44**	**23.43**	**25.43**	**27.42**	**29.42**	**31.41**	**33.41**	**35.40**	**37.39**	**39.38**
2.44	0.20	0.32	0.51	0.69	0.88	1.06	1.25	1.43	1.62	1.80	1.99	2.17	2.36	2.54	2.73	2.91	3.10	3.29	3.47	3.66

AIRFLOW / WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1602K
	Free Area %	47%
	Free Area sq. ft. (sq. m.)	7.55 (0.70)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	401 fpm (122 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	3028 cfm (1429 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.02 in. w.g. (5 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

MODEL 1602K PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

PERFORMANCE DATA:
MODEL: 1602D

FREE AREA in Square Feet and Square Meters

Height in Inches and Meters	Width in Inches and Meters																				
	8	**12**	**18**	**24**	**30**	**36**	**42**	**48**	**54**	**60**	**66**	**72**	**78**	**84**	**90**	**96**	**102**	**108**	**114**	**120**
	0.20	0.30	0.46	0.61	0.76	0.91	1.07	1.22	1.37	1.52	1.68	1.83	1.98	2.13	2.29	2.44	2.59	2.74	2.90	3.05
8	**0.07**	**0.12**	**0.19**	**0.27**	**0.34**	**0.41**	**0.49**	**0.56**	**0.63**	**0.70**	**0.78**	**0.85**	**0.92**	**1.00**	**1.07**	**1.14**	**1.21**	**1.29**	**1.36**	**1.43**
0.20	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.05	0.06	0.07	0.07	0.08	0.09	0.09	0.10	0.11	0.11	0.12	0.13	0.13
12	**0.15**	**0.25**	**0.40**	**0.55**	**0.70**	**0.85**	**1.01**	**1.16**	**1.31**	**1.46**	**1.61**	**1.76**	**1.91**	**2.06**	**2.21**	**2.36**	**2.51**	**2.67**	**2.82**	**2.97**
0.30	0.01	0.02	0.04	0.05	0.07	0.08	0.09	0.11	0.12	0.14	0.15	0.16	0.18	0.19	0.21	0.22	0.23	0.25	0.26	0.28
18	**0.27**	**0.45**	**0.73**	**1.00**	**1.27**	**1.54**	**1.81**	**2.08**	**2.36**	**2.63**	**2.90**	**3.17**	**3.44**	**3.72**	**3.99**	**4.26**	**4.53**	**4.80**	**5.08**	**5.35**
0.46	0.03	0.04	0.07	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.32	0.35	0.37	0.40	0.42	0.45	0.47	0.50
24	**0.39**	**0.65**	**1.05**	**1.44**	**1.83**	**2.22**	**2.61**	**3.01**	**3.40**	**3.79**	**4.18**	**4.57**	**4.97**	**5.36**	**5.76**	**6.14**	**6.53**	**6.93**	**7.32**	**7.71**
0.61	0.04	0.06	0.10	0.13	0.17	0.21	0.24	0.28	0.32	0.35	0.39	0.42	0.46	0.50	0.53	0.57	0.61	0.64	0.68	0.72
30	**0.54**	**0.90**	**1.44**	**1.98**	**2.52**	**3.06**	**3.60**	**4.14**	**4.68**	**5.22**	**5.76**	**6.30**	**6.84**	**7.38**	**7.92**	**8.46**	**9.00**	**9.54**	**10.08**	**10.62**
0.76	0.05	0.08	0.13	0.18	0.23	0.28	0.33	0.38	0.43	0.49	0.54	0.59	0.64	0.69	0.74	0.79	0.84	0.89	0.94	0.99
36	**0.66**	**1.10**	**1.76**	**2.42**	**3.08**	**3.74**	**4.40**	**5.06**	**5.72**	**6.38**	**7.04**	**7.70**	**8.36**	**9.02**	**9.68**	**10.34**	**11.00**	**11.66**	**12.32**	**12.98**
0.36	0.06	0.10	0.16	0.22	0.29	0.35	0.41	0.47	0.53	0.59	0.65	0.72	0.78	0.84	0.90	0.96	1.02	1.08	1.14	1.21
42	**0.78**	**1.30**	**2.08**	**2.86**	**3.64**	**4.42**	**5.20**	**5.98**	**6.76**	**7.54**	**8.32**	**9.10**	**9.88**	**10.66**	**11.44**	**12.22**	**13.00**	**13.78**	**14.56**	**15.34**
1.07	0.07	0.12	0.19	0.27	0.34	0.41	0.48	0.56	0.63	0.70	0.77	0.85	0.92	0.99	1.06	1.14	1.21	1.28	1.35	1.43
48	**0.93**	**1.55**	**2.48**	**3.41**	**4.34**	**5.27**	**6.20**	**6.91**	**8.06**	**8.99**	**9.92**	**10.84**	**11.77**	**12.70**	**13.63**	**14.56**	**15.49**	**16.42**	**17.35**	**18.28**
1.22	0.09	0.14	0.23	0.32	0.40	0.49	0.58	0.64	0.75	0.83	0.92	1.01	1.09	1.18	1.27	1.35	1.44	1.53	1.61	1.70
54	**1.05**	**1.75**	**2.80**	**3.85**	**4.90**	**5.95**	**7.00**	**8.05**	**9.10**	**10.15**	**11.19**	**12.24**	**13.29**	**14.34**	**15.39**	**16.44**	**17.49**	**18.54**	**19.59**	**20.64**
1.37	0.10	0.16	0.26	0.36	0.45	0.55	0.65	0.75	0.84	0.94	1.04	1.14	1.23	1.33	1.43	1.53	1.62	1.72	1.82	1.92
60	**1.17**	**1.95**	**3.12**	**4.29**	**5.46**	**6.62**	**7.79**	**8.96**	**10.13**	**11.30**	**12.47**	**13.64**	**14.81**	**15.98**	**17.15**	**18.32**	**19.48**	**20.65**	**21.82**	**22.99**
1.52	0.11	0.18	0.29	0.40	0.51	0.62	0.72	0.83	0.94	1.05	1.16	1.27	1.38	1.48	1.59	1.70	1.81	1.92	2.03	2.14
66	**1.32**	**2.20**	**3.52**	**4.84**	**6.15**	**7.47**	**8.79**	**10.11**	**11.43**	**12.75**	**14.07**	**15.39**	**16.71**	**18.02**	**19.34**	**20.66**	**21.98**	**23.30**	**24.62**	**25.94**
1.68	0.12	0.20	0.33	0.45	0.57	0.69	0.82	0.94	1.06	1.18	1.31	1.43	1.55	1.67	1.80	1.92	2.04	2.16	2.29	2.41
72	**1.44**	**2.40**	**3.84**	**5.27**	**6.71**	**8.15**	**9.59**	**11.03**	**12.47**	**13.90**	**15.34**	**16.78**	**18.22**	**19.66**	**21.10**	**22.54**	**23.97**	**25.93**	**27.39**	**28.86**
1.83	0.13	0.22	0.36	0.49	0.62	0.76	0.89	1.02	1.16	1.29	1.43	1.56	1.69	1.83	1.96	2.09	2.23	2.36	2.49	2.63
78	**1.65**	**2.76**	**4.41**	**6.06**	**7.71**	**9.37**	**11.02**	**12.67**	**14.33**	**15.98**	**17.63**	**19.29**	**20.94**	**22.59**	**24.25**	**25.90**	**27.55**	**29.20**	**30.86**	**32.51**
1.98	0.15	0.26	0.41	0.56	0.72	0.87	1.02	1.18	1.33	1.48	1.64	1.79	1.95	2.10	2.25	2.41	2.56	2.71	2.87	3.02
84	**1.76**	**2.93**	**4.69**	**6.44**	**8.20**	**9.96**	**11.71**	**13.47**	**15.23**	**16.98**	**18.74**	**20.50**	**22.25**	**24.01**	**25.77**	**27.52**	**29.28**	**31.04**	**32.80**	**34.55**
2.13	0.16	0.27	0.44	0.60	0.76	0.92	1.09	1.25	1.41	1.58	1.74	1.90	2.07	2.23	2.39	2.56	2.72	2.88	3.05	3.21
90	**1.83**	**3.05**	**4.88**	**6.71**	**8.54**	**10.37**	**12.20**	**14.04**	**15.87**	**17.70**	**19.53**	**21.36**	**23.19**	**25.02**	**26.85**	**28.68**	**30.51**	**32.34**	**34.17**	**36.00**
2.29	0.17	0.28	0.45	0.62	0.79	0.96	1.13	1.30	1.47	1.64	1.81	1.98	2.15	2.32	2.49	2.66	2.83	3.00	3.17	3.34
96	**1.95**	**3.25**	**5.19**	**7.14**	**9.09**	**11.04**	**12.99**	**14.93**	**16.88**	**18.83**	**20.78**	**22.72**	**24.67**	**26.62**	**28.57**	**30.52**	**32.46**	**34.41**	**36.36**	**38.31**
2.44	0.18	0.30	0.48	0.66	0.84	1.03	1.21	1.39	1.57	1.75	1.93	2.11	2.29	2.47	2.65	2.83	3.02	3.20	3.38	3.56
102	**2.10**	**3.50**	**5.59**	**7.69**	**9.79**	**11.89**	**13.98**	**16.08**	**18.18**	**20.28**	**22.37**	**24.47**	**26.57**	**28.67**	**30.76**	**32.86**	**34.96**	**37.06**	**39.15**	**41.25**
2.59	0.19	0.32	0.52	0.71	0.91	1.10	1.30	1.49	1.69	1.88	2.08	2.27	2.47	2.66	2.86	3.05	3.25	3.44	3.64	3.83
108	**2.22**	**3.70**	**5.91**	**8.13**	**10.35**	**12.57**	**14.79**	**17.00**	**19.22**	**21.44**	**23.66**	**25.87**	**28.09**	**30.31**	**32.53**	**34.75**	**36.96**	**39.18**	**41.40**	**43.62**
2.74	0.21	0.34	0.55	0.76	0.96	1.17	1.37	1.58	1.79	1.99	2.20	2.40	2.61	2.82	3.02	3.23	3.43	3.64	3.85	4.05
114	**2.34**	**3.90**	**6.23**	**8.57**	**10.91**	**13.25**	**15.59**	**17.93**	**20.26**	**22.60**	**24.94**	**27.28**	**29.62**	**31.95**	**34.29**	**36.63**	**38.97**	**41.31**	**43.64**	**45.98**
2.90	0.22	0.36	0.58	0.80	1.01	1.23	1.45	1.67	1.88	2.10	2.32	2.53	2.75	2.97	3.19	3.40	3.62	3.84	4.05	4.27
120	**2.49**	**4.14**	**6.63**	**9.12**	**11.61**	**14.09**	**16.58**	**19.07**	**21.55**	**24.04**	**26.53**	**29.01**	**31.50**	**33.99**	**36.47**	**38.96**	**41.45**	**43.93**	**46.42**	**48.91**
3.05	0.23	0.39	0.62	0.85	1.08	1.31	1.54	1.77	2.00	2.23	2.46	2.70	2.93	3.16	3.39	3.62	3.85	4.08	4.31	4.54

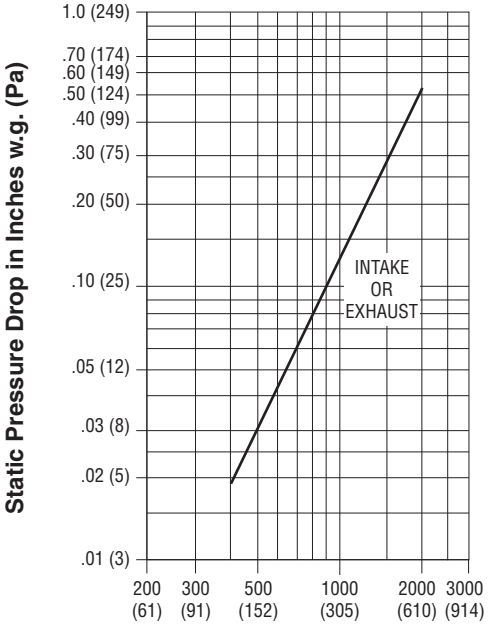
AIRFLOW/ WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1602D
	Free Area %	43%
	Free Area sq. ft. (sq. m.)	6.91 (0.64)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	1123 fpm (342 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	7760 cfm (3662 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.17 in. w.g. (42 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

Nailor Industries Inc. certifies the Model 1602D shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. Seal applies to air performance ratings and water penetration ratings.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 - 6.5.

HOW TO SPECIFY

MODEL 1602J
EXTRUDED ALUMINUM THINLINE FRAME LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 2" (51) deep channel type (**or specifier to select:** flanged type **or** glazing adapter type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" ([9.5] undersize **or** 1/2" [12.7] undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from ASTM B211 Alloy 6063-T5 extruded aluminum of .060" (1.5) nominal wall thickness. Blades shall be stationary J style, constructed from type 6063-T5 extruded aluminum of .060" (1.5) nominal wall thickness with reinforcing bosses, fixed at 30 degrees on approximately 2" (51) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Large louvers that require multiple sections for shipping shall be constructed with concealed vertical mullions for continuous blade appearance when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen.

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty **or** 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Furnish where indicated on plans and/or schedules, blank-off panels fabricated by the louver manufacturer. Blank-off panels to be 0.040" (1.02) thick aluminum sheet (**or specifier to select:** 0.040" [1.02] thick aluminum sheet with 1" [25] insulation **or** 0.040" (1.02) thick aluminum sheet with 2" [51] insulation **or** 20 ga. [1.0] galvanized steel **or** 20 ga. [1.0] galvanized steel with 1" [25] insulation **or** 20 ga. [1.0] galvanized steel with 2" [51] insulation). Blank-off panels to be finished to match louvers.

Submitted performance data to be based on tests in accordance with AMCA Standard 500-L. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1602J.

MODEL 1602K
EXTRUDED ALUMINUM THINLINE FRAME LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 2" (51) deep channel type (**or specifier to select:** flanged type **or** glazing adapter type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from ASTM B211 Alloy 6063-T5 extruded aluminum of .060" (1.5) nominal wall thickness. Blades shall be stationary K style, with rear water baffle, center rain hook and reinforcing bosses, constructed from type 6063-T5 extruded aluminum of .060" (1.5) nominal wall thickness, fixed at 30 degrees on approximately 2" (51) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Large louvers that require multiple sections for shipping shall be constructed with concealed vertical mullions for continuous blade appearance when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty **or** 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Furnish where indicated on plans **and/or** schedules, blank-off panels fabricated by the louver manufacturer. Blank-off panels to be 0.040" (1.02) thick aluminum sheet (**or specifier to select:** 0.040" [1.02] thick aluminum sheet with 1" [25] insulation **or** 0.040" [1.02] thick aluminum sheet with 2" [51] insulation **or** 20 ga. [1.0] galvanized steel **or** 20 ga. [1.0] galvanized steel with 1" [25] insulation **or** 20 ga. [1.0] galvanized steel with 2" [51] insulation). Blank-off panels to be finished to match louvers.

Submitted performance data to be based on tests in accordance with AMCA Standard 500-L. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1602K.

HOW TO SPECIFY

MODEL 1602D

EXTRUDED ALUMINUM THINLINE FRAME LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 2" (51) deep channel type (**or specifier to select:** flanged type **or** glazing adapter type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" (9.5) undersize **or** 1/2" (12.7) undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from ASTM B211 Alloy 6063-T5 extruded aluminum of .060" (1.5) nominal wall thickness. Blades shall be stationary drainable style, constructed from type 6063-T5 extruded aluminum of .060" (1.5) nominal wall thickness with reinforcing bosses, fixed at 45 degrees on approximately 2 1/4" (57) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Large louvers that require multiple sections for shipping shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen.

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty **or** 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Furnish where indicated on plans and/or schedules, blank-off panels fabricated by the louver manufacturer. Blank-off panels to be 0.040" (1.02) thick aluminum sheet (**or specifier to select:** 0.040" (1.02) thick aluminum sheet with 1" (25) insulation **or** 0.040" (1.02) thick aluminum sheet with 2" (51) insulation **or** 20 ga. (1.0) galvanized steel **or** 20 ga. (1.0) galvanized steel with 1" (25) insulation **or** 20 ga. (1.0) galvanized steel with 2" (51) insulation). Blank-off panels to be finished to match louvers.

Performance data must be licensed by AMCA under the AMCA Certified Ratings Program and shall bear the AMCA Certified Ratings seal for water penetration and air performance. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1602D.

- CLEAN ARCHITECTURAL APPEARANCE
- CONTINUOUS BLADE
- CONCEALED MULLIONS
- HIGH FREE AREA

Models:

1604J 4" (102) Deep

1606J 6" (152) Deep

Model 1604J Model 1606J

Model 1604J

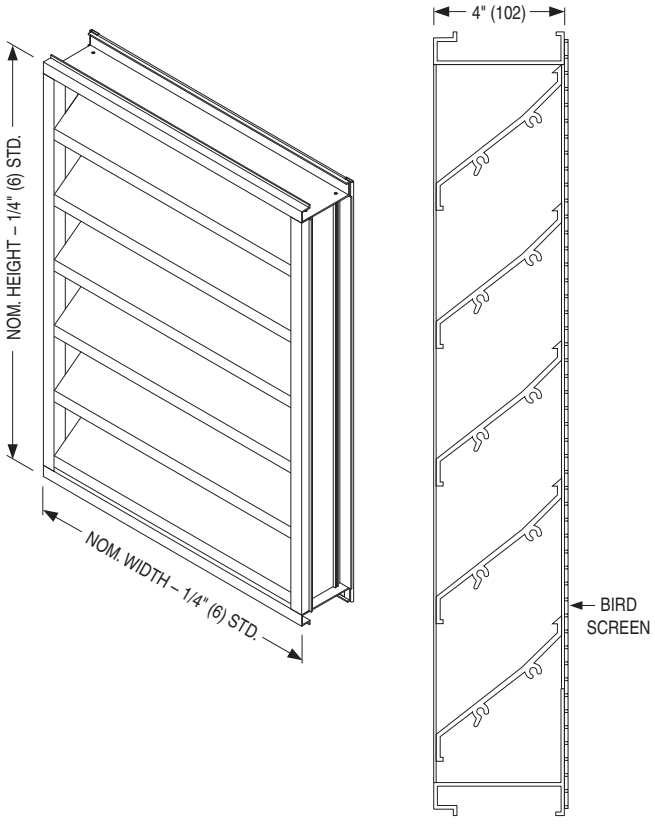
Nailor Model 1604J is an architecturally styled louver utilizing high performance J style blades, crafted with a clean continuous architectural appearance that will visually compliment any structure's exterior. The blade design provides protection against general weather conditions where water infiltration is not a primary concern, with low pressure drop characteristics and a high free area. Standard concealed architectural mullions allow for a smooth, continuous look. Reinforcing bosses run the full length of each blade for superior strength. Suitable for use in ventilation, exhaust and low to medium velocity intake applications, ideal for use in specialty shape and architectural applications. Available in channel, flanged, or glazing adapter type, the 4" (102) deep frame installs easily in most common wall configurations and mechanical installations. Nailor's architectural louvers are engineered to be aesthetically appealing as well as mechanically enduring.

STANDARD CONSTRUCTION:

Frame:	4" (102) deep, Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness. Integral caulking slot provided.
Blades:	Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness, with reinforcing bosses. J style.
Blade Angle:	Fixed at 37 degrees.
Blade Spacing:	Approximately 4" (102) on centers.
Blade Support Brackets:	Concealed type, factory installed on rear of louver on maximum 60" (1524) centers. Reinforced with 1 1/2" x 2" (38 x 51) angle (adds approx. 2" [51] to overall louver depth).
Mullions:	Concealed architectural style allowing continuous line appearance.
Screen:	3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen in removable frame, inside (rear) mount (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	120" W x 84" H (3048 x 2134) or 84" W x 120" H (2134 x 3048). 70 sq. ft. (6.5 m^2). Larger louvers will require field assembly of smaller sections.

COMMON OPTIONS:

- Flanged or Glazing Adaptor Frame styles.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Aluminum Installation Clips or Continuous Angles.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.
- Clear or Color Anodized finishes.



MODEL 1604J

Model 1606J

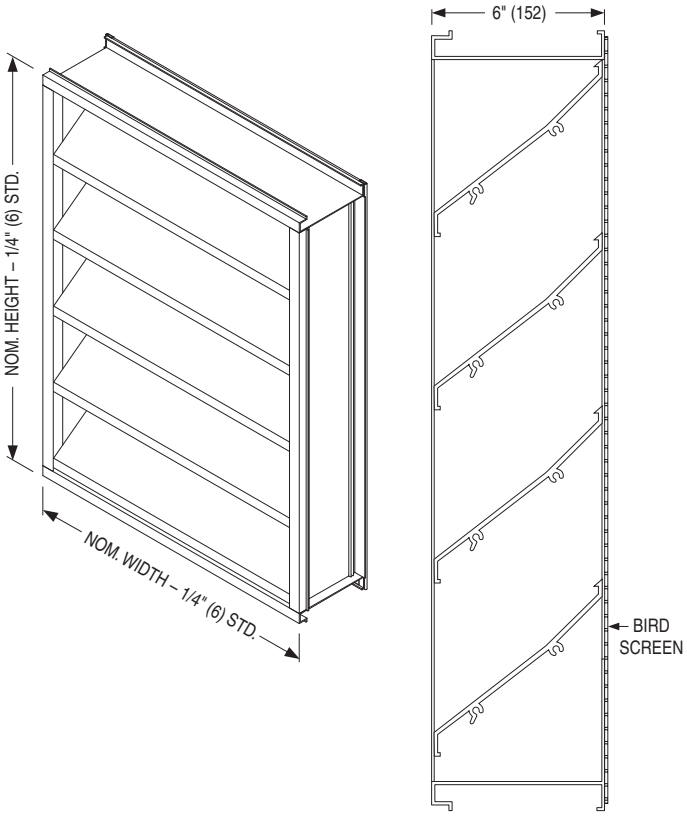
Nailor Model 1606J is an architecturally styled louver utilizing high performance J style blades, constructed with a continuous architectural appearance that will visually compliment any structure's facade. The blade design provides protection against general weather conditions and performs well in areas where water infiltration is a concern due to a longer blade, but still exhibits low pressure drop characteristics and a high free area. Standard concealed architectural mullions allow for a desirable continuous look. Reinforcing bosses run the full length of each blade for superior strength. Suitable for use in ventilation, exhaust and low to medium velocity intake applications, well suited for use in specialty shape and architectural applications. Available in channel, flanged, or glazing adapter type, the 6" (152) deep frame installs easily in most common wall configurations. Nailor's architectural louvers are engineered to be aesthetically appealing as well as mechanically enduring.

STANDARD CONSTRUCTION:

Frame:	6" (152) deep, Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness. Integral caulking slot provided.
Blades:	Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness, with reinforcing bosses. J style.
Blade Angle:	Fixed at 37 degrees.
Blade Spacing:	Approximately 6" (152) on centers.
Blade Support Brackets:	Concealed type, factory installed on rear of louver on maximum 60" (1524) centers. Reinforced with 1 1/2" x 2" (38 x 51) angle (adds approx. 2" [51] to overall louver depth).
Mullions:	Concealed architectural style allowing continuous line appearance.
Screen:	3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen in removable frame, inside (rear) mount (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	120" W x 84" H (3048 x 2134) or 84" W x 120" H (2134 x 3048). 70 sq. ft. (6.5 m^2). Larger louvers will require field assembly of smaller sections.

COMMON OPTIONS:

- Flanged or Glazing Adaptor Frame styles.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Aluminum Installation Clips or Continuous Angles.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.
- Clear or Color Anodized finishes.



MODEL 1606J

PERFORMANCE DATA:

MODEL: 1604J

FREE AREA in Square Feet and Square Meters

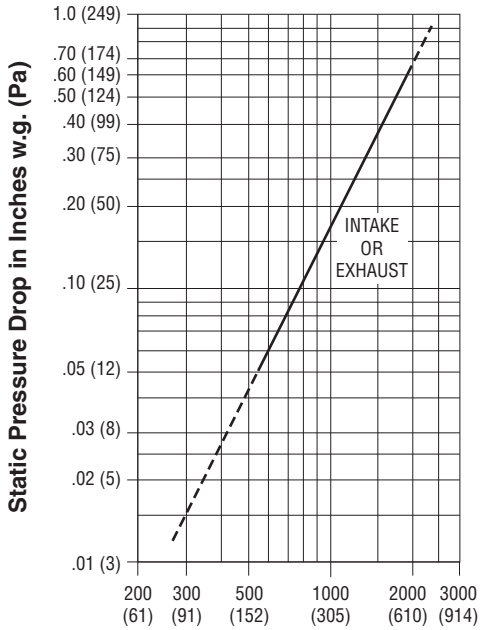
Height in Inches and Meters	Width in Inches and Meters																			
	12 0.30	18 0.46	24 0.61	30 0.76	36 0.91	42 1.07	48 1.22	54 1.37	60 1.52	66 1.68	72 1.83	78 1.98	84 2.13	90 2.29	96 2.44	102 2.59	108 2.74	114 2.90	120 3.05
12 .30	**0.25** 0.02	**0.39** 0.03	**0.54** 0.05	**0.69** 0.06	**0.84** 0.07	**0.99** 0.09	**1.14** 0.10	**1.29** 0.12	**1.44** 0.13	**1.59** 0.14	**1.74** 0.16	**1.89** 0.17	**2.04** 0.19	**2.19** 0.20	**2.34** 0.21	**2.49** 0.22	**2.64** 0.25	**2.79** 0.26	**2.94** 0.27
18 .46	**0.52** 0.05	**0.83** 0.07	**1.14** 0.10	**1.46** 0.13	**1.77** 0.16	**2.09** 0.19	**2.40** 0.22	**2.71** 0.25	**3.03** 0.28	**3.34** 0.31	**3.65** 0.34	**3.97** 0.36	**4.28** 0.39	**4.59** 0.42	**4.91** 0.45	**5.22** 0.49	**5.53** 0.51	**5.85** 0.54	**6.16** 0.57
24 .61	**0.80** 0.07	**1.28** 0.12	**1.77** 0.16	**2.25** 0.21	**2.73** 0.25	**3.22** 0.29	**3.70** 0.34	**4.19** 0.38	**4.67** 0.43	**5.15** 0.47	**5.64** 0.52	**6.12** 0.56	**6.60** 0.61	**7.09** 0.65	**7.57** 0.70	**8.05** 0.75	**8.54** 0.79	**9.02** 0.84	**9.50** 0.88
30 .76	**1.04** 0.09	**1.67** 0.15	**2.30** 0.21	**2.93** 0.27	**3.56** 0.33	**4.19** 0.39	**4.82** 0.44	**5.45** 0.50	**6.08** 0.56	**6.71** 0.62	**7.34** 0.68	**7.97** 0.74	**8.60** 0.79	**9.23** 0.85	**9.86** 0.91	**10.49** 0.98	**11.12** 1.03	**11.75** 1.09	**12.38** 1.15
36 .91	**1.33** 0.12	**2.13** 0.19	**2.93** 0.27	**3.73** 0.34	**4.53** 0.42	**5.33** 0.49	**6.13** 0.57	**6.93** 0.64	**7.73** 0.71	**8.53** 0.79	**9.33** 0.86	**10.13** 0.94	**10.93** 1.01	**11.73** 1.09	**12.53** 1.16	**13.33** 1.24	**14.13** 1.31	**14.93** 1.39	**15.73** 1.46
42 1.07	**1.58** 0.14	**2.52** 0.23	**3.47** 0.32	**4.42** 0.41	**5.37** 0.49	**6.32** 0.58	**7.27** 0.67	**8.22** 0.76	**9.16** 0.85	**10.11** 0.94	**11.06** 1.02	**12.01** 1.11	**12.96** 1.20	**13.91** 1.29	**14.86** 1.38	**15.81** 1.47	**16.76** 1.56	**17.71** 1.65	**18.66** 1.73
48 1.22	**1.85** 0.17	**2.97** 0.27	**4.09** 0.38	**5.20** 0.48	**6.32** 0.58	**7.43** 0.69	**8.62** 0.80	**9.66** 0.89	**10.78** 1.00	**11.89** 1.10	**13.01** 1.20	**14.12** 1.31	**15.24** 1.41	**16.35** 1.52	**17.47** 1.62	**18.58** 1.73	**19.70** 1.83	**20.81** 1.93	**21.93** 2.04
54 1.37	**2.11** 0.19	**3.38** 0.31	**4.64** 0.43	**5.91** 0.54	**7.18** 0.66	**8.44** 0.78	**9.71** 0.90	**10.98** 1.02	**12.25** 1.13	**13.51** 1.25	**14.78** 1.37	**16.05** 1.49	**17.32** 1.60	**18.58** 1.72	**19.85** 1.84	**21.12** 1.96	**22.38** 2.08	**23.64** 2.20	**24.91** 2.32
60 1.52	**2.38** 0.22	**3.81** 0.35	**5.25** 0.48	**6.68** 0.62	**8.11** 0.75	**9.54** 0.88	**10.97** 1.02	**12.41** 1.15	**13.84** 1.28	**15.27** 1.41	**16.70** 1.55	**18.13** 1.68	**19.57** 1.81	**21.00** 1.95	**22.43** 2.08	**23.86** 2.22	**25.29** 2.35	**26.73** 2.48	**28.16** 2.62
66 1.68	**2.67** 0.24	**4.27** 0.39	**5.87** 0.54	**7.47** 0.69	**9.08** 0.84	**10.68** 0.99	**12.28** 1.14	**13.88** 1.29	**15.48** 1.43	**17.09** 1.58	**18.69** 1.73	**20.29** 1.88	**21.89** 2.03	**23.50** 2.18	**25.10** 2.33	**26.70** 2.48	**28.30** 2.63	**29.91** 2.78	**31.51** 2.93
72 1.83	**2.91** 0.27	**4.66** 0.43	**6.41** 0.59	**8.16** 0.75	**9.91** 0.92	**11.66** 1.08	**13.41** 1.24	**15.16** 1.40	**16.91** 1.57	**18.66** 1.73	**20.40** 1.89	**22.15** 2.05	**23.90** 2.22	**25.65** 2.38	**27.40** 2.54	**29.14** 2.71	**30.89** 2.87	**32.64** 3.03	**34.39** 3.20
78 1.98	**3.19** 0.29	**5.11** 0.47	**7.03** 0.65	**8.94** 0.83	**10.86** 1.01	**12.78** 1.18	**14.70** 1.36	**16.62** 1.54	**18.53** 1.72	**20.45** 1.90	**22.37** 2.07	**24.29** 2.25	**26.20** 2.43	**28.12** 2.61	**30.04** 2.79	**31.96** 2.97	**33.87** 3.15	**35.79** 3.33	**37.71** 3.50
84 2.13	**3.45** 0.32	**5.52** 0.51	**7.59** 0.70	**9.65** 0.89	**11.72** 1.09	**13.79** 1.28	**15.86** 1.47	**17.93** 1.66	**20.00** 1.85	**22.07** 2.05	**24.14** 2.24	**26.21** 2.43	**28.28** 2.62	**30.35** 2.82	**32.42** 3.01	**34.49** 3.21	**36.56** 3.40	**38.63** 3.59	**40.70** 3.78
90 2.29	**3.72** 0.34	**5.95** 0.55	**8.19** 0.76	**10.42** 0.96	**12.66** 1.17	**14.89** 1.38	**17.13** 1.59	**19.36** 1.79	**21.60** 2.00	**23.83** 2.21	**26.06** 2.42	**28.30** 2.62	**30.53** 2.83	**32.77** 3.04	**35.00** 3.25	**37.24** 3.46	**39.47** 3.67	**41.71** 3.88	**43.94** 4.08
96 2.44	**4.00** 0.37	**6.41** 0.59	**8.81** 0.81	**11.22** 1.04	**13.62** 1.26	**16.03** 1.48	**18.43** 1.71	**20.84** 1.93	**23.24** 2.16	**25.65** 2.38	**28.05** 2.60	**30.46** 2.83	**32.86** 3.05	**35.27** 3.27	**37.67** 3.50	**40.07** 3.72	**42.48** 3.95	**44.80** 4.16	**47.28** 4.39

AIRFLOW / WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1604J
	Free Area %	54%
	Free Area sq. ft. (sq. m.)	8.62 (0.80)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	722 fpm (220 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	6224 cfm (2937 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.09 in. w.g. (22 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

PERFORMANCE DATA:
MODEL: 1606J

FREE AREA in Square Feet and Square Meters

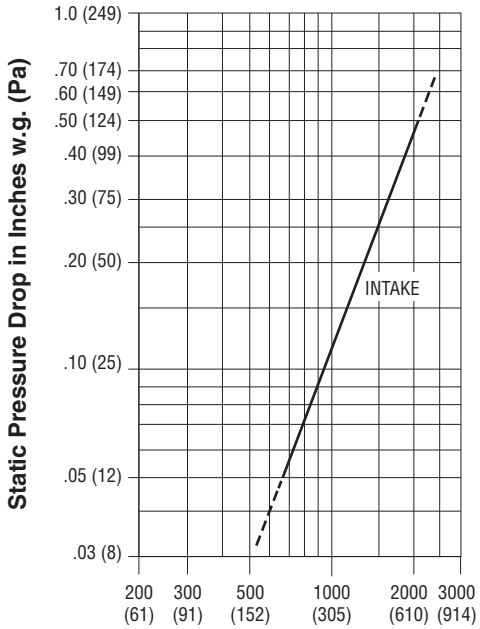
Height in Inches and Meters	Width in Inches and Meters																		
	12 0.30	18 0.46	24 0.61	30 0.76	36 0.91	42 1.07	48 1.22	54 1.37	60 1.52	66 1.68	72 1.83	78 1.98	84 2.13	90 2.29	96 2.44	102 2.59	108 2.74	114 2.90	120 3.05
12 0.30	**0.21** 0.02	**0.33** 0.03	**0.45** 0.04	**0.57** 0.05	**0.69** 0.06	**0.81** 0.08	**0.93** 0.09	**1.05** 0.10	**1.17** 0.11	**1.29** 0.12	**1.41** 0.13	**1.53** 0.14	**1.65** 0.15	**1.77** 0.16	**1.89** 0.18	**2.02** 0.19	**2.14** 0.20	**2.26** 0.21	**2.38** 0.22
18 0.46	**0.48** 0.04	**0.75** 0.07	**1.03** 0.10	**1.31** 0.12	**1.59** 0.15	**1.87** 0.17	**2.14** 0.20	**2.42** 0.23	**2.70** 0.25	**2.98** 0.28	**3.26** 0.30	**3.54** 0.33	**3.81** 0.35	**4.09** 0.38	**4.37** 0.41	**4.65** 0.43	**4.93** 0.46	**5.21** 0.48	**5.48** 0.51
24 0.61	**0.75** 0.07	**1.18** 0.11	**1.62** 0.15	**2.06** 0.19	**2.50** 0.23	**2.94** 0.27	**3.37** 0.31	**3.81** 0.35	**4.25** 0.39	**4.69** 0.44	**5.12** 0.48	**5.56** 0.52	**6.00** 0.56	**6.44** 0.60	**6.87** 0.64	**7.31** 0.68	**7.75** 0.72	**8.19** 0.76	**8.62** 0.80
30 0.76	**1.02** 0.09	**1.62** 0.15	**2.21** 0.21	**2.81** 0.26	**3.41** 0.32	**4.01** 0.37	**4.60** 0.43	**5.20** 0.48	**5.80** 0.54	**6.40** 0.59	**6.99** 0.65	**7.59** 0.71	**8.19** 0.76	**8.78** 0.82	**9.38** 0.87	**9.98** 0.93	**10.58** 0.98	**11.17** 1.04	**11.77** 1.09
36 0.91	**1.29** 0.12	**2.05** 0.19	**2.81** 0.26	**3.56** 0.33	**4.32** 0.40	**5.08** 0.47	**5.84** 0.54	**6.59** 0.61	**7.35** 0.68	**8.11** 0.75	**8.86** 0.82	**9.62** 0.89	**10.38** 0.96	**11.14** 1.03	**11.89** 1.10	**12.65** 1.18	**13.41** 1.25	**14.16** 1.32	**14.92** 1.39
42 1.07	**1.52** 0.14	**2.40** 0.22	**3.29** 0.31	**4.18** 0.39	**5.07** 0.47	**5.96** 0.55	**6.84** 0.64	**7.73** 0.72	**8.62** 0.80	**9.51** 0.88	**10.40** 0.97	**11.28** 1.05	**12.17** 1.13	**13.06** 1.21	**13.95** 1.30	**14.84** 1.38	**15.72** 1.46	**16.61** 1.54	**17.50** 1.63
48 1.22	**1.79** 0.17	**2.84** 0.26	**3.88** 0.36	**4.93** 0.46	**5.98** 0.56	**7.04** 0.65	**8.13** 0.76	**9.12** 0.85	**10.17** 0.94	**11.22** 1.04	**12.27** 1.14	**13.31** 1.24	**14.36** 1.33	**15.41** 1.43	**16.46** 1.53	**17.50** 1.63	**18.55** 1.72	**19.60** 1.82	**20.65** 1.92
54 1.37	**2.06** 0.19	**3.27** 0.30	**4.48** 0.42	**5.68** 0.53	**6.89** 0.64	**8.10** 0.75	**9.31** 0.86	**10.51** 0.98	**11.72** 1.09	**12.93** 1.20	**14.14** 1.31	**15.34** 1.43	**16.55** 1.54	**17.76** 1.65	**18.97** 1.76	**20.17** 1.87	**21.38** 1.99	**22.59** 2.10	**23.80** 2.21
60 1.52	**2.34** 0.22	**3.70** 0.34	**5.07** 0.47	**6.44** 0.60	**7.80** 0.73	**9.17** 0.85	**10.54** 0.98	**11.91** 1.11	**13.27** 1.23	**14.64** 1.36	**16.01** 1.49	**17.38** 1.61	**18.74** 1.74	**20.11** 1.87	**21.48** 2.00	**22.84** 2.12	**24.21** 2.25	**25.58** 2.38	**26.95** 2.50
66 1.68	**2.61** 0.24	**4.14** 0.38	**5.66** 0.53	**7.19** 0.67	**8.72** 0.81	**10.24** 0.95	**11.77** 1.09	**13.30** 1.24	**14.83** 1.38	**16.35** 1.52	**17.88** 1.66	**19.41** 1.80	**20.93** 1.94	**22.46** 2.09	**23.99** 2.23	**25.52** 2.37	**27.04** 2.51	**28.57** 2.65	**30.10** 2.80
72 1.83	**2.88** 0.27	**4.57** 0.42	**6.26** 0.58	**7.94** 0.74	**9.63** 0.89	**11.32** 1.05	**13.00** 1.21	**14.69** 1.36	**16.38** 1.52	**18.07** 1.68	**19.75** 1.84	**21.44** 1.99	**23.13** 2.15	**24.81** 2.31	**26.50** 2.46	**28.19** 2.62	**29.87** 2.78	**31.56** 2.93	**33.25** 3.09
78 1.98	**3.16** 0.29	**5.00** 0.46	**6.85** 0.64	**8.70** 0.81	**10.54** 0.98	**12.39** 1.15	**14.24** 1.32	**16.08** 1.49	**17.93** 1.67	**19.78** 1.84	**21.63** 2.01	**23.47** 2.18	**25.32** 2.35	**27.17** 2.52	**29.01** 2.70	**30.86** 2.87	**32.71** 3.04	**34.55** 3.21	**36.40** 3.38
84 2.13	**3.43** 0.32	**5.44** 0.50	**7.44** 0.69	**9.45** 0.88	**11.46** 1.06	**13.46** 1.25	**15.47** 1.44	**17.48** 1.62	**19.48** 1.81	**21.49** 2.00	**23.50** 2.18	**25.51** 2.37	**27.51** 2.56	**29.52** 2.74	**31.53** 2.93	**33.53** 3.12	**35.54** 3.30	**37.55** 3.49	**39.55** 3.67
90 2.29	**3.70** 0.34	**5.87** 0.55	**8.04** 0.75	**10.20** 0.95	**12.37** 1.15	**14.54** 1.35	**16.70** 1.55	**18.87** 1.75	**21.04** 1.95	**23.21** 2.16	**25.37** 2.36	**27.54** 2.56	**29.71** 2.76	**31.87** 2.96	**34.04** 3.16	**36.21** 3.36	**38.37** 3.57	**40.54** 3.77	**42.71** 3.97
96 2.44	**3.98** 0.37	**6.30** 0.59	**8.63** 0.80	**10.96** 1.02	**13.28** 1.23	**15.61** 1.45	**17.94** 1.67	**20.26** 1.88	**22.59** 2.10	**24.92** 2.32	**27.25** 2.53	**29.57** 2.75	**31.90** 2.96	**34.23** 3.18	**36.55** 3.40	**38.88** 3.61	**41.21** 3.83	**43.53** 4.04	**45.86** 4.26

AIRFLOW / WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1606J
	Free Area %	51%
	Free Area sq. ft. (sq. m.)	8.13 (0.76)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	1029 fpm (314 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	8366 cfm (3948 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.13 in. w.g. (32 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

HOW TO SPECIFY

MODEL 1604J
EXTRUDED ALUMINUM ARCHITECTURAL BLADE LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 4" (102) deep channel type (**or specifier to select:** flanged type **or** glazing adapter type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from ASTM B211 Alloy 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness. Blades shall be stationary J style, constructed from type 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness with reinforcing bosses, fixed at 37 degrees on approximately 4" (102) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Large louvers that require multiple sections for shipping shall be constructed with concealed vertical mullions for continuous blade appearance when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty **or** 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Furnish where indicated on plans and/or schedules, blank-off panels fabricated by the louver manufacturer. Blank-off panels to be 0.040" (1.02) thick aluminum sheet (**or specifier to select:** 0.040" [1.02] thick aluminum sheet with 1" [25] insulation **or** 0.040" [1.02] thick aluminum sheet with 2" [51] insulation **or** 20 ga. [1.0] galvanized steel **or** 20 ga. [1.0] galvanized steel with 1" [25] insulation **or** 20 ga. [1.0] galvanized steel with 2" [51] insulation). Blank-off panels to be finished to match louvers.

Submitted performance data to be based on tests in accordance with AMCA Standard 500-L. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1604J.

MODEL 1606J
EXTRUDED ALUMINUM ARCHITECTURAL BLADE LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 6" (152) deep channel type (**or specifier to select:** flanged type **or** glazing adapter type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" (9.5) undersize **or** 1/2" (12.7) undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from ASTM B211 Alloy 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness. Blades shall be stationary J style, constructed from type 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness with reinforcing bosses, fixed at 37 degrees on approximately 6" (152) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Large louvers that require multiple sections for shipping shall be constructed with concealed vertical mullions for continuous blade appearance when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty **or** 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Furnish where indicated on plans and/or schedules, blank-off panels fabricated by the louver manufacturer. Blank-off panels to be 0.040" (1.02) thick aluminum sheet (**or specifier to select:** 0.040" [1.02] thick aluminum sheet with 1" [25] insulation **or** 0.040" [1.02] thick aluminum sheet with 2" [51] insulation **or** 20 ga. [1.0] galvanized steel **or** 20 ga. [1.0] galvanized steel with 1" [25] insulation **or** 20 ga. [1.0] galvanized steel with 2" [51] insulation). Blank-off panels to be finished to match louvers.

Submitted performance data to be based on tests in accordance with AMCA Standard 500-L. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1606J.

- AMCA LICENSED
- WEATHER RESISTANT
- DRAINABLE HEAD
- ARCHITECTURAL BLADE
- CONCEALED DOWNSPOUTS

Models:

1604JD 4" (102) Deep

1606JD 6" (152) Deep

Model 1604JD

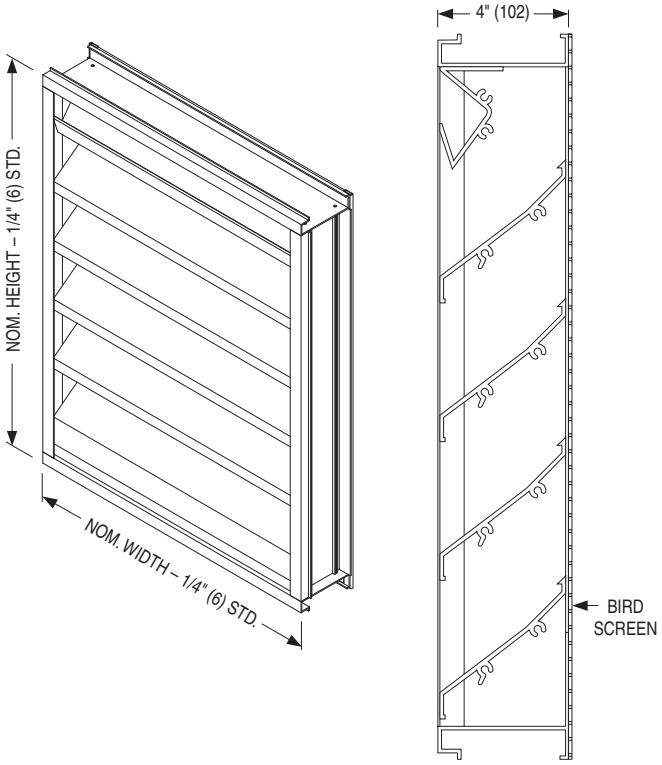
Model 1606JD

Model 1604JD

Model 1604JD combines the aesthetic appeal of a non-drainable blade with the water penetration protection of a drainable louver. High performance J style blades, combined with a drainable head that utilizes a top rain gutter with concealed downspouts in the side frame, prevent cascading water running down the building's face from entering into the building during light to moderate rain conditions. The blade design features a rear water baffle, with low pressure drop characteristics and a high free area. Reinforcing bosses run the full length of each blade for superior strength. Suitable for use in ventilation, exhaust and low to medium velocity intake applications where water penetration is a concern. Available in channel, flanged, or glazing adapter type, the 4" (102) deep frame installs easily in most common wall configurations. Model 1604JD is AMCA Licensed for Water Penetration and Air Performance.

STANDARD CONSTRUCTION:

Frame:	4" (102) deep, Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness. Integral caulking slot provided.
Blades:	Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness, with reinforcing bosses. J style.
Blade Angle:	Fixed at 37 degrees.
Blade Spacing:	Approximately 4" (102) on centers.
Blade Support Brackets:	Concealed type, factory installed on rear of louver on maximum 60" (1524) centers. Reinforced with 1 1/2" x 2" (38 x 51) angle (adds approx. 2" [51] to overall louver depth).
Mullions:	Concealed type allowing continuous line appearance up to 120" (3048) wide. Larger assemblies require separate visible frames with downspouts.
Screen:	3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen in removable frame, inside (rear) mount (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	120" W x 84" H (3048 x 2134) or 84" W x 120" H (2134 x 3048). 70 sq. ft. (6.5 m^2). Larger louvers will require field assembly of smaller sections.



MODEL 1604JD

COMMON OPTIONS:

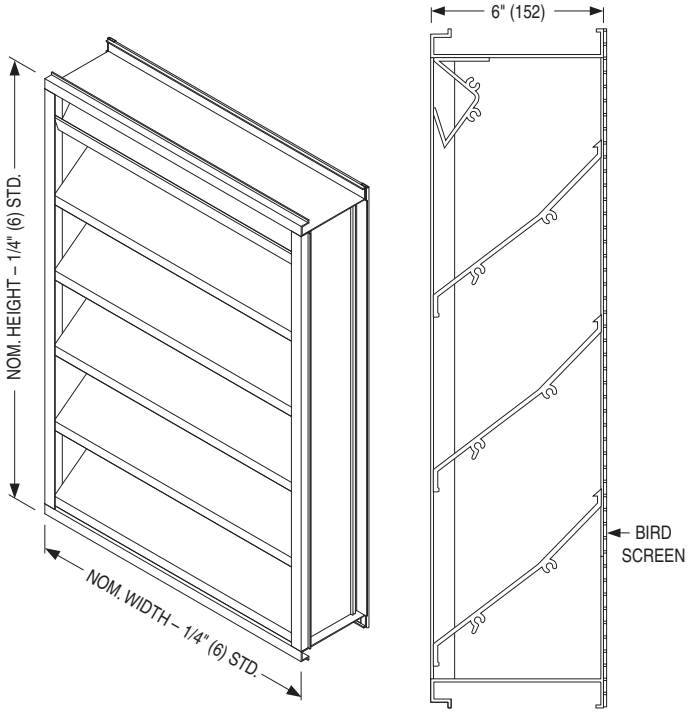
- Flanged or Glazing Adaptor Frame styles.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Aluminum Installation Clips or Continuous Angles.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.
- Clear or Color Anodized finishes.

Model 1606JD

Model 1606JD combines the desired foul weather performance of a drainable louver with the pleasing aesthetics of an architectural louver. High performance J style architectural blades, combined with a drainable head that utilizes a top rain gutter with concealed downspouts in the side frame, prevent cascading water running down the building's face from entering into the airstream during light to moderate rain conditions. The blade design features a rear water baffle, with low pressure drop characteristics and a high free area. Reinforcing bosses run the full length of each blade for superior strength. Suitable for use in ventilation, exhaust and low to medium velocity intake applications where water penetration is a concern. Available in channel, flanged, or glazing adapter type, the 6" (152) deep frame installs easily in most common wall configurations. Model 1606JD is AMCA Licensed for Water Penetration and Air Performance.

STANDARD CONSTRUCTION:

Frame:	6" (152) deep, Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness. Integral caulking slot provided.
Blades:	Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness, with reinforcing bosses. J style.
Blade Angle:	Fixed at 37 degrees.
Blade Spacing:	Approximately 6" (152) on centers.
Blade Support Brackets:	Concealed type, factory installed on rear of louver on maximum 60" (1524) centers. Reinforced with 1 1/2" x 2" (38 x 51) angle (adds approx. 2" [51] to overall louver depth).
Mullions:	Concealed type allowing continuous line appearance up to 120" (3048) wide. Larger assemblies require separate visible frames with downspouts.
Screen:	3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen in removable frame, inside (rear) mount (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	120" W x 84" H (3048 x 2134) or 84" W x 120" H (2134 x 3048). 70 sq. ft. (6.5 m^2). Larger louvers will require field assembly of smaller sections.



MODEL 1606JD

COMMON OPTIONS:

- Flanged or Glazing Adaptor Frame styles.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Aluminum Installation Clips or Continuous Angles.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.
- Clear or Color Anodized finishes.

PERFORMANCE DATA:
MODEL: 1604JD

FREE AREA in Square Feet and Square Meters

Height in Inches and Meters	Width in Inches and Meters																		
	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
	0.30	0.46	0.61	0.76	0.91	1.07	1.22	1.37	1.52	1.68	1.83	1.98	2.13	2.29	2.44	2.59	2.74	2.90	3.05
12	**0.25**	**0.39**	**0.54**	**0.69**	**0.84**	**0.99**	**1.14**	**1.29**	**1.44**	**1.59**	**1.74**	**1.89**	**2.04**	**2.19**	**2.34**	**2.49**	**2.64**	**2.79**	**2.94**
.30	0.02	0.03	0.05	0.06	0.07	0.09	0.10	0.12	0.13	0.14	0.16	0.17	0.19	0.20	0.21	0.22	0.25	0.26	0.27
18	**0.52**	**0.83**	**1.14**	**1.46**	**1.77**	**2.09**	**2.40**	**2.71**	**3.03**	**3.34**	**3.65**	**3.97**	**4.28**	**4.59**	**4.91**	**5.22**	**5.53**	**5.85**	**6.16**
.46	0.05	0.07	0.10	0.13	0.16	0.19	0.22	0.25	0.28	0.31	0.34	0.36	0.39	0.42	0.45	0.49	0.51	0.54	0.57
24	**0.80**	**1.28**	**1.77**	**2.25**	**2.73**	**3.22**	**3.70**	**4.19**	**4.67**	**5.15**	**5.64**	**6.12**	**6.60**	**7.09**	**7.57**	**8.05**	**8.54**	**9.02**	**9.50**
.61	0.07	0.12	0.16	0.21	0.25	0.29	0.34	0.38	0.43	0.47	0.52	0.56	0.61	0.65	0.70	0.75	0.79	0.84	0.88
30	**1.04**	**1.67**	**2.30**	**2.93**	**3.56**	**4.19**	**4.82**	**5.45**	**6.08**	**6.71**	**7.34**	**7.97**	**8.60**	**9.23**	**9.86**	**10.49**	**11.12**	**11.75**	**12.38**
.76	0.09	0.15	0.21	0.27	0.33	0.39	0.44	0.50	0.56	0.62	0.68	0.74	0.79	0.85	0.91	0.98	1.03	1.09	1.15
36	**1.33**	**2.13**	**2.93**	**3.73**	**4.53**	**5.33**	**6.13**	**6.93**	**7.73**	**8.53**	**9.33**	**10.13**	**10.93**	**11.73**	**12.53**	**13.33**	**14.13**	**14.93**	**15.73**
.91	0.12	0.19	0.27	0.34	0.42	0.49	0.57	0.64	0.71	0.79	0.86	0.94	1.01	1.09	1.16	1.24	1.31	1.39	1.46
42	**1.58**	**2.52**	**3.47**	**4.42**	**5.37**	**6.32**	**7.27**	**8.22**	**9.16**	**10.11**	**11.06**	**12.01**	**12.96**	**13.91**	**14.86**	**15.81**	**16.76**	**17.71**	**18.66**
1.07	0.14	0.23	0.32	0.41	0.49	0.58	0.67	0.76	0.85	0.94	1.02	1.11	1.20	1.29	1.38	1.47	1.56	1.65	1.73
48	**1.85**	**2.97**	**4.09**	**5.20**	**6.32**	**7.43**	**8.57**	**9.66**	**10.78**	**11.89**	**13.01**	**14.12**	**15.24**	**16.35**	**17.47**	**18.58**	**19.70**	**20.81**	**21.93**
1.22	0.17	0.27	0.38	0.48	0.58	0.69	0.80	0.89	1.00	1.10	1.20	1.31	1.41	1.52	1.62	1.73	1.83	1.93	2.04
54	**2.11**	**3.38**	**4.64**	**5.91**	**7.18**	**8.44**	**9.71**	**10.98**	**12.25**	**13.51**	**14.78**	**16.05**	**17.32**	**18.58**	**19.85**	**21.12**	**22.38**	**23.64**	**24.91**
1.37	0.19	0.31	0.43	0.54	0.66	0.78	0.90	1.02	1.13	1.25	1.37	1.49	1.60	1.72	1.84	1.96	2.08	2.20	2.32
60	**2.38**	**3.81**	**5.25**	**6.68**	**8.11**	**9.54**	**10.97**	**12.41**	**13.84**	**15.27**	**16.70**	**18.13**	**19.57**	**21.00**	**22.43**	**23.86**	**25.29**	**26.73**	**28.16**
1.52	0.22	0.35	0.48	0.62	0.75	0.88	1.02	1.15	1.28	1.41	1.55	1.68	1.81	1.95	2.08	2.22	2.35	2.48	2.62
66	**2.67**	**4.27**	**5.87**	**7.47**	**9.08**	**10.68**	**12.28**	**13.88**	**15.48**	**17.09**	**18.69**	**20.29**	**21.89**	**23.50**	**25.10**	**26.70**	**28.30**	**29.91**	**31.51**
1.68	0.24	0.39	0.54	0.69	0.84	0.99	1.14	1.29	1.43	1.58	1.73	1.88	2.03	2.18	2.33	2.48	2.63	2.78	2.93
72	**2.91**	**4.66**	**6.41**	**8.16**	**9.91**	**11.66**	**13.41**	**15.16**	**16.91**	**18.66**	**20.40**	**22.15**	**23.90**	**25.65**	**27.40**	**29.14**	**30.89**	**32.64**	**34.39**
1.83	0.27	0.43	0.59	0.75	0.92	1.08	1.24	1.40	1.57	1.73	1.89	2.05	2.22	2.38	2.54	2.71	2.87	3.03	3.20
78	**3.19**	**5.11**	**7.03**	**8.94**	**10.86**	**12.78**	**14.70**	**16.62**	**18.53**	**20.45**	**22.37**	**24.29**	**26.20**	**28.12**	**30.04**	**31.96**	**33.87**	**35.79**	**37.71**
1.98	0.29	0.47	0.65	0.83	1.01	1.18	1.36	1.54	1.72	1.90	2.07	2.25	2.43	2.61	2.79	2.97	3.15	3.33	3.50
84	**3.45**	**5.52**	**7.59**	**9.65**	**11.72**	**13.79**	**15.86**	**17.93**	**20.00**	**22.07**	**24.14**	**26.21**	**28.28**	**30.35**	**32.42**	**34.49**	**36.56**	**38.63**	**40.70**
2.13	0.32	0.51	0.70	0.89	1.09	1.28	1.47	1.66	1.85	2.05	2.24	2.43	2.62	2.82	3.01	3.21	3.40	3.59	3.78
90	**3.72**	**5.95**	**8.19**	**10.42**	**12.66**	**14.89**	**17.13**	**19.36**	**21.60**	**23.83**	**26.06**	**28.30**	**30.53**	**32.77**	**35.00**	**37.24**	**39.47**	**41.71**	**43.94**
2.29	0.34	0.55	0.76	0.96	1.17	1.38	1.59	1.79	2.00	2.21	2.42	2.62	2.83	3.04	3.25	3.46	3.67	3.88	4.08
96	**4.00**	**6.41**	**8.81**	**11.22**	**13.62**	**16.03**	**18.43**	**20.84**	**23.24**	**25.65**	**28.05**	**30.46**	**32.86**	**35.27**	**37.67**	**40.07**	**42.48**	**44.80**	**47.28**
2.44	0.37	0.59	0.81	1.04	1.26	1.48	1.71	1.93	2.16	2.38	2.60	2.83	3.05	3.27	3.50	3.72	3.95	4.16	4.39
102	**4.30**	**6.88**	**9.46**	**12.04**	**14.61**	**17.19**	**19.77**	**22.35**	**24.93**	**27.51**	**30.09**	**32.67**	**35.25**	**37.82**	**40.40**	**42.98**	**45.56**	**48.14**	**50.72**
2.59	0.40	0.64	0.88	1.12	1.36	1.60	1.84	2.08	2.32	2.56	2.80	3.03	3.27	3.51	3.75	3.99	4.23	4.47	4.71
108	**4.54**	**7.26**	**9.98**	**12.71**	**15.43**	**18.15**	**20.88**	**23.60**	**26.32**	**29.04**	**31.77**	**34.49**	**37.21**	**39.94**	**42.66**	**45.38**	**48.10**	**50.83**	**53.55**
2.74	0.42	0.67	0.93	1.18	1.43	1.69	1.94	2.19	2.45	2.70	2.95	3.20	3.46	3.71	3.96	4.22	4.47	4.72	4.97
114	**4.82**	**7.72**	**10.61**	**13.51**	**16.40**	**19.30**	**22.19**	**25.09**	**27.98**	**30.88**	**33.77**	**36.67**	**39.56**	**42.46**	**45.35**	**48.24**	**51.14**	**54.03**	**56.93**
2.90	0.45	0.72	0.99	1.25	1.52	1.79	2.06	2.33	2.60	2.87	3.14	3.41	3.68	3.94	4.21	4.48	4.75	5.02	5.29
120	**5.06**	**8.10**	**11.14**	**14.18**	**17.21**	**20.25**	**23.29**	**26.33**	**29.37**	**32.40**	**35.44**	**38.48**	**41.52**	**44.55**	**47.59**	**50.63**	**53.67**	**56.71**	**59.74**
3.05	0.47	0.75	1.03	1.32	1.60	1.88	2.16	2.45	2.73	3.01	3.29	3.57	3.86	4.14	4.42	4.70	4.99	5.27	5.55

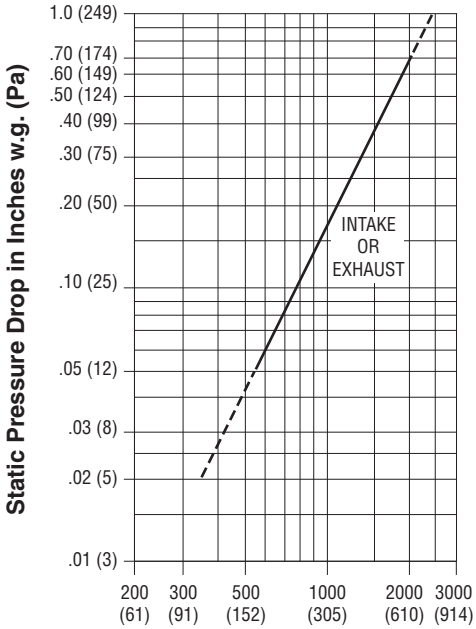
AIRFLOW/ WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1604JD
	Free Area %	54%
	Free Area sq. ft. (sq. m.)	8.57 (0.80)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	961 fpm (293 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	8236 cfm (3887 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.16 in. w.g. (40 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

Nailor Industries Inc. certifies the Model 1604JD, shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Air Performance and Water Penetration ratings.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

PERFORMANCE DATA:
MODEL: 1606JD

FREE AREA in Square Feet and Square Meters

Height in Inches and Meters	Width in Inches and Meters																		
	12 0.30	**18** 0.46	**24** 0.61	**30** 0.76	**36** 0.91	**42** 1.07	**48** 1.22	**54** 1.37	**60** 1.52	**66** 1.68	**72** 1.83	**78** 1.98	**84** 2.13	**90** 2.29	**96** 2.44	**102** 2.59	**108** 2.74	**114** 2.90	**120** 3.05
12 0.30	**0.11** 0.01	**0.18** 0.02	**0.25** 0.02	**0.32** 0.03	**0.38** 0.04	**0.45** 0.04	**0.52** 0.05	**0.59** 0.05	**0.66** 0.06	**0.73** 0.07	**0.80** 0.07	**0.86** 0.08	**0.93** 0.09	**1.00** 0.09	**1.07** 0.10	**1.14** 0.11	**1.21** 0.11	**1.28** 0.12	**1.34** 0.12
18 0.46	**0.41** 0.04	**0.67** 0.06	**0.92** 0.09	**1.18** 0.11	**1.43** 0.13	**1.69** 0.16	**1.94** 0.18	**2.20** 0.20	**2.45** 0.23	**2.71** 0.25	**2.97** 0.28	**3.22** 0.30	**3.48** 0.32	**3.73** 0.35	**3.99** 0.37	**4.24** 0.39	**4.50** 0.42	**4.75** 0.44	**5.01** 0.47
24 0.61	**0.66** 0.06	**1.07** 0.10	**1.48** 0.14	**1.89** 0.18	**2.31** 0.21	**2.72** 0.25	**3.13** 0.29	**3.54** 0.33	**3.95** 0.37	**4.36** 0.41	**4.77** 0.44	**5.19** 0.48	**5.60** 0.52	**6.01** 0.56	**6.42** 0.60	**6.83** 0.63	**7.24** 0.67	**7.65** 0.71	**8.07** 0.75
30 0.76	**1.01** 0.09	**1.64** 0.15	**2.27** 0.21	**2.90** 0.27	**3.53** 0.33	**4.16** 0.39	**4.79** 0.44	**5.42** 0.50	**6.05** 0.56	**6.68** 0.62	**7.31** 0.68	**7.94** 0.74	**8.57** 0.80	**9.19** 0.85	**9.82** 0.91	**10.45** 0.97	**11.08** 1.03	**11.71** 1.09	**12.34** 1.15
36 0.91	**1.26** 0.12	**2.05** 0.19	**2.83** 0.26	**3.62** 0.34	**4.40** 0.41	**5.19** 0.48	**5.97** 0.55	**6.76** 0.63	**7.54** 0.70	**8.33** 0.77	**9.11** 0.85	**9.90** 0.92	**10.69** 0.99	**11.47** 1.07	**12.26** 1.14	**13.04** 1.21	**13.83** 1.28	**14.61** 1.36	**15.40** 1.43
42 1.07	**1.52** 0.14	**2.47** 0.23	**3.42** 0.32	**4.36** 0.41	**5.31** 0.49	**6.26** 0.58	**7.21** 0.67	**8.15** 0.76	**9.10** 0.85	**10.05** 0.93	**11.00** 1.02	**11.94** 1.11	**12.89** 1.20	**13.84** 1.29	**14.79** 1.37	**15.73** 1.46	**16.68** 1.55	**17.63** 1.64	**18.58** 1.73
48 1.22	**1.67** 0.16	**2.71** 0.25	**3.75** 0.35	**4.79** 0.45	**5.83** 0.54	**6.88** 0.64	**7.45** 0.69	**8.43** 0.78	**9.41** 0.87	**10.39** 0.97	**11.37** 1.06	**12.35** 1.15	**13.33** 1.24	**14.31** 1.33	**15.29** 1.42	**16.27** 1.51	**17.25** 1.60	**18.23** 1.69	**19.21** 1.78
54 1.37	**2.03** 0.19	**3.30** 0.31	**4.56** 0.42	**5.83** 0.54	**7.09** 0.66	**8.36** 0.78	**9.62** 0.89	**10.89** 1.01	**12.15** 1.13	**13.42** 1.25	**14.68** 1.36	**15.95** 1.48	**17.22** 1.60	**18.48** 1.72	**19.75** 1.83	**21.01** 1.95	**22.28** 2.07	**23.54** 2.19	**24.81** 2.30
60 1.52	**2.29** 0.21	**3.72** 0.35	**5.15** 0.48	**6.57** 0.61	**8.00** 0.74	**9.43** 0.88	**10.86** 1.01	**12.28** 1.14	**13.71** 1.27	**15.14** 1.41	**16.57** 1.54	**17.99** 1.67	**19.42** 1.80	**20.85** 1.94	**22.28** 2.07	**23.70** 2.20	**25.13** 2.33	**26.56** 2.47	**27.99** 2.60
66 1.68	**2.55** 0.24	**4.14** 0.38	**5.73** 0.53	**7.32** 0.58	**8.91** 0.83	**10.50** 0.98	**12.09** 1.12	**13.68** 1.27	**15.27** 1.42	**16.86** 1.57	**18.45** 1.71	**20.04** 1.86	**21.63** 2.01	**23.21** 2.16	**24.80** 2.30	**26.39** 2.45	**27.98** 2.60	**29.57** 2.75	**31.16** 2.90
72 1.83	**2.81** 0.26	**4.56** 0.42	**6.31** 0.59	**8.07** 0.75	**9.82** 0.91	**11.57** 1.07	**13.32** 1.24	**15.07** 1.40	**16.82** 1.56	**18.58** 1.73	**20.33** 1.89	**22.08** 2.05	**23.83** 2.21	**25.58** 2.38	**27.33** 2.54	**29.09** 2.70	**30.84** 2.86	**32.59** 3.03	**34.34** 3.19
78 1.98	**3.06** 0.28	**4.97** 0.46	**6.88** 0.64	**8.78** 0.82	**10.69** 0.99	**12.60** 1.17	**14.51** 1.35	**16.41** 1.52	**18.32** 1.70	**20.23** 1.88	**22.14** 2.06	**24.04** 2.23	**25.95** 2.41	**27.86** 2.59	**29.77** 2.77	**31.67** 2.94	**33.58** 3.12	**35.49** 3.30	**37.40** 3.47
84 2.13	**3.31** 0.31	**5.37** 0.50	**7.44** 0.69	**9.50** 0.88	**11.56** 1.07	**13.63** 1.27	**15.69** 1.46	**17.75** 1.65	**19.82** 1.84	**21.88** 2.03	**23.94** 2.22	**26.01** 2.42	**28.07** 2.61	**30.13** 2.80	**32.20** 2.99	**34.26** 3.18	**36.32** 3.37	**38.39** 3.57	**40.45** 3.76
90 2.29	**3.57** 0.33	**5.80** 0.54	**8.02** 0.75	**10.25** 0.95	**12.47** 1.16	**14.70** 1.37	**16.92** 1.57	**19.15** 1.78	**21.37** 1.99	**23.60** 2.19	**25.82** 2.40	**28.05** 2.61	**30.28** 2.81	**32.50** 3.02	**34.73** 3.23	**36.95** 3.43	**39.18** 3.64	**41.40** 3.85	**43.63** 4.05
96 2.44	**3.84** 0.36	**6.23** 0.58	**8.63** 0.80	**11.02** 1.02	**13.42** 1.25	**15.81** 1.47	**18.20** 1.69	**20.60** 1.91	**22.99** 2.14	**25.38** 2.36	**27.78** 2.58	**30.17** 2.80	**32.57** 3.03	**34.96** 3.25	**37.35** 3.47	**39.75** 3.69	**42.14** 3.91	**44.53** 4.14	**46.93** 4.36
102 2.59	**4.09** 0.38	**6.64** 0.62	**9.19** 0.85	**11.74** 1.09	**14.29** 1.33	**16.84** 1.56	**19.39** 1.80	**21.94** 2.04	**24.49** 2.27	**27.04** 2.51	**29.59** 2.75	**32.14** 2.99	**34.69** 3.22	**37.23** 3.46	**39.78** 3.70	**42.33** 3.69	**44.88** 4.17	**47.43** 4.41	**49.98** 4.64
108 2.74	**4.35** 0.40	**7.06** 0.66	**9.77** 0.91	**12.49** 1.16	**15.20** 1.41	**17.91** 1.66	**20.62** 1.92	**23.33** 2.17	**26.04** 2.42	**28.76** 2.67	**31.47** 2.92	**34.18** 3.18	**36.89** 3.43	**39.60** 3.68	**42.31** 3.93	**45.03** 4.18	**47.74** 4.43	**50.45** 4.69	**53.16** 4.94
114 2.90	**4.60** 0.43	**7.47** 0.69	**10.34** 0.96	**13.20** 1.23	**16.07** 1.49	**18.94** 1.76	**21.81** 2.03	**24.67** 2.29	**27.54** 2.56	**30.41** 2.82	**33.28** 3.09	**36.14** 3.66	**39.01** 3.62	**41.88** 3.89	**44.75** 4.16	**47.61** 4.42	**50.48** 4.69	**53.35** 4.96	**56.22** 5.22
120 3.05	**4.85** 0.45	**7.87** 0.73	**10.90** 1.01	**13.92** 1.29	**16.94** 1.57	**19.97** 1.85	**22.99** 2.14	**26.01** 2.42	**29.04** 2.70	**32.06** 2.98	**35.08** 3.26	**38.11** 3.54	**41.13** 3.82	**44.15** 4.10	**47.18** 4.38	**50.20** 4.66	**53.22** 4.94	**56.25** 5.23	**59.27** 5.51

AIRFLOW / WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

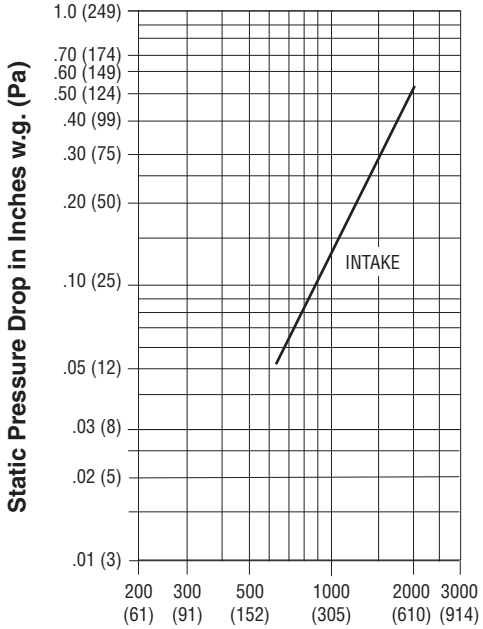
	Model	1606JD
	Free Area %	47%
	Free Area sq. ft. (sq. m.)	7.45 (0.69)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	1250 fpm (381 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	9313 cfm (4395 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.21 in. w.g. (52 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

amca WORLDWIDE CERTIFIED RATINGS — WATER PENETRATION — AIR PERFORMANCE — AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL, INC. — www.amca.org

Nailor Industries Inc. certifies the Model 1606JD, shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Air Performance and Water Penetration ratings.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

HOW TO SPECIFY

MODEL 1604JD

EXTRUDED ALUMINUM DRAINABLE HEAD LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 4" (102) deep channel type (**or specifier to select:** flanged type **or** glazing adapter type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from ASTM B211 Alloy 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness. Blades shall be stationary J style, constructed from type 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness with reinforcing bosses, fixed at 37 degrees on approximately 4" (102) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Drain gutter in head frame. Concealed downspouts in jambs to drain water from louver for minimum water cascade from blade to blade. Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Concealed type mullions for louvers up to 120" (3048) wide allowing continuous line appearance. Large louvers that require multiple sections for shipping shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty **or** 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Furnish where indicated on plans and/or schedules, blank-off panels fabricated by the louver manufacturer. Blank-off panels to be 0.040" (1.02) thick aluminum sheet (**or specifier to select:** 0.040" [1.02] thick aluminum sheet with 1" [25] insulation **or** 0.040" [1.02] thick aluminum sheet with 2" [51] insulation **or** 20 ga. [1.0] galvanized steel **or** 20 ga. [1.0] galvanized steel with 1" [25] insulation **or** 20 ga. [1.0] galvanized steel with 2" [51] insulation). Blank-off panels to be finished to match louvers.

Performance data must be licensed by AMCA under the AMCA Certified Ratings Program and shall bear the AMCA Certified Ratings seal for water penetration and air performance. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1604JD.

MODEL 1606JD

EXTRUDED ALUMINUM DRAINABLE HEAD LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 6" (152) deep channel type (**or specifier to select:** flanged type **or** glazing adapter type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from ASTM B211 Alloy 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness. Blades shall be stationary J style, constructed from type 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness with reinforcing bosses, fixed at 37 degrees on approximately 6" (152) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Drain gutter in head frame. Concealed downspouts in jambs to drain water from louver for minimum water cascade from blade to blade. Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Concealed type mullions for louvers up to 120" (3048) wide allowing continuous line appearance. Large louvers that require multiple sections for shipping shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty **or** 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Furnish where indicated on plans **and/or** schedules, blank-off panels fabricated by the louver manufacturer. Blank-off panels to be 0.040" (1.02) thick aluminum sheet (**or specifier to select:** 0.040" [1.02] thick aluminum sheet with 1" [25] insulation **or** 0.040" [1.02] thick aluminum sheet with 2" [51] insulation **or** 20 ga. [1.0] galvanized steel **or** 20 ga. [1.0] galvanized steel with 1" [25] insulation **or** 20 ga. [1.0] galvanized steel with 2" [51] insulation). Blank-off panels to be finished to match louvers.

Performance data must be licensed by AMCA under the AMCA Certified Ratings Program and shall bear the AMCA Certified Ratings seal for water penetration and air performance. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1606JD.

- AMCA LICENSED
- WEATHER RESISTANT
- DRAINABLE HEAD
- CONCEALED DOWNSPOUTS
- LOW PRESSURE DROP

Models:

1604KD 4" (102) Deep

1606KD 6" (152) Deep

Model 1604KD

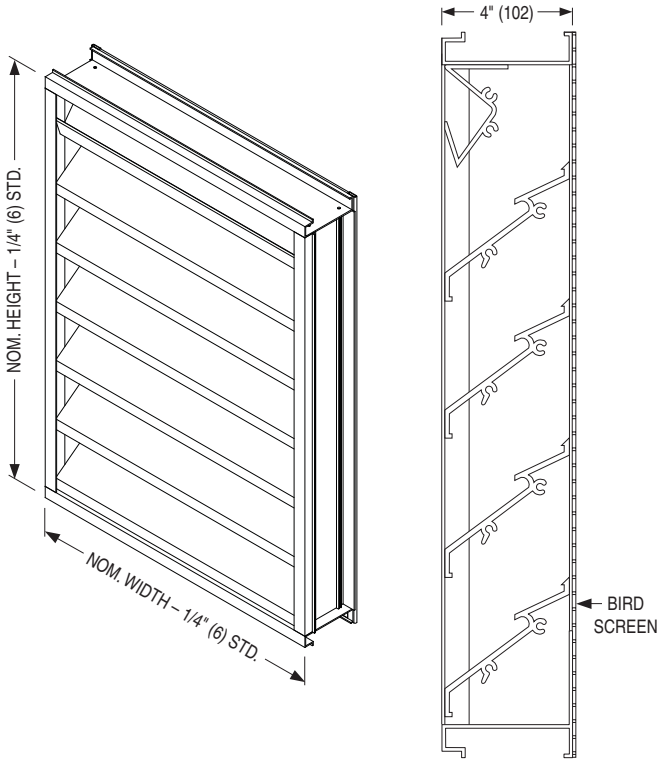
Model 1606KD

Model 1604KD

Model 1604KD combines K style blades with a drainable head that utilizes a top rain gutter with concealed downspouts in the side frame, preventing cascading water running down the building's face from entering into the airstream and infiltrating the space. The blade design features a rear water baffle plus an additional center rain hook, providing additional protection against more forbidding weather. Reinforcing bosses run the full length of each blade for superior strength. Suitable for use in ventilation, exhaust and low to medium velocity intake applications where water penetration is a concern. Available in channel, flanged, or glazing adapter type, the 4" (102) deep frame installs easily in most common wall configurations. Model 1604KD is AMCA Licensed for Water Penetration and Air Performance.

STANDARD CONSTRUCTION:

Frame:	4" (102) deep, Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness. Integral caulking slot provided.
Blades:	Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness, with reinforcing bosses. K style.
Blade Angle:	Fixed at 37 degrees.
Blade Spacing:	Approximately 4" (102) on centers.
Blade Support Brackets:	Concealed type, factory installed on rear of louver on maximum 60" (1524) centers. Reinforced with 1 1/2" x 2" (38 x 51) angle (adds approx. 2" [51] to overall louver depth).
Mullions:	Concealed type allowing continuous line appearance up to 120" (3048) wide. Larger assemblies require separate visible frames with downspouts.
Screen:	3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen in removable frame, inside (rear) mount (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	120" W x 84" H (3048 x 2134) or 84" W x 120" H (2134 x 3048). 70 sq. ft. (6.5 m^2). Larger louvers will require field assembly of smaller sections.



MODEL 1604KD

COMMON OPTIONS:

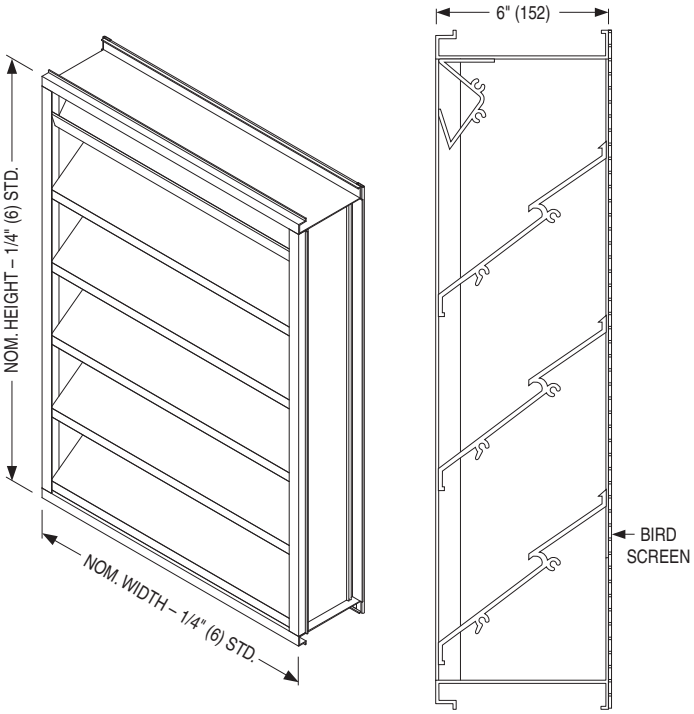
- Flanged or Glazing Adaptor Frame styles.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Aluminum Installation Clips or Continuous Angles.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.
- Clear or Color Anodized finishes.

Model 1606KD

Model 1606KD blends the aesthetic appeal of a non-drainable blade louver and the higher water penetration protection of a drainable louver. The drainable head feature utilizes a top rain gutter with concealed downspouts in the side frame, efficiently reducing water entrainment in the space. The K style blade design features a rear water baffle plus an additional center rain hook, providing good protection against more forbidding weather conditions. Reinforcing bosses run the full length of each blade for superior strength. Suitable for use in ventilation, exhaust and low to medium velocity intake applications where water penetration is a concern. Available in channel, flanged, or glazing adapter type, the 6" (152) deep frame installs easily in most common wall configurations. Model 1606KD is AMCA Licensed for Water Penetration and Air Performance.

STANDARD CONSTRUCTION:

Frame:	6" (152) deep, Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness. Integral caulking slot provided.
Blades:	Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness, with reinforcing bosses. K style.
Blade Angle:	Fixed at 37 degrees.
Blade Spacing:	Approximately 6" (152) on centers.
Blade Support Brackets:	Concealed type, factory installed on rear of louver on maximum 60" (1524) centers. Reinforced with 1 1/2" x 2" (38 x 51) angle (adds approx. 2" [51] to overall louver depth).
Mullions:	Concealed type allowing continuous line appearance up to 120" (3048) wide. Larger assemblies require separate visible frames with downspouts.
Screen:	3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen in removable frame, inside (rear) mount (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	120" W x 84" H (3048 x 2134) or 84" W x 120" H (2134 x 3048). 70 sq. ft. (6.5 m^2). Larger louvers will require field assembly of smaller sections.



MODEL 1606KD

COMMON OPTIONS:

- Flanged or Glazing Adaptor Frame styles.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Aluminum Installation Clips or Continuous Angles.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.
- Clear or Color Anodized finishes.

PERFORMANCE DATA:
MODEL: 1604KD

FREE AREA in Square Feet and Square Meters

Height in Inches and Meters	Width in Inches and Meters																		
	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
	0.30	0.46	0.61	0.76	0.91	1.07	1.22	1.37	1.52	1.68	1.83	1.98	2.13	2.29	2.44	2.59	2.74	2.90	3.05
12	**0.21**	**0.34**	**0.47**	**0.60**	**0.73**	**0.85**	**0.98**	**1.11**	**1.24**	**1.37**	**1.49**	**1.62**	**1.75**	**1.88**	**2.01**	**2.13**	**2.26**	**2.39**	**2.52**
0.30	0.02	0.03	0.04	0.06	0.07	0.08	0.09	0.10	0.12	0.13	0.14	0.15	0.16	0.17	0.19	0.20	0.21	0.22	0.23
18	**0.46**	**0.74**	**1.02**	**1.30**	**1.58**	**1.86**	**2.14**	**2.41**	**2.69**	**2.97**	**3.25**	**3.53**	**3.81**	**4.09**	**4.37**	**4.64**	**4.92**	**5.20**	**5.48**
0.46	0.04	0.07	0.09	0.12	0.15	0.17	0.20	0.22	0.25	0.28	0.30	0.33	0.35	0.38	0.41	0.43	0.46	0.48	0.51
24	**0.73**	**1.17**	**1.60**	**2.04**	**2.48**	**2.91**	**3.35**	**3.79**	**4.22**	**4.66**	**5.10**	**5.53**	**5.97**	**6.41**	**6.85**	**7.28**	**7.72**	**8.16**	**8.59**
0.61	0.07	0.11	0.15	0.19	0.23	0.27	0.31	0.35	0.39	0.43	0.47	0.51	0.55	0.60	0.64	0.68	0.72	0.76	0.80
30	**0.93**	**1.49**	**2.05**	**2.61**	**3.17**	**3.74**	**4.30**	**4.86**	**5.42**	**5.98**	**6.54**	**7.10**	**7.66**	**8.22**	**8.78**	**9.34**	**9.90**	**10.46**	**11.02**
0.76	0.09	0.14	0.19	0.24	0.29	0.35	0.40	0.45	0.50	0.56	0.61	0.66	0.71	0.76	0.82	0.87	0.92	0.97	1.02
36	**1.15**	**1.85**	**2.54**	**3.23**	**3.93**	**4.62**	**5.31**	**6.00**	**6.70**	**7.39**	**8.08**	**8.77**	**9.47**	**10.16**	**10.85**	**11.54**	**12.24**	**12.93**	**13.62**
0.91	0.11	0.17	0.24	0.30	0.36	0.43	0.49	0.56	0.62	0.69	0.75	0.82	0.88	0.94	1.01	1.07	1.14	1.20	1.27
42	**1.40**	**2.24**	**3.08**	**3.93**	**4.77**	**5.61**	**6.45**	**7.29**	**8.13**	**8.97**	**9.81**	**10.66**	**11.50**	**12.34**	**13.18**	**14.02**	**14.86**	**15.70**	**16.54**
1.07	0.13	0.21	0.29	0.36	0.44	0.52	0.60	0.68	0.76	0.83	0.91	0.99	1.07	1.15	1.22	1.30	1.38	1.46	1.54
48	**1.62**	**2.59**	**3.56**	**4.53**	**5.50**	**6.48**	**7.51**	**8.42**	**9.39**	**10.36**	**11.33**	**12.30**	**13.28**	**14.25**	**15.22**	**16.19**	**17.16**	**18.13**	**19.10**
1.22	0.15	0.24	0.33	0.42	0.51	0.60	0.70	0.78	0.87	0.96	1.05	1.14	1.23	1.32	1.41	1.50	1.59	1.68	1.77
54	**1.84**	**2.95**	**4.06**	**5.16**	**6.27**	**7.37**	**8.48**	**9.58**	**10.69**	**11.80**	**12.90**	**14.01**	**15.11**	**16.22**	**17.33**	**18.43**	**19.54**	**20.64**	**21.75**
1.37	0.17	0.27	0.38	0.48	0.58	0.68	0.79	0.89	0.99	1.10	1.20	1.30	1.40	1.51	1.61	1.71	1.82	1.92	2.02
60	**2.09**	**3.34**	**4.59**	**5.84**	**7.10**	**8.35**	**9.60**	**10.85**	**12.11**	**13.36**	**14.61**	**15.86**	**17.12**	**18.37**	**19.62**	**20.87**	**22.13**	**23.38**	**24.63**
1.52	0.19	0.31	0.43	0.54	0.66	0.78	0.89	1.01	1.12	1.24	1.36	1.47	1.59	1.71	1.82	1.94	2.06	2.17	2.29
66	**2.31**	**3.69**	**5.07**	**6.46**	**7.84**	**9.23**	**10.61**	**12.00**	**13.38**	**14.76**	**16.15**	**17.53**	**18.92**	**20.30**	**21.68**	**23.07**	**24.45**	**25.84**	**27.22**
1.68	0.21	0.34	0.47	0.60	0.73	0.86	0.99	1.11	1.24	1.37	1.50	1.63	1.76	1.89	2.01	2.14	2.27	2.40	2.53
72	**2.55**	**4.08**	**5.62**	**7.15**	**8.68**	**10.21**	**11.74**	**13.27**	**14.80**	**16.34**	**17.87**	**19.40**	**20.93**	**22.46**	**23.99**	**25.53**	**27.06**	**28.59**	**30.12**
1.83	0.24	0.38	0.52	0.66	0.81	0.95	1.09	1.23	1.38	1.52	1.66	1.80	1.94	2.09	2.23	2.37	2.51	2.66	2.80
78	**2.77**	**4.43**	**6.10**	**7.76**	**9.42**	**11.08**	**12.75**	**14.41**	**16.07**	**17.74**	**19.40**	**21.06**	**22.72**	**24.39**	**26.05**	**27.71**	**29.37**	**31.04**	**32.70**
1.98	0.26	0.41	0.57	0.72	0.88	1.03	1.18	1.34	1.49	1.65	1.80	1.96	2.11	2.27	2.42	2.57	2.73	2.88	3.04
84	**2.99**	**4.79**	**6.59**	**8.38**	**10.18**	**11.98**	**13.77**	**15.57**	**17.37**	**19.16**	**20.96**	**22.76**	**24.55**	**26.35**	**28.15**	**29.94**	**31.74**	**33.54**	**35.33**
2.13	0.28	0.45	0.61	0.78	0.95	1.11	1.28	1.45	1.61	1.78	1.95	2.11	2.28	2.45	2.61	2.78	2.95	3.12	3.28
90	**3.24**	**5.18**	**7.12**	**9.07**	**11.01**	**12.95**	**14.90**	**16.84**	**18.78**	**20.72**	**22.67**	**24.61**	**26.55**	**28.49**	**30.44**	**32.38**	**34.32**	**36.27**	**38.21**
2.29	0.30	0.48	0.66	0.84	1.02	1.20	1.38	1.56	1.74	1.93	2.11	2.29	2.47	2.65	2.83	3.01	3.19	3.37	3.55
96	**3.46**	**5.53**	**7.61**	**9.68**	**11.76**	**13.83**	**15.91**	**17.99**	**20.06**	**22.14**	**24.21**	**26.29**	**28.36**	**30.44**	**32.51**	**34.59**	**36.66**	**38.74**	**40.81**
2.44	0.32	0.51	0.71	0.90	1.09	1.29	1.48	1.67	1.86	2.06	2.25	2.44	2.63	2.83	3.02	3.21	3.41	3.60	3.79
102	**3.68**	**5.89**	**8.10**	**10.31**	**12.52**	**14.73**	**16.94**	**19.15**	**21.36**	**23.56**	**25.77**	**27.98**	**30.19**	**32.40**	**34.61**	**36.82**	**39.03**	**41.24**	**43.45**
2.59	0.34	0.55	0.75	0.96	1.16	1.37	1.57	1.78	1.98	2.19	2.39	2.60	2.80	3.01	3.22	3.42	3.63	3.83	4.04
108	**3.92**	**6.28**	**8.63**	**10.99**	**13.34**	**15.69**	**18.05**	**20.40**	**22.76**	**25.11**	**27.46**	**29.82**	**32.17**	**34.53**	**36.88**	**39.23**	**41.59**	**43.94**	**46.30**
2.74	0.36	0.58	0.80	1.02	1.24	1.46	1.68	1.90	2.11	2.33	2.55	2.77	2.99	3.21	3.43	3.64	3.86	4.08	4.30
114	**4.15**	**6.63**	**9.12**	**11.61**	**14.10**	**16.58**	**19.07**	**21.56**	**24.05**	**26.53**	**29.02**	**31.51**	**34.00**	**36.48**	**38.97**	**41.46**	**43.95**	**46.43**	**48.92**
2.90	0.39	0.62	0.85	1.08	1.31	1.54	1.77	2.00	2.23	2.46	2.70	2.93	3.16	3.39	3.62	3.85	4.08	4.31	4.54
120	**4.39**	**7.02**	**9.66**	**12.29**	**14.93**	**17.56**	**20.19**	**22.83**	**25.46**	**28.10**	**30.73**	**33.36**	**36.00**	**38.63**	**41.27**	**43.90**	**46.53**	**49.17**	**51.80**
3.05	0.41	0.65	0.90	1.14	1.39	1.63	1.88	2.12	2.37	2.61	2.85	3.10	3.34	3.59	3.83	4.08	4.32	4.57	4.81

AIRFLOW / WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

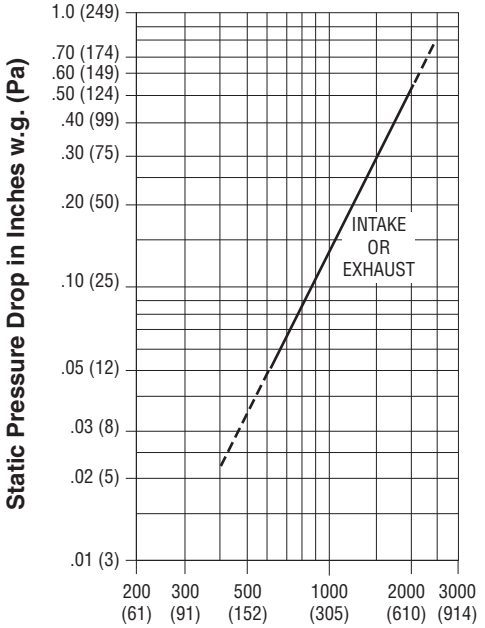
	Model	1604KD
	Free Area %	47%
	Free Area sq. ft. (sq. m.)	7.51 (0.70)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	892 fpm (272 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	6699 cfm (3161 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.11 in. w.g. (27 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

amca WORLDWIDE CERTIFIED RATINGS — WATER PENETRATION — AIR PERFORMANCE — AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL, INC.® www.amca.org

Nailor Industries Inc. certifies the Model 1604KD, shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Air Performance and Water Penetration ratings.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

PERFORMANCE DATA:
MODEL: 1606KD

FREE AREA in Square Feet and Square Meters

Height in Inches and Meters	Width in Inches and Meters																		
	12 (0.30)	18 (0.46)	24 (0.61)	30 (0.76)	36 (0.91)	42 (1.07)	48 (1.22)	54 (1.37)	60 (1.52)	66 (1.68)	72 (1.83)	78 (1.98)	84 (2.13)	90 (2.29)	96 (2.44)	102 (2.59)	108 (2.74)	114 (2.90)	120 (3.05)
12 (0.30)	0.18 (0.02)	0.29 (0.03)	0.39 (0.04)	0.50 (0.05)	0.61 (0.06)	0.72 (0.07)	0.82 (0.08)	0.93 (0.09)	1.04 (0.10)	1.15 (0.11)	1.25 (0.12)	1.36 (0.13)	1.47 (0.14)	1.57 (0.15)	1.68 (0.16)	1.79 (0.17)	1.90 (0.18)	2.00 (0.19)	2.11 (0.20)
18 (0.46)	0.44 (0.04)	0.71 (0.07)	0.97 (0.09)	1.24 (0.12)	1.51 (0.14)	1.77 (0.16)	2.04 (0.19)	2.30 (0.21)	2.57 (0.24)	2.84 (0.26)	3.10 (0.29)	3.37 (0.31)	3.63 (0.34)	3.90 (0.36)	4.17 (0.39)	4.43 (0.41)	4.70 (0.44)	4.96 (0.46)	5.23 (0.49)
24 (0.61)	0.68 (0.06)	1.09 (0.10)	1.50 (0.14)	1.92 (0.18)	2.33 (0.22)	2.74 (0.25)	3.15 (0.29)	3.56 (0.33)	3.97 (0.37)	4.38 (0.41)	4.79 (0.44)	5.20 (0.48)	5.61 (0.52)	6.02 (0.56)	6.43 (0.60)	6.84 (0.64)	7.25 (0.67)	7.66 (0.71)	8.07 (0.75)
30 (0.76)	0.9 (0.09)	1.51 (0.14)	2.08 (0.19)	2.64 (0.25)	3.21 (0.30)	3.78 (0.35)	4.35 (0.40)	4.91 (0.46)	5.48 (0.51)	6.05 (0.56)	6.61 (0.61)	7.18 (0.67)	7.75 (0.72)	8.31 (0.77)	8.88 (0.82)	9.45 (0.88)	10.01 (0.93)	10.58 (0.98)	11.15 (1.04)
36 (0.91)	1.21 (0.11)	1.93 (0.18)	2.65 (0.25)	3.38 (0.31)	4.10 (0.38)	4.82 (0.45)	5.55 (0.52)	6.27 (0.58)	6.99 (0.65)	7.72 (0.72)	8.44 (0.78)	9.16 (0.85)	9.89 (0.92)	10.61 (0.99)	11.33 (1.05)	12.06 (1.12)	12.78 (1.19)	13.50 (1.25)	14.23 (1.32)
42 (1.07)	1.47 (0.14)	2.35 (0.22)	3.23 (0.30)	4.11 (0.38)	4.99 (0.46)	5.87 (0.54)	6.75 (0.63)	7.63 (0.71)	8.51 (0.79)	9.39 (0.87)	10.26 (0.95)	11.14 (1.04)	12.02 (1.12)	12.90 (1.20)	13.78 (1.28)	14.66 (1.36)	15.54 (1.44)	16.42 (1.53)	17.30 (1.61)
48 (1.22)	1.73 (0.16)	2.76 (0.26)	3.80 (0.35)	4.84 (0.45)	5.87 (0.55)	6.91 (0.64)	7.93 (0.74)	8.98 (0.83)	10.02 (0.93)	11.06 (1.03)	12.09 (1.12)	13.13 (1.22)	14.17 (1.32)	15.20 (1.41)	16.24 (1.51)	17.28 (1.60)	18.31 (1.70)	19.35 (1.80)	20.39 (1.89)
54 (1.37)	1.99 (0.18)	3.18 (0.30)	4.37 (0.41)	5.57 (0.52)	6.76 (0.63)	7.95 (0.74)	9.15 (0.85)	10.34 (0.96)	11.53 (1.07)	12.72 (1.18)	13.92 (1.29)	15.11 (1.40)	16.30 (1.51)	17.50 (1.63)	18.69 (1.74)	19.88 (1.85)	21.07 (1.96)	22.27 (2.07)	23.46 (2.18)
60 (1.52)	2.25 (0.21)	3.60 (0.33)	4.95 (0.46)	6.30 (0.59)	7.65 (0.71)	9.00 (0.84)	10.35 (0.96)	11.70 (1.09)	13.05 (1.21)	14.40 (1.34)	15.75 (1.46)	17.10 (1.59)	18.45 (1.71)	19.80 (1.84)	21.15 (1.96)	22.50 (2.09)	23.85 (2.22)	25.20 (2.34)	26.55 (2.47)
66 (1.68)	2.51 (0.23)	4.02 (0.37)	5.52 (0.51)	7.03 (0.65)	8.54 (0.79)	10.04 (0.93)	11.55 (1.07)	13.06 (1.21)	14.56 (1.35)	16.07 (1.49)	17.57 (1.63)	19.08 (1.77)	20.59 (1.91)	22.09 (2.05)	23.60 (2.19)	25.11 (2.33)	26.61 (2.47)	28.12 (2.61)	29.63 (2.75)
72 (1.83)	2.77 (0.26)	4.43 (0.41)	6.10 (0.57)	7.76 (0.72)	9.42 (0.88)	11.09 (1.03)	12.75 (1.18)	14.41 (1.34)	16.08 (1.49)	17.74 (1.65)	19.40 (1.80)	21.07 (1.96)	22.73 (2.11)	24.39 (2.27)	26.05 (2.42)	27.72 (2.57)	29.38 (2.73)	31.04 (2.88)	32.71 (3.04)
78 (1.98)	3.03 (0.28)	4.85 (0.45)	6.67 (0.62)	8.49 (0.79)	10.31 (0.96)	12.13 (1.13)	13.95 (1.30)	15.77 (1.46)	17.59 (1.63)	19.41 (1.80)	21.23 (1.97)	23.05 (2.14)	24.87 (2.31)	26.69 (2.48)	28.51 (2.65)	30.33 (2.82)	32.15 (2.99)	33.96 (3.16)	35.78 (3.32)
84 (2.13)	3.29 (0.31)	5.27 (0.49)	7.25 (0.67)	9.22 (0.86)	11.20 (1.04)	13.18 (1.22)	15.15 (1.41)	17.13 (1.59)	19.10 (1.77)	21.08 (1.96)	23.06 (2.14)	25.03 (2.33)	27.01 (2.51)	28.99 (2.69)	30.96 (2.88)	32.94 (3.06)	34.92 (3.24)	36.89 (3.43)	38.87 (3.61)
90 (2.29)	3.56 (0.33)	5.69 (0.53)	7.82 (0.73)	9.95 (0.92)	12.09 (1.12)	14.22 (1.32)	16.35 (1.52)	18.49 (1.72)	20.62 (1.92)	22.75 (2.11)	24.89 (2.31)	27.02 (2.51)	29.15 (2.71)	31.29 (2.91)	33.42 (3.10)	35.55 (3.30)	37.69 (3.50)	39.82 (3.70)	41.95 (3.90)
96 (2.44)	3.82 (0.35)	6.11 (0.57)	8.39 (0.78)	10.68 (0.99)	12.97 (1.21)	15.26 (1.42)	17.55 (1.63)	19.84 (1.84)	22.13 (2.06)	24.42 (2.27)	26.71 (2.48)	29.00 (2.69)	31.29 (2.91)	33.58 (3.12)	35.87 (3.33)	38.16 (3.54)	40.45 (3.76)	42.74 (3.97)	45.03 (4.18)
102 (2.59)	4.08 (0.38)	6.52 (0.61)	8.97 (0.83)	11.42 (1.06)	13.86 (1.29)	16.31 (1.52)	18.75 (1.74)	21.20 (1.97)	23.65 (2.20)	26.09 (2.42)	28.54 (2.65)	30.99 (2.88)	33.43 (3.11)	35.88 (3.33)	38.32 (3.56)	40.77 (3.79)	43.22 (4.01)	45.66 (4.24)	48.11 (4.47)
108 (2.74)	4.34 (0.40)	6.94 (0.64)	9.54 (0.89)	12.14 (1.13)	14.75 (1.37)	17.35 (1.61)	19.95 (1.85)	22.55 (2.10)	25.16 (2.34)	27.76 (2.58)	30.36 (2.82)	32.96 (3.06)	35.57 (3.30)	38.17 (3.55)	40.77 (3.79)	43.37 (4.03)	45.98 (4.27)	48.58 (4.51)	51.18 (4.75)
114 (2.90)	4.70 (0.44)	7.53 (0.70)	10.35 (0.96)	13.17 (1.22)	15.99 (1.49)	18.81 (1.75)	21.63 (2.01)	24.46 (2.27)	27.28 (2.53)	30.10 (2.80)	32.92 (3.06)	35.74 (3.32)	38.57 (3.58)	41.39 (3.84)	44.21 (4.11)	47.03 (4.37)	49.85 (4.63)	52.68 (4.89)	55.50 (5.16)
120 (3.05)	4.86 (0.45)	7.78 (0.72)	10.69 (0.99)	13.61 (1.26)	16.52 (1.54)	19.44 (1.81)	22.35 (2.08)	25.27 (2.35)	28.19 (2.62)	31.10 (2.89)	34.02 (3.16)	36.93 (3.43)	39.85 (3.70)	42.77 (3.97)	45.68 (4.24)	48.60 (4.51)	51.51 (4.79)	54.43 (5.06)	57.35 (5.33)

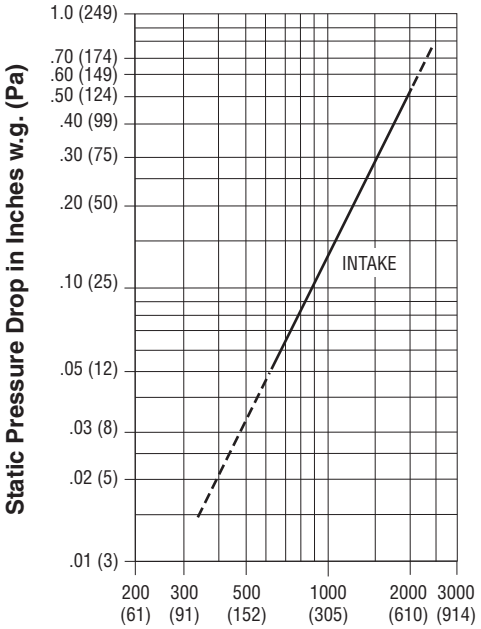
AIRFLOW/ WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1606KD
	Free Area %	50%
	Free Area sq. ft. (sq. m.)	7.93 (0.74)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	1017 fpm (310 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	8065 cfm (3806 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.14 in. w.g. (35 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

Nailor Industries Inc. certifies the Model 1606KD, shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Air Performance and Water Penetration ratings.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

HOW TO SPECIFY

MODEL 1604KD

EXTRUDED ALUMINUM DRAINABLE HEAD LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 4" (102) deep channel type (**or specifier to select:** flanged type **or** glazing adapter type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from ASTM B211 Alloy 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness. Blades shall be stationary K style, with rear water baffle, center rain hook and reinforcing bosses, constructed from type 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness, fixed at 37 degrees on approximately 4" (102) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Drain gutter in head frame. Concealed downspouts in jambs to drain water from louver for minimum water cascade from blade to blade. Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Concealed type mullions for louvers up to 120" (3048) wide allowing continuous line appearance. Large louvers that require multiple sections for shipping shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty **or** 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Furnish where indicated on plans and/or schedules, blank-off panels fabricated by the louver manufacturer. Blank-off panels to be 0.040" (1.02) thick aluminum sheet (**or specifier to select:** 0.040" [1.02] thick aluminum sheet with 1" [25] insulation **or** 0.040" [1.02] thick aluminum sheet with 2" [51] insulation **or** 20 ga. [1.0] galvanized steel **or** 20 ga. [1.0] galvanized steel with 1" [25] insulation **or** 20 ga. [1.0] galvanized steel with 2" [51] insulation). Blank-off panels to be finished to match louvers.

Performance data must be licensed by AMCA under the AMCA 511 Certified Ratings Program and shall bear the AMCA Certified Ratings seal for water penetration and air performance. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1604KD.

MODEL 1606KD

EXTRUDED ALUMINUM DRAINABLE HEAD LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 6" (152) deep channel type (**or specifier to select:** flanged type **or** glazing adapter type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from ASTM B211 Alloy 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness. Blades shall be stationary K style, with rear water baffle, center rain hook and reinforcing bosses, constructed from type 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness, fixed at 37 degrees on approximately 6" (152) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Drain gutter in head frame. Concealed downspouts in jambs to drain water from louver for minimum water cascade from blade to blade. Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Concealed type mullions for louvers up to 120" (3048) wide allowing continuous line appearance. Large louvers that require multiple sections for shipping shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen.

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty **or** 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Furnish where indicated on plans and/or schedules, blank-off panels fabricated by the louver manufacturer. Blank-off panels to be 0.040" (1.02) thick aluminum sheet (**or specifier to select:** 0.040" [1.02] thick aluminum sheet with 1" [25] insulation **or** 0.040" [1.02] thick aluminum sheet with 2" [51] insulation **or** 20 ga. [1.0] galvanized steel **or** 20 ga. [1.0] galvanized steel with 1" [25] insulation **or** 20 ga. [1.0] galvanized steel with 2" [51] insulation). Blank-off panels to be finished to match louvers.

Performance data must be licensed by AMCA under the AMCA 511 Certified Ratings Program and shall bear the AMCA Certified Ratings seal for water penetration and air performance. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1606KD.

- AMCA LICENSED
- DRAINABLE HEAD AND BLADE
- CONCEALED DOWNSPOUTS
- HIGH PERFORMANCE
- LOW PRESSURE DROP

Models:

1604D 4" (102) Deep

1606D 6" (152) Deep

Model 1604D

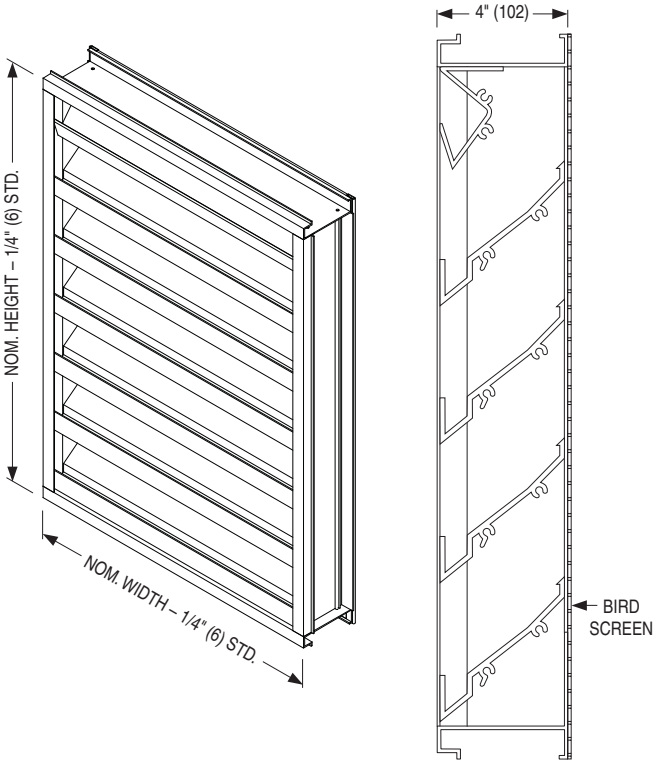
Model 1606D

Model 1604D

Model 1604D is engineered to deliver excellent weather protection in foul weather conditions with great air performance and pleasing aesthetics that compliment any structure's exterior styling. The drainable head feature is enhanced by the drainable blade design which utilizes additional rain gutters that divert collected water through concealed side downspouts and out the sill, effectively preventing water cascading down the building's face from infiltrating the space. Blades are reinforced with full length integral bosses for superior strength. Suitable for use in exhaust and low to medium velocity intake applications where water penetration concerns are a top priority. Available in channel, flanged, or glazing adapter type, the 4" (102) deep frame installs easily in most common wall configurations. Model 1604D is AMCA Licensed for Water Penetration and Air Performance.

STANDARD CONSTRUCTION:

Frame:	4" (102) deep, Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness. Integral downspouts and caulking slot provided.
Blades:	Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness, with reinforcing bosses.
Blade Angle:	Fixed at 37 degrees.
Blade Spacing:	Approximately 4" (102) on centers.
Blade Support Brackets:	Concealed type, factory installed on rear of louver on maximum 60" (1524) centers. Reinforced with 1 1/2" x 2" (38 x 51) angle (adds approx. 2" [51] to overall louver depth).
Mullions:	Concealed type allowing continuous line appearance up to 120" (3048) wide. Larger assemblies require separate visible frames with downspouts.
Screen:	3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen in removable frame, inside (rear) mount (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	120" W x 84" H (3048 x 2134) or 84" W x 120" H (2134 x 3048). 70 sq. ft. (6.5 m^2). Larger louvers will require field assembly of smaller sections.



MODEL 1604D

COMMON OPTIONS:

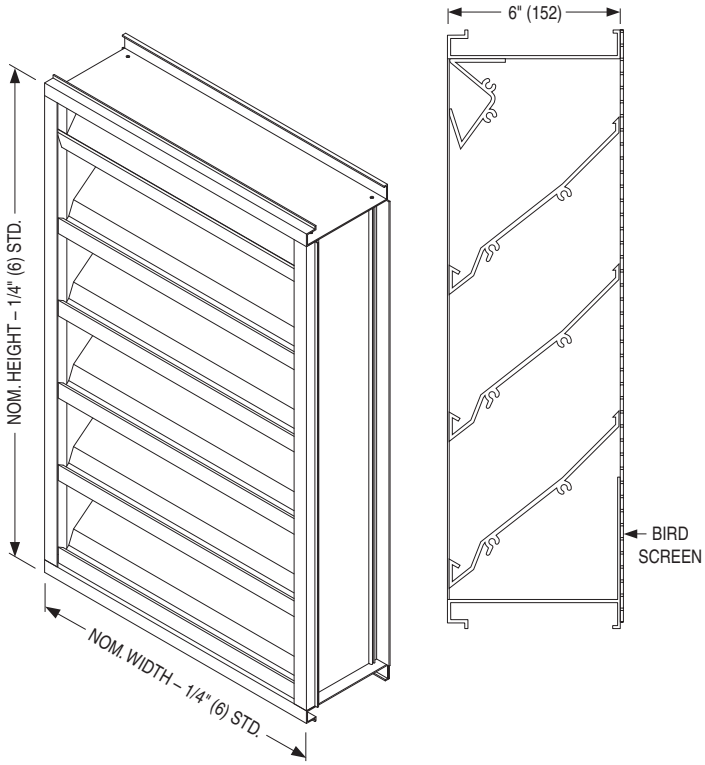
- Flanged or Glazing Adaptor Frame styles.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Aluminum Installation Clips or Continuous Angles.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.
- Clear or Color Anodized finishes.

Model 1606D

Model 1606D is designed to provide excellent weather protection in non-wind driven rain conditions with great air performance and pleasing aesthetics that compliment any structure's exterior styling. The drainable head feature is enhanced by the drainable blade design which utilizes additional rain gutters that divert collected water through concealed side downspouts and out the sill, effectively preventing water from infiltrating the space. Blades are reinforced with full length integral bosses for superior strength. Suitable for use in exhaust and low to medium velocity intake applications where water penetration concerns are a priority. Available in channel, flanged, or glazing adapter type, the 6" (152) deep frame installs easily in most common wall configurations. Model 1606D is AMCA Licensed for Water Penetration and Air Performance.

STANDARD CONSTRUCTION:

Frame:	6" (152) deep, Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness. Integral downspouts and caulking slot provided.
Blades:	Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness, with reinforcing bosses.
Blade Angle:	Fixed at 37/45 degrees.
Blade Spacing:	Approximately 5 1/2" (140) on centers.
Blade Support Brackets:	Concealed type, factory installed on rear of louver on maximum 60" (1524) centers. Reinforced with 1 1/2" x 2" (38 x 51) angle (adds approx. 2" [51] to overall louver depth).
Mullions:	Concealed type allowing continuous line appearance up to 120" (3048) wide. Larger assemblies require separate visible frames with downspouts.
Screen:	3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen in removable frame, inside (rear) mount (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	120" W x 84" H (3048 x 2134) or 84" W x 120" H (2134 x 3048). 70 sq. ft. (6.5 m^2). Larger louvers will require field assembly of smaller sections.



MODEL 1606D

COMMON OPTIONS:

- Flanged or Glazing Adaptor Frame styles.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Aluminum Installation Clips or Continuous Angles.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.
- Clear or Color Anodized finishes.

PERFORMANCE DATA:
MODEL: 1604D

FREE AREA in Square Feet and Square Meters

Height in Inches and Meters	Width in Inches and Meters																		
	12 0.30	18 0.46	24 0.61	30 0.76	36 0.91	42 1.07	48 1.22	54 1.37	60 1.52	66 1.68	72 1.83	78 1.98	84 2.13	90 2.29	96 2.44	102 2.59	108 2.74	114 2.90	120 3.05
12 0.30	**0.31** 0.03	**0.50** 0.05	**0.68** 0.06	**0.87** 0.08	**1.06** 0.10	**1.24** 0.12	**1.43** 0.13	**1.62** 0.15	**1.80** 0.17	**1.99** 0.18	**2.18** 0.20	**2.36** 0.22	**2.55** 0.24	**2.74** 0.25	**2.92** 0.27	**3.11** 0.29	**3.30** 0.31	**3.48** 0.32	**3.67** 0.34
18 0.46	**0.54** 0.05	**0.87** 0.08	**1.20** 0.11	**1.52** 0.14	**1.85** 0.17	**2.18** 0.20	**2.50** 0.23	**2.83** 0.26	**3.16** 0.29	**3.48** 0.32	**3.81** 0.35	**4.14** 0.38	**4.47** 0.41	**4.79** 0.45	**5.12** 0.48	**5.45** 0.51	**5.77** 0.54	**6.10** 0.57	**6.43** 0.60
24 0.61	**0.78** 0.07	**1.24** 0.12	**1.71** 0.16	**2.18** 0.20	**2.64** 0.25	**3.11** 0.29	**3.58** 0.33	**4.04** 0.38	**4.51** 0.42	**4.98** 0.46	**5.44** 0.51	**5.91** 0.55	**6.38** 0.59	**6.85** 0.64	**7.31** 0.68	**7.78** 0.72	**8.25** 0.77	**8.71** 0.81	**9.18** 0.85
30 0.76	**1.06** 0.10	**1.69** 0.16	**2.33** 0.22	**2.97** 0.28	**3.60** 0.33	**4.24** 0.39	**4.87** 0.45	**5.51** 0.51	**6.14** 0.57	**6.78** 0.63	**7.41** 0.69	**8.05** 0.75	**8.69** 0.81	**9.32** 0.87	**9.96** 0.92	**10.59** 0.98	**11.23** 1.04	**11.86** 1.10	**12.50** 1.16
36 0.91	**1.29** 0.12	**2.07** 0.19	**2.84** 0.26	**3.62** 0.34	**4.39** 0.41	**5.17** 0.48	**5.95** 0.55	**6.72** 0.62	**7.50** 0.70	**8.27** 0.77	**9.05** 0.84	**9.82** 0.91	**10.60** 0.98	**11.37** 1.06	**12.15** 1.13	**12.93** 1.20	**13.70** 1.27	**14.48** 1.34	**15.25** 1.42
42 1.07	**1.57** 0.15	**2.52** 0.23	**3.46** 0.32	**4.41** 0.41	**5.35** 0.50	**6.30** 0.58	**7.24** 0.67	**8.18** 0.76	**9.13** 0.85	**10.07** 0.94	**11.02** 1.02	**11.96** 1.11	**12.91** 1.20	**13.85** 1.29	**14.79** 1.37	**15.74** 1.46	**16.68** 1.55	**17.63** 1.64	**18.57** 1.73
48 1.22	**1.81** 0.17	**2.89** 0.27	**3.98** 0.37	**5.06** 0.47	**6.14** 0.57	**7.23** 0.67	**8.26** 0.77	**9.40** 0.87	**10.48** 0.97	**11.57** 1.07	**12.65** 1.18	**13.74** 1.28	**14.82** 1.38	**15.90** 1.48	**16.99** 1.58	**18.07** 1.68	**19.16** 1.78	**20.24** 1.88	**21.33** 1.98
54 1.37	**2.04** 0.19	**3.27** 0.30	**4.49** 0.42	**5.71** 0.53	**6.94** 0.64	**8.16** 0.76	**9.39** 0.87	**10.61** 0.99	**11.84** 1.10	**13.06** 1.21	**14.28** 1.33	**15.51** 1.44	**16.73** 1.55	**17.96** 1.67	**19.18** 1.78	**20.41** 1.90	**21.63** 2.01	**22.86** 2.12	**24.08** 2.24
60 1.52	**2.32** 0.22	**3.72** 0.35	**5.11** 0.47	**6.50** 0.60	**7.89** 0.73	**9.29** 0.86	**10.68** 0.99	**12.07** 1.12	**13.47** 1.25	**14.86** 1.38	**16.25** 1.51	**17.65** 1.64	**19.04** 1.77	**20.43** 1.90	**21.83** 2.03	**23.22** 2.16	**24.61** 2.29	**26.01** 2.42	**27.40** 2.55
66 1.68	**2.56** 0.24	**4.09** 0.38	**5.62** 0.52	**7.15** 0.66	**8.69** 0.81	**10.22** 0.95	**11.75** 1.09	**13.29** 1.23	**14.82** 1.38	**16.35** 1.52	**17.89** 1.66	**19.42** 1.80	**20.95** 1.95	**22.49** 2.09	**24.02** 2.23	**25.55** 2.37	**27.09** 2.52	**28.62** 2.66	**30.15** 2.80
72 1.83	**2.84** 0.26	**4.54** 0.42	**6.24** 0.58	**7.94** 0.74	**9.64** 0.90	**11.35** 1.05	**13.05** 1.21	**14.75** 1.37	**16.45** 1.53	**18.15** 1.69	**19.86** 1.84	**21.56** 2.00	**23.26** 2.16	**24.96** 2.32	**26.66** 2.48	**28.37** 2.64	**30.07** 2.79	**31.77** 2.95	**33.47** 3.11
78 1.98	**3.07** 0.29	**4.91** 0.46	**6.75** 0.63	**8.60** 0.80	**10.44** 0.97	**12.28** 1.14	**14.12** 1.31	**15.96** 1.48	**17.81** 1.65	**19.65** 1.83	**21.49** 2.00	**23.33** 2.17	**25.17** 2.34	**27.02** 2.51	**28.86** 2.68	**30.70** 2.85	**32.54** 3.02	**34.38** 3.19	**36.23** 3.37
84 2.13	**3.30** 0.31	**5.29** 0.49	**7.27** 0.68	**9.25** 0.86	**11.23** 1.04	**13.21** 1.23	**15.20** 1.41	**17.18** 1.60	**19.16** 1.78	**21.14** 1.96	**23.12** 2.15	**25.11** 2.33	**27.09** 2.52	**29.07** 2.70	**31.05** 2.88	**33.03** 3.07	**35.02** 3.25	**37.00** 3.44	**38.98** 3.62
90 2.29	**3.58** 0.33	**5.74** 0.53	**7.89** 0.73	**10.04** 0.93	**12.19** 1.13	**14.34** 1.33	**16.49** 1.53	**18.64** 1.73	**20.79** 1.93	**22.94** 2.13	**25.09** 2.33	**27.24** 2.53	**29.39** 2.73	**31.55** 2.93	**33.70** 3.13	**35.85** 3.33	**38.00** 3.53	**40.15** 3.73	**42.30** 3.93
96 2.44	**3.82** 0.35	**6.11** 0.57	**8.40** 0.78	**10.69** 0.99	**12.98** 1.21	**15.27** 1.42	**17.56** 1.63	**19.85** 1.84	**22.15** 2.06	**24.44** 2.27	**26.73** 2.48	**29.02** 2.70	**31.31** 2.91	**33.60** 3.12	**35.89** 3.33	**38.18** 3.55	**40.47** 3.76	**42.76** 3.97	**45.05** 4.19
102 2.59	**4.10** 0.38	**6.56** 0.61	**9.02** 0.84	**11.48** 1.07	**13.94** 1.29	**16.40** 1.52	**18.86** 1.75	**21.32** 1.98	**23.78** 2.21	**26.24** 2.44	**28.70** 2.67	**31.16** 2.89	**33.62** 3.12	**36.08** 3.35	**38.53** 3.58	**40.99** 3.81	**43.45** 4.04	**45.91** 4.27	**48.37** 4.49
108 2.74	**4.33** 0.40	**6.93** 0.64	**9.53** 0.89	**12.13** 1.13	**14.73** 1.37	**17.33** 1.61	**19.93** 1.85	**22.53** 2.09	**25.13** 2.33	**27.73** 2.58	**30.33** 2.82	**32.93** 3.06	**35.53** 3.30	**38.13** 3.54	**40.73** 3.78	**43.33** 4.03	**45.93** 4.27	**48.53** 4.51	**51.53** 4.75
114 2.90	**4.57** 0.42	**7.31** 0.68	**1005** 0.93	**12.79** 1.19	**15.53** 1.44	**18.26** 1.70	**21.00** 1.95	**23.74** 2.21	**26.48** 2.46	**29.22** 2.71	**31.96** 2.97	**34.70** 3.22	**37.44** 3.48	**40.18** 3.73	**42.92** 3.99	**45.66** 4.24	**48.40** 4.50	**51.14** 4.75	**53.88** 5.01
120 3.05	**4.85** 0.45	**7.76** 0.72	**10.66** 0.99	**13.57** 1.26	**16.48** 1.53	**19.39** 1.80	**22.30** 2.07	**25.21** 2.34	**28.12** 2.61	**31.02** 2.88	**33.93** 3.15	**36.84** 3.42	**39.75** 3.69	**42.66** 3.96	**45.57** 4.23	**48.48** 4.50	**51.38** 4.77	**54.29** 5.04	**57.20** 5.31

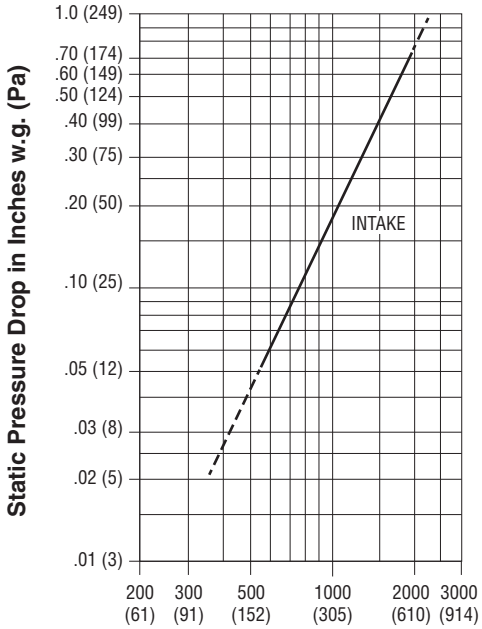
AIRFLOW/WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1604D
	Free Area %	52%
	Free Area sq. ft. (sq. m.)	8.26 (0.77)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	906 fpm (272 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	7484 cfm (3532 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.15 in. w.g. (37 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

Nailor Industries Inc. certifies the Model 1604D, shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Air Performance and Water Penetration ratings.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

PERFORMANCE DATA:
MODEL: 1606D

FREE AREA in Square Feet and Square Meters

Height in Inches and Meters	Width in Inches and Meters																		
	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
	0.30	0.46	0.61	0.76	0.91	1.07	1.22	1.37	1.52	1.68	1.83	1.98	2.13	2.29	2.44	2.59	2.74	2.90	3.05
12	**0.24**	**0.39**	**0.54**	**0.70**	**0.85**	**1.00**	**1.15**	**1.30**	**1.45**	**1.60**	**1.75**	**1.90**	**2.05**	**2.20**	**2.36**	**2.51**	**2.66**	**2.81**	**2.96**
0.30	0.02	0.04	0.05	0.06	0.08	0.09	0.11	0.12	0.13	0.15	0.16	0.18	0.19	0.20	0.22	0.23	0.25	0.26	0.27
18	**0.41**	**0.67**	**0.93**	**1.19**	**1.45**	**1.70**	**1.96**	**2.22**	**2.48**	**2.74**	**2.99**	**3.25**	**3.51**	**3.77**	**4.03**	**4.28**	**4.54**	**4.80**	**5.06**
0.46	0.04	0.06	0.09	0.11	0.13	0.16	0.18	0.21	0.23	0.25	0.28	0.30	0.33	0.35	0.37	0.40	0.42	0.45	0.47
24	**0.68**	**1.10**	**1.53**	**1.95**	**2.38**	**2.80**	**3.23**	**3.65**	**4.07**	**4.50**	**4.92**	**5.35**	**5.77**	**6.20**	**6.62**	**7.04**	**7.47**	**7.89**	**8.32**
0.61	0.06	0.10	0.14	0.18	0.22	0.26	0.30	0.34	0.38	0.42	0.46	0.50	0.54	0.58	0.61	0.65	0.69	0.73	0.77
30	**0.93**	**1.51**	**2.09**	**2.67**	**3.25**	**3.83**	**4.40**	**4.98**	**5.56**	**6.14**	**6.72**	**7.30**	**7.88**	**8.46**	**9.04**	**9.62**	**10.20**	**10.78**	**11.35**
0.76	0.09	0.14	0.19	0.25	0.30	0.36	0.41	0.46	0.52	0.57	0.62	0.68	0.73	0.79	0.84	0.89	0.95	1.00	1.05
36	**1.09**	**1.77**	**2.45**	**3.13**	**3.81**	**4.49**	**5.17**	**5.85**	**6.53**	**7.21**	**7.89**	**8.58**	**9.26**	**9.94**	**10.62**	**11.30**	**11.98**	**12.66**	**13.34**
0.36	0.10	0.16	0.23	0.29	0.35	0.42	0.48	0.54	0.61	0.67	0.73	0.80	0.86	0.92	0.99	1.05	1.11	1.18	1.24
42	**1.44**	**2.34**	**3.23**	**4.13**	**5.03**	**5.92**	**6.82**	**7.72**	**8.61**	**9.51**	**10.41**	**11.30**	**12.20**	**13.10**	**13.99**	**14.89**	**15.79**	**16.68**	**17.58**
1.07	0.13	0.22	0.30	0.38	0.47	0.55	0.63	0.72	0.80	0.88	0.97	1.05	1.13	1.22	1.30	1.38	1.47	1.55	1.63
48	**1.69**	**2.74**	**3.79**	**4.84**	**5.89**	**6.94**	**7.99**	**9.05**	**10.10**	**11.15**	**12.20**	**13.25**	**14.30**	**15.35**	**16.40**	**17.46**	**18.51**	**19.56**	**20.61**
1.22	0.16	0.25	0.35	0.45	0.55	0.65	0.74	0.84	0.94	1.04	1.13	1.23	1.33	1.43	1.52	1.62	1.72	1.82	1.91
54	**1.94**	**3.15**	**4.36**	**5.57**	**6.78**	**7.99**	**9.20**	**10.41**	**11.62**	**12.83**	**14.04**	**15.25**	**16.46**	**17.67**	**18.88**	**20.09**	**21.30**	**22.51**	**23.72**
1.37	0.18	0.29	0.41	0.52	0.63	0.74	0.85	0.97	1.08	1.19	1.30	1.42	1.53	1.64	1.75	1.87	1.98	2.09	2.20
60	**2.19**	**3.56**	**4.93**	**6.30**	**7.67**	**9.04**	**10.40**	**11.77**	**13.14**	**14.51**	**15.88**	**17.24**	**18.61**	**19.98**	**21.35**	**22.72**	**24.08**	**25.45**	**26.82**
1.52	0.20	0.33	0.46	0.59	0.71	0.84	0.97	1.09	1.22	1.35	1.47	1.60	1.73	1.86	1.98	2.11	2.24	2.36	2.49
66	**2.45**	**3.98**	**5.50**	**7.03**	**8.55**	**10.08**	**11.61**	**13.13**	**14.66**	**16.19**	**17.71**	**19.24**	**20.77**	**22.29**	**23.82**	**25.34**	**26.87**	**28.40**	**29.92**
1.68	0.23	0.37	0.51	0.65	0.79	0.94	1.08	1.22	1.36	1.50	1.65	1.79	1.93	2.07	2.21	2.35	2.50	2.64	2.78
72	**2.70**	**4.39**	**6.07**	**7.76**	**9.45**	**11.13**	**12.82**	**14.50**	**16.19**	**17.87**	**19.56**	**21.24**	**22.93**	**24.61**	**26.30**	**27.98**	**29.67**	**31.36**	**33.04**
1.83	0.25	0.41	0.56	0.72	0.88	1.03	1.19	1.35	1.50	1.66	1.82	1.97	2.13	2.29	2.44	2.60	2.76	2.91	3.07
78	**2.96**	**4.80**	**6.65**	**8.49**	**10.33**	**12.18**	**14.02**	**15.86**	**17.71**	**19.55**	**21.40**	**23.24**	**25.08**	**26.93**	**28.77**	**30.61**	**32.46**	**34.30**	**36.14**
1.98	0.27	0.45	0.62	0.79	0.96	1.13	1.30	1.47	1.65	1.82	1.99	2.16	2.33	2.50	2.67	2.84	3.02	3.19	3.36
84	**3.21**	**5.22**	**7.22**	**9.22**	**11.22**	**13.23**	**15.23**	**17.23**	**19.23**	**21.24**	**23.24**	**25.24**	**27.24**	**29.25**	**31.25**	**33.25**	**35.25**	**37.26**	**39.26**
2.13	0.30	0.48	0.67	0.86	1.04	1.23	1.41	1.60	1.79	1.97	2.16	2.34	2.53	2.72	2.90	3.09	3.28	3.46	3.65
90	**3.47**	**5.63**	**7.79**	**9.95**	**12.11**	**14.27**	**16.44**	**18.60**	**20.76**	**22.96**	**25.08**	**27.24**	**29.40**	**31.57**	**33.73**	**35.89**	**38.05**	**40.21**	**42.37**
2.29	0.32	0.52	0.72	0.92	1.13	1.33	1.53	1.73	1.93	2.13	2.33	2.53	2.73	2.93	3.13	3.33	3.53	3.74	3.94
96	**3.72**	**6.04**	**8.36**	**10.68**	**13.00**	**15.32**	**17.64**	**19.96**	**22.29**	**24.61**	**26.93**	**29.25**	**31.57**	**33.89**	**36.21**	**38.53**	**40.85**	**43.17**	**45.49**
2.44	0.35	0.56	0.78	0.99	1.21	1.42	1.64	1.85	2.07	2.29	2.50	2.72	2.93	3.15	3.36	3.58	3.79	4.01	4.23
102	**3.98**	**6.46**	**8.94**	**11.41**	**13.89**	**16.37**	**18.85**	**21.33**	**23.81**	**26.29**	**28.77**	**31.25**	**33.73**	**36.20**	**38.68**	**41.16**	**43.64**	**46.12**	**48.60**
2.59	0.37	0.60	0.83	1.06	1.29	1.52	1.75	1.98	2.21	2.44	2.67	2.90	3.13	3.36	3.59	3.82	4.05	4.28	4.51
108	**4.23**	**6.87**	**9.51**	**12.15**	**14.78**	**17.42**	**20.06**	**22.70**	**25.33**	**27.97**	**30.61**	**33.25**	**35.89**	**38,52**	**41.16**	**43.80**	**46.44**	**49.08**	**51.71**
2.74	0.39	0.64	0.88	1.13	1.37	1.62	1.86	2.11	2.35	2.60	2.84	3.09	3.33	3.58	3.82	4.07	4.31	4.56	4.80
114	**4.51**	**7.31**	**10.12**	**12.93**	**15.74**	**18.55**	**21.36**	**24.16**	**26.97**	**29.78**	**32.59**	**35.40**	**38.21**	**41.02**	**43.82**	**46.63**	**49.44**	**52.25**	**55.06**
2.90	0.42	0.68	0.94	1.20	1.46	1.72	1.98	2.24	2.51	2.77	3.03	3.29	3.55	3.81	4.07	4.33	4.59	4.85	5.11
120	**4.74**	**7.70**	**10.66**	**13.61**	**16.57**	**19.52**	**22.48**	**25.44**	**28.39**	**31.35**	**34.31**	**37.26**	**40.22**	**43.17**	**46.13**	**49.09**	**52.04**	**55.00**	**57.96**
3.05	0.44	0.72	0.99	1.26	1.54	1.81	2.09	2.36	2.64	2.91	3.19	3.46	3.74	4.01	4.29	4.56	4.83	5.11	5.38

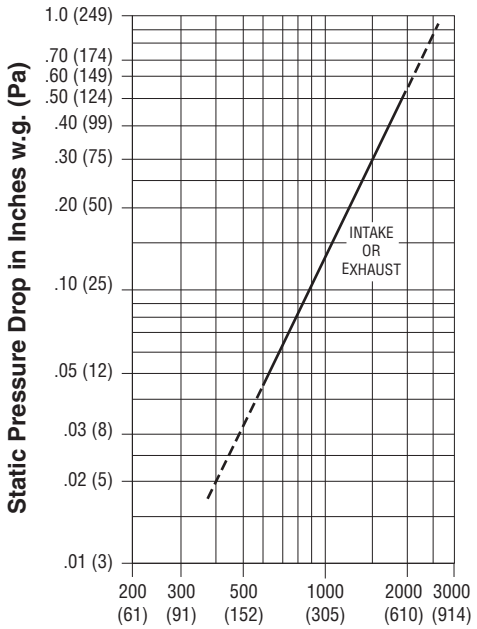
AIRFLOW / WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1606D
	Free Area %	50%
	Free Area sq. ft. (sq. m.)	7.99 (0.74)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	1195 fpm (364 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	9452 cfm (4460 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.18 in. w.g. (45 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

Nailor Industries Inc. certifies the Model 1606D, shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Air Performance and Water Penetration ratings.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 - 6.5.

HOW TO SPECIFY

MODEL 1604D

EXTRUDED ALUMINUM DRAINABLE BLADE LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 4" (102) deep channel type (**or specifier to select:** flanged type **or** glazing adapter type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from ASTM B211 Alloy 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness. Blades shall be stationary drainable style, with drain gutter in each blade and gutter in head frame, constructed from type 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness with reinforcing bosses, fixed at 37 degrees on approximately 4" (102) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Concealed downspouts in jambs to drain water from louver for minimum water cascade from blade to blade. Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Concealed type mullions for louvers up to 120" (3048) wide allowing continuous line appearance. Large louvers that require multiple sections for shipping shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty **or** 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Furnish where indicated on plans and/or schedules, blank-off panels fabricated by the louver manufacturer. Blank-off panels to be 0.040" (1.02) thick aluminum sheet (**or specifier to select:** 0.040" [1.0] thick aluminum sheet with 1" [25] insulation **or** 0.040" [1.02] thick aluminum sheet with 2" [51] insulation **or** 20 ga. [1.0] galvanized steel **or** 20 ga. [1.0] galvanized steel with 1" [25] insulation **or** 20 ga. [1.0] galvanized steel with 2" [51] insulation). Blank-off panels to be finished to match louvers.

Performance data must be licensed by AMCA under the AMCA 511 Certified Ratings Program and shall bear the AMCA Certified Ratings seal for water penetration and air performance. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1604D.

MODEL 1606D

EXTRUDED ALUMINUM DRAINABLE BLADE LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 6" (152) deep channel type (**or specifier to select:** flanged type **or** glazing adapter type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from ASTM B211 Alloy 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness. Blades shall be stationary drainable style, with drain gutter in each blade and gutter in head frame. Concealed downspouts in jambs to drain water from louver for minimum water cascade from blade to blade. Constructed from type 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness, fixed at 37/45 degrees on approximately 5 1/2" (140) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Concealed type mullions for louvers up to 120" (3048) wide allowing continuous line appearance. Large louvers that require multiple sections for shipping shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty **or** 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Furnish where indicated on plans and/or schedules, blank-off panels fabricated by the louver manufacturer. Blank-off panels to be 0.040" (1.02) thick aluminum sheet (**or specifier to select:** 0.040" [1.02] thick aluminum sheet with 1" [25] insulation **or** 0.040" [1.02] thick aluminum sheet with 2" [51] insulation **or** 20 ga. [1.0] galvanized steel **or** 20 ga. [1.0] galvanized steel with 1" [25] insulation **or** 20 ga. [1.0] galvanized steel with 2" [51] insulation). Blank-off panels to be finished to match louvers.

Performance data must be licensed by AMCA under the AMCA 511 Certified Ratings Program and shall bear the AMCA Certified Ratings seal for water penetration and air performance. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1606D.

- AMCA LICENSED
- DUAL DRAINABLE BLADE
- DRAINABLE HEAD
- PROTECTS AGAINST HEAVY RAIN
- SUPERIOR PERFORMANCE

Models:

1604DD 4" (102) Deep
1606DD 6" (152) Deep

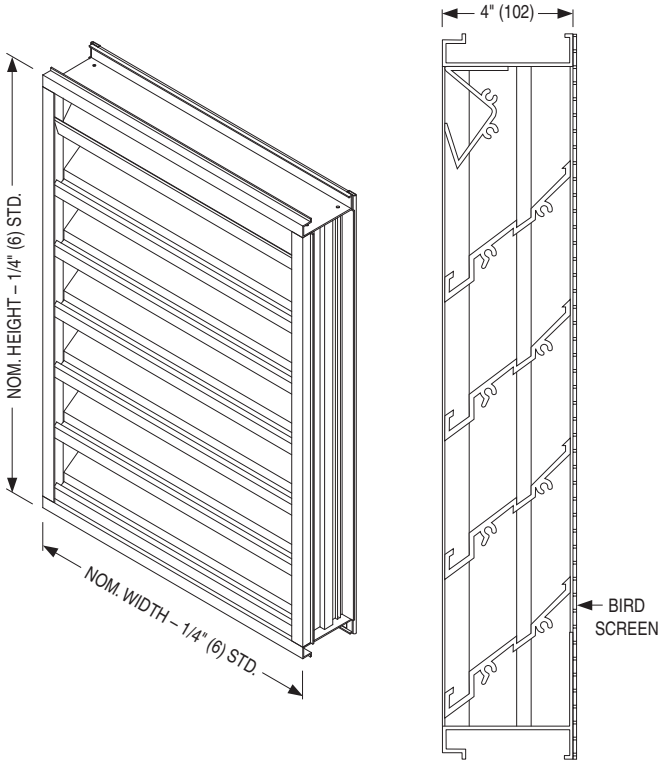
Model 1604DD Model 1606DD

Model 1604DD

Model's 1604DD combines exceptional weather protection during the most enduring non-wind driven rain conditions, great air performance through a large free area and pleasing aesthetics that enhance any structure's exterior design. Complemented by a drainable head, the dual drainable blade design utilizes double rain gutters that divert collected water down concealed side downspouts and out through the sill, preventing water from infiltrating the space. Blades are reinforced with full length integral bosses for superior strength. Suitable for use in exhaust and medium to high velocity intake applications where water penetration concerns are a top priority. Available in channel, flanged, or glazing adapter type, the 4" (102) deep frame installs easily in most common wall configurations. Model 1604DD is AMCA Licensed for Water Penetration and Air Performance.

STANDARD CONSTRUCTION:

Frame:	4" (102) deep, Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness. Integral downspouts and caulking slot provided.
Blades:	Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness, with reinforcing bosses.
Blade Angle:	Fixed at 37 degrees.
Blade Spacing:	Approximately 4" (102) on centers.
Blade Support Brackets:	Concealed type, factory installed on rear of louver on maximum 60" (1524) centers. Reinforced with 1 1/2" x 2" (38 x 51) angle (adds approx. 2" [51] to overall louver depth).
Mullions:	Concealed type allowing continuous line appearance up to 120" (3048) wide. Larger assemblies require separate visible frames with downspouts.
Screen:	3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen in removable frame, inside (rear) mount (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	120" W x 84" H (3048 x 2134) or 84" W x 120" H (2134 x 3048). 70 sq. ft. (6.5 m^2). Larger louvers will require field assembly of smaller sections.



MODEL 1604DD

COMMON OPTIONS:

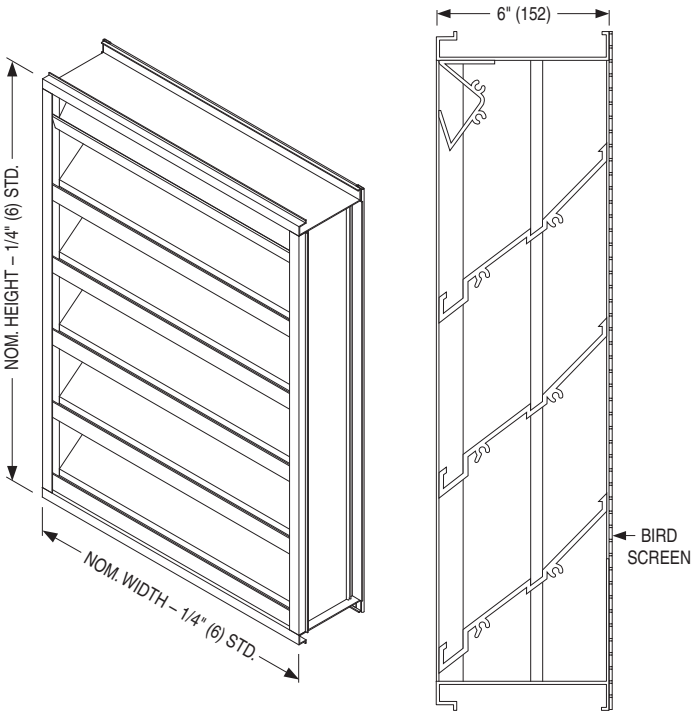
- Flanged or Glazing Adaptor Frame styles.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Aluminum Installation Clips or Continuous Angles.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.
- Clear or Color Anodized finishes.

Model 1606DD

Model 1606DD combines exceptional weather protection during the most enduring non-wind driven rain conditions, great air performance through a large free area and a clean look that will enhance the exterior of any structure. Complemented by a drainable head, the dual drainable blade design features double rain gutters that divert cascading water running down the building's face down concealed side downspouts and out through the sill, preventing water from infiltrating the space. Blades are reinforced with full length integral bosses for superior strength. Suitable for use in exhaust and medium to high velocity intake applications where water penetration concerns are a top priority. Available in channel, flanged, or glazing adapter type, the 6" (152) deep frame installs easily in most common wall configurations. Model 1606DD is AMCA Licensed for Water Penetration and Air Performance.

STANDARD CONSTRUCTION:

Frame:	6" (152) deep, Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness. Integral downspouts and caulking slot provided.
Blades:	Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness, with reinforcing bosses.
Blade Angle:	Fixed at 37 degrees.
Blade Spacing:	Approximately 6" (152) on centers.
Blade Support Brackets:	Concealed type, factory installed on rear of louver on maximum 60" (1524) centers. Reinforced with 1 1/2" x 2" (38 x 51) angle (adds approx. 2" [51] to overall louver depth).
Mullions:	Concealed type allowing continuous line appearance up to 120" (3048) wide. Larger assemblies require separate visible frames with downspouts.
Screen:	3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen in removable frame, inside (rear) mount (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	120" W x 84" H (3048 x 2134) or 84" W x 120" H (2134 x 3048). 70 sq. ft. (6.5 m^2). Larger louvers will require field assembly of smaller sections.



MODEL 1606DD

COMMON OPTIONS:

- Flanged or Glazing Adaptor Frame styles.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Aluminum Installation Clips or Continuous Angles.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.
- Clear or Color Anodized finishes.

PERFORMANCE DATA:
MODEL: 1604DD

FREE AREA in Square Feet and Square Meters

Height in Inches and Meters	Width in Inches and Meters																		
	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
	0.30	0.46	0.61	0.76	0.91	1.07	1.22	1.37	1.52	1.68	1.83	1.98	2.13	2.29	2.44	2.59	2.74	2.90	3.05
12	**0.23**	**0.37**	**0.51**	**0.65**	**0.79**	**0.93**	**1.07**	**1.21**	**1.35**	**1.49**	**1.63**	**1.77**	**1.91**	**2.05**	**2.19**	**2.33**	**2.47**	**2.61**	**2.75**
0.30	0.02	0.03	0.05	0.06	0.07	0.09	0.10	0.11	0.13	0.14	0.15	0.16	0.18	0.19	0.20	0.22	0.23	0.24	0.26
18	**0.54**	**0.86**	**1.18**	**1.51**	**1.83**	**2.15**	**2.47**	**2.80**	**3.12**	**3.44**	**3.77**	**4.09**	**4.41**	**4.73**	**5.06**	**5.38**	**5.70**	**6.02**	**6.35**
0.46	0.05	0.08	0.11	0.14	0.17	0.20	0.23	0.26	0.29	0.32	0.35	0.38	0.41	0.44	0.47	0.50	0.53	0.56	0.59
24	**0.73**	**1.17**	**1.61**	**2.05**	**2.49**	**2.93**	**3.37**	**3.81**	**4.25**	**4.69**	**5.13**	**5.57**	**6.01**	**6.45**	**6.89**	**7.33**	**7.77**	**8.21**	**8.65**
0.61	0.07	0.11	0.15	0.19	0.23	0.27	0.31	0.35	0.40	0.44	0.48	0.52	0.56	0.60	0.64	0.68	0.72	0.76	0.80
30	**1.01**	**1.62**	**2.23**	**2.83**	**3.44**	**4.05**	**4.65**	**5.26**	**5.87**	**6.47**	**7.08**	**7.69**	**8.30**	**8.90**	**9.51**	**10.12**	**10.72**	**11.33**	**11.94**
0.76	0.09	0.15	0.21	0.26	0.32	0.38	0.43	0.49	0.55	0.60	0.66	0.71	0.77	0.83	0.88	0.94	1.00	1.05	1.11
36	**1.29**	**2.06**	**2.84**	**3.61**	**4.39**	**5.16**	**5.93**	**6.71**	**7.48**	**8.26**	**9.03**	**9.80**	**10.58**	**11.35**	**12.13**	**12.90**	**13.67**	**14.45**	**15.22**
0.91	0.12	0.19	0.26	0.34	0.41	0.48	0.55	0.62	0.70	0.77	0.84	0.91	0.98	1.05	1.13	1.20	1.27	1.34	1.41
42	**1.51**	**2.42**	**3.33**	**4.24**	**5.15**	**6.06**	**6.96**	**7.87**	**8.78**	**9.69**	**10.60**	**11.51**	**12.41**	**13.32**	**14.23**	**15.14**	**16.05**	**16.95**	**17.86**
1.07	0.14	0.23	0.31	0.39	0.48	0.56	0.65	0.73	0.82	0.90	0.98	1.07	1.15	1.24	1.32	1.41	1.49	1.58	1.66
48	**1.79**	**2.87**	**3.94**	**5.02**	**6.09**	**7.17**	**8.14**	**9.32**	**10.39**	**11.47**	**12.54**	**13.62**	**14.69**	**15.77**	**16.84**	**17.92**	**18.99**	**20.07**	**21.14**
1.22	0.17	0.27	0.37	0.47	0.57	0.67	0.76	0.87	0.97	1.07	1.17	1.27	1.37	1.46	1.56	1.66	1.76	1.86	1.96
54	**2.07**	**3.31**	**4.55**	**5.80**	**7.04**	**8.28**	**9.52**	**10.76**	**12.00**	**13.25**	**14.49**	**15.73**	**16.97**	**18.21**	**19.46**	**20.70**	**21.94**	**23.18**	**24.42**
1.37	0.19	0.31	0.42	0.54	0.65	0.77	0.88	1.00	1.12	1.23	1.35	1.46	1.58	1.69	1.81	1.92	2.04	2.15	2.27
60	**2.29**	**3.67**	**5.05**	**6.42**	**7.80**	**9.18**	**10.55**	**11.93**	**13.30**	**14.68**	**16.06**	**17.43**	**18.81**	**20.19**	**21.56**	**22.94**	**24.32**	**25.69**	**27.07**
1.52	0.21	0.34	0.47	0.60	0.72	0.85	0.98	1.11	1.24	1.36	1.49	1.62	1.75	1.88	2.00	2.13	2.26	2.39	2.51
66	**2.58**	**4.13**	**5.68**	**7.23**	**8.78**	**10.32**	**11.87**	**13.42**	**14.97**	**16.52**	**18.07**	**19.61**	**21.16**	**22.71**	**24.26**	**25.81**	**27.36**	**28.91**	**30.45**
1.68	0.24	0.38	0.53	0.67	0.82	0.96	1.10	1.25	1.39	1.53	1.68	1.82	1.97	2.11	2.25	2.40	2.54	2.69	2.83
72	**2.80**	**4.47**	**6.15**	**7.83**	**9.50**	**11.18**	**12.86**	**14.54**	**16.21**	**17.89**	**19.57**	**21.25**	**22.92**	**24.60**	**26.28**	**27.96**	**29.63**	**31.31**	**32.99**
1.83	0.26	0.42	0.57	0.73	0.88	1.04	1.19	1.35	1.51	1.66	1.82	1.97	2.13	2.29	2.44	2.60	2.75	2.91	3.06
78	**3.07**	**4.92**	**6.76**	**8.61**	**10.45**	**12.30**	**14.14**	**15.99**	**17.83**	**19.67**	**21.52**	**23.36**	**25.21**	**27.05**	**28.90**	**30.74**	**32.59**	**34.43**	**36.28**
1.98	0.29	0.46	0.63	0.80	0.97	1.14	1.31	1.49	1.66	1.83	2.00	2.17	2.34	2.51	2.68	2.86	3.03	3.20	3.37
84	**3.35**	**5.36**	**7.38**	**9.39**	**11.40**	**13.41**	**15.42**	**17.43**	**19.44**	**21.45**	**23.47**	**25.48**	**27.49**	**29.50**	**31.51**	**33.52**	**35.53**	**37.55**	**39.56**
2.13	0.31	0.50	0.69	0.87	1.06	1.25	1.43	1.62	1.81	1.99	2.18	2.37	2.55	2.74	2.93	3.11	3.30	3.49	3.67
90	**3.58**	**5.72**	**7.87**	**10.01**	**12.16**	**14.30**	**16.45**	**18.59**	**20.74**	**22.88**	**25.03**	**27.17**	**29.32**	**31.46**	**33.61**	**35.75**	**37.90**	**40.04**	**42.19**
2.29	0.33	0.53	0.73	0.93	1.13	1.33	1.53	1.73	1.93	2.13	2.33	2.52	2.72	2.92	3.12	3.32	3.52	3.72	3.92
96	**3.85**	**6.17**	**8.48**	**10.79**	**13.10**	**15.42**	**17.73**	**20.04**	**22.35**	**24.67**	**26.98**	**29.29**	**31.60**	**33.91**	**36.23**	**38.54**	**40.85**	**43.16**	**45.48**
2.44	0.36	0.57	0.79	1.00	1.22	1.43	1.65	1.86	2.08	2.29	2.51	2.72	2.94	3.15	3.37	3.58	3.80	4.01	4.22
102	**4.14**	**6.62**	**9.10**	**11.58**	**14.06**	**16.55**	**19.03**	**21.51**	**23.99**	**26.47**	**28.95**	**31.44**	**33.92**	**36.40**	**38.88**	**41.36**	**43.85**	**46.33**	**48.81**
2.59	0.38	0.61	0.85	1.08	1.31	1.54	1.77	2.00	2.23	2.46	2.69	2.92	3.15	3.38	3.61	3.84	4.07	4.30	4.53
108	**4.36**	**6.97**	**9.58**	**12.20**	**14.81**	**17.42**	**20.04**	**22.65**	**25.27**	**27.88**	**30.49**	**33.11**	**35.72**	**38.33**	**40.95**	**43.56**	**46.17**	**48.79**	**51.40**
2.74	0.40	0.65	0.89	1.13	1.38	1.62	1.86	2.10	2.35	2.59	2.83	3.08	3.32	3.56	3.80	4.05	4.29	4.53	4.78
114	**4.63**	**7.42**	**10.20**	**12.98**	**15.76**	**18.54**	**21.32**	**24.10**	**26.88**	**29.66**	**32.44**	**35.22**	**38.00**	**40.78**	**43.56**	**46.34**	**49.13**	**51.91**	**54.69**
2.90	0.43	0.69	0.95	1.21	1.46	1.72	1.98	2.24	2.50	2.76	3.01	3.27	3.53	3.79	4.05	4.31	4.56	4.82	5.08
120	**4.86**	**7.77**	**10.69**	**13.60**	**16.51**	**19.43**	**22.34**	**25.26**	**28.17**	**31.09**	**34.00**	**36.91**	**39.83**	**42.74**	**45.66**	**48.57**	**51.49**	**54.40**	**57.32**
3.05	0.45	0.72	0.99	1.26	1.53	1.80	2.08	2.35	2.62	2.89	3.16	3.43	3.70	3.97	4.24	4.51	4.78	5.05	5.32

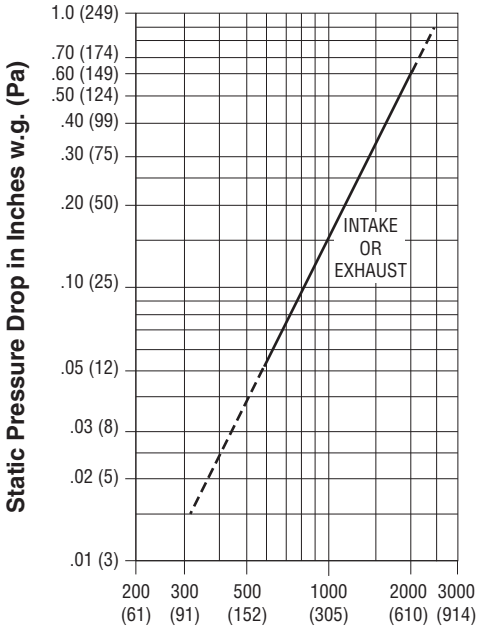
AIRFLOW / WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1604DD
	Free Area %	51%
	Free Area sq. ft. (sq. m.)	8.14 (0.76)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	1000 fpm (305 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	8140 cfm (3841 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.16 in. w.g. (40 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

Nailor Industries Inc. certifies the Model 1604DD, shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Air Performance and Water Penetration ratings.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

PERFORMANCE DATA:
MODEL: 1606DD

FREE AREA in Square Feet and Square Meters

Height in Inches and Meters	Width in Inches and Meters																		
	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
	0.30	0.46	0.61	0.76	0.91	1.07	1.22	1.37	1.52	1.68	1.83	1.98	2.13	2.29	2.44	2.59	2.74	2.90	3.05
12	**0.18**	**0.29**	**0.39**	**0.50**	**0.61**	**0.72**	**0.82**	**0.93**	**1.04**	**1.15**	**1.25**	**1.36**	**1.47**	**1.58**	**1.68**	**1.79**	**1.90**	**2.01**	**2.11**
0.30	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20
18	**0.43**	**0.69**	**0.95**	**1.21**	**1.47**	**1.73**	**1.99**	**2.25**	**2.51**	**2.77**	**3.03**	**3.29**	**3.55**	**3.81**	**4.07**	**4.33**	**4.59**	**4.85**	**5.11**
0.46	0.04	0.06	0.09	0.11	0.14	0.16	0.19	0.21	0.23	0.26	0.28	0.31	0.33	0.35	0.38	0.40	0.43	0.45	0.47
24	**0.69**	**1.10**	**1.51**	**1.92**	**2.33**	**2.75**	**3.16**	**3.57**	**3.98**	**4.40**	**4.81**	**5.22**	**5.63**	**6.04**	**6.46**	**6.87**	**7.28**	**7.69**	**8.10**
0.61	0.06	0.10	0.14	0.18	0.22	0.26	0.29	0.33	0.37	0.41	0.45	0.48	0.52	0.56	0.60	0.64	0.68	0.71	0.75
30	**0.95**	**1.51**	**2.08**	**2.65**	**3.22**	**3.78**	**4.35**	**4.92**	**5.49**	**6.05**	**6.62**	**7.19**	**7.76**	**8.32**	**8.89**	**9.46**	**10.02**	**10.59**	**11.16**
0.76	0.09	0.14	0.19	0.25	0.30	0.35	0.40	0.46	0.51	0.56	0.62	0.67	0.72	0.77	0.83	0.88	0.93	0.98	1.04
36	**1.21**	**1.93**	**2.65**	**3.37**	**4.10**	**4.82**	**5.54**	**6.27**	**6.99**	**7.71**	**8.44**	**9.16**	**9.88**	**10.60**	**11.33**	**12.05**	**12.77**	**13.50**	**14.22**
0.91	0.11	0.18	0.25	0.31	0.38	0.45	0.51	0.58	0.65	0.72	0.78	0.85	0.92	0.99	1.05	1.12	1.19	1.25	1.32
42	**1.46**	**2.34**	**3.22**	**4.10**	**4.98**	**5.86**	**6.74**	**7.62**	**8.50**	**9.37**	**10.25**	**11.13**	**12.01**	**12.89**	**13.77**	**14.65**	**15.53**	**16.41**	**17.28**
1.07	0.14	0.22	0.30	0.38	0.46	0.54	0.63	0.71	0.79	0.87	0.95	1.03	1.12	1.20	1.28	1.36	1.44	1.52	1.61
48	**1.72**	**2.76**	**3.79**	**4.83**	**5.86**	**6.90**	**7.92**	**8.96**	**10.00**	**11.03**	**12.07**	**13.10**	**14.14**	**15.17**	**16.21**	**17.24**	**18.27**	**19.31**	**20.34**
1.22	0.16	0.26	0.35	0.45	0.54	0.64	0.74	0.83	0.93	1.03	1.12	1.22	1.31	1.41	1.51	1.60	1.70	1.79	1.89
54	**1.98**	**3.17**	**4.36**	**5.55**	**6.74**	**7.93**	**9.12**	**10.31**	**11.50**	**12.69**	**13.88**	**15.07**	**16.26**	**17.45**	**18.64**	**19.83**	**21.02**	**22.21**	**23.40**
1.37	0.18	0.29	0.41	0.52	0.63	0.74	0.85	0.96	1.07	1.18	1.29	1.40	1.51	1.62	1.73	1.84	1.95	2.06	2.17
60	**2.30**	**3.68**	**5.06**	**6.44**	**7.81**	**9.19**	**10.57**	**11.95**	**13.33**	**14.71**	**16.09**	**17.47**	**18.85**	**20.22**	**21.60**	**22.98**	**24.36**	**25.74**	**27.12**
1.52	0.21	0.34	0.47	0.60	0.73	0.85	0.98	1.11	1.24	1.37	1.49	1.62	1.75	1.88	2.01	2.14	2.26	2.39	2.52
66	**2.50**	**4.00**	**5.50**	**7.01**	**8.51**	**10.01**	**11.51**	**13.01**	**14.51**	**16.01**	**17.52**	**19.02**	**20.52**	**22.02**	**23.52**	**25.02**	**26.52**	**28.03**	**29.53**
1.68	0.23	0.37	0.51	0.65	0.79	0.93	1.07	1.21	1.35	1.49	1.63	1.77	1.91	2.05	2.19	2.32	2.46	2.60	2.74
72	**2.77**	**4.44**	**6.10**	**7.76**	**9.43**	**11.09**	**12.75**	**14.42**	**16.08**	**17.74**	**19.41**	**21.07**	**22.73**	**24.40**	**26.06**	**27.72**	**29.39**	**31.05**	**32.71**
1.83	0.26	0.41	0.57	0.72	0.88	1.03	1.18	1.34	1.49	1.65	1.80	1.96	2.11	2.27	2.42	2.58	2.73	2.88	3.04
78	**3.02**	**4.83**	**6.65**	**8.46**	**10.27**	**12.09**	**13.90**	**15.71**	**17.53**	**19.34**	**21.15**	**22.96**	**24.78**	**26.59**	**28.40**	**30.22**	**32.03**	**33.84**	**35.65**
1.98	0.28	0.45	0.62	0.79	0.95	1.12	1.29	1.46	1.63	1.80	1.96	2.13	2.30	2.47	2.64	2.81	2.98	3.14	3.31
84	**3.28**	**5.25**	**7.22**	**9.19**	**11.15**	**13.12**	**15.09**	**17.06**	**19.03**	**21.00**	**22.97**	**24.93**	**26.90**	**28.87**	**30.84**	**32.81**	**34.78**	**36.74**	**38.71**
2.13	0.30	0.49	0.67	0.85	1.04	1.22	1.40	1.58	1.77	1.95	2.13	2.32	2.50	2.68	2.86	3.05	3.23	3.41	3.60
90	**3.54**	**5.66**	**7.79**	**9.91**	**12.04**	**14.16**	**16.28**	**18.41**	**20.53**	**22.66**	**24.78**	**26.90**	**29.03**	**31.15**	**33.28**	**35.40**	**37.52**	**39.65**	**41.77**
2.29	0.33	0.53	0.72	0.92	1.12	1.32	1.51	1.71	1.91	2.10	2.30	2.50	2.70	2.89	3.09	3.29	3.49	3.68	3.88
96	**3.80**	**6.08**	**8.36**	**10.64**	**12.92**	**15.20**	**17.48**	**19.76**	**22.04**	**24.32**	**26.60**	**28.88**	**31.16**	**33.44**	**35.72**	**38.00**	**40.28**	**42.56**	**44.84**
2.44	0.35	0.56	0.78	0.99	1.20	1.41	1.62	1.84	2.05	2.26	2.47	2.68	2.89	3.11	3.32	3.53	3.74	3.95	4.17
102	**4.06**	**6.49**	**8.93**	**11.36**	**13.80**	**16.24**	**18.67**	**21.11**	**23.54**	**25.98**	**28.41**	**30.85**	**33.28**	**35.72**	**38.15**	**40.59**	**43.02**	**45.46**	**47.89**
2.59	0.38	0.60	0.83	1.06	1.28	1.51	1.73	1.96	2.19	2.41	2.64	2.87	3.09	3.32	3.54	3.77	4.00	4.22	4.45
108	**4.32**	**6.91**	**9.50**	**12.09**	**14.68**	**17.27**	**19.87**	**22.46**	**25.05**	**27.64**	**30.23**	**32.82**	**35.41**	**38.00**	**40.60**	**43.19**	**45.78**	**48.37**	**50.96**
2.74	0.40	0.64	0.88	1.12	1.36	1.60	1.85	2.09	2.33	2.57	2.81	3.05	3.29	3.53	3.77	4.01	4.25	4.49	4.73
114	**4.58**	**7.32**	**10.07**	**12.82**	**15.56**	**18.31**	**21.06**	**23.80**	**26.55**	**29.30**	**32.04**	**34.79**	**37.54**	**40.28**	**43.03**	**45.77**	**48.52**	**51.27**	**54.01**
2.90	0.43	0.68	0.94	1.19	1.45	1.70	1.96	2.21	2.47	2.72	2.98	3.23	3.49	3.74	4.00	4.25	4.51	4.76	5.02
120	**4.84**	**7.74**	**10.64**	**13.54**	**16.45**	**19.35**	**22.25**	**25.15**	**28.06**	**30.96**	**33.86**	**36.76**	**39.66**	**42.57**	**45.47**	**48.37**	**51.27**	**54.18**	**57.08**
3.05	0.45	0.72	0.99	1.26	1.53	1.80	2.07	2.34	2.61	2.88	3.15	3.42	3.68	3.95	4.22	4.49	4.76	5.03	5.30

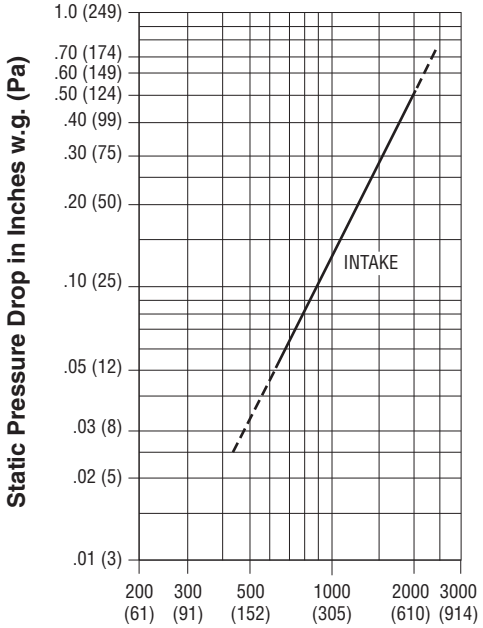
AIRFLOW/WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1606DD
	Free Area %	50%
	Free Area sq. ft. (sq. m.)	7.92 (0.74)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	1193 fpm (364 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	9449 cfm (4459 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.18 in. w.g. (45 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

Nailor Industries Inc. certifies the Model 1606DD, shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Air Performance and Water Penetration ratings.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

HOW TO SPECIFY

MODEL 1604DD
EXTRUDED ALUMINUM DUAL DRAINABLE BLADE LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 4" (102) deep channel type (**or specifier to select:** flanged type **or** glazing adapter type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from ASTM B211 Alloy 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness. Blades shall be stationary drainable style, with a dual drain gutter in each blade and gutter in head frame, constructed from type 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness with reinforcing bosses, fixed at 37 degrees on approximately 4" (102) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Concealed downspouts in jambs to drain water from louver for minimum water cascade from blade to blade. Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Concealed type mullions for louvers up to 120" (3048) wide allowing continuous line appearance. Large louvers that require multiple sections for shipping shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty **or** 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) or AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Furnish where indicated on plans and/or schedules, blank-off panels fabricated by the louver manufacturer. Blank-off panels to be 0.040" (1.02) thick aluminum sheet (**or specifier to select:** 0.040" [1.02] thick aluminum sheet with 1" [25] insulation **or** 0.040" [1.02] thick aluminum sheet with 2" [51] insulation **or** 20 ga. [1.0] galvanized steel **or** 20 ga. [1.0] galvanized steel with 1" [25] insulation **or** 20 ga. [1.0] galvanized steel with 2" [51] insulation). Blank-off panels to be finished to match louvers.

Performance data must be licensed by AMCA under the AMCA 511 Certified Ratings Program and shall bear the AMCA Certified Ratings seal for water penetration and air performance. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1604DD.

MODEL 1606DD
EXTRUDED ALUMINUM DUAL DRAINABLE BLADE LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 6" (152) deep channel type (**or specifier to select:** flanged type **or** glazing adapter type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from ASTM B211 Alloy 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness. Blades shall be stationary drainable style, with a dual drain gutter in each blade and gutter in head frame, constructed from type 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness with reinforcing bosses, fixed at 37 degrees on approximately 6" (152) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Concealed downspouts in jambs to drain water from louver for minimum water cascade from blade to blade. Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Concealed type mullions for louvers up to 120" (3048) wide allowing continuous line appearance. Large louvers that require multiple sections for shipping shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty **or** 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or custom** color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Furnish where indicated on plans and/or schedules, blank-off panels fabricated by the louver manufacturer. Blank-off panels to be 0.040" (1.02) thick aluminum sheet (**or specifier to select:** 0.040" [1.02] thick aluminum sheet with 1" [25] insulation **or** 0.040" [1.02] thick aluminum sheet with 2" [51] insulation **or** 20 ga. [1.0] galvanized steel **or** 20 ga. [1.0] galvanized steel with 1" [25] insulation **or** 20 ga. [1.0] galvanized steel with 2" [51] insulation). Blank-off panels to be finished to match louvers.

Performance data must be licensed by AMCA under the AMCA 511 Certified Ratings Program and shall bear the AMCA Certified Ratings seal for water penetration and air performance. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1606DD.

EXTRUDED ALUM. • WIND-DRIVEN RAIN RESISTANT

Nailor®

- AMCA LICENSED
- WIND-DRIVEN RAIN PROTECTION
- DRAINABLE HEAD AND BLADE
- SIGHTPROOF DESIGN
- SUPERIOR PERFORMANCE

Model:

1605WD 5" (127) Deep

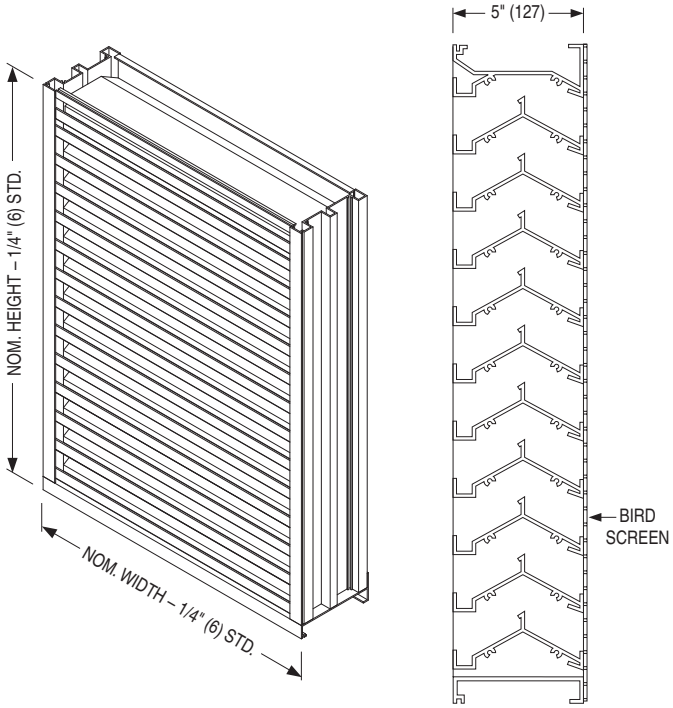
Model 1605WD

Model 1605WD

Model 1605WD Wind-Driven Rain Horizontal Drainable Blade Louver provides superior weather protection against wind-driven rain in severe weather design conditions. The drainable "Inverted Y" blade design has a high free area and excellent air performance. Combined with a drainable head, collected water is diverted down concealed side downspouts and out through the sill, effectively preventing water infiltration. Blades are reinforced with full length integral bosses for superior strength. Suitable for use in exhaust and medium to high velocity intake applications in extreme weather, ideally suited for high wind areas or applications where wind-driven rain penetration is a major concern. Available in channel, flanged, or glazing adapter type, the 5" (127) deep frame installs easily in most common wall configurations. Model 1605WD is AMCA Licensed for Wind-Driven Rain, Water Penetration, and Air Performance.

STANDARD CONSTRUCTION:

Frame:	5" (102) deep, Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness. Integral downspouts and caulking slot provided.
Blades:	Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness, with reinforcing bosses.
Blade Angle:	Fixed at 30 degrees.
Blade Spacing:	Approximately 2" (51) on centers.
Blade Support Brackets:	Concealed type, factory installed on rear of louver on maximum 24" (610) centers. Reinforced with 1 1/2" x 2" (38 x 51) angle (adds approx. 2" [51] to overall louver depth).
Mullions:	Concealed type allowing continuous line appearance up to 120" (3048) wide. Larger assemblies require separate visible frames with downspouts.
Screen:	3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen in removable frame, inside (rear) mount (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	120" W x 84" H (3048 x 2134) or 84" W x 120" H (2134 x 3048). 70 sq. ft. (6.5 m^2). Larger louvers will require field assembly of smaller sections.



MODEL 1605WD

COMMON OPTIONS:

- Flanged or Glazing Adaptor Frame styles.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Aluminum Installation Clips or Continuous Angles.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.
- Clear or Color Anodized finishes.

PERFORMANCE DATA:
MODEL: 1605WD

FREE AREA in Square Feet and Square Meters

Height in Inches and Meters	Width in Inches and Meters																		
	12 0.30	18 0.46	24 0.61	30 0.76	36 0.91	42 1.07	48 1.22	54 1.37	60 1.52	66 1.68	72 1.83	78 1.98	84 2.13	90 2.29	96 2.44	102 2.59	108 2.74	114 2.90	120 3.05
12 0.30	**0.35** 0.03	**0.56** 0.05	**0.77** 0.07	**0.98** 0.09	**1.18** 0.11	**1.39** 0.13	**1.60** 0.15	**1.81** 0.17	**2.01** 0.19	**2.22** 0.21	**2.43** 0.23	**2.64** 0.24	**2.84** 0.26	**3.05** 0.28	**3.26** 0.30	**3.47** 0.32	**3.67** 0.34	**3.88** 0.36	**4.09** 0.38
18 0.46	**0.62** 0.06	**0.99** 0.09	**1.35** 0.13	**1.72** 0.16	**2.08** 0.19	**2.45** 0.23	**2.81** 0.26	**3.18** 0.30	**3.54** 0.33	**3.91** 0.36	**4.27** 0.40	**4.63** 0.43	**5.00** 0.46	**5.36** 0.50	**5.73** 0.53	**6.09** 0.57	**6.46** 0.60	**6.82** 0.63	**7.19** 0.67
24 0.61	**0.84** 0.08	**1.33** 0.12	**1.82** 0.17	**2.31** 0.21	**2.80** 0.26	**3.29** 0.31	**3.79** 0.35	**4.28** 0.40	**4.77** 0.44	**5.26** 0.49	**5.75** 0.53	**6.24** 0.58	**6.73** 0.63	**7.22** 0.67	**7.71** 0.72	**8.21** 0.76	**8.70** 0.81	**9.19** 0.85	**9.68** 0.90
30 0.76	**1.11** 0.10	**1.76** 0.16	**2.40** 0.22	**3.05** 0.28	**3.70** 0.34	**4.35** 0.40	**5.00** 0.46	**5.65** 0.52	**6.30** 0.58	**6.94** 0.65	**7.59** 0.71	**8.24** 0.77	**8.89** 0.83	**9.54** 0.89	**10.19** 0.95	**10.83** 1.01	**11.48** 1.07	**12.13** 1.13	**12.78** 1.19
36 0.91	**1.38** 0.13	**2.18** 0.20	**2.99** 0.28	**3.79** 0.35	**4.60** 0.43	**5.41** 0.50	**6.21** 0.58	**7.02** 0.65	**7.82** 0.73	**8.63** 0.80	**9.43** 0.88	**10.24** 0.95	**11.05** 1.03	**11.85** 1.10	**12.66** 1.18	**13.46** 1.25	**14.27** 1.33	**15.07** 1.40	**15.88** 1.48
42 1.07	**1.65** 0.15	**2.61** 0.24	**3.57** 0.33	**4.53** 0.42	**5.50** 0.51	**6.46** 0.60	**7.42** 0.69	**8.39** 0.78	**9.35** 0.87	**10.31** 0.96	**11.28** 1.05	**12.24** 1.14	**13.20** 1.23	**14.17** 1.32	**15.13** 1.41	**16.09** 1.49	**17.05** 1.58	**18.02** 1.67	**18.98** 1.76
48 1.22	**1.91** 0.18	**3.03** 0.28	**4.15** 0.39	**5.28** 0.49	**6.40** 0.59	**7.52** 0.70	**8.64** 0.80	**9.76** 0.91	**10.88** 1.01	**12.00** 1.11	**13.12** 1.22	**14.24** 1.32	**15.36** 1.43	**16.48** 1.53	**17.60** 1.64	**18.72** 1.74	**19.84** 1.84	**20.96** 1.95	**22.08** 2.05
54 1.37	**2.13** 0.20	**3.38** 0.31	**4.62** 0.43	**5.87** 0.55	**7.12** 0.66	**8.36** 0.78	**9.61** 0.89	**10.86** 1.01	**12.10** 1.12	**13.35** 1.24	**14.60** 1.36	**15.84** 1.47	**17.09** 1.59	**18.34** 1.70	**19.59** 1.82	**20.83** 1.94	**22.08** 2.05	**23.33** 2.17	**24.57** 2.28
60 1.52	**2.40** 0.22	**3.80** 0.35	**5.21** 0.48	**6.61** 0.61	**8.02** 0.74	**9.42** 0.88	**10.82** 1.01	**12.23** 1.14	**13.63** 1.27	**15.04** 1.40	**16.44** 1.53	**17.84** 1.66	**19.25** 1.79	**20.65** 1.92	**22.06** 2.05	**23.46** 2.18	**24.86** 2.31	**26.27** 2.44	**27.67** 2.57
66 1.68	**2.67** 0.25	**4.23** 0.39	**5.79** 0.54	**7.35** 0.68	**8.91** 0.83	**10.47** 0.97	**12.04** 1.12	**13.60** 1.26	**15.16** 1.41	**16.72** 1.55	**18.28** 1.70	**19.84** 1.84	**21.40** 1.99	**22.96** 2.13	**24.52** 2.28	**26.08** 2.42	**27.64** 2.57	**29.20** 2.71	**30.76** 2.86
72 1.83	**2.94** 0.27	**4.65** 0.43	**6.37** 0.59	**8.09** 0.75	**9.81** 0.91	**11.53** 1.07	**13.25** 1.23	**14.97** 1.39	**16.69** 1.55	**18.40** 1.71	**20.12** 1.87	**21.84** 2.03	**23.56** 2.19	**25.28** 2.35	**27.00** 2.51	**28.72** 2.67	**30.44** 2.83	**32.15** 2.99	**33.87** 3.15
78 1.98	**3.20** 0.30	**5.08** 0.47	**6.96** 0.65	**8.83** 0.82	**10.71** 0.99	**12.59** 1.17	**14.46** 1.34	**16.34** 1.52	**18.21** 1.69	**20.09** 1.87	**21.97** 2.04	**23.84** 2.21	**25.72** 2.39	**27.59** 2.56	**29.47** 2.74	**31.35** 2.91	**33.22** 3.09	**35.10** 3.26	**36.97** 3.43
84 2.13	**3.42** 0.32	**5.42** 0.50	**7.43** 0.69	**9.43** 0.88	**11.43** 1.06	**13.43** 1.25	**15.44** 1.43	**17.44** 1.62	**19.44** 1.81	**21.44** 1.99	**23.45** 2.18	**25.45** 2.36	**27.45** 2.55	**29.45** 2.74	**31.46** 2.92	**33.46** 3.11	**35.46** 3.29	**37.46** 3.48	**39.47** 3.67
90 2.29	**3.69** 0.34	**5.85** 0.54	**8.01** 0.74	**10.17** 0.94	**12.33** 1.15	**14.49** 1.35	**16.65** 1.55	**18.81** 1.75	**20.97** 1.95	**23.13** 2.15	**25.29** 2.35	**27.45** 2.55	**29.61** 2.75	**31.77** 2.95	**33.93** 3.15	**36.09** 3.35	**38.25** 3.55	**40.41** 3.75	**42.57** 3.95
96 2.44	**3.96** 0.37	**6.28** 0.58	**8.59** 0.80	**10.91** 1.01	**13.23** 1.23	**15.54** 1.44	**17.86** 1.66	**20.18** 1.87	**22.50** 2.09	**24.81** 2.31	**27.13** 2.52	**29.45** 2.74	**31.76** 2.95	**34.08** 3.17	**36.40** 3.38	**38.71** 3.60	**41.03** 3.81	**43.35** 4.03	**45.67** 4.24
102 2.59	**4.18** 0.39	**6.69** 0.62	**9.20** 0.85	**11.71** 1.09	**14.22** 1.32	**16.73** 1.55	**19.24** 1.79	**21.74** 2.02	**24.25** 2.25	**26.76** 2.49	**29.27** 2.72	**31.78** 2.95	**34.29** 3.19	**36.80** 3.42	**39.31** 3.65	**41.82** 3.88	**44.33** 4.12	**46.83** 4.35	**49.34** 4.58
108 2.74	**4.45** 0.41	**7.12** 0.66	**9.79** 0.91	**12.47** 1.16	**15.14** 1.41	**17.81** 1.65	**20.48** 1.90	**23.15** 2.15	**25.82** 2.40	**28.49** 2.65	**31.16** 2.90	**33.83** 3.14	**36.51** 3.39	**39.18** 3.64	**41.85** 3.89	**44.52** 4.14	**47.19** 4.38	**49.86** 4.63	**52.53** 4.88
114 2.90	**4.72** 0.44	**7.56** 0.70	**10.39** 0.97	**13.22** 1.23	**16.06** 1.49	**18.89** 1.75	**21.72** 2.02	**24.55** 2.28	**27.39** 2.54	**30.22** 2.81	**33.05** 3.07	**35.89** 3.33	**38.72** 3.60	**41.55** 3.86	**44.39** 4.12	**47.22** 4.39	**50.05** 4.65	**52.89** 4.91	**55.72** 5.18
120 3.05	**4.99** 0.46	**7.99** 0.74	**10.98** 1.02	**13.98** 1.30	**16.97** 1.58	**19.97** 1.86	**22.96** 2.13	**25.96** 2.41	**28.96** 2.69	**31.95** 2.97	**34.95** 3.25	**37.94** 3.52	**40.94** 3.80	**43.93** 4.08	**46.93** 4.36	**49.92** 4.64	**52.92** 4.92	**55.91** 5.19	**58.91** 5.47

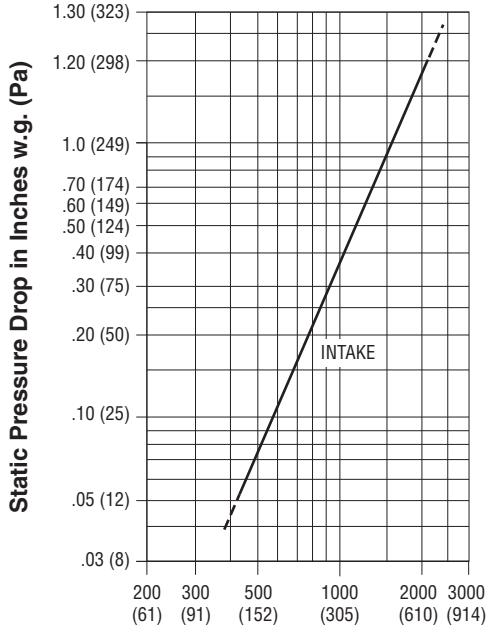
AIRFLOW / WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1605WD
	Free Area %	54%
	Free Area sq. ft. (sq. m.)	8.64 (0.80)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	1025 fpm (312 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	8856 cfm (4179 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.32 in. w.g. (80 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

PERFORMANCE DATA:
MODEL: 1605WD

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

WIND-DRIVEN RAIN PERFORMANCE

Core Ventilation, Rate in fpm (m/s)	0 (0.0)	98 (0.5)	197 (1.0)	295 (1.5)	394 (2.0)	492 (2.5)	591 (3.0)	689 (3.5)
Free Area Ventilation, Rate in fpm (m/s)	0 (0.0)	181 (0.9)	364 (1.8)	545 (2.8)	727 (3.7)	908 (4.6)	1091 (5.5)	1272 (6.5)
Effectiveness Ratio (%)	100	100	100	99.6	99.8	99.3	98.5	97.7
Penetration Class	A	A	A	A	A	A	B	B

Test was based on a 39.375" x 39.375" (1.0 m x 1.0 m) core area louver tested at a rainfall rate of 3" per hour (76 mm/hour) with a wind velocity of 29.1 mph (13 m/s).
DISCHARGE LOSS COEFFICIENT CLASS (INTAKE): 2
(Discharge Loss Coefficient Classification is as follows: 1 = 0.4 and above, 2 = 0.3 to 0.399, 3 = 0.2 to 0.299, 4 = 0.199 and below.)

Nailor Industries Inc. certifies the Model 1605WD shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Air Performance, Water Penetration and Wind-Driven Rain ratings.

HOW TO SPECIFY

MODEL 1605WD
EXTRUDED ALUMINUM WIND-DRIVEN RAIN RESISTANT LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 5" (127) deep channel type (**or specifier to select:** flanged type **or** glazing adapter type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from ASTM B211 Alloy 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness. Blades shall be stationary drainable style, with drain gutter in each blade and gutter in head frame, constructed from type 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness with reinforcing bosses, fixed at 30 degrees on approximately 2" (51) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Concealed downspouts in jambs to drain water from louver for minimum water cascade from blade to blade. Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Concealed type mullions for louvers up to 120" (3048) wide allowing continuous line appearance. Large louvers that require multiple sections for shipping shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty **or** 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Furnish where indicated on plans and/or schedules, blank-off panels fabricated by the louver manufacturer. Blank-off panels to be 0.040" (1.02) thick aluminum sheet (**or specifier to select:** 0.040" [1.02] thick aluminum sheet with 1" [25] insulation **or** 0.040" [1.02] thick aluminum sheet with 2" [51] insulation **or** 20 ga. [1.0] galvanized steel **or** 20 ga. [1.0] galvanized steel with 1" [25] insulation **or** 20 ga. [1.0] galvanized steel with 2" [51] insulation). Blank-off panels to be finished to match louvers.

Performance data must be licensed by AMCA under the AMCA 511 Certified Ratings Program and shall bear the AMCA Certified Ratings seal for water penetration, air performance and wind-driven rain. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1605WD.

- SIGHTPROOF DESIGN
- VANDALISM PROTECTION
- WEATHER RESISTANT
- CORROSION RESISTANT

Model:

1604Y 4" (102) Deep

Model 1604Y

Model 1604Y

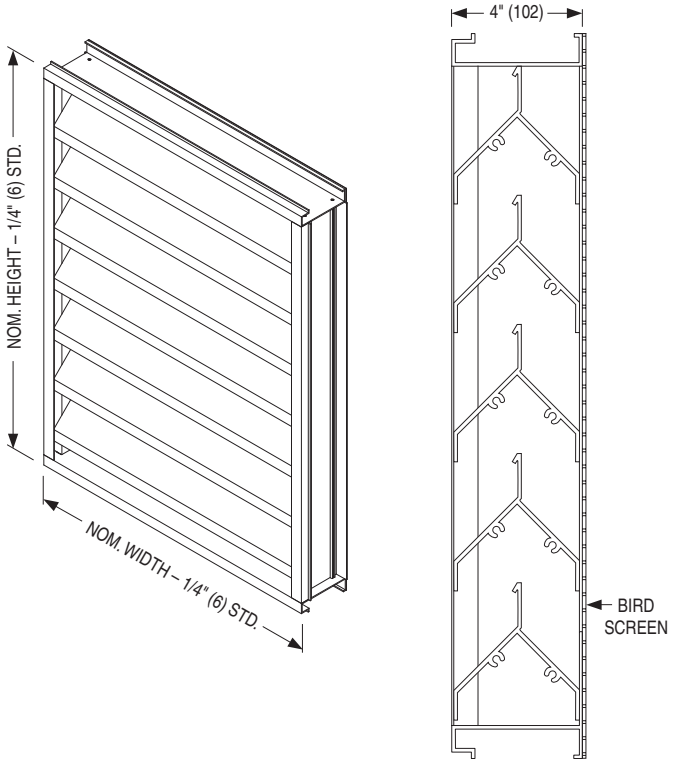
Model 1604Y utilizes "Inverted Y" style blades to achieve an architecturally styled sightproof louver that provides protection against general weather conditions as well as providing great protection against potential vandalism for ground level applications. The sightproof blade design features a center water baffle that performs adequately under enduring conditions. Standard concealed architectural mullions allow for a smooth, continuous look. Reinforcing bosses run the full length of each blade for superior strength. Available in channel, flanged, or glazing adapter type, the 4" (102) deep frame installs easily in most common wall configurations. Suitable for use in exhaust and low to medium velocity intake applications.

STANDARD CONSTRUCTION:

Frame:	4" (102) deep, Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness. Integral caulking slot provided.
Blades:	Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness, with reinforcing bosses. Inverted Y style.
Blade Angle:	Fixed at 45 degrees.
Blade Spacing:	Approximately 4" (102) on centers.
Blade Support Brackets:	Concealed type, factory installed on rear of louver on maximum 60" (1524) centers. Reinforced with 1 1/2" x 2" (38 x 51) angle (adds approx. 2" [51] to overall louver depth).
Mullions:	Concealed architectural style allowing continuous line appearance.
Screen:	3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen in removable frame, inside (rear) mount (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	120" W x 84" H (3048 x 2134) or 84" W x 120" H (2134 x 3048). 70 sq. ft. (6.5 m^2). Larger louvers will require field assembly of smaller sections.

COMMON OPTIONS:

- Flanged or Glazing Adaptor Frame styles.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Aluminum Installation Clips or Continuous Angles.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.
- Clear or Color Anodized finishes.



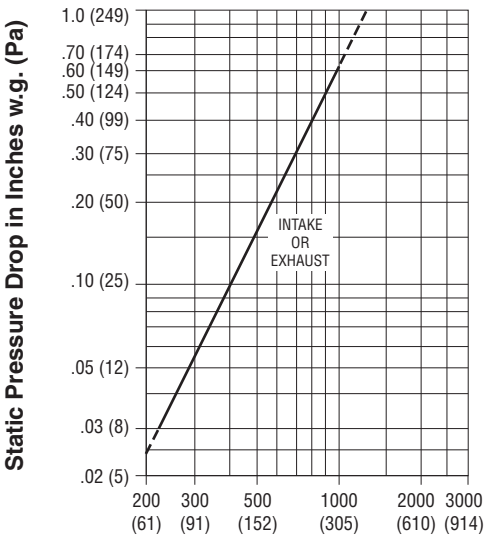
MODEL 1604Y

PERFORMANCE DATA:
MODEL: 1604Y

FREE AREA in Square Feet and Square Meters

Height in Inches and Meters	Width in Inches and Meters																		
	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
	0.30	0.46	0.61	0.76	0.91	1.07	1.22	1.37	1.52	1.68	1.83	1.98	2.13	2.29	2.44	2.59	2.74	2.90	3.05
12	**0.11**	**0.17**	**0.24**	**0.30**	**0.37**	**0.43**	**0.50**	**0.57**	**0.63**	**0.70**	**0.76**	**0.83**	**0.90**	**0.96**	**1.03**	**1.09**	**1.16**	**1.22**	**1.29**
.30	0.01	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.06	0.07	0.08	0.08	0.09	0.10	0.10	0.11	0.11	0.12
18	**0.28**	**0.46**	**0.63**	**0.81**	**0.98**	**1.16**	**1.33**	**1.51**	**1.68**	**1.86**	**2.03**	**2.21**	**2.38**	**2.56**	**2.73**	**2.91**	**3.08**	**3.26**	**3.43**
.46	0.03	0.04	0.06	0.07	0.09	0.11	0.12	0.14	0.16	0.17	0.19	0.21	0.22	0.24	0.25	0.27	0.29	0.30	0.32
24	**0.40**	**0.66**	**0.91**	**1.16**	**1.42**	**1.67**	**1.92**	**2.17**	**2.43**	**2.68**	**2.93**	**3.19**	**3.44**	**3.69**	**3.94**	**4.20**	**4.45**	**4.70**	**4.96**
.61	0.04	0.06	0.08	0.11	0.13	0.16	0.18	0.20	0.23	0.25	0.27	0.30	0.32	0.34	0.37	0.39	0.41	0.44	0.46
30	**0.57**	**0.93**	**1.29**	**1.65**	**2.01**	**2.37**	**2.73**	**3.09**	**3.45**	**3.81**	**4.17**	**4.53**	**4.89**	**5.25**	**5.61**	**5.97**	**6.63**	**6.68**	**7.04**
.76	0.05	0.09	0.12	0.15	0.19	0.22	0.25	0.29	0.32	0.35	0.39	0.42	0.45	0.49	0.52	0.55	0.59	0.62	0.65
36	**0.69**	**1.12**	**1.55**	**1.99**	**2.42**	**2.85**	**3.28**	**3.72**	**4.15**	**4.58**	**5.01**	**5.44**	**5.88**	**6.31**	**6.74**	**7.17**	**7.60**	**8.04**	**8.47**
.91	0.06	0.10	0.14	0.18	0.22	0.26	0.30	0.35	0.39	0.43	0.47	0.51	0.55	0.59	0.63	0.67	0.71	0.75	0.79
42	**0.87**	**1.41**	**1.96**	**2.50**	**3.04**	**3.59**	**4.13**	**4.67**	**5.22**	**5.76**	**6.31**	**6.85**	**7.39**	**7.94**	**8.48**	**9.02**	**9.57**	**10.11**	**10.65**
1.07	0.08	0.13	0.18	0.23	0.28	0.33	0.38	0.43	0.48	0.54	0.59	0.64	0.69	0.74	0.79	0.84	0.89	0.94	0.99
48	**0.98**	**1.60**	**2.21**	**2.83**	**3.44**	**4.05**	**4.67**	**5.28**	**5.90**	**6.51**	**7.13**	**7.74**	**8.36**	**8.97**	**9.58**	**10.20**	**10.81**	**11.43**	**12.04**
1.22	0.09	0.15	0.21	0.26	0.32	0.38	0.43	0.49	0.55	0.61	0.66	0.72	0.78	0.83	0.89	0.95	1.00	1.06	1.12
54	**1.16**	**1.89**	**2.62**	**3.34**	**4.07**	**4.80**	**5.53**	**6.25**	**6.98**	**7.71**	**8.44**	**9.16**	**9.89**	**10.62**	**11.35**	**12.07**	**12.80**	**13.53**	**14.26**
1.37	0.11	0.18	0.24	0.31	0.38	0.45	0.51	0.58	0.65	0.72	0.78	0.85	0.92	0.99	1.05	1.12	1.19	1.26	1.32
60	**1.27**	**2.07**	**2.86**	**3.66**	**4.46**	**5.25**	**6.05**	**6.85**	**7.64**	**8.44**	**9.23**	**10.03**	**10.83**	**11.62**	**12.42**	**13.21**	**14.01**	**14.81**	**15.60**
1.52	0.12	0.19	0.27	0.34	0.41	0.49	0.56	0.64	0.71	0.78	0.86	0.93	1.01	1.08	1.15	1.23	1.30	1.38	1.45
66	**1.46**	**2.38**	**3.29**	**4.20**	**5.12**	**6.03**	**6.95**	**7.86**	**8.77**	**9.69**	**10.60**	**11.52**	**12.43**	**13.35**	**14.26**	**15.17**	**16.09**	**17.00**	**17.92**
1.68	0.14	0.22	0.31	0.39	0.48	0.56	0.65	0.73	0.82	0.90	0.98	1.07	1.15	1.24	1.32	1.41	1.49	1.58	1.66
72	**1.57**	**2.56**	**3.54**	**4.53**	**5.51**	**6.49**	**7.48**	**8.46**	**9.45**	**10.43**	**11.42**	**12.40**	**13.39**	**14.37**	**15.35**	**16.34**	**17.32**	**18.31**	**19.29**
1.83	0.15	0.24	0.33	0.42	0.51	0.60	0.69	0.79	0.88	0.97	1.06	1.15	1.24	1.33	1.43	1.52	1.61	1.70	1.79
78	**1.76**	**2.86**	**3.97**	**5.07**	**6.17**	**7.27**	**8.38**	**9.48**	**10.58**	**11.68**	**12.79**	**13.89**	**14.99**	**16.09**	**17.20**	**18.30**	**19.40**	**20.50**	**21.61**
1.98	0.16	0.27	0.37	0.47	0.57	0.68	0.78	0.88	0.98	1.09	1.19	1.29	1.39	1.50	1.60	1.70	1.80	1.90	2.01
84	**1.86**	**3.02**	**4.18**	**5.34**	**6.51**	**7.67**	**8.83**	**9.99**	**11.15**	**12.32**	**13.48**	**14.64**	**15.80**	**16.96**	**18.13**	**19.29**	**20.45**	**21.61**	**22.77**
2.13	0.17	0.28	0.39	0.50	0.60	0.71	0.82	0.93	1.04	1.14	1.25	1.36	1.47	1.58	1.68	1.79	1.90	2.01	2.12
90	**2.06**	**3.35**	**4.63**	**5.92**	**7.21**	**8.50**	**9.79**	**11.07**	**12.36**	**13.65**	**14.94**	**16.23**	**17.51**	**18.80**	**20.09**	**21.38**	**22.66**	**23.95**	**25.24**
2.29	0.19	0.31	0.43	0.55	0.67	0.79	0.91	1.03	1.15	1.27	1.39	1.51	1.63	1.75	1.87	1.99	2.11	2.23	2.34
96	**2.17**	**3.53**	**4.89**	**6.24**	**7.60**	**8.96**	**10.32**	**11.67**	**13.03**	**14.39**	**15.75**	**17.11**	**18.46**	**19.82**	**21.18**	**22.54**	**23.90**	**25.25**	**26.61**
2.44	0.20	0.33	0.45	0.58	0.71	0.83	0.96	1.08	1.21	1.34	1.46	1.59	1.72	1.84	1.97	2.09	2.22	2.35	2.47
102	**2.34**	**3.81**	**5.27**	**6.74**	**8.20**	**9.67**	**11.13**	**12.60**	**14.07**	**15.53**	**17.00**	**18.46**	**19.93**	**21.39**	**22.86**	**24.32**	**25.79**	**27.25**	**28.72**
2.59	0.22	0.35	0.49	0.63	0.76	0.90	1.03	1.17	1.31	1.44	1.58	1.72	1.85	1.99	2.12	2.26	2.40	2.53	2.67
108	**2.46**	**4.00**	**5.54**	**7.08**	**8.62**	**10.16**	**11.70**	**13.24**	**14.78**	**16.32**	**17.86**	**19.40**	**20.94**	**22.48**	**24.02**	**25.56**	**27.10**	**28.64**	**30.18**
2.74	0.23	0.37	0.51	0.66	0.80	0.94	1.09	1.23	1.37	1.52	1.66	1.80	1.95	2.09	2.23	2.37	2.52	2.66	2.80
114	**2.65**	**4.31**	**5.97**	**7.63**	**9.28**	**10.94**	**12.60**	**14.26**	**15.92**	**17.58**	**19.24**	**20.89**	**22.55**	**24.21**	**25.87**	**27.53**	**29.19**	**30.85**	**32.50**
2.90	0.25	0.40	0.55	0.71	0.86	1.02	1.17	1.32	1.48	1.63	1.79	1.94	2.10	2.25	2.40	2.56	2.71	2.87	3.02
120	**2.76**	**4.48**	**6.21**	**7.93**	**9.66**	**11.38**	**13.11**	**14.83**	**16.56**	**18.28**	**20.01**	**21.73**	**23.46**	**25.18**	**26.91**	**28.63**	**30.36**	**32.08**	**33.81**
3.05	0.26	0.42	0.58	0.74	0.90	1.06	1.22	1.38	1.54	1.70	1.86	2.02	2.18	2.34	2.50	2.66	2.82	2.98	3.14

PRESSURE DROP



Air Velocity in Ft. (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

HOW TO SPECIFY

MODEL 1604Y

EXTRUDED ALUMINUM SIGHTPROOF LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 4" (102) deep channel type (**or specifier to select:** flanged type **or** glazing adapter type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from ASTM B211 Alloy 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness. Blades shall be sightproof inverted Y style, constructed from type 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness with reinforcing bosses, fixed at 45 degrees on approximately 4" (102) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Large louvers that require multiple sections for shipping shall be constructed with concealed vertical mullions for continuous blade appearance when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen or no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty **or** 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Furnish where indicated on plans and/or schedules, blank-off panels fabricated by the louver manufacturer. Blank-off panels to be 0.040" (1.02) thick aluminum sheet (**or specifier to select:** 0.040" (1.02) thick aluminum sheet with 1" (25) insulation **or** 0.040" (1.02) thick aluminum sheet with 2" (51) insulation **or** 20 ga. (1.0) galvanized steel **or** 20 ga. (1.0) galvanized steel with 1" (25) insulation **or** 20 ga. (1.0) galvanized steel with 2" (51) insulation). Blank-off panels to be finished to match louvers.

Submitted performance data to be based on tests in accordance with AMCA Standard 500-L. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1604Y.

HOW TO ORDER

MODEL SERIES: 1602, 1604, 1605 AND 1606
STATIONARY EXTRUDED ALUMINUM LOUVERS

EXAMPLE: 1604DD - 48x36 - U25 - CH - BSA - MI - STD

1. **Models**
   - 1602J 2" (51) Deep, J Blade
   - 1602K 2" (51) Deep, K Blade
   - 1604J 4" (102) Deep, J Blade
   - 1604JD 4" (102) Deep, J Blade, Drainable Head
   - 1604KD 4" (102) Deep, K Blade, Drainable Head
   - 1604D 4" (102) Deep, Drainable Blade
   - 1604DD 4" (102) Deep, Dual Drainable Blade
   - 1604Y 4" (102) Deep, Y Blade, Sightproof
   - 1605WD 5" (127) Deep, Wind-Driven Rain Resistant, Sightproof
   - 1606J 6" (152) Deep, J Blade
   - 1606JD 6" (152) Deep, J Blade, Drainable Head
   - 1606KD 6" (152) Deep, K Blade, Drainable Head
   - 1606D 6" (152) Deep, Drainable Blade
   - 1606DD 6" (152) Deep, Dual Drainable Blade
2. **Nominal Width x Height**
   inches (mm's)
3. **Sizing**
   - U00 Exact Size
   - U25 Undersize 1/4" (6.3) (default)
   - U38 Undersize 3/8" (9.5)
   - U50 Undersize 1/2" (12.7)
4. **Frame**
   - CH Channel (default)
   - FL Flanged
   - GA Glazing Adaptor
5. **Bird Screen**
   - BSA Aluminum (default)
   - BSG Galvanized Steel
   - BSSS Type 304 Stainless Steel
   - BSN None
6. **Insect Screen**
   - – None (default)
   - ISA Aluminum
   - ISSS Type 304 Stainless Steel
7. **Finish**
   - MI Mill Finish (default)
   - PC3S Powder Coat, Standard Color
   - PC3C Powder Coat, Custom Color
   - PC4S H. P. Powder Coat, Standard color
   - PC4C H. P. Powder Coat, Custom Color
   - PC5S Fluoropolymer Powder Coat, Standard Color
   - PC5C Fluoropolymer Powder Coat, Custom Color
   - PPC Prime Coat
   - AN04 Anodized, Clear 204-R1
   - AN15 Anodized, Clear 215-R1
   - ANLB Anodized, Light Bronze
   - ANMB Anodized, Medium Bronze
   - ANDB Anodized, Dark Bronze
   - ANBK Anodized, Black
8. **Welded Construction**
   - – None (default)
   - WE Welded Construction
9. **Extended Sill**
   - – None (default)
   - ESI Extended Sill

OPTIONS & ACCESSORIES:

10. **Shape**
    - STD Rectangular or Square (default)
    - CA Circle (Round)
    - CB Semi-circle
    - CC 1/4 circle left
    - CD 1/4 circle right
    - CE Arch semi-circular
    - CFC Arch custom, (dropped or lancet)
    - CFE Arch equilateral
    - CG Oval
    - CH Arch 1/4 circle left
    - CJ Arch 1/4 circle right
    - TA Triangle isosceles
    - TB Arch gable
    - TC Triangle RA left
    - TD Triangle RA right
    - TE Quadrilateral left
    - TF Quadrilateral right
    - TG Diamond/Rhombus
    - TH Trapezoid
    - TJ Octagon
    - TK Left corner
    - TL Right corner
11. **Filter Rack**
    - – None (default)
    - FR1 1" (25) Filter rack
    - FR2 2" (51) Filter rack

12a. **Blank-off Panel**
   - – None (default)
   - BG 20 ga. galv. steel
   - BGI1 20 ga. galv. w/1" (25) insulation
   - BGI2 20 ga. galv. w/2" (51) insulation
   - BA 0.040" aluminum
   - BAI1 0.040" alum. w/1" (25) insulation
   - BAI2 0.040" alum. w/2" (51) insulation

12b. **Percentage of Area Blanked**
   1 – 100%

13a. **Sleeve**
   - – None (default)
   - SGLV Galvanized Steel
   - SALU Aluminum
   - S304 Type 304 Stainless Steel

13b. **Sleeve Length**
   SL = Specify
   12" (305) standard (default)
   8" – 28" (203 – 711)

13c. **Sleeve Gauge**
   - – None (default)
   - 20G 20 Ga.
   - 18G 18 Ga.
   - 16G 16 Ga.
   - 14G 14 Ga.
   - 10G 10 Ga.

14a. **False Mullions**
   - – None (default)
   - FMA 2" (51) wide x .080" aluminum
   - FMG 2" (51) wide x 18 ga. galv. steel

14b. **Quantity = _____ .**

15a. **Subframe/Door**
   - – None (default)
   - CSUB Channel Subframe
   - CSHS Hinged Door w/staple plate

15b. **Hinge Position**
   - – None (default)
   - HL Hinged Left (vertical)
   - HR Hinged Right (vertical)
   - HT Hinged Top (horizontal)
   - HB Hinged Bottom (horizontal)

16. **Special Corner Construction**
   - – None (default)
   - SBCC Box Corner
   - SMCC Mitered Corner

17a. **Installation Angles**
   - – None (default)
   - PACA Clips 1 1/2" x 1 1/2" x .125" (38 x 38 x 3), 3" (76) long alum.
   - SMCC Angles - aluminum continuous

17b. **PACA Qty =** ___ (12" [305] max. o. c.)

Notes:

1. Standard color powder coat paint finishes require a color selection from the 21 color finishes on the "Nailor Louver Finishes and Color Guide".

Codes: LF00 Color to follow, LF01 Slate Blue, LF02 Medium Bronze, LF03 Sandstone, LF04 Light Gray, LF05 Charcoal, LF06 Bone White, LF07 Western Tan, LF08 Architectural Bronze, LF09 Regal Blue, LF10 Forest Green, LF11 Surrey Beige, LF12 Royal Brown, LF13 Barn Red, LF14 Burgandy, LF15 Clay, LF16 Almond, LF17 Coastal White, LF18 Vista Green, LF19 Black, LF20 Gloss Black, LF21 Campus Green.

2. Custom color powder coat paint finishes require color matching. A suitable paint chip must be supplied and Nailor will select or mix and formulate a powder coat paint that matches as closely as possible. We will forward a sample for approval.

Codes: LF00 Color to follow. You may alternatively enter a unique code and description.

- AMCA LICENSED
- ADJUSTABLE CONTROL
- DRAINABLE HEAD AND BLADE
- EXCELLENT WEATHER PROTECTION

Adjustable Models:

1604AD 4" (102) Deep

1606AD 6" (152) Deep

Combination Louver/Damper Model:

1606CDAF 6" (152) Deep

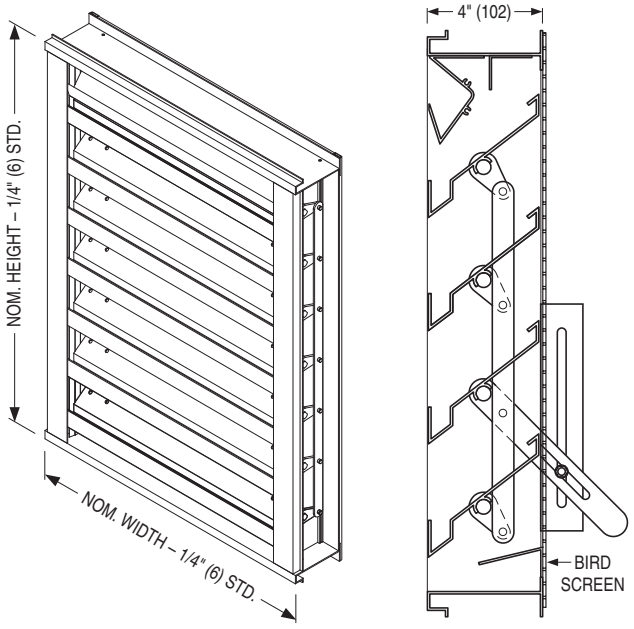
Model 1604AD | Model 1606AD (w/ Concealed Actuator) | Model 1606CDAF

Model 1604AD

Model 1604AD Adjustable Drainable Blade Type Louver combines effective weather protection and pleasing aesthetics with airflow control, featuring operable drainable blades that provide positive airflow shutoff when closed and protection against water penetration when open. The drainable design utilizes rain gutters in the head member and each blade that divert collected water through concealed side downspouts and out the sill, effectively preventing water entrainment in the space when the blades are in the open position. Low torque, concealed linkage blade control can be operated manually or with a variety of factory mounted electric or pneumatic actuators to provide tight shut-off when desired. Suitable for use in exhaust and low to medium velocity intake applications where water penetration is a concern and airflow control is desired. Available in channel or flanged type, the 4" (102) deep frame installs easily in most common wall configurations. Model 1604AD is AMCA Licensed for Water Penetration and Air Performance

STANDARD CONSTRUCTION:

Frame:	4" (102) deep, Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness. Integral downspouts and caulking slot provided.
Blades:	Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness, with reinforcing bosses.
Blade Spacing:	Approximately 4" (102) on centers, at 37 1/2° angle (fully open).
Jamb Seals:	Compression type cambered metal.
Axles:	1/2" (13) dia. plated steel.
Bearings:	1/2" (13) dia. stainless steel sleeve type.
Linkage:	Plated steel. Concealed in frame.
Screen:	3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen in removable frame, inside (rear) mount (adds approximately 3/8" [10] to louver depth).
Actuator:	Hand locking louver quadrant.
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	48" W x 96" H (1219 x 2438) (With Blade and/or Jamb Seals). 60" W x 96" H (1524 x 2438) (Without Seals). Larger sizes will be manufactured in sections with visible mullion side frame (downspouts are concealed) for field assembly.



MODEL 1604AD

COMMON OPTIONS:

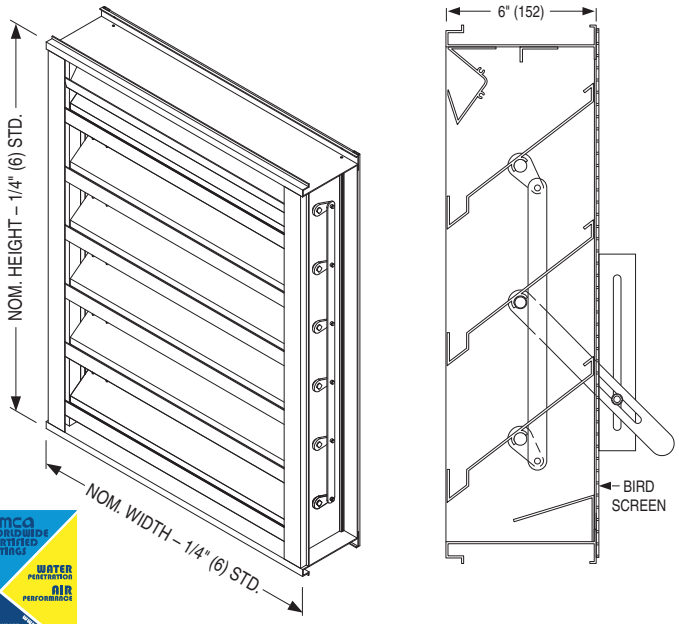
- Flanged Frame.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Factory installed pneumatic or electric actuators.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.
- Clear or Color Anodized finishes.

Model 1606AD

Model 1606AD Adjustable Drainable Blade Type Louver combines effective weather protection and pleasing aesthetics with airflow control, featuring operable drainable blades that provide positive airflow shutoff when closed and protection against water penetration when open. The drainable design utilizes rain gutters in the head member and each blade that divert collected water through concealed side downspouts and out the sill, effectively preventing water from infiltrating the space when the blades are in the open position. Low torque, concealed linkage blade control can be operated manually or with a variety of factory mounted electric or pneumatic actuators to provide tight shut-off when desired. Suitable for use in exhaust and low to medium velocity intake applications where water penetration is a concern and airflow control is desired. Available in channel or flanged type, the 6" (152) deep frame installs easily in most common wall configurations. Model 1606AD is AMCA Licensed for Water Penetration and Air Performance.

STANDARD CONSTRUCTION:

Frame:	6" (152) deep, Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness. Integral downspouts and caulking slot provided.
Blades:	Type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness, with reinforcing bosses.
Blade Spacing:	Approximately 6" (152) on centers, at 37 1/2° angle (fully open).
Jamb Seals:	Compression type cambered metal.
Axles:	1/2" (13) dia. plated steel.
Bearings:	1/2" (13) dia. stainless steel sleeve type.
Linkage:	Plated steel. Concealed in frame.
Screen:	3/4" x .051 (19 x 1.3) expanded, flattened alum. bird screen in removable frame, inside (rear) mount (adds approx. 3/8" [10] to louver depth).
Actuator:	Hand locking louver quadrant.
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	48" W x 96" H (1219 x 2438) (With Blade and/or Jamb Seals). 60" W x 96" H (1524 x 2438) (Without Seals). Larger sizes will be manufactured in sections with visible mullion side frame (downspouts are concealed) for field assembly.



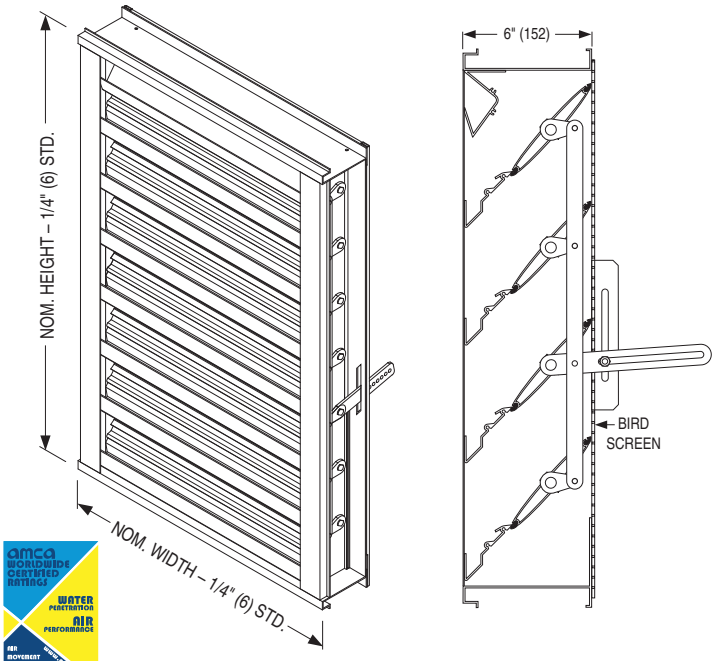
MODEL 1606AD

Model 1606CDAF

Model 1606CDAF is a combination louver and damper that incorporates a drainable head, front stationary drainable blades and integral rear adjustable high performance airfoil blades, all within a single frame, to provide excellent protection against water penetration when open and positive airflow shutoff when closed. The drainable blade design utilizes rain gutters that divert collected water through concealed side downspouts and out the sill, effectively preventing water from infiltrating the space when the blades are in the open position. Low torque, concealed linkage blade control can be operated manually or with a variety of factory mounted electric or pneumatic actuators to provide tight shut-off when desired. Suitable for use in exhaust and low to medium velocity intake applications. Available in channel or flanged type, the 6" (152) deep frame installs easily in most common wall configurations. Model 1606AD is AMCA Licensed for Water Penetration and Air Performance.

STANDARD CONSTRUCTION:

Frame:	6" (152) deep type 6063-T5 extruded aluminum, .125" (3.18) nominal wall thickness. Integral downspouts and caulking slot provided.
Blades:	Front stationary blades: drainable style, type 6063-T5 extruded aluminum, .080" (2.03) nominal wall thickness. Rear operable blades: Airfoil style, type 6063-T5 extruded aluminum.
Blade Angle:	Front blades fixed at 45 degrees.
Blade Spacing:	Approximately 5 1/2" (140) on centers.
Blade Seals:	Silicone. Mechanically locked in place.
Jamb Seals:	Cambered stainless steel.
Axles:	1/2" (13) dia. plated steel double bolted to blades.
Bearings:	1/2" (13) dia. Oilite® self-lubricating bronze.
Linkage:	Concealed in frame.
Screen:	3/4" x .051 (19 x 1.3) expanded, flattened alum. bird screen in removable frame, inside (rear) mount (adds approx. 3/8" [10] to louver depth).
Actuator:	Hand locking louver quadrant.
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	60" W x 96" H (1524 x 2438). Larger sizes will be manufactured in sections with visible mullion side frame (downspouts are concealed) for field assembly.



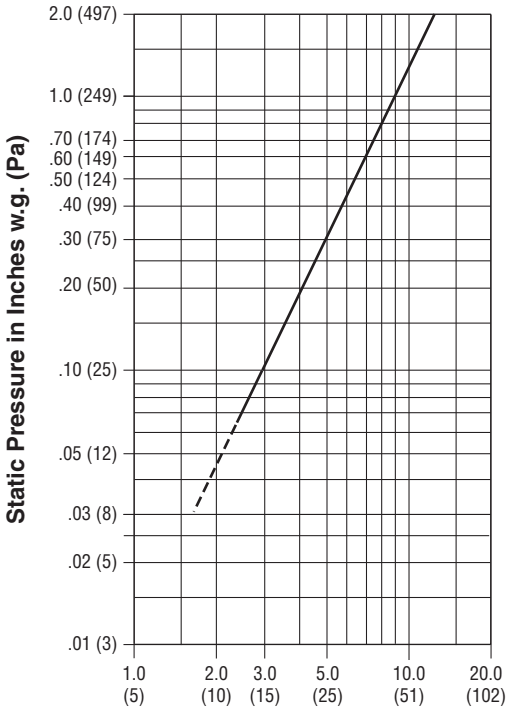
MODEL 1606CDAF

PERFORMANCE DATA:
MODEL: 1604AD

FREE AREA in Square Feet and Square Meters

Height in Inches and Meters	Width in Inches and Meters								
	12 0.30	18 0.46	24 0.61	30 0.76	36 0.91	42 1.07	48 1.22	54 1.37	60 1.52
12 .30	**0.22** 0.02	**0.39** 0.04	**0.56** 0.05	**0.73** 0.07	**0.90** 0.08	**1.07** 0.10	**1.24** 0.12	**1.41** 0.13	**1.58** 0.15
18 .46	**0.39** 0.04	**0.69** 0.06	**1.00** 0.09	**1.30** 0.12	**1.60** 0.15	**1.90** 0.18	**2.21** 0.20	**2.51** 0.23	**2.81** 0.26
24 .61	**0.60** 0.06	**1.06** 0.10	**1.53** 0.14	**1.99** 0.18	**2.45** 0.23	**2.92** 0.27	**3.38** 0.31	**3.84** 0.36	**4.31** 0.40
30 .76	**0.77** 0.07	**1.37** 0.13	**1.96** 0.18	**2.56** 0.24	**3.16** 0.29	**3.75** 0.35	**4.35** 0.40	**4.95** 0.46	**5.54** 0.51
36 0.91	**0.98** 0.09	**1.74** 0.16	**2.49** 0.23	**3.25** 0.30	**4.01** 0.37	**4.77** 0.44	**5.52** 0.51	**6.28** 0.58	**7.04** 0.65
42 1.07	**1.15** 0.11	**2.04** 0.19	**2.93** 0.27	**3.82** 0.36	**4.71** 0.44	**5.60** 0.52	**6.49** 0.60	**7.38** 0.69	**8.27** 0.77
48 1.22	**1.36** 0.13	**2.41** 0.22	**3.46** 0.32	**4.51** 0.42	**5.56** 0.52	**6.61** 0.61	**7.10** 0.66	**8.72** 0.81	**9.77** 0.91
54 1.37	**1.53** 0.14	**2.71** 0.25	**3.90** 0.36	**5.08** 0.47	**6.27** 0.58	**7.45** 0.69	**8.64** 0.80	**9.82** 0.91	**11.00** 1.02
60 1.52	**1.74** 0.16	**3.08** 0.29	**4.43** 0.41	**5.77** 0.54	**7.12** 0.66	**8.46** 0.79	**9.81** 0.91	**11.15** 1.04	**12.50** 1.16
66 1.68	**1.91** 0.18	**3.39** 0.31	**4.87** 0.45	**6.34** 0.59	**7.82** 0.73	**9.30** 0.86	**10.78** 1.00	**12.26** 1.14	**13.73** 1.28
72 1.83	**2.12** 0.20	**3.76** 0.35	**5.40** 0.50	**7.03** 0.65	**8.67** 0.81	**10.31** 0.96	**11.95** 1.11	**13.59** 1.26	**15.23** 1.41
78 1.98	**2.29** 0.21	**4.06** 0.38	**5.83** 0.54	**7.61** 0.71	**9.38** 0.87	**11.15** 1.04	**12.92** 1.20	**14.69** 1.36	**16.47** 1.53
84 2.13	**2.50** 0.23	**4.43** 0.41	**6.36** 0.59	**8.30** 0.77	**10.23** 0.95	**12.16** 1.13	**14.09** 1.31	**16.03** 1.49	**17.96** 1.67
90 2.29	**2.67** 0.25	**4.73** 0.44	**6.80** 0.63	**8.87** 0.82	**10.93** 1.02	**13.00** 1.21	**15.06** 1.40	**17.13** 1.59	**19.20** 1.78
96 2.44	**2.88** 0.27	**5.10** 0.47	**7.33** 0.68	**9.56** 0.89	**11.78** 1.09	**14.01** 1.30	**16.24** 1.51	**18.46** 1.72	**20.69** 1.92

AIR LEAKAGE (blades fully closed)



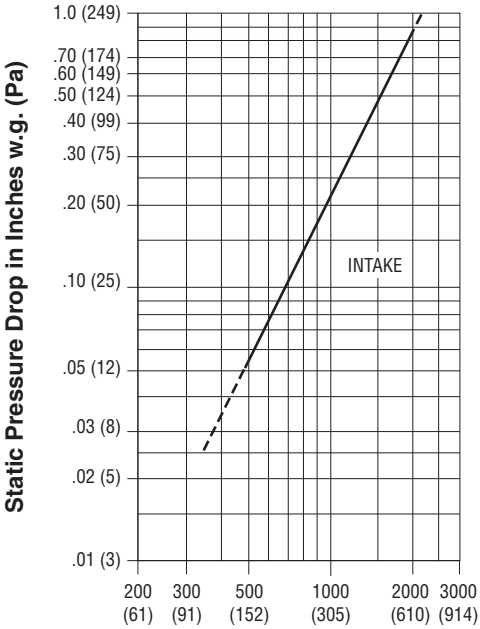
Louver test size: 48" x 48" (1219 x 1219 mm) with blade and jamb seals.

AIRFLOW/ WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1604AD
	Free Area %	44%
	Free Area sq. ft. (sq. m.)	7.10 (0.66)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	953 fpm (290 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	6766 cfm (3193 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.21 in. w.g. (52 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

PRESSURE DROP (blades fully open)



Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

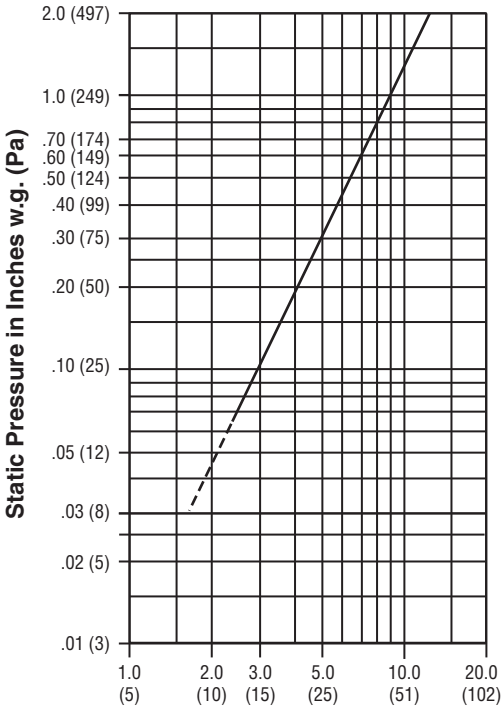
Nailor Industries Inc. certifies the Model 1604AD, shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Air Performance and Water Penetration ratings.

PERFORMANCE DATA:
MODEL: 1606AD

FREE AREA in Square Feet and Square Meters

Height in Inches and Meters	Width in Inches and Meters								
	12 0.30	18 0.46	24 0.61	30 0.76	36 0.91	42 1.07	48 1.22	54 1.37	60 1.52
12 .30	**0.20** 0.02	**0.35** 0.03	**0.50** 0.05	**0.65** 0.06	**0.80** 0.07	**0.95** 0.09	**1.11** 0.10	**1.26** 0.12	**1.41** 0.13
18 .46	**0.41** 0.04	**0.73** 0.07	**1.05** 0.10	**1.37** 0.13	**1.69** 0.16	**2.01** 0.19	**2.33** 0.22	**2.65** 0.25	**2.97** 0.28
24 .61	**0.59** 0.06	**1.05** 0.10	**1.51** 0.14	**1.97** 0.18	**2.43** 0.23	**2.89** 0.27	**3.35** 0.31	**3.81** 0.35	**4.27** 0.40
30 .76	**0.86** 0.08	**1.53** 0.14	**2.20** 0.20	**2.87** 0.27	**3.54** 0.33	**4.21** 0.39	**4.88** 0.45	**5.55** 0.52	**6.22** 0.58
36 0.91	**1.07** 0.10	**1.90** 0.18	**2.72** 0.25	**3.55** 0.33	**4.38** 0.41	**5.21** 0.48	**6.03** 0.56	**6.86** 0.64	**7.69** 0.71
42 1.07	**1.28** 0.12	**2.28** 0.21	**3.27** 0.30	**4.26** 0.40	**5.25** 0.49	**6.25** 0.58	**7.24** 0.67	**8.23** 0.76	**9.23** 0.86
48 1.22	**1.48** 0.14	**2.63** 0.24	**3.78** 0.35	**4.92** 0.46	**6.07** 0.56	**7.22** 0.67	**8.15** 0.76	**9.51** 0.88	**10.66** 0.99
54 1.37	**1.67** 0.15	**2.96** 0.27	**4.25** 0.39	**5.54** 0.51	**6.83** 0.63	**8.13** 0.75	**9.42** 0.87	**10.71** 0.99	**12.00** 1.11
60 1.52	**1.87** 0.17	**3.32** 0.31	**4.77** 0.44	**6.22** 0.58	**7.67** 0.71	**9.12** 0.85	**10.57** 0.98	**12.01** 1.12	**13.46** 1.25
66 1.68	**2.05** 0.19	**3.63** 0.34	**5.22** 0.49	**6.81** 0.63	**8.39** 0.78	**9.98** 0.93	**11.57** 1.07	**13.15** 1.22	**14.74** 1.37
72 1.83	**2.27** 0.21	**4.02** 0.37	**5.77** 0.54	**7.53** 0.70	**9.28** 0.86	**11.04** 1.03	**12.79** 1.19	**14.55** 1.35	**16.30** 1.51
78 1.98	**2.48** 0.23	**4.41** 0.41	**6.33** 0.59	**8.25** 0.77	**10.17** 0.95	**12.10** 1.12	**14.02** 1.30	**15.94** 1.48	**17.86** 1.66
84 2.13	**2.70** 0.25	**4.79** 0.45	**6.88** 0.64	**8.97** 0.83	**11.07** 1.03	**13.16** 1.22	**15.25** 1.42	**17.34** 1.61	**19.43** 1.81
90 2.29	**2.91** 0.27	**5.16** 0.48	**7.41** 0.69	**9.66** 0.90	**11.91** 1.11	**14.16** 1.32	**16.42** 1.53	**18.67** 1.73	**20.92** 1.94
96 2.44	**3.15** 0.29	**5.59** 0.52	**8.03** 0.75	**10.47** 0.97	**12.91** 1.20	**15.35** 1.43	**17.79** 1.65	**20.23** 1.88	**22.67** 2.11

AIR LEAKAGE (blades fully closed)



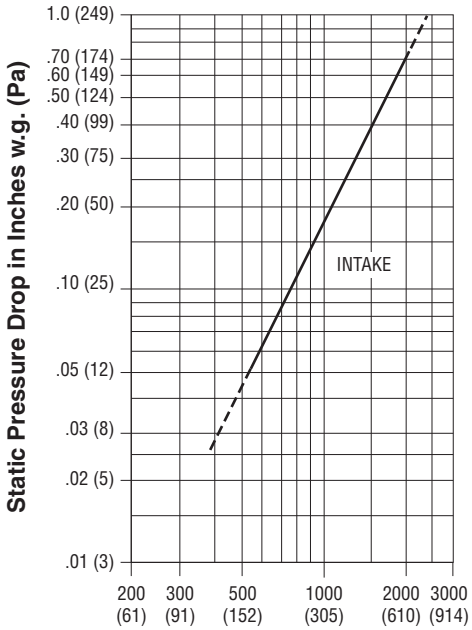
Louver test size: 48" x 48" (1219 x 1219 mm) with blade and jamb seals.

AIRFLOW/ WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1606AD
	Free Area %	51%
	Free Area sq. ft. (sq. m.)	8.15 (0.76)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	970 fpm (296 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	7906 cfm (3731 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.17 in. w.g. (42 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

PRESSURE DROP (blades fully open)



Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

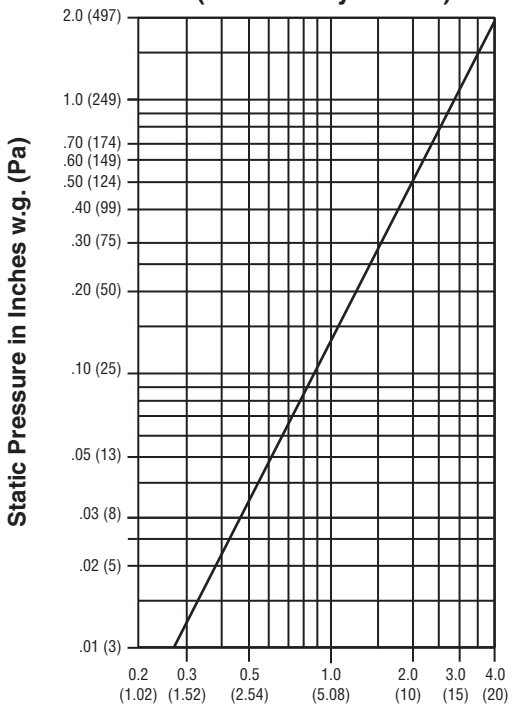
Nailor Industries Inc. certifies the Model 1606AD, shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Air Performance and Water Penetration ratings.

PERFORMANCE DATA:
MODEL: 1606CDAF

FREE AREA in Square Feet and Square Meters

Height in Inches and Meters	Width in Inches and Meters								
	12 0.30	18 0.46	24 0.61	30 0.76	36 0.91	42 1.07	48 1.22	54 1.37	60 1.52
12 0.30	**0.27** 0.03	**0.44** 0.04	**0.61** 0.06	**0.78** 0.07	**0.95** 0.09	**1.12** 0.10	**1.28** 0.12	**1.45** 0.14	**1.62** 0.15
18 0.46	**0.48** 0.04	**0.78** 0.07	**1.09** 0.10	**1.39** 0.13	**1.69** 0.16	**1.99** 0.18	**2.29** 0.21	**2.59** 0.24	**2.90** 0.27
24 0.61	**0.69** 0.06	**1.13** 0.10	**1.56** 0.15	**2.00** 0.19	**2.43** 0.23	**2.87** 0.27	**3.30** 0.31	**3.73** 0.35	**4.17** 0.39
30 0.76	**0.95** 0.09	**1.54** 0.14	**2.13** 0.20	**2.72** 0.25	**3.31** 0.31	**3.91** 0.36	**4.50** 0.42	**5.09** 0.47	**5.68** 0.53
36 0.91	**1.19** 0.11	**1.93** 0.18	**2.68** 0.25	**3.42** 0.32	**4.17** 0.39	**4.91** 0.46	**5.66** 0.53	**6.40** 0.59	**7.15** 0.66
42 1.07	**1.33** 0.12	**2.16** 0.20	**2.99** 0.28	**3.83** 0.36	**4.66** 0.43	**5.49** 0.51	**6.32** 0.59	**7.16** 0.66	**7.99** 0.74
48 1.22	**1.58** 0.15	**2.56** 0.24	**3.55** 0.33	**4.53** 0.42	**5.52** 0.51	**6.50** 0.60	**7.33** 0.68	**8.47** 0.79	**9.46** 0.88
54 1.37	**1.79** 0.17	**2.91** 0.27	**4.02** 0.37	**5.14** 0.48	**6.26** 0.58	**7.38** 0.69	**8.50** 0.79	**9.62** 0.89	**10.73** 1.00
60 1.52	**2.03** 0.19	**3.30** 0.31	**4.58** 0.43	**5.85** 0.54	**7.12** 0.66	**8.39** 0.78	**9.66** 0.90	**10.93** 1.02	**12.21** 1.13
66 1.68	**2.28** 0.21	**3.70** 0.34	**5.13** 0.48	**6.55** 0.61	**7.98** 0.74	**9.40** 0.87	**10.83** 1.01	**12.25** 1.14	**13.68** 1.27
72 1.83	**2.52** 0.23	**4.10** 0.38	**5.68** 0.53	**7.26** 0.67	**8.84** 0.82	**10.42** 0.97	**11.99** 1.11	**13.57** 1.26	**15.15** 1.41
78 1.98	**2.60** 0.24	**4.23** 0.39	**5.86** 0.54	**7.49** 0.70	**9.11** 0.85	**10.74** 1.00	**12.37** 1.15	**14.00** 1.30	**15.63** 1.46
84 2.13	**2.81** 0.26	**4.57** 0.42	**6.33** 0.59	**8.10** 0.75	**9.86** 0.92	**11.62** 1.08	**13.38** 1.24	**15.14** 1.41	**16.90** 1.57
90 2.29	**3.03** 0.28	**4.92** 0.46	**6.81** 0.63	**8.70** 0.81	**10.60** 0.98	**12.49** 1.16	**14.38** 1.34	**16.28** 1.51	**18.17** 1.69
96 2.44	**3.45** 0.32	**5.61** 0.52	**7.77** 0.72	**9.92** 0.92	**12.08** 1.12	**14.24** 1.32	**16.40** 1.52	**18.56** 1.72	**20.72** 1.92

AIR LEAKAGE (blades fully closed)



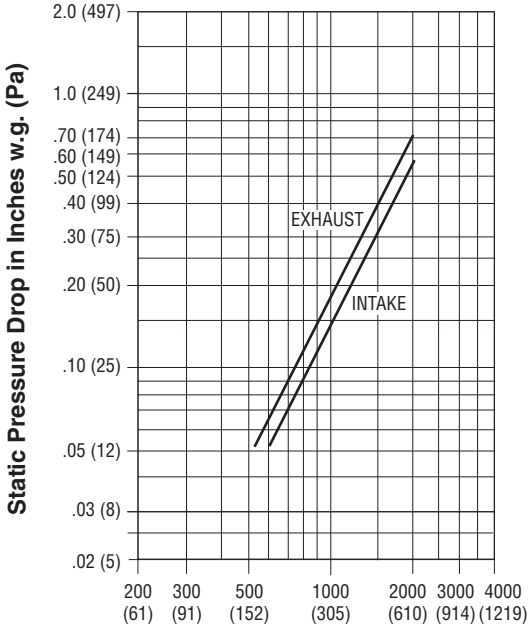
Louver test size: 48" x 48" (1219 x 1219 mm).

AIRFLOW/ WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1606CDAF
	Free Area %	46%
	Free Area sq. ft. (sq. m.)	7.34 (0.68)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	1144 fpm (349 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	8397 cfm (3963 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.19 in. w.g. (47 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

PRESSURE DROP (blades fully open)



Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

Nailor Industries Inc. certifies the Model 1606CDAF shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. Seal applies to air performance ratings and water penetration ratings.

HOW TO SPECIFY

MODEL 1604AD

EXTRUDED ALUMINUM ADJUSTABLE BLADE LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 4" (102) deep channel type (**or specifier to select:** flanged type **or** glazing adapter type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from ASTM B211 Alloy 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness. Blades shall be adjustable drainable style, with a drain gutter in each blade and gutter in head frame, constructed from type 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness with reinforcing bosses (**and specifier to select:** PVC blade seals), fixed at 37 1/2 degrees on approximately 4" (102) centers. Concealed downspouts in jambs to drain water from louver for minimum water cascade from blade to blade, compression type cambered metal jamb seals (**or specifier to select:** no jamb seals). Plated steel axles and linkage, concealed in frame, with stainless steel sleeve type bearings. Manufacturer to provide hand locking louver quadrant (**or specifier to select:** electric actuator **or** pneumatic actuator). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Large louvers that require multiple sections for shipping shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty or 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Performance data must be licensed by AMCA under the AMCA 511 Certified Ratings Program and shall bear the AMCA Certified Ratings seal for water penetration and air performance. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1604AD.

MODEL 1606AD

EXTRUDED ALUMINUM ADJUSTABLE BLADE LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 6" (152) deep channel type (**or specifier to select:** flanged type **or** glazing adapter type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from ASTM B211 Alloy 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness. Blades shall be adjustable drainable style, with a drain gutter in each blade and gutter in head frame, constructed from type 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness with reinforcing bosses (**and specifier to select:** PVC blade seals), fixed at 37 1/2 degrees on approximately 6" (152) centers. Concealed downspouts in jambs to drain water from louver for minimum water cascade from blade to blade, compression type cambered metal jamb seals (**or specifier to select:** no jamb seals). Plated steel axles and linkage, concealed in frame, with stainless steel sleeve type bearings. Manufacturer to provide hand locking louver quadrant (**or specifier to select:** electric actuator **or** pneumatic actuator). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Large louvers that require multiple sections for shipping shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty **or** 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty or color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Performance data must be licensed by AMCA under the AMCA 511 Certified Ratings Program and shall bear the AMCA Certified Ratings seal for water penetration and air performance. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1606AD.

HOW TO SPECIFY

MODEL 1606CDAF
EXTRUDED ALUMINUM COMBINATION LOUVER/AIRFOIL BLADE DAMPER

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 6" (152) deep channel type (**or specifier to select:** flanged type **or** glazing adapter type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from ASTM B211 Alloy 6063-T5 extruded aluminum of .125" (3.18) nominal wall thickness with a drainable head feature. Front blades shall be stationary drainable style with a drain gutter in each blade, constructed from type 6063-T5 extruded aluminum of .080" (2.03) nominal wall thickness, fixed at 45 degrees on approximately 5 1/2" (140) centers. Rear airfoil style operable blades, constructed from type 6063-T5 extruded aluminum with silicone blade seal mechanically locked in place. Concealed downspouts in jambs to drain water from louver for minimum water cascade from blade to blade, compression type cambered stainless steel jamb seals. Plated steel axles double bolted to blades, concealed linkage in frame with self-lubricating bronze bearings. Manufacturer to provide hand locking louver quadrant (**or specifier to select:** electric actuator **or** pneumatic actuator). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Large louvers that require multiple sections for shipping shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty **or** 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Performance data must be licensed by AMCA under the AMCA 511 Certified Ratings Program and shall bear the AMCA Certified Ratings seal for water penetration and air performance. Free area, water penetration, leakage and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1606CDAF.

HOW TO ORDER

MODELS: 1604AD, 1606AD AND 1606CDAF

EXTRUDED ALUMINUM ADJUSTABLE BLADE AND COMBINATION LOUVERS

EXAMPLE: 1606CDAF - 48x36 - U25 - CH - BSA - MI - HLLQ

1. **Models**
   - 1604AD 4" (102) Deep, Adjustable, Drainable Blade
   - 1606AD 6" (152) Deep, Adjustable, Drainable Blade
   - 1606CDAF 6" (152) Deep, Combination Drainable Blade, Airfoil Damper
2. **Nominal Width x Height**
   inches (mm's)
3. **Sizing**
   - U00 Exact Size
   - U25 Undersize 1/4" (6.3) (default)
   - U38 Undersize 3/8" (9.5)
   - U50 Undersize 1/2" (12.7)
4. **Frame**
   - CH Channel (default)
   - FL Flanged
5. **Blade Seals** (1604AD/1606AD only)
   - – None (default)
   - BPV PVC
6. **Jamb Seals** (1604AD/1606AD only)
   - JSM Metallic (default)
   - JSN None
7. **Bird Screen**
   - BSA Aluminum (default)
   - BSG Galvanized Steel
   - BSSS Type 304 Stainless Steel
   - BSN None
8. **Insect Screen**
   - – None (default)
   - ISA Aluminum
   - ISSS Type 304 Stainless Steel
9. **Finish**
   - MI Mill Finish (default)
   - PC3S Powder Coat, Standard Color
   - PC3C Powder Coat, Custom Color
   - PC4S H. P. Powder Coat, Standard Color
   - PC4C H. P. Powder Coat, Custom Color
   - PC5S Fluoropolymer Powder Coat, Standard Color
   - PC5C Fluoropolymer Powder Coat, Custom Color
   - PPC Prime Coat
   - AN04 Anodized, Clear 204-R1
   - AN15 Anodized, Clear 215-R1
   - ANLB Anodized, Light Bronze
   - ANMB Anodized, Medium Bronze
   - ANDB Anodized, Dark Bronze
   - ANBK Anodized, Black

OPTIONS & ACCESSORIES:

10. **Welded Construction**
    - – None (default)
    - WE Welded Construction
11. **Sill Extensions**
    - – None (default)
    - ESI Extended Sill
12. **Filter Rack**
    - – None (default)
    - FR1 1" (25) Filter rack
    - FR2 2" (51) Filter rack
13. **Actuator/Operator**
    - HLLQ Hand Locking Louver Quadrant (default)
    - HRCO Hand Rotary Crank Operator
    - PCOI Pull Chain Operator (internal)
    - ACT Actuator
    - CACT Concealed Actuator
14. **Chain Operator**
    - – None (default)
    - PCE External
    - PCI Internal
15. **Chain**
    - CH Chain Length (specify ft.)
16. **Actuator Selected By**
    - AUTO Least Cost (Auto-select) (default)
    - BEL Belimo
    - HON Honeywell
    - MAN Manually Select
    - N/A Not Applicable
    - SIE Siemens
17. **Power Requirement**
    - 120 120 VAC
    - 230 230 VAC
    - 24 24V AC
    - PNU Pneumatic
18. **Spring Return**
    - NSPR Non-Spring Return
    - SPR Spring Return
19. **Control Type**
    - 2POS Two Position
    - FL Floating
    - FMZS Float and Module, 0/Span
    - MOD Modulating
    - MODF Float and Modulating
20. **Fail Position (Spring Only)**
    - – None
    - CL Close
    - OP Open
21. **Auxiliary Switch Package**
    - – None
    - 300 Nailor MLS-300 Position Indicator
    - AUXS On Electric Actuator
22. **Actuator**

    Electric:

411	ML4115	120 VAC
811	ML8115	24 VAC
412	MS4120F10	120 VAC
812	MS8120F10	24 VAC
MS4	MS4X09F	120 VAC
MS8	MS8X09F	120 VAC
F12	FSNF120	120 VAC
F24	FSNF24	24 VAC
FA12	FSAF120	120 VAC
FA24	FSAF24	24 VAC
FL12	FSLF120	120 VAC
FL24	FSLF24	24 VAC

    Pneumatic:

296	331-2961
306	331-3060
482	331-4826

23a. **Sleeve**
   - – None (default)
   - SGLV Galvanized Steel
   - SALU Aluminum
   - S304 Type 304 Stainless Steel
23b. **Sleeve Length**
   SL = Specify
   12" (305) standard (default)
   8" – 28" (203 – 711)
23c. **Sleeve Gauge**
   - – None (default)
   - 20G 20 Ga.
   - 18G 18 Ga.
   - 16G 16 Ga.
   - 14G 14 Ga.
   - 10G 10 Ga.

Notes:

1. Standard color powder coat paint finishes require a color selection from the 21 color finishes on the "Nailor Louver Finishes and Color Guide".

Codes: LF00 Color to follow, LF01 Slate Blue, LF02 Medium Bronze, LF03 Sandstone, LF04 Light Gray, LF05 Charcoal, LF06 Bone White, LF07 Western Tan, LF08 Architectural Bronze, LF09 Regal Blue, LF10 Forest Green, LF11 Surrey Beige, LF12 Royal Brown, LF13 Barn Red, LF14 Burgandy, LF15 Clay, LF16 Almond, LF17 Coastal White, LF18 Vista Green, LF19 Black, LF20 Gloss Black, LF21 Campus Green.

2. Custom color powder coat paint finishes require color matching. A suitable paint chip must be supplied and Nailor will select or mix and formulate a powder coat paint that matches as closely as possible. We will forward a sample for approval.

Codes: LF00 Color to follow. You may alternatively enter a unique code and description.

- AMCA LICENSED
- SOUND CONTROL
- SIGHTPROOF DESIGN
- CORROSION RESISTANT
- HIGH PERFORMANCE

Model:

1612QS 12" (305) Deep

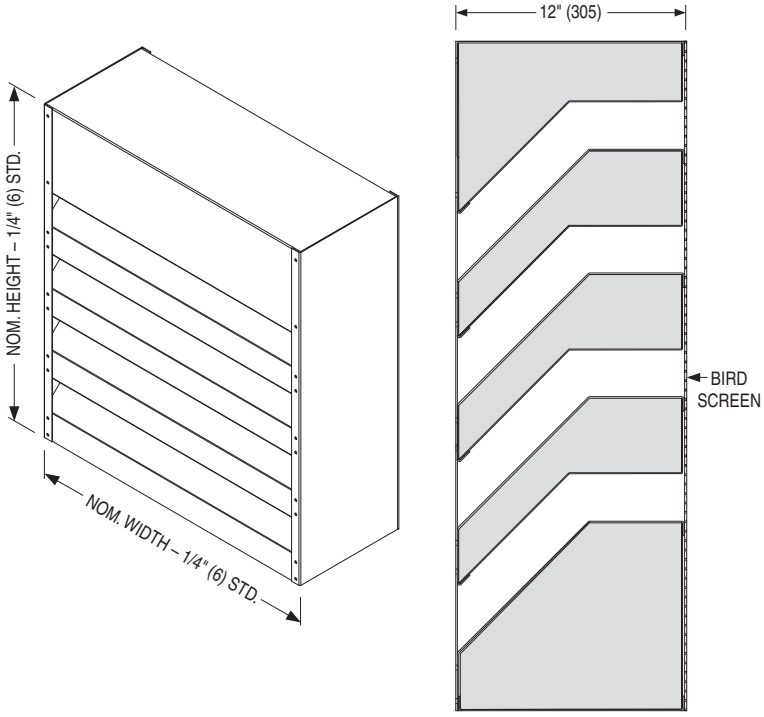
Model 1612QS

Model 1612QS

Model 1612QS Acoustical Louvers combine effective sound attenuation and good airflow performance with protection from the elements in an architecturally pleasing design. Acoustical insulation provides outstanding sound absorption qualities and the closely centered multiple formed J blade design is sight-proof, providing additional benefits as a visual screen and safety barrier in ground level applications where vandalism is a concern. Suitable for either intake or exhaust applications where maximum noise reduction is required. Available in channel or flanged type, the 12" (305) deep frame installs easily in most common wall configurations. Model 1612QS is AMCA Licensed for Water Penetration, Sound and Air Performance.

STANDARD CONSTRUCTION:

Frame:	12" (305) deep. Formed aluminum, .080" (2.03) nominal thickness.
Blades:	Formed aluminum, .080" (2.03) nominal thickness. Perforated interior retains and protects internal insulation.
Acoustical Insulation:	Fiberglass.
Blade Angle:	Fixed at 45 degrees.
Blade Spacing:	Approximately 6 1/2" (165) on centers.
Mullions:	Visible type, as required, depending upon width.
Screen:	3/4" x .051" (19 x 1.3) expanded, flattened aluminum bird screen in removable frame (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 18" H (305 x 457).
Maximum Single Section Size:	60" W x 96" H (1524 x 3048). Larger louvers will require field assembly of smaller sections.



MODEL 1612QS

COMMON OPTIONS:

- Flanged Frame.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.
- Clear or Color Anodized finishes. (Aluminum construction only).

PERFORMANCE DATA:
MODEL: 1612QS

FREE AREA in Square Feet and Square Meters

Height in Inches and Meters	Width in Inches and Meters								
	12 0.30	18 0.46	24 0.61	30 0.76	36 0.91	42 1.07	48 1.22	54 1.37	60 1.52
18 0.46	**0.27** 0.03	**0.44** 0.04	**0.61** 0.06	**0.77** 0.07	**0.94** 0.09	**1.11** 0.10	**1.27** 0.12	**1.44** 0.13	**1.61** 0.15
24 0.61	**0.41** 0.04	**0.66** 0.06	**0.92** 0.09	**1.17** 0.11	**1.42** 0.13	**1.68** 0.16	**1.93** 0.18	**2.18** 0.20	**2.44** 0.23
30 0.76	**0.56** 0.05	**0.91** 0.08	**1.26** 0.12	**1.60** 0.15	**1.95** 0.18	**2.30** 0.21	**2.64** 0.25	**2.99** 0.28	**3.34** 0.31
36 0.91	**0.71** 0.07	**1.14** 0.11	**1.58** 0.15	**2.01** 0.19	**2.45** 0.23	**2.88** 0.27	**3.32** 0.31	**3.75** 0.35	**4.19** 0.39
42 1.07	**0.85** 0.08	**1.37** 0.13	**1.90** 0.18	**2.42** 0.22	**2.94** 0.27	**3.47** 0.32	**3.99** 0.37	**4.51** 0.42	**5.04** 0.47
48 1.22	**0.99** 0.09	**1.61** 0.15	**2.22** 0.21	**2.83** 0.26	**3.44** 0.32	**4.05** 0.38	**4.72** 0.44	**5.28** 0.49	**5.89** 0.55
54 1.37	**1.14** 0.11	**1.84** 0.17	**2.54** 0.24	**3.24** 0.30	**3.94** 0.37	**4.64** 0.43	**5.34** 0.50	**6.04** 0.56	**6.74** 0.63
60 1.52	**1.28** 0.12	**2.07** 0.19	**2.86** 0.27	**3.65** 0.34	**4.44** 0.41	**5.23** 0.49	**6.02** 0.56	**6.81** 0.63	**7.59** 0.71
66 1.68	**1.43** 0.13	**2.30** 0.21	**3.18** 0.30	**4.06** 0.38	**4.94** 0.46	**5.81** 0.54	**6.69** 0.62	**7.57** 0.70	**8.45** 0.78
72 1.83	**1.57** 0.15	**2.54** 0.24	**3.50** 0.33	**4.47** 0.41	**5.43** 0.50	**6.40** 0.59	**7.36** 0.68	**8.33** 0.77	**9.30** 0.86
78 1.98	**1.71** 0.16	**2.77** 0.26	**3.82** 0.36	**4.88** 0.45	**5.93** 0.55	**6.98** 0.65	**8.04** 0.75	**9.09** 0.84	**10.15** 0.94
84 2.13	**1.86** 0.17	**3.00** 0.28	**4.14** 0.38	**5.28** 0.49	**6.43** 0.60	**7.57** 0.70	**8.71** 0.81	**9.85** 0.92	**11.00** 1.02
90 2.29	**2.14** 0.20	**3.46** 0.32	**4.78** 0.44	**6.10** 0.57	**7.42** 0.69	**8.74** 0.81	**10.06** 0.93	**11.38** 1.06	**12.70** 1.18
96 2.44	**2.29** 0.21	**3.70** 0.34	**5.10** 0.47	**6.51** 0.60	**7.92** 0.74	**9.33** 0.87	**10.73** 1.00	**12.14** 1.13	**13.55** 1.26

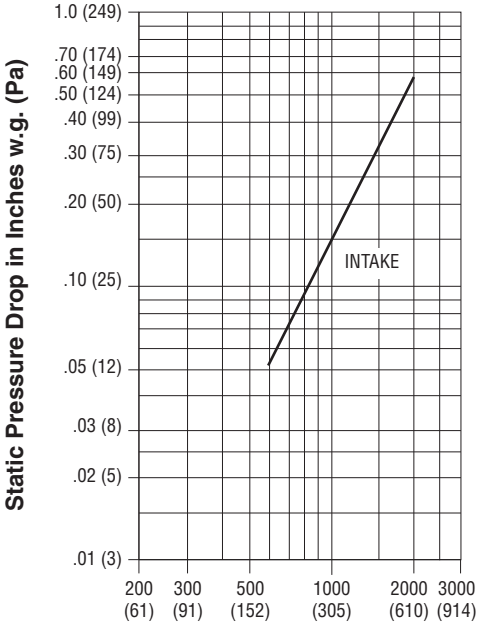
Nailor Industries Inc. certifies the Model 1612QS shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Water Penetration, Air Performance and Sound ratings.

AIRFLOW / WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1612QS
	Free Area %	30%
	Free Area sq. ft. (sq. m.)	4.72 (0.44)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	826 fpm (252 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	3899 cfm (1840 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.10 in. w.g. (25 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

FREE FIELD NOISE REDUCTION

Octave Band (Frequency) (Hz)	Free Field Noise Reduction (db)	Transmission Loss (db)	Sound Transmission Class
2 (125)	11	5	13
3 (250)	11	5	
4 (500)	16	10	
5 (1000)	25	19	
6 (2000)	20	14	
7 (4000)	19	13	

NOTE: The Sound Transmission Class (STC) is a single number rating of the louver's resistance to transfer airbourne sound, calculated in accordance with ASTM E413-04. The higher the STC rating number, the less sound is transmitted through the louver. STC is not AMCA certified.

HOW TO SPECIFY OR TO ORDER

MODEL 1612QS
FORMED ALUMINUM (OR STEEL) ACOUSTICAL LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, formed aluminum louvers meeting or exceeding the following criteria: Frame shall be 12" (305) deep channel type (**or specifier to select:** flanged type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), with integral caulking slots (and **specifier to select, if required:** extended sill), constructed from formed aluminum of .080" (2.03) nominal wall thickness. Blades shall be sightproof J style, constructed from formed aluminum of .080" (2.03) nominal wall thickness with perforated interior and internal mineral wool insulation, fixed at 45 degrees on approximately 6 1/2" (165) centers. Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Large louvers that require multiple sections for shipping and field assembly shall be constructed with visible type mullions when installed together on site. Louvers shall be equipped with removable 3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen (**or specifier to select:** type 304 stainless steel bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty or 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Performance data must be licensed by AMCA under the AMCA 511 Certified Ratings Program and shall bear the AMCA Certified Ratings seal for water penetration, sound and air performance. Free area, water penetration, free field noise reduction and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1612QS.

MODEL: 1612QS
FORMED ALUMINUM (OR STEEL) ACOUSTICAL LOUVERS

EXAMPLE: 1612QS - 48x36 - U25 - CH - BSA - MI

1. **Models**
   - 1612QS 12" (305) Deep, Sightproof
2. **Nominal Width x Height**
   - inches (mm's)
3. **Construction**
   - ALM Aluminum (default)
   - 18GA 18 ga. galvanized steel
4. **Sizing**
   - U00 Exact Size
   - U25 Undersize 1/4" (6.3) (default)
   - U38 Undersize 3/8" (9.5)
   - U50 Undersize 1/2" (12.7)
5. **Frame**
   - CH Channel (default)
   - FL Flanged
6. **Bird Screen**
   - BSA Aluminum (default)
   - BSG Galvanized Steel
   - BSSS Type 304 Stainless Steel
   - BSN None (default)
7. **Insect Screen**
   - – None (default)
   - ISA Aluminum
   - ISSS Type 304 Stainless Steel
8. **Finish**
   - MI Mill Finish (default)
   - PC3S Powder Coat, Standard Color
   - PC3C Powder Coat, Custom Color
   - PC4S H. P. Powder Coat, Standard Color
   - PC4C H. P. Powder Coat, Custom Color
   - PC5S Fluoropolymer Powder Coat, Standard Color
   - PC5C Fluoropolymer Powder Coat, Custom Color
   - PPC Prime Coat
   - AN04 Anodized, Clear 204-R1
   - AN15 Anodized, Clear 215-R1
   - ANLB Anodized, Light Bronze
   - ANMB Anodized, Medium Bronze
   - ANDB Anodized, Dark Bronze
   - ANBK Anodized, Black

OPTIONS & ACCESSORIES:

10. **Welded Construction**
    - – None (default)
    - WE Welded Construction
11. **Extended Sill**
    - – None (default)
    - ESI Extended Sill
12. **Filter Rack**
    - – None (default)
    - FR1 1" (25) Filter rack
    - FR2 2" (51) Filter rack

13a. **Sleeve**
   - – None (default)
   - SGLV Galvanized Steel
   - SALU Aluminum
   - S304 Type 304 Stainless Steel

13b. **Sleeve Length**
   - **SL = Specify**
   - 12" (305) standard (default)
   - 8" – 28" (203 – 711)

13c. **Sleeve Gauge**
   - – None (default)
   - 20G 20 Ga.
   - 18G 18 Ga.
   - 16G 16 Ga.
   - 14G 14 Ga.
   - 10G 10 Ga.

Notes:

1. Standard color powder coat paint finishes require a color selection from the 21 color finishes on the "Nailor Louver Finishes and Color Guide".

Codes: LF00 Color to follow, LF01 Slate Blue, LF02 Medium Bronze, LF03 Sandstone, LF04 Light Gray, LF05 Charcoal, LF06 Bone White, LF07 Western Tan, LF08 Architectural Bronze, LF09 Regal Blue, LF10 Forest Green, LF11 Surrey Beige, LF12 Royal Brown, LF13 Barn Red, LF14 Burgandy, LF15 Clay, LF16 Almond, LF17 Coastal White, LF18 Vista Green, LF19 Black, LF20 Gloss Black, LF21 Campus Green.

2. Custom color powder coat paint finishes require color matching. A suitable paint chip must be supplied and Nailor will select or mix and formulate a powder coat paint that matches as closely as possible. We will forward a sample for approval.

Codes: LF00 Color to follow. You may alternatively enter a unique code and description.

- ARCHITECTURAL BLADE
- PLEASING VISUAL AESTHETICS
- HIGH FREE AREA
- LOW PRESSURE DROP
- DURABLE CONSTRUCTION

Models:

1704J 4" (102) Deep

1706J 6" (152) Deep

Model 1704J

Model 1706J

Model 1704J

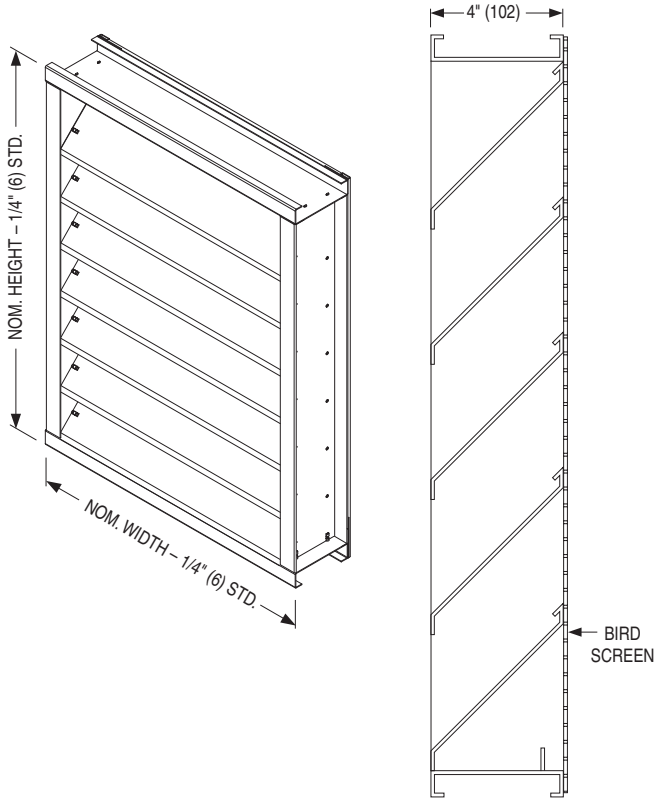
Model 1704J is an architecturally styled louver utilizing J style blades, crafted with a clean continuous architectural appearance that will visually compliment any structure's exterior. The blade design features a rear water baffle and provides protection against general weather conditions, with low pressure drop characteristics and a high free area. Galvanized steel construction is economical and durable and can withstand and perform well under the most demanding conditions. Suitable for use in ventilation, exhaust and low to medium velocity intake applications. Available in channel or flanged type, the 4" (102) deep frame installs easily in most common wall configurations.

STANDARD CONSTRUCTION:

Frame:	4" (102) deep, 20 ga. (1.0) formed galvanized steel.
Blades:	20 ga. (1.0) formed galvanized steel. J style.
Blade Angle:	Fixed at 45 degrees.
Blade Spacing:	Approximately 4" (102) on centers.
Screen:	1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized bird screen in removable frame (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	60" wide x 96" high (1524 x 2438). Larger louvers will require field assembly of smaller sections.

COMMON OPTIONS:

- Flanged Frame.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.



MODEL 1704J

Model 1706J

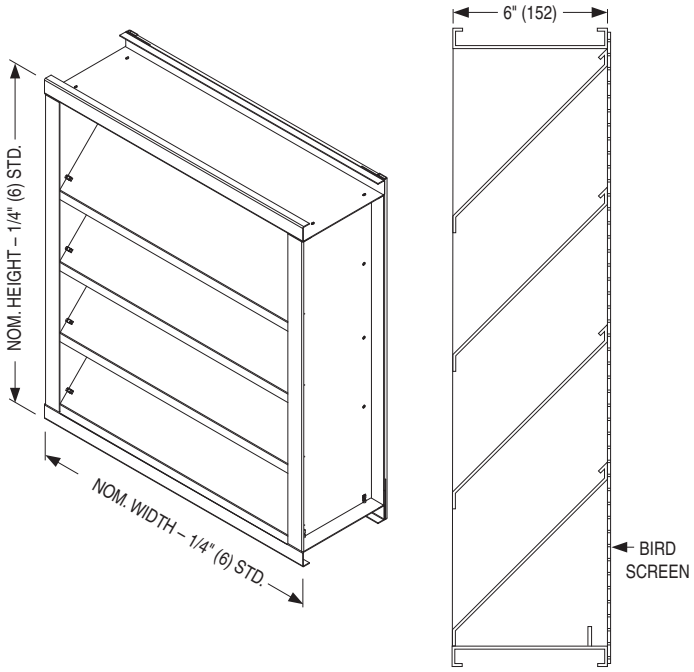
Model 1706J is an architecturally styled louver utilizing J style blades, designed with smooth, clean lines that visually compliment any structure's exterior styling. The blade design features a rear water baffle and provides good protection against general weather conditions, with low pressure drop characteristics and a high free area. Galvanized steel construction is economical and durable and can withstand and perform well under the most demanding conditions. Suitable for use in ventilation, exhaust and low to medium velocity intake applications. Available in channel or flanged type, the 6" (152) deep frame installs easily in most common wall configurations.

STANDARD CONSTRUCTION:

Frame:	6" (152) deep, 20 ga. (1.0) formed galvanized steel.
Blades:	20 ga. (1.0) formed galvanized steel. J style.
Blade Angle:	Fixed at 45 degrees.
Blade Spacing:	Approximately 5 1/2" (140) on centers.
Screen:	1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized bird screen in removable frame (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	60" wide x 96" high (1524 x 2438). Larger louvers will require field assembly of smaller sections.

COMMON OPTIONS:

- Flanged Frame.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.



MODEL 1706J

PERFORMANCE DATA:
MODEL: 1704J

FREE AREA in Square Feet and Square Meters

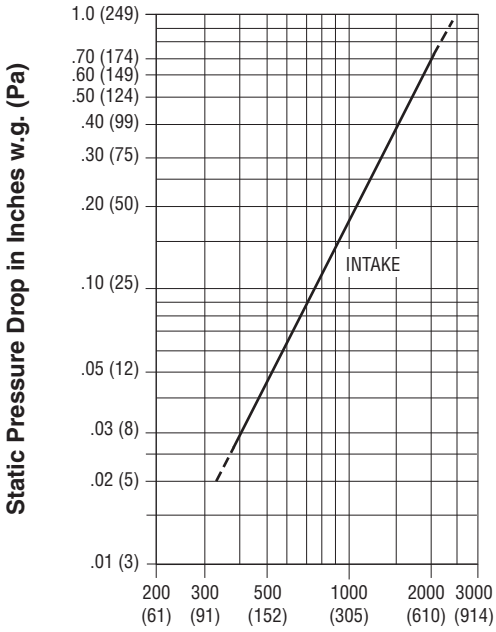
Height in Inches and Meters	Width in Inches and Meters								
	12 0.30	**18** 0.46	**24** 0.61	**30** 0.76	**36** 0.91	**42** 1.07	**48** 1.22	**54** 1.37	**60** 1.52
12 0.30	**0.30** 0.02	**0.41** 0.04	**0.57** 0.05	**0.71** 0.07	**0.86** 0.08	**1.02** 0.09	**1.16** 0.11	**1.32** 0.12	**1.47** 0.14
18 0.46	**0.56** 0.05	**0.87** 0.08	**1.19** 0.11	**1.50** 0.14	**1.82** 0.17	**2.14** 0.20	**2.46** 0.23	**2.78** 0.26	**3.10** 0.29
24 0.61	**0.82** 0.08	**1.29** 0.12	**1.76** 0.16	**2.22** 0.21	**2.70** 0.25	**3.17** 0.29	**3.63** 0.34	**4.11** 0.38	**4.57** 0.42
30 0.76	**1.11** 0.10	**1.75** 0.16	**2.39** 0.22	**3.01** 0.28	**3.65** 0.34	**4.29** 0.40	**4.93** 0.46	**5.56** 0.52	**6.19** 0.58
36 0.91	**1.40** 0.13	**2.20** 0.20	**3.00** 0.28	**3.81** 0.35	**4.61** 0.43	**5.41** 0.50	**6.22** 0.58	**7.02** 0.65	**7.82** 0.73
42 1.07	**1.67** 0.16	**2.62** 0.24	**3.58** 0.33	**4.53** 0.42	**5.48** 0.51	**6.44** 0.60	**7.39** 0.69	**8.35** 0.78	**9.30** 0.86
48 1.22	**1.97** 0.18	**3.08** 0.29	**4.20** 0.39	**5.32** 0.49	**6.44** 0.60	**7.56** 0.70	**8.53** 0.79	**9.81** 0.91	**10.93** 1.02
54 1.37	**2.22** 0.21	**3.50** 0.33	**4.77** 0.44	**6.04** 0.56	**7.32** 0.68	**8.59** 0.80	**9.86** 0.92	**11.13** 1.03	**12.40** 1.15
60 1.52	**2.52** 0.23	**3.96** 0.37	**5.39** 0.50	**6.83** 0.63	**8.27** 0.77	**9.71** 0.90	**11.15** 1.04	**12.59** 1.17	**14.03** 1.30
66 1.68	**2.79** 0.26	**4.37** 0.41	**5.97** 0.55	**7.55** 0.70	**9.15** 0.85	**10.73** 1.00	**12.33** 1.15	**13.92** 1.29	**15.51** 1.44
72 1.83	**3.08** 0.29	**4.83** 0.45	**6.59** 0.61	**8.35** 0.78	**10.10** 0.94	**11.86** 1.10	**13.62** 1.27	**15.37** 1.43	**17.13** 1.59
78 1.98	**3.36** 0.31	**5.29** 0.49	**7.21** 0.67	**9.14** 0.85	**11.06** 1.03	**12.99** 1.21	**14.91** 1.39	**16.83** 1.56	**18.76** 1.74
84 2.13	**3.63** 0.34	**5.71** 0.53	**7.78** 0.72	**9.86** 0.92	**11.94** 1.11	**14.01** 1.30	**16.08** 1.49	**18.16** 1.69	**20.24** 1.88
90 2.29	**3.92** 0.36	**6.16** 0.57	**8.41** 0.78	**10.65** 0.99	**12.89** 1.20	**15.14** 1.41	**17.38** 1.61	**19.62** 1.82	**21.87** 2.03
96 2.44	**4.19** 0.39	**6.59** 0.61	**8.97** 0.83	**11.37** 1.06	**13.77** 1.28	**16.16** 1.50	**18.55** 1.72	**20.95** 1.95	**23.34** 2.17

AIRFLOW/ WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1704J
	Free Area %	53%
	Free Area sq. ft. (sq. m.)	8.53 (0.79)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	869 fpm (265 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	7413 cfm (3498 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.13 in. w.g. (32 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

PERFORMANCE DATA:

MODEL: 1706J

FREE AREA in Square Feet and Square Meters

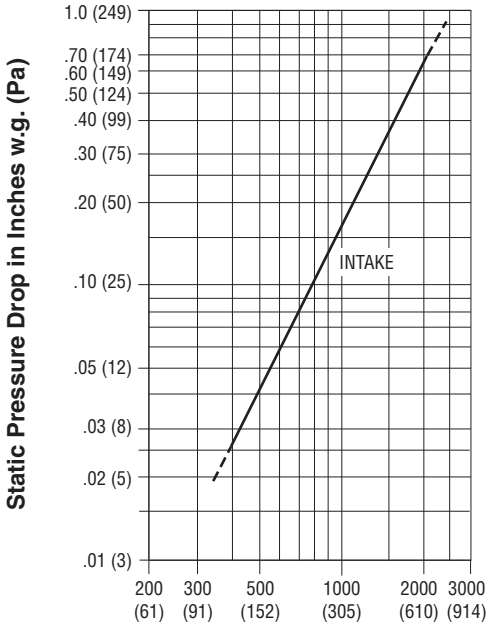
Height in Inches and Meters	Width in Inches and Meters								
	12 0.30	**18** 0.46	**24** 0.61	**30** 0.76	**36** 0.91	**42** 1.07	**48** 1.22	**54** 1.37	**60** 1.52
12 0.30	**0.19** 0.02	**0.29** 0.03	**0.39** 0.04	**0.49** 0.05	**0.61** 0.06	**0.71** 0.07	**0.81** 0.08	**0.92** 0.09	**1.02** 0.09
18 0.46	**0.47** 0.04	**0.75** 0.07	**1.02** 0.09	**1.29** 0.12	**1.56** 0.14	**1.83** 0.17	**2.11** 0.20	**2.38** 0.22	**2.64** 0.25
24 0.61	**0.77** 0.07	**1.20** 0.11	**1.65** 0.15	**2.08** 0.19	**2.52** 0.23	**2.96** 0.27	**3.40** 0.32	**3.84** 0.36	**4.27** 0.40
30 0.76	**1.06** 0.10	**1.67** 0.16	**2.27** 0.21	**2.87** 0.27	**3.48** 0.32	**4.09** 0.38	**4.69** 0.44	**5.30** 0.49	**5.90** 0.55
36 0.91	**1.35** 0.13	**2.12** 0.20	**2.89** 0.27	**3.66** 0.34	**4.43** 0.41	**5.21** 0.48	**5.98** 0.56	**6.75** 0.63	**7.52** 0.70
42 1.07	**1.65** 0.15	**2.58** 0.24	**3.52** 0.33	**4.56** 0.42	**5.40** 0.50	**6.34** 0.59	**7.28** 0.68	**8.21** 0.76	**9.15** 0.85
48 1.22	**1.93** 0.18	**3.04** 0.28	**4.15** 0.39	**5.25** 0.49	**6.36** 0.59	**7.46** 0.69	**8.53** 0.79	**9.67** 0.90	**10.77** 1.00
54 1.37	**2.22** 0.21	**3.50** 0.33	**4.77** 0.44	**6.04** 0.56	**7.32** 0.68	**8.59** 0.80	**9.86** 0.92	**11.13** 1.04	**12.40** 1.15
60 1.52	**2.52** 0.23	**3.96** 0.37	**5.39** 0.50	**6.83** 0.63	**8.27** 0.77	**9.71** 0.90	**11.15** 1.04	**12.59** 1.17	**14.03** 1.30
66 1.68	**2.81** 0.26	**4.41** 0.41	**6.02** 0.56	**7.62** 0.71	**9.23** 0.86	**10.84** 1.01	**12.44** 1.16	**14.05** 1.31	**15.65** 1.45
72 1.83	**3.10** 0.29	**4.88** 0.45	**6.65** 0.62	**8.42** 0.78	**10.19** 0.95	**11.97** 1.11	**13.74** 1.28	**15.51** 1.44	**17.28** 1.61
78 1.98	**3.40** 0.32	**5.33** 0.50	**7.28** 0.68	**9.21** 0.86	**11.15** 1.04	**13.09** 1.22	**15.03** 1.40	**16.97** 1.58	**18.90** 1.76
84 2.13	**3.68** 0.34	**5.79** 0.54	**7.89** 0.73	**10.00** 0.93	**12.11** 1.13	**14.21** 1.32	**16.32** 1.52	**18.43** 1.71	**20.53** 1.91
90 2.29	**3.98** 0.37	**6.25** 0.58	**8.52** 0.79	**10.79** 1.00	**13.07** 1.21	**15.34** 1.43	**17.62** 1.64	**19.89** 1.85	**21.15** 2.06
96 2.44	**4.27** 0.40	**6.71** 0.62	**9.15** 0.85	**11.59** 1.08	**14.03** 1.30	**16.46** 1.53	**18.90** 1.76	**21.34** 1.98	**23.78** 2.21

AIRFLOW / WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1706J
	Free Area %	53%
	Free Area sq. ft. (sq. m.)	8.53 (0.79)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	938 fpm (286 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	8001 cfm (3776 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.15 in. w.g. (37 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

HOW TO SPECIFY

MODEL 1704J
FORMED STEEL ARCHITECTURAL BLADE LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, formed steel louvers meeting or exceeding the following criteria: Frame shall be 4" (102) deep channel type (**or specifier to select:** flanged type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), (**specifier to select, if required:** with extended sill,) constructed from formed 20 ga. (1.0) galvanized steel (**or specifier to select:** formed 16 ga. [1.6] galvanized steel **or** formed 18 ga. [1.3] galvanized steel **or** formed 304 stainless steel **or** formed 316 stainless steel). Blades shall be stationary J style, constructed from formed 20 ga. (1.0) galvanized steel (**or specifier to select:** to match frame), fixed at 45 degrees on approximately 4" (102) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Louvers shall be equipped with removable 1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized steel bird screen (**or specifier to select:** type 304 stainless steel bird screen **or** aluminum bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Submitted performance data to be based on tests in accordance with AMCA Standard 500-L. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1704J.

MODEL 1706J
FORMED STEEL ARCHITECTURAL BLADE LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, formed steel louvers meeting or exceeding the following criteria: Frame shall be 6" (152) deep channel type (**or specifier to select:** flanged type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), (**specifier to select, if required:** with extended sill,) constructed from formed 20 ga. (1.0) galvanized steel (**or specifier to select:** formed 16 ga. [1.6] galvanized steel **or** formed 18 ga. [1.3] galvanized steel **or** formed 304 stainless steel **or** formed 316 stainless steel). Blades shall be stationary J style, constructed from formed 20 ga. (1.0) galvanized steel (**or specifier to select:** to match frame), fixed at 45 degrees on approximately 5 1/2" (140) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Louvers shall be equipped with removable 1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized steel bird screen (**or specifier to select:** type 304 stainless steel bird screen **or** aluminum bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) or AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Submitted performance data to be based on tests in accordance with AMCA Standard 500-L. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1706J.

- DRAINABLE HEAD
- ARCHITECTURAL BLADE
- EXCELLENT WEATHER PROTECTION

Models:

1704JD 4" (102) Deep

1706JD 6" (152) Deep

Model 1704JD

Model 1706JD

Model 1704JD

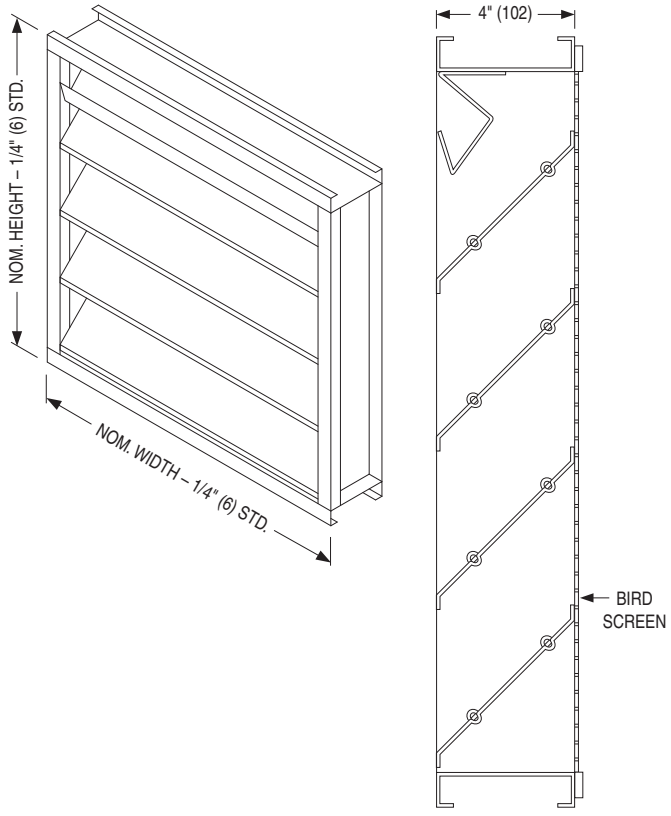
Model 1704JD combines the desired foul weather performance of a drainable louver with the pleasing aesthetics of an architectural louver. J style architectural blades work with a drainable head feature that utilizes a top rain gutter to collect cascading water and channel it out through concealed downspouts in the side frame, preventing water from entering into the airstream. Constructed from durable galvanized steel, the design provides superb weather protection and great air performance results at an affordable cost. Suitable for use in ventilation, exhaust and low to medium velocity intake applications where water penetration is a concern. Available in channel or flanged type, the 4" (102) deep frame installs easily in most common wall configurations.

STANDARD CONSTRUCTION:

Frame:	4" (102) deep, 20 ga. (1.0) formed galvanized steel.
Blades:	20 ga. (1.0) formed galvanized steel. J style.
Blade Angle:	Fixed at 45 degrees.
Blade Spacing:	Approximately 3.875" (98) on centers.
Screen:	1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized bird screen in removable frame (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	60" wide x 96" high (1524 x 2438). Larger louvers will require field assembly of smaller sections.

COMMON OPTIONS:

- Flanged Frame.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.



MODEL 1704JD

Model 1706JD

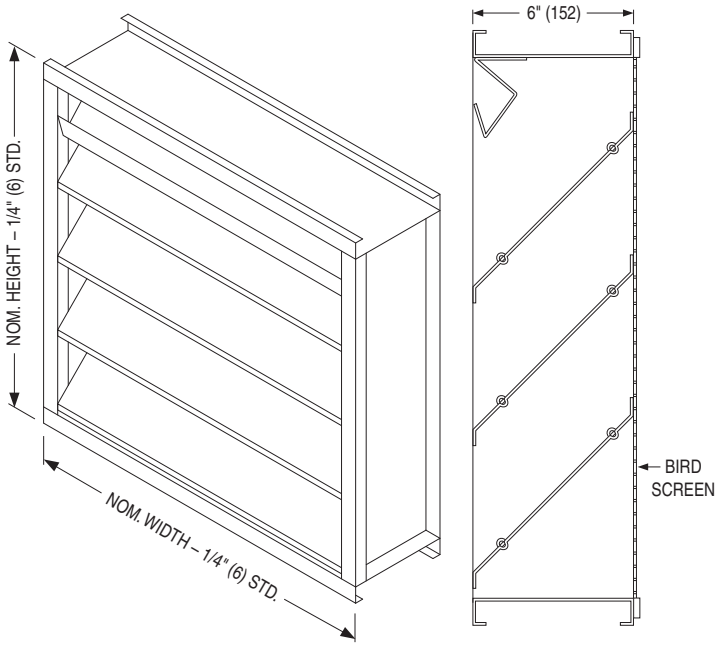
Model 1706JD combines the aesthetic appeal of a non-drainable blade with the water penetration protection of a drainable louver. J style architectural blades work with a drainable head feature that utilizes a top rain gutter to collect cascading water and channel it out through concealed downspouts in the side frame, preventing water from entering the airstream and entraining into the space. Economical galvanized steel construction provides outstanding weather protection and excellent air performance at an affordable cost. Suitable for use in ventilation, exhaust and low to medium velocity intake applications where water penetration is a concern. Available in channel or flanged type, the 6" (152) deep frame installs easily in most common wall configurations.

STANDARD CONSTRUCTION:

Frame:	6" (152) deep, 20 ga. (1.0) formed galvanized steel.
Blades:	20 ga. (1.0) formed galvanized steel. J style.
Blade Angle:	Fixed at 45 degrees.
Blade Spacing:	Approximately 5 1/2" (140) on centers.
Screen:	1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized bird screen in removable frame (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	60" wide x 96" high (1524 x 2438). Larger louvers will require field assembly of smaller sections.

COMMON OPTIONS:

- Flanged Frame.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.



MODEL 1706JD

PERFORMANCE DATA:

MODEL: 1704JD

FREE AREA in Square Feet and Square Meters

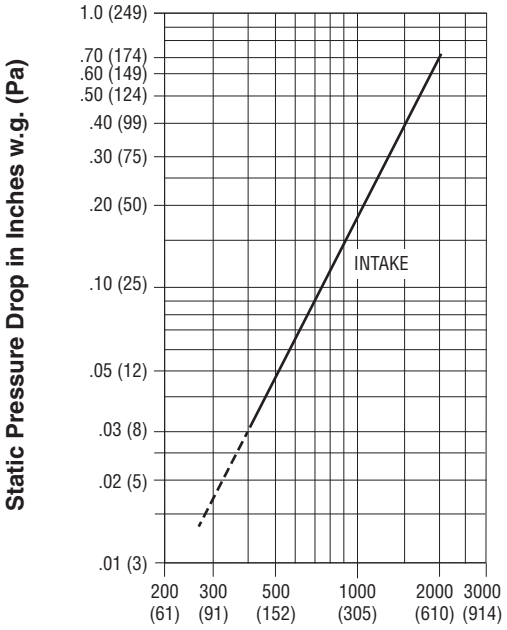
Height in Inches and Meters	Width in Inches and Meters								
	12 0.30	**18** 0.46	**24** 0.61	**30** 0.76	**36** 0.91	**42** 1.07	**48** 1.22	**54** 1.37	**60** 1.52
12 0.30	**0.25** 0.02	**0.40** 0.04	**0.56** 0.05	**0.71** 0.07	**0.87** 0.08	**1.02** 0.09	**1.17** 0.11	**1.33** 0.12	**1.48** 0.14
18 0.46	**0.54** 0.05	**0.87** 0.08	**1.20** 0.11	**1.54** 0.14	**1.87** 0.17	**2.20** 0.20	**2.53** 0.24	**2.87** 0.27	**3.20** 0.30
24 0.61	**0.77** 0.07	**1.24** 0.12	**1.72** 0.16	**2.19** 0.20	**2.67** 0.25	**3.14** 0.29	**3.61** 0.34	**4.09** 0.38	**4.56** 0.42
30 0.76	**1.04** 0.10	**1.68** 0.16	**2.32** 0.22	**2.96** 0.27	**3.60** 0.33	**4.24** 0.39	**4.88** 0.45	**5.52** 0.51	**6.16** 0.57
36 0.91	**1.36** 0.12	**2.13** 0.20	**2.94** 0.27	**3.76** 0.35	**4.57** 0.42	**5.38** 0.50	**6.19** 0.58	**7.01** 0.65	**7.82** 0.73
42 1.07	**1.57** 0.15	**2.54** 0.24	**3.50** 0.33	**4.47** 0.42	**5.43** 0.50	**6.40** 0.59	**7.37** 0.68	**8.33** 0.77	**9.30** 0.86
48 1.22	**1.82** 0.17	**2.94** 0.27	**4.06** 0.38	**5.18** 0.48	**6.30** 0.59	**7.42** 0.69	**8.38** 0.78	**9.38** 0.87	**10.46** 0.97
54 1.37	**2.07** 0.19	**3.34** 0.31	**4.62** 0.43	**5.89** 0.55	**7.17** 0.67	**8.44** 0.78	**9.71** 0.90	**10.99** 1.02	**12.26** 1.14
60 1.52	**2.34** 0.22	**3.78** 0.35	**5.22** 0.48	**6.66** 0.62	**8.10** 0.75	**9.54** 0.89	**10.98** 1.02	**12.42** 1.15	**13.86** 1.29
66 1.68	**2.62** 0.24	**4.23** 0.39	**5.84** 0.54	**7.46** 0.69	**9.07** 0.84	**10.68** 0.99	**12.29** 1.14	**13.91** 1.29	**15.52** 1.44
72 1.83	**2.89** 0.28	**4.67** 0.43	**6.45** 0.60	**8.23** 0.76	**10.00** 0.93	**11.78** 1.09	**13.56** 1.26	**15.34** 1.43	**17.12** 1.59
78 1.98	**3.15** 0.29	**5.09** 0.47	**7.03** 0.65	**8.97** 0.83	**10.90** 1.01	**12.84** 1.19	**14.78** 1.37	**16.72** 1.55	**18.66** 1.73
84 2.13	**3.41** 0.32	**5.51** 0.51	**7.61** 0.71	**9.71** 0.90	**11.80** 1.10	**13.90** 1.29	**16.00** 1.49	**18.10** 1.68	**20.20** 1.88
90 2.29	**3.67** 0.34	**5.93** 0.55	**8.19** 0.76	**10.45** 0.97	**12.70** 1.18	**14.96** 1.39	**17.22** 1.60	**19.48** 1.81	**21.74** 2.02
96 2.44	**3.91** 0.36	**6.32** 0.59	**8.72** 0.81	**11.13** 1.03	**13.53** 1.26	**15.94** 1.48	**18.35** 1.70	**20.75** 1.93	**23.16** 2.15

AIRFLOW / WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1704JD
	Free Area %	52%
	Free Area sq. ft. (sq. m.)	8.38 (0.78)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	1123 fpm (342 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	9410 cfm (4441 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.22 in. w.g. (55 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

PERFORMANCE DATA:
MODEL: 1706JD

FREE AREA in Square Feet and Square Meters

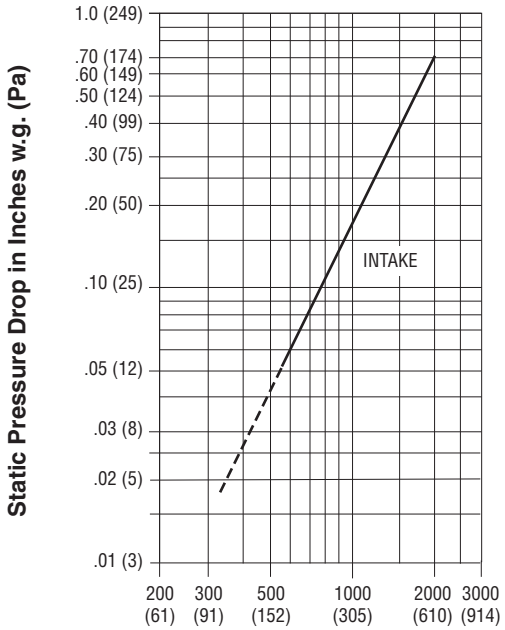
Height in Inches and Meters	Width in Inches and Meters								
	12 0.30	**18** 0.46	**24** 0.61	**30** 0.76	**36** 0.91	**42** 1.07	**48** 1.22	**54** 1.37	**60** 1.52
12 0.30	**0.18** 0.02	**0.29** 0.03	**0.40** 0.04	**0.51** 0.05	**0.62** 0.06	**0.73** 0.07	**0.84** 0.08	**0.96** 0.09	**1.07** 0.10
18 0.46	**0.43** 0.04	**0.69** 0.06	**0.96** 0.09	**1.22** 0.11	**1.49** 0.14	**1.75** 0.16	**2.02** 0.19	**2.28** 0.21	**2.55** 0.24
24 0.61	**0.69** 0.06	**1.11** 0.10	**1.54** 0.14	**1.96** 0.18	**2.39** 0.22	**2.81** 0.26	**3.24** 0.30	**3.66** 0.34	**4.09** 0.38
30 0.76	**0.92** 0.09	**1.49** 0.14	**2.05** 0.19	**2.62** 0.24	**3.18** 0.30	**3.75** 0.35	**4.32** 0.40	**4.88** 0.45	**5.45** 0.51
36 0.91	**1.18** 0.11	**1.91** 0.18	**2.63** 0.24	**3.36** 0.31	**4.08** 0.38	**4.81** 0.45	**5.54** 0.51	**6.26** 0.58	**6.99** 0.65
42 1.07	**1.44** 0.13	**2.33** 0.22	**3.21** 0.30	**4.10** 0.38	**4.98** 0.46	**5.87** 0.55	**6.76** 0.63	**7.64** 0.71	**8.53** 0.79
48 1.22	**1.70** 0.16	**2.75** 0.26	**3.79** 0.35	**4.85** 0.45	**5.88** 0.55	**6.93** 0.64	**7.85** 0.73	**8.88** 0.82	**9.91** 0.92
54 1.37	**1.96** 0.18	**3.17** 0.29	**4.37** 0.41	**5.58** 0.52	**6.78** 0.63	**7.99** 0.74	**9.20** 0.85	**10.40** 0.97	**11.61** 1.08
60 1.52	**2.23** 0.21	**3.60** 0.33	**4.97** 0.46	**6.35** 0.59	**7.72** 0.72	**9.09** 0.84	**10.46** 0.97	**11.84** 1.10	**13.21** 1.23
66 1.68	**2.51** 0.23	**4.05** 0.38	**5.60** 0.52	**7.14** 0.66	**8.69** 0.81	**10.23** 0.95	**11.78** 1.09	**13.32** 1.24	**14.87** 1.38
72 1.83	**2.75** 0.26	**4.44** 0.41	**6.13** 0.57	**7.83** 0.73	**9.52** 0.88	**11.21** 1.04	**12.90** 1.20	**14.60** 1.36	**16.29** 1.51
78 1.98	**3.01** 0.28	**4.86** 0.45	**6.71** 0.62	**8.57** 0.80	**10.42** 0.97	**12.27** 1.14	**14.12** 1.31	**15.98** 1.48	**17.83** 1.66
84 2.13	**3.27** 0.30	**5.28** 0.49	**7.29** 0.68	**9.31** 0.86	**11.32** 1.05	**13.33** 1.24	**15.34** 1.43	**17.36** 1.61	**19.37** 1.80
90 2.29	**3.53** 0.33	**5.70** 0.53	**7.87** 0.73	**10.05** 0.93	**12.22** 1.14	**14.39** 1.34	**16.56** 1.54	**18.74** 1.74	**20.91** 1.94
96 2.44	**3.80** 0.35	**6.14** 0.57	**8.48** 0.79	**10.82** 1.00	**13.15** 1.22	**15.49** 1.44	**17.83** 1.66	**20.17** 1.87	**22.51** 2.09

AIRFLOW/ WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1706JD
	Free Area %	49%
	Free Area sq. ft. (sq. m.)	7.85 (0.73)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	1250 fpm (381 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	9813 cfm (4631 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.27 in. w.g. (67 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

HOW TO SPECIFY

MODEL 1704JD

FORMED STEEL DRAINABLE HEAD, ARCHITECTURAL BLADE LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, formed steel louvers meeting or exceeding the following criteria: Frame shall be 4" (102) deep channel type (**or specifier to select:** flanged type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), (**specifier to select, if required:** with extended sill,) constructed from formed 20 ga. (1.0) galvanized steel (**or specifier to select:** formed 16 ga. [1.6] galvanized steel **or** formed 18 ga. [1.3] galvanized steel **or** formed 304 stainless steel **or** formed 316 stainless steel) with a drainable head feature. Blades shall be stationary J style, constructed from formed 20 ga. (1.0) galvanized steel (**or specifier to select:** to match frame), fixed at 45 degrees on approximately 4" (102) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Louvers shall be equipped with removable 1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized steel bird screen (**or specifier to select:** type 304 stainless steel bird screen **or** aluminum bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) or AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Submitted performance data to be based on tests in accordance with AMCA Standard 500-L. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1704JD.

MODEL 1706JD

FORMED STEEL DRAINABLE HEAD, ARCHITECTURAL BLADE LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, formed steel louvers meeting or exceeding the following criteria: Frame shall be 6" (152) deep channel type (**or specifier to select:** flanged type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), (**specifier to select, if required:** with extended sill,) constructed from formed 20 ga. (1.0) galvanized steel (**or specifier to select:** formed 16 ga. [1.6] galvanized steel **or** formed 18 ga. [1.3] galvanized steel **or** formed 304 stainless steel **or** formed 316 stainless steel) with a drainable head feature. Blades shall be stationary J style, constructed from formed 20 ga. (1.0) galvanized steel (**or specifier to select:** to match frame), fixed at 45 degrees on approximately 5 1/2" (140) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Louvers shall be equipped with removable 1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized steel bird screen (**or specifier to select:** type 304 stainless steel bird screen **or** aluminum bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Submitted performance data to be based on tests in accordance with AMCA Standard 500-L. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1706JD.

- AMCA LICENSED (1706D ONLY)
- DRAINABLE BLADE
- EXCELLENT WEATHER PROTECTION
- DURABLE CONSTRUCTION

Models:

1704D 4" (102) Deep

1706D 6" (152) Deep

Model 1704D Model 1706D

Model 1704D

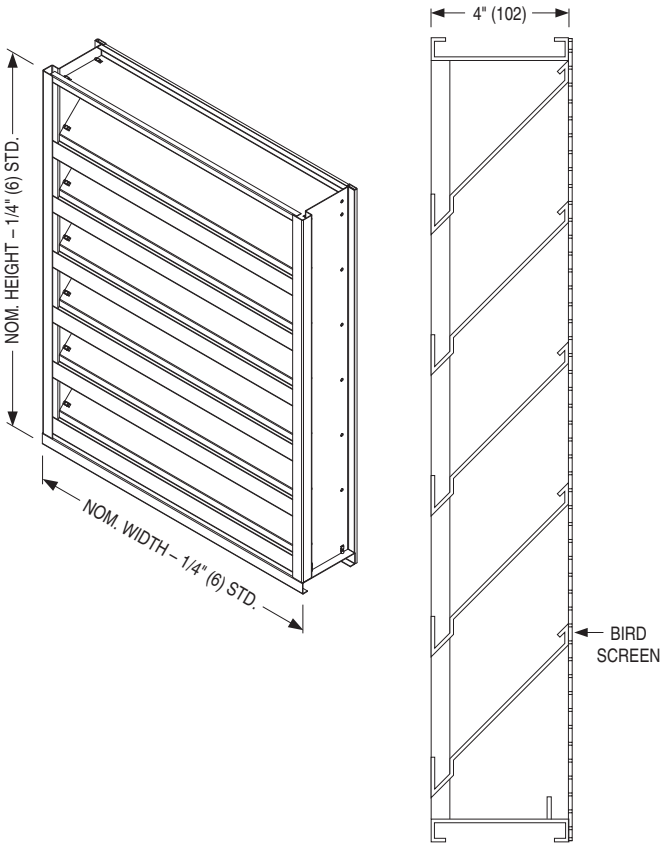
Model 1704D combines excellent weather protection with superb air performance and pleasing aesthetics that compliment any structure's exterior styling. Constructed of durable galvanized steel, the drainable blade design features a rain gutter that diverts collected water down concealed side downspouts and out through the sill, preventing water from entering the airstream and entraining into the space. This engineered design provides a large free area and low pressure drop. Suitable for use in exhaust and low to medium velocity intake applications where water penetration concerns are a priority. Available in channel or flanged type, the 4" (102) deep frame installs easily in most common wall configurations. Nailor's steel drainable blade louvers are engineered to be durable, architecturally pleasing and cost effective.

STANDARD CONSTRUCTION:

Frame:	4" (102) deep, 20 ga. (1.0) formed galvanized steel.
Blades:	20 ga. (1.0) formed galvanized steel. Drainable style.
Blade Angle:	Fixed at 45 degrees.
Blade Spacing:	Approximately 4" (102) on centers.
Screen:	1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized bird screen in removable frame (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	60" wide x 96" high (1524 x 2438). Larger louvers will require field assembly of smaller sections.

COMMON OPTIONS:

- Flanged Frame.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.



MODEL 1704D

Model 1706D

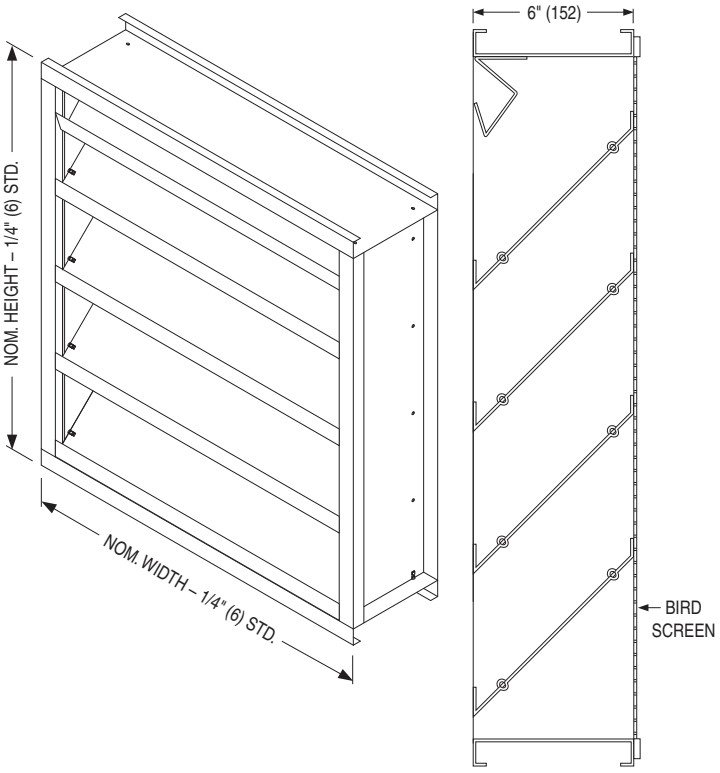
Model 1706D provides excellent weather protection with great air performance and pleasing aesthetics that compliment any structure's exterior styling. Superior water penetration velocities result in one of the industry's best performing steel louvers under demanding conditions. Constructed of durable galvanized steel, the drainable head and blade design features a rain gutter that diverts collected water down concealed side downspouts and out through the sill. Suitable for use in exhaust and low to medium velocity intake applications where water penetration concerns are a priority. Available in channel or flanged type, the 6" (152) deep frame installs easily in most common wall configurations. Nailor Model 1706D is AMCA Licensed for Water Penetration and Air Performance.

STANDARD CONSTRUCTION:

Frame:	6" (152) deep, 20 ga. (1.0) formed galvanized steel.
Blades:	20 ga. (1.0) formed galvanized steel. Drainable style.
Blade Angle:	Fixed at 45 degrees.
Blade Spacing:	Approximately 5 1/2" (140) on centers.
Screen:	1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized bird screen in removable frame (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	60" wide x 96" high (1524 x 2438). Larger louvers will require field assembly of smaller sections.

COMMON OPTIONS:

- Flanged Frame.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.



MODEL 1706D

PERFORMANCE DATA:
MODEL: 1704D

FREE AREA in Square Feet and Square Meters

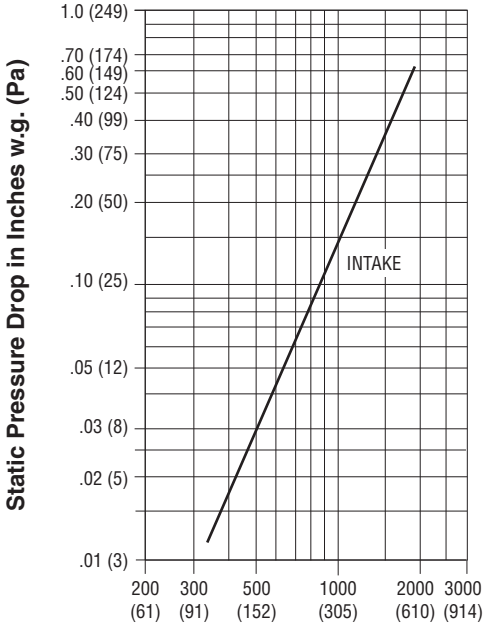
		Width in Inches and Meters								
		12 0.30	**18** 0.46	**24** 0.61	**30** 0.76	**36** 0.91	**42** 1.07	**48** 1.22	**54** 1.37	**60** 1.52
	12 0.30	**0.26** 0.02	**0.40** 0.04	**0.55** 0.05	**0.69** 0.06	**0.84** 0.08	**0.99** 0.09	**1.13** 0.11	**1.28** 0.12	**1.43** 0.13
	18 0.46	**0.54** 0.05	**0.85** 0.08	**1.16** 0.11	**1.46** 0.14	**1.77** 0.16	**2.08** 0.19	**2.39** 0.22	**2.70** 0.25	**3.01** 0.28
	24 0.61	**0.80** 0.07	**1.25** 0.12	**1.71** 0.16	**2.16** 0.20	**2.62** 0.24	**3.08** 0.29	**3.53** 0.33	**3.99** 0.37	**4.44** 0.41
	30 0.76	**1.08** 0.10	**1.70** 0.16	**2.32** 0.22	**2.93** 0.27	**3.55** 0.33	**4.17** 0.39	**4.79** 0.44	**5.40** 0.50	**6.02** 0.56
	36 0.91	**1.36** 0.13	**2.14** 0.20	**2.92** 0.27	**3.70** 0.34	**4.48** 0.42	**5.26** 0.49	**6.04** 0.56	**6.82** 0.63	**7.60** 0.71
	42 1.07	**1.62** 0.15	**2.55** 0.24	**3.48** 0.32	**4.40** 0.41	**5.33** 0.50	**6.26** 0.58	**7.18** 0.67	**8.11** 0.75	**9.04** 0.84
	48 1.22	**1.91** 0.18	**2.99** 0.28	**4.08** 0.38	**5.17** 0.48	**6.26** 0.58	**7.35** 0.68	**8.44** 0.78	**9.53** 0.89	**10.62** 0.99
	54 1.37	**2.16** 0.20	**3.40** 0.32	**4.64** 0.43	**5.87** 0.55	**7.11** 0.66	**8.35** 0.78	**9.58** 0.89	**10.82** 1.01	**12.05** 1.12
	60 1.52	**2.45** 0.23	**3.85** 0.36	**5.24** 0.49	**6.64** 0.62	**8.04** 0.75	**9.44** 0.88	**10.84** 1.01	**12.24** 1.14	**13.63** 1.27
	66 1.68	**2.71** 0.25	**4.25** 0.39	**5.80** 0.54	**7.34** 0.68	**8.89** 0.83	**10.43** 0.97	**11.98** 1.11	**13.53** 1.26	**15.07** 1.40
	72 1.83	**2.99** 0.28	**4.70** 0.44	**6.40** 0.59	**8.11** 0.75	**9.82** 0.91	**11.53** 1.07	**13.24** 1.23	**14.94** 1.39	**16.65** 1.55
	78 1.98	**3.27** 0.30	**5.14** 0.48	**7.01** 0.65	**8.88** 0.83	**10.75** 1.00	**12.62** 1.17	**14.49** 1.35	**16.36** 1.52	**18.23** 1.69
	84 2.13	**3.53** 0.33	**5.55** 0.52	**7.56** 0.70	**9.58** 0.89	**11.60** 1.08	**13.62** 1.26	**15.63** 1.45	**17.65** 1.64	**19.67** 1.83
	90 2.29	**3.81** 0.35	**5.99** 0.56	**8.17** 0.76	**10.35** 0.96	**12.53** 1.16	**14.71** 1.37	**16.89** 1.57	**19.07** 1.77	**21.25** 1.97
	96 2.44	**4.07** 0.38	**6.40** 0.59	**8.72** 0.81	**11.05** 1.03	**13.38** 1.24	**15.70** 1.46	**18.03** 1.68	**20.36** 1.89	**22.68** 2.11

AIRFLOW/ WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1704D
	Free Area %	53%
	Free Area sq. ft. (sq. m.)	8.44 (0.78)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	976 fpm (297 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	8237 cfm (3887 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.14 in. w.g. (35 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

PERFORMANCE DATA:
MODEL: 1706D

FREE AREA in Square Feet and Square Meters

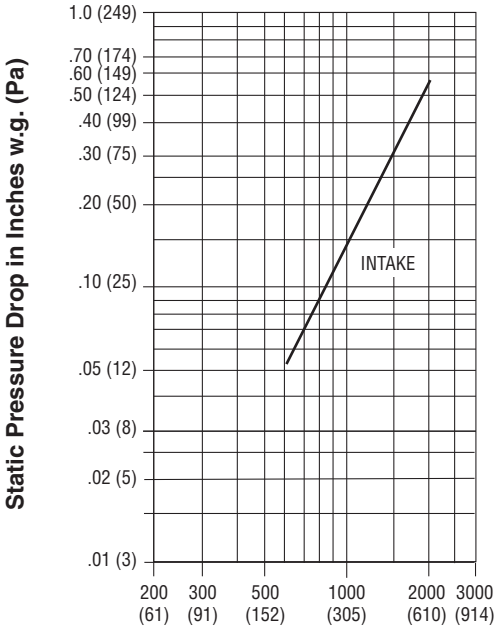
Height in Inches and Meters	Width in Inches and Meters								
	12 0.30	18 0.46	24 0.61	30 0.76	36 0.91	42 1.07	48 1.22	54 1.37	60 1.52
12 0.30	0.17 0.02	0.27 0.03	0.38 0.04	0.48 0.04	0.58 0.04	0.69 0.06	0.79 0.07	0.89 0.08	0.99 0.09
18 0.46	0.42 0.04	0.68 0.06	0.93 0.09	1.18 0.11	1.44 0.13	1.69 0.16	1.95 0.18	2.20 0.20	2.45 0.23
24 0.61	0.70 0.07	1.13 0.10	1.55 0.14	1.97 0.18	2.40 0.22	2.82 0.26	3.24 0.30	3.66 0.34	4.09 0.38
30 0.76	1.03 0.10	1.65 0.15	2.27 0.21	2.88 0.27	3.50 0.33	4.12 0.38	4.74 0.44	5.35 0.50	5.97 0.55
36 0.91	1.30 0.12	2.07 0.19	2.85 0.26	3.63 0.34	4.41 0.41	5.18 0.48	5.96 0.55	6.74 0.63	7.52 0.70
42 1.07	1.56 0.15	2.50 0.23	3.44 0.32	4.38 0.41	5.31 0.49	6.25 0.58	7.19 0.67	8.13 0.75	9.06 0.84
48 1.22	1.76 0.16	2.81 0.26	3.87 0.36	4.92 0.46	5.97 0.56	7.03 0.65	8.02 0.75	9.14 0.85	10.19 0.95
54 1.37	2.10 0.19	3.35 0.31	4.61 0.43	5.87 0.55	7.13 0.66	8.38 0.78	9.64 0.89	10.90 1.01	12.16 1.12
60 1.52	2.36 0.22	3.78 0.35	5.20 0.48	6.62 0.61	8.03 0.75	9.45 0.88	10.87 1.01	12.29 1.14	13.70 1.27
66 1.68	2.63 0.24	4.21 0.39	5.79 0.54	7.36 0.68	8.94 0.83	10.52 0.98	12.10 1.12	13.67 1.27	15.25 1.42
72 1.83	2.90 0.27	4.63 0.43	6.37 0.59	8.11 0.75	9.85 0.91	11.59 1.08	13.32 1.24	15.06 1.40	16.80 1.56
78 1.98	3.16 0.29	5.06 0.47	6.96 0.65	8.86 0.82	10.76 1.00	12.65 1.18	14.55 1.35	16.45 1.53	18.35 1.70
84 2.13	3.43 0.32	5.49 0.51	7.55 0.70	9.60 0.89	11.66 1.08	13.72 1.27	15.78 1.47	17.83 1.66	19.89 1.85
90 2.29	3.70 0.34	5.92 0.55	8.13 0.76	10.35 0.96	12.57 1.17	14.79 1.37	17.01 1.58	19.22 1.79	21.44 1.99
96 2.44	3.96 0.37	6.34 0.59	8.72 0.81	11.10 1.03	13.47 1.25	15.85 1.47	18.23 1.69	20.61 1.91	22.99 2.14

AIRFLOW / WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1706D
	Free Area %	50%
	Free Area sq. ft. (sq. m.)	8.02 (0.75)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	1250 fpm (381 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	10,063 cfm (4749 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.22 in. w.g. (55 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

Nailor Industries Inc. certifies the Model 1706D shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. Seal applies to air performance ratings and water penetration ratings.

HOW TO SPECIFY

MODEL 1704D

FORMED STEEL DRAINABLE BLADE LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, formed steel louvers meeting or exceeding the following criteria: Frame shall be 4" (102) deep channel type (**or specifier to select:** flanged type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), (**specifier to select, if required:** with extended sill,) constructed from formed 20 ga. (1.0) galvanized steel (**or specifier to select:** formed 16 ga. [1.6] galvanized steel **or** formed 18 ga. [1.3] galvanized steel **or** formed 304 stainless steel **or** formed 316 stainless steel). Blades shall be drainable style, constructed from formed 20 ga. (1.0) galvanized steel (**or specifier to select:** to match frame), fixed at 45 degrees on approximately 4" (102) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Large louvers that require multiple sections for shipping and field assembly shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized steel bird screen (**or specifier to select:** type 304 stainless steel bird screen **or** aluminum bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Submitted performance data to be based on tests in accordance with AMCA Standard 500-L. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1704D.

MODEL 1706D

FORMED STEEL DRAINABLE BLADE LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, formed steel louvers meeting or exceeding the following criteria: Frame shall be 6" (152) deep channel type (**or specifier to select:** flanged type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), (**specifier to select, if required:** with extended sill,) constructed from formed 20 ga. (1.0) galvanized steel (**or specifier to select:** formed 16 ga. [1.6] galvanized steel **or** formed 18 ga. [1.3] galvanized steel **or** formed 304 stainless steel **or** formed 316 stainless steel). Blades shall be drainable style, constructed from formed 20 ga. (1.0) galvanized steel (**or specifier to select:** to match frame), fixed at 45 degrees on approximately 5 1/2" (140) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Large louvers that require multiple sections for shipping and field assembly shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized steel bird screen (**or specifier to select:** type 304 stainless steel bird screen **or** aluminum bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Performance data must be licensed by AMCA under the 511 Certified Ratings Program and shall bear the AMCA Certified Ratings seal for water penetration, sound and air performance. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1706D.

- HIGH PERFORMANCE
- DRAINABLE BLADE
- EXCELLENT WATER PENETRATION
- HIGH FREE AREA
- LOW PRESSURE DROP

Models:

1704DHP 4" (102) Deep

1706DHP 6" (152) Deep

Model 1704DHP

Model 1706DHP

Model 1704DHP

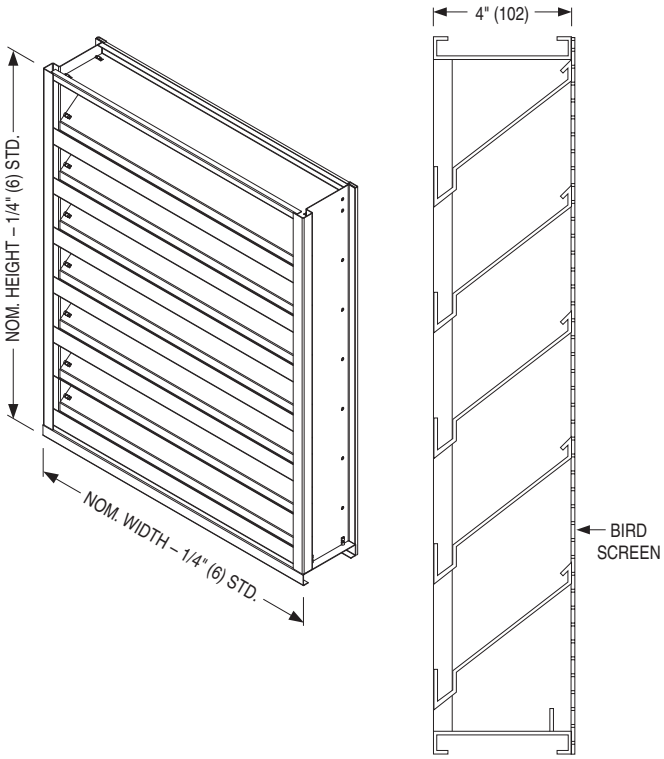
Model 1704DHP combines exceptional air performance and excellent weather protection with smooth, clean lines that visually compliment any structure's exterior design. The drainable blade design, constructed of durable galvanized steel, utilizes a rain gutter that diverts collected water down concealed side downspouts and out through the sill, effectively preventing water from entraining into the space. Suitable for use in exhaust and low to medium velocity intake applications where water infiltration is a concern, the design also provides excellent air performance at higher velocities through its large free area. Available in channel or flanged type, the 4" (102) deep frame installs easily in most common wall configurations. Nailor's high performance steel louvers are engineered to be durable, architecturally pleasing and cost effective.

STANDARD CONSTRUCTION:

Frame:	4" (102) deep, 20 ga. (1.0) formed galvanized steel.
Blades:	20 ga. (1.0) formed galvanized steel. Drainable style.
Blade Angle:	Fixed at 37.5 degrees.
Blade Spacing:	Approximately 3 1/2" (89) on centers.
Screen:	1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized bird screen in removable frame (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	60" wide x 96" high (1524 x 2438). Larger louvers will require field assembly of smaller sections.

COMMON OPTIONS:

- Flanged Frame.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.



MODEL 1704DHP

Model 1706DHP

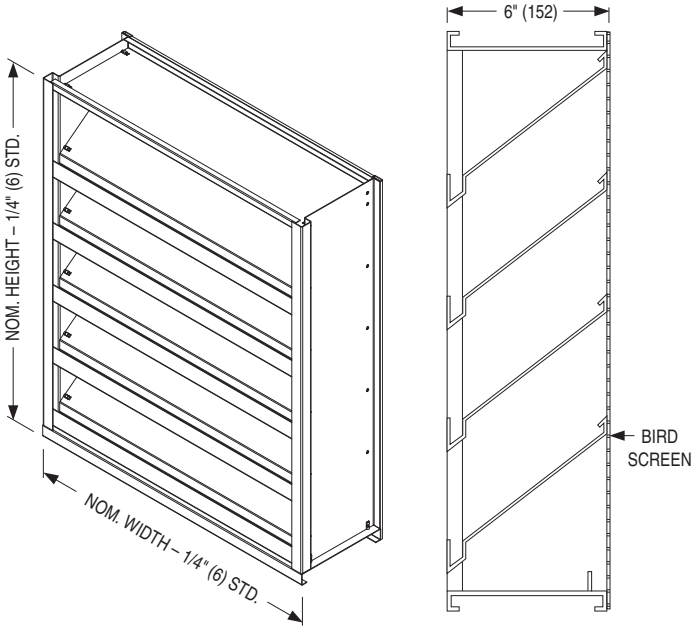
Model 1706DHP combines extraordinary air performance and excellent weather protection with smooth, clean lines that visually compliment any structure's exterior design. The drainable blade design, constructed of durable galvanized steel, utilizes a rain gutter that diverts collected water down concealed side downspouts and out through the sill, preventing water from cascading from blade to blade and entering into the air stream. Suitable for use in exhaust and low to medium velocity intake applications. The design also provides excellent air performance at higher velocities through its large free area, exhibiting a very low pressure drop. Available in channel or flanged type, the 6" (152) deep frame installs easily in most common wall configurations. Nailor's high performance steel louvers are engineered to be durable, architecturally pleasing and cost effective.

STANDARD CONSTRUCTION:

Frame:	6" (152) deep, 20 ga. (1.0) formed galvanized steel.
Blades:	20 ga. (1.0) formed galvanized steel. Drainable style.
Blade Angle:	Fixed at 37.5 degrees.
Blade Spacing:	Approximately 4 1/2" (114) on centers.
Screen:	1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized bird screen in removable frame (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	60" wide x 96" high (1524 x 2438). Larger louvers will require field assembly of smaller sections.

COMMON OPTIONS:

- Flanged Frame.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Extended Sills.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.



MODEL 1706DHP

PERFORMANCE DATA:

MODEL: 1704DHP

FREE AREA in Square Feet and Square Meters

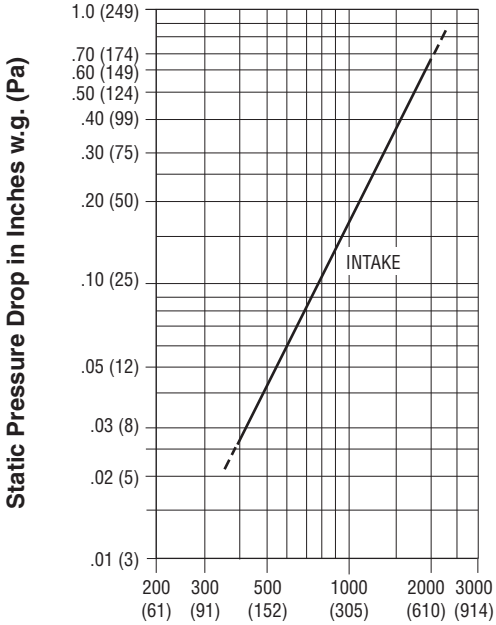
Height in Inches and Meters	Width in Inches and Meters								
	12 0.30	18 0.46	24 0.61	30 0.76	36 0.91	42 1.07	48 1.22	54 1.37	60 1.52
12 0.30	0.31 0.03	0.48 0.04	0.66 0.06	0.83 0.08	1.01 0.09	1.19 0.11	1.36 0.13	1.54 0.14	1.71 0.16
18 0.46	0.58 0.05	0.91 0.08	1.24 0.12	1.57 0.15	1.90 0.18	2.23 0.21	2.56 0.24	2.89 0.27	3.22 0.30
24 0.61	0.89 0.08	1.39 0.13	1.90 0.18	2.41 0.22	2.91 0.27	3.42 0.32	3.93 0.36	4.43 0.41	4.94 0.46
30 0.76	1.16 0.11	1.82 0.17	2.48 0.23	3.14 0.29	3.80 0.35	4.46 0.41	5.13 0.48	5.79 0.54	6.45 0.60
36 0.91	1.43 0.13	2.24 0.21	3.06 0.28	3.88 0.36	4.69 0.44	5.51 0.51	6.32 0.59	7.14 0.66	7.96 0.74
42 1.07	1.74 0.16	2.73 0.25	3.72 0.35	4.71 0.44	5.71 0.53	6.70 0.62	7.69 0.71	8.68 0.81	9.68 0.90
48 1.22	2.01 0.19	3.15 0.29	4.30 0.40	5.45 0.51	6.60 0.61	7.74 0.72	8.55 0.79	10.04 0.93	11.19 1.04
54 1.37	2.32 0.22	3.64 0.34	4.96 0.46	6.29 0.58	7.61 0.71	8.93 0.83	10.26 0.95	11.58 1.08	12.91 1.20
60 1.52	2.59 0.24	4.07 0.38	5.54 0.52	7.02 0.65	8.50 0.79	9.98 0.93	11.46 1.06	12.94 1.20	14.41 1.34
66 1.68	2.86 0.27	4.49 0.42	6.12 0.57	7.76 0.72	9.39 0.87	11.02 1.02	12.66 1.18	14.29 1.33	15.92 1.48
72 1.83	3.17 0.29	4.98 0.46	6.79 0.63	8.59 0.80	10.40 0.97	12.21 1.13	14.02 1.30	15.83 1.47	17.64 1.64
78 1.98	3.44 0.32	5.40 0.50	7.37 0.68	9.33 0.87	11.29 1.05	13.26 1.23	15.22 1.41	17.19 1.60	19.15 1.78
84 2.13	3.75 0.35	5.89 0.55	8.03 0.75	10.17 0.94	12.31 1.14	14.45 1.34	16.59 1.54	18.73 1.74	20.87 1.94
90 2.29	4.02 0.37	6.31 0.59	8.61 0.80	10.90 1.01	13.20 1.23	15.49 1.44	17.79 1.65	20.08 1.87	22.38 2.08
96 2.44	4.29 0.40	6.74 0.63	9.19 0.85	11.64 1.08	14.09 1.31	16.54 1.54	18.99 1.76	21.44 1.99	23.89 2.22

AIRFLOW / WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1704DHP
	Free Area %	53%
	Free Area sq. ft. (sq. m.)	8.55 (0.79)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	896 fpm (273 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	7661 cfm (3615 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.14 in. w.g. (35 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

PERFORMANCE DATA:
MODEL: 1706DHP

FREE AREA in Square Feet and Square Meters

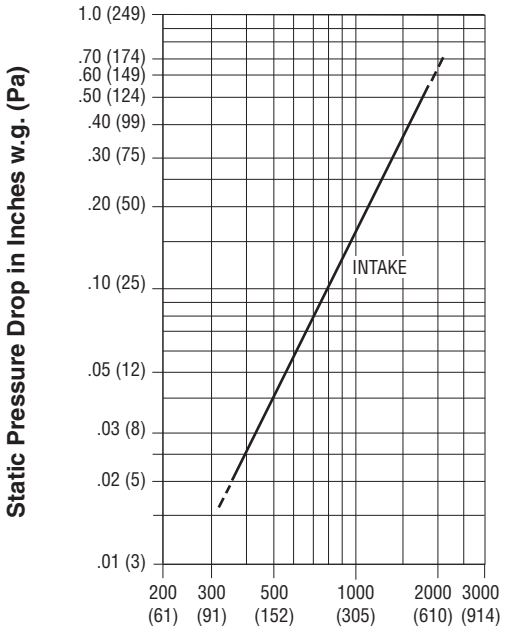
Height in Inches and Meters	Width in Inches and Meters								
	12 0.30	**18** 0.46	**24** 0.61	**30** 0.76	**36** 0.91	**42** 1.07	**48** 1.22	**54** 1.37	**60** 1.52
12 0.30	**0.26** 0.02	**0.40** 0.04	**0.55** 0.05	**0.70** 0.06	**0.84** 0.08	**0.99** 0.09	**1.14** 0.11	**1.28** 0.12	**1.43** 0.13
18 0.46	**0.53** 0.05	**0.83** 0.08	**1.13** 0.11	**1.43** 0.13	**1.73** 0.16	**2.03** 0.19	**2.34** 0.22	**2.64** 0.25	**2.94** 0.27
24 0.61	**0.84** 0.08	**1.31** 0.12	**1.79** 0.17	**2.27** 0.21	**2.75** 0.26	**3.23** 0.30	**3.70** 0.34	**4.18** 0.39	**4.66** 0.43
30 0.76	**1.15** 0.11	**1.82** 0.17	**2.48** 0.23	**3.14** 0.29	**3.80** 0.35	**4.46** 0.41	**5.13** 0.47	**5.79** 0.53	**6.45** 0.59
36 0.91	**1.45** 0.14	**2.28** 0.21	**3.12** 0.29	**3.95** 0.37	**4.78** 0.44	**5.61** 0.52	**6.44** 0.60	**7.27** 0.68	**8.10** 0.75
42 1.07	**1.76** 0.16	**2.77** 0.26	**3.78** 0.35	**4.78** 0.44	**5.79** 0.54	**6.80** 0.63	**7.81** 0.73	**8.81** 0.82	**9.82** 0.91
48 1.22	**2.03** 0.19	**3.20** 0.30	**4.36** 0.40	**5.52** 0.51	**6.68** 0.62	**7.84** 0.73	**9.05** 0.84	**10.17** 0.94	**11.33** 1.05
54 1.37	**2.34** 0.22	**3.68** 0.34	**5.02** 0.47	**6.36** 0.59	**7.70** 0.72	**9.03** 0.84	**10.37** 0.98	**11.71** 1.09	**13.05** 1.21
60 1.52	**2.65** 0.25	**4.17** 0.39	**5.68** 0.53	**7.20** 0.67	**8.71** 0.81	**10.23** 0.95	**11.74** 1.09	**13.26** 1.23	**14.77** 1.37
66 1.68	**2.96** 0.27	**4.65** 0.43	**6.34** 0.59	**8.03** 0.75	**9.73** 0.90	**11.42** 1.06	**13.11** 1.22	**14.80** 1.37	**16.49** 1.53
72 1.83	**3.27** 0.30	**5.14** 0.48	**7.00** 0.65	**8.87** 0.82	**10.74** 1.00	**12.61** 1.17	**14.48** 1.34	**16.34** 1.52	**18.21** 1.69
78 1.98	**3.54** 0.33	**5.56** 0.52	**7.58** 0.70	**9.61** 0.89	**11.63** 1.08	**13.65** 1.27	**15.68** 1.46	**17.70** 1.64	**19.72** 1.83
84 2.13	**3.85** 0.36	**5.89** 0.56	**8.03** 0.77	**10.17** 0.97	**12.31** 1.17	**14.45** 1.38	**16.59** 1.58	**18.73** 1.79	**20.87** 1.99
90 2.29	**4.16** 0.39	**6.31** 0.61	**8.61** 0.83	**10.90** 1.05	**13.20** 1.27	**15.49** 1.49	**17.79** 1.71	**20.08** 1.93	**22.38** 2.15
96 2.44	**4.47** 0.41	**7.02** 0.65	**9.57** 0.89	**12.12** 1.13	**14.67** 1.36	**17.23** 1.60	**19.78** 1.84	**22.33** 2.07	**24.88** 2.31

AIRFLOW/ WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1706DHP
	Free Area %	56%
	Free Area sq. ft. (sq. m.)	9.05 (0.84)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	988 fpm (301 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	8941 cfm (4219 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.16 in. w.g. (40 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

PRESSURE DROP



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

HOW TO SPECIFY

MODEL 1704DHP

FORMED STEEL DRAINABLE BLADE, HIGH PERFORMANCE LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, formed steel louvers meeting or exceeding the following criteria: Frame shall be 4" (102) deep channel type (**or specifier to select:** flanged type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), (**specifier to select, if required:** with extended sill,) constructed from formed 20 ga. (1.0) galvanized steel (**or specifier to select:** formed 16 ga. (1.6) galvanized steel **or** formed 18 ga. (1.3) galvanized steel **or** formed 304 stainless steel **or** formed 316 stainless steel). Blades shall be drainable style, to match frame constructed from formed 20 ga. (1.0) galvanized steel (**or specifier to select:** formed 16 ga. (1.6) galvanized steel **or** formed 18 ga. (1.3) galvanized steel **or** formed 304 stainless steel **or** formed 316 stainless steel), fixed at 37 1/2" degrees on approximately 3 1/2" (89) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Large louvers that require multiple sections for shipping and field assembly shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized steel bird screen (**or specifier to select:** type 304 stainless steel bird screen **or** aluminum bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Submitted performance data to be based on tests in accordance with AMCA Standard 500-L. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1704DHP.

MODEL 1706DHP

FORMED STEEL DRAINABLE BLADE, HIGH PERFORMANCE LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, formed steel louvers meeting or exceeding the following criteria: Frame shall be 6" (152) deep channel type (**or specifier to select:** flanged type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), (**specifier to select, if required:** with extended sill,) constructed from formed 20 ga. (1.0) galvanized steel (**or specifier to select:** formed 16 ga. [1.6] galvanized steel **or** formed 18 ga. [1.3] galvanized steel **or** formed 304 stainless steel **or** formed 316 stainless steel). Blades shall be drainable style, to match frame constructed from formed 20 ga. (1.0) galvanized steel (**or specifier to select:** formed 16 ga. [1.6] galvanized steel **or** formed 18 ga. [1.3] galvanized steel **or** formed 304 stainless steel **or** formed 316 stainless steel), fixed at 37 1/2" degrees on approximately 4 1/2" (114) centers and shall be supported by angle reinforced concealed brackets as required to withstand a wind force of not less than 25 pounds per square foot (100 miles per hour). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Large louvers that require multiple sections for shipping and field assembly shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized steel bird screen (**or specifier to select:** type 304 stainless steel bird screen **or** aluminum bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) or AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Submitted performance data to be based on tests in accordance with AMCA Standard 500-L. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1706DHP.

HOW TO ORDER

MODEL SERIES: 1704 AND 1706

STATIONARY FORMED STEEL LOUVERS

EXAMPLE: 1704J - 48x36 - 20GA - U25 - CH - BSA - MI

1. **Models**
   - 1704J 4" (102) Deep, J Blade
   - 1704JD 4" (102) Deep, J Blade, Drainable Head
   - 1704D 4" (102) Deep, Drainable Blade
   - 1704DHP 4" (102) Deep, Drainable Blade, High Performance
   - 1706J 6" (152) Deep, J Blade
   - 1706JD 6" (152) Deep, J Blade, Drainable Head
   - 1706D 6" (152) Deep, Drainable Blade
   - 1706DHP 6" (152) Deep, Drainable Blade, High Performance
2. **Nominal Width x Height**
   inches (mm's)
3. **Construction**
   - 20GA 20 ga. galvanized steel (default)
   - 18GA 18 ga. galvanized steel
   - 16GA 16 ga. galvanized steel
   - 304 Type 304 stainless steel
   - 316 Type 316 stainless steel
4. **Sizing**
   - U25 Undersize 1/4" (6.3) (default)
   - U00 Exact Size
   - U38 Undersize 3/8" (9.5)
   - U50 Undersize 1/2" (12.7)
5. **Frame**
   - CH Channel (default)
   - FL Flanged
6. **Bird Screen**
   - BSG Galvanized Steel (default)
   - BSA Aluminum
   - BSSS Type 304 Stainless Steel
   - BSN None
7. **Insect Screen**
   - – None (default)
   - ISA Aluminum
   - ISSS Type 304 Stainless Steel
8. **Finish**
   - MI Mill Finish (default)
   - PC3S Powder Coat, Standard Color
   - PC3C Powder Coat, Custom Color
   - PC4S H. P. Powder Coat, Standard Color
   - PC4C H. P. Powder Coat, Custom Color
   - PC5S Fluoropolymer Powder Coat, Standard Color
   - PC5C Fluoropolymer Powder Coat, Custom Color
   - PPC Prime Coat

OPTIONS & ACCESSORIES:

9. **Welded Construction**
   - – None (default)
   - WE Welded Construction
10. **Sill Extensions**
    - – None (default)
    - ESI Extended Sill
11. **Filter Rack**
    - – None (default)
    - FR1 1" (25) Filter rack
    - FR2 2" (51) Filter rack

12a. **Sleeve**
   - – None (default)
   - SGLV Galvanized Steel
   - SALU Aluminum
   - S304 Type 304 Stainless Steel

12b. **Sleeve Length**
   SL = Specify
   12" (305) standard (default)
   8" – 28" (203 – 711)

12c. **Sleeve Gauge**
   - – None (default)
   - 20G 20 Ga.
   - 18G 18 Ga.
   - 16G 16 Ga.
   - 14G 14 Ga.
   - 10G 10 Ga.

Notes:

1. Standard color powder coat paint finishes require a color selection from the 21 color finishes on the "Nailor Louver Finishes and Color Guide".

Codes: LF00 Color to follow, LF01 Slate Blue, LF02 Medium Bronze, LF03 Sandstone, LF04 Light Gray, LF05 Charcoal, LF06 Bone White, LF07 Western Tan, LF08 Architectural Bronze, LF09 Regal Blue, LF10 Forest Green, LF11 Surrey Beige, LF12 Royal Brown, LF13 Barn Red, LF14 Burgandy, LF15 Clay, LF16 Almond, LF17 Coastal White, LF18 Vista Green, LF19 Black, LF20 Gloss Black, LF21 Campus Green.

2. Custom color powder coat paint finishes require color matching. A suitable paint chip must be supplied and Nailor will select or mix and formulate a powder coat paint that matches as closely as possible. We will forward a sample for approval.

Codes: LF00 Color to follow. You may alternatively enter a unique code and description.

- ADJUSTABLE BLADE CONTROL
- DRAINABLE BLADE
- EXCELLENT WEATHER PROTECTION
- TIGHT SHUT-OFF WHEN REQUIRED
- VARIETY OF ACTUATOR OPTIONS

Models:

1704AD 4" (102) Deep

1706AD 6" (152) Deep

Model 1704AD Model 1706AD

Model 1704AD

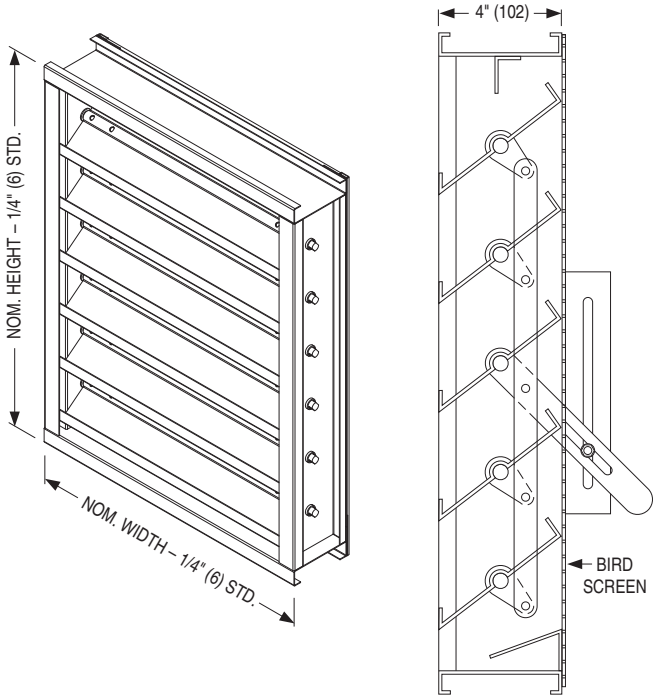
Model 1704AD Adjustable, Drainable Blade Louver combines architecturally pleasing aesthetics with airflow control in one single unit. Suitable for use in exhaust and low to medium velocity intake applications, the design features a drainable blade with rain gutters that divert collected water down concealed side downspouts and out the sill. Low torque, concealed linkage blade control can be operated manually or with an actuator to provide tight shut-off when desired, providing operable flexibility as well as excellent protection against the elements. Rugged galvanized steel construction provides excellent durability. Available in channel or flanged type, the 4" (102) deep frame installs easily in most common wall configurations. Nailor's adjustable steel louvers are engineered to be aesthetically appealing as well as mechanically enduring.

STANDARD CONSTRUCTION:

Frame:	4" (102) deep, 16 ga. (1.6) formed galvanized steel.
Blades:	16 ga. (1.6) formed galvanized steel at 37 1/2 degree angle. Drainable style.
Blade Spacing:	Approximately 3 1/2" (89) on centers.
Jamb Seals:	Compression type cambered metal.
Axles:	1/2" (13) dia. plated steel.
Bearings:	1/2" (13) dia. stainless steel sleeve type.
Linkage:	Plated steel. Concealed in frame.
Operator:	Hand locking louver quadrant.
Screen:	1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized bird screen in removable frame (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	48" wide x 96" high (1219 x 2438) with jamb and/or blade seals. 60" wide x 96" high (1524 x 2438) without seals. Larger louvers will require field assembly of smaller sections.

COMMON OPTIONS:

- Type 304 or 316 Stainless Steel Construction.
- Flanged Frames.
- Extruded PVC Blade Seals.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Factory installed pneumatic or electric actuators.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.



MODEL 1704AD

Model 1706AD

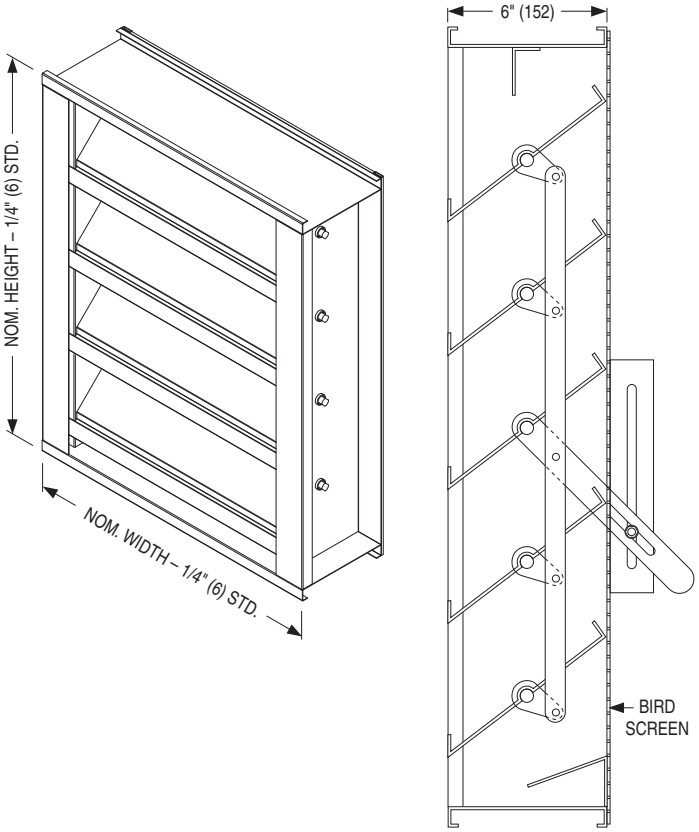
Model 1706AD Adjustable, Drainable Blade Louver combines architecturally pleasing aesthetics with airflow control, including tight shut-off. Suitable for use in exhaust and low to medium velocity intake applications, the design features a drainable blade with rain gutters that divert collected water down concealed side downspouts and out the sill. Low torque, concealed linkage blade control can be operated manually or with an actuator to provide tight shut-off when desired, providing operable flexibility as well as excellent protection against the elements. Rugged galvanized steel construction provides excellent durability. Available in channel or flanged type, the 6" (152) deep frame installs easily in most common wall configurations. Nailor's adjustable steel louvers are engineered to be aesthetically appealing as well as mechanically enduring.enduring.

STANDARD CONSTRUCTION:

Frame:	6" (152) deep, 16 ga. (1.6) formed galvanized steel.
Blades:	16 ga. (1.6) formed galvanized steel at 37 1/2 degree angle. Drainable style.
Blade Spacing:	Approximately 5" (127) on centers.
Jamb Seals:	Compression type cambered metal.
Axles:	1/2" (13) dia. plated steel.
Bearings:	1/2" (13) dia. stainless steel sleeve type.
Linkage:	Plated steel. Concealed in frame.
Operator:	Hand locking louver quadrant.
Screen:	1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized bird screen in removable frame (adds approximately 3/8" [10] to louver depth).
Finish:	Mill.
Minimum Size:	12" W x 12" H (305 x 305).
Maximum Single Section Size:	48" wide x 96" high (1219 x 2438) with jamb and/or blade seals. 60" wide x 96" high (1524 x 2438) without seals. Larger louvers will require field assembly of smaller sections.

COMMON OPTIONS:

- Type 304 or 316 Stainless Steel Construction.
- Flanged Frames.
- Extruded PVC Blade Seals.
- Aluminum or Type 304 Stainless Steel Insect Screens.
- Factory installed pneumatic or electric actuators.
- Variety of Standard and High Performance Powder Coat finishes available in a multitude of colors. Custom color matching available.



MODEL 1706AD

PERFORMANCE DATA:

MODEL: 1704AD

FREE AREA in Square Feet and Square Meters

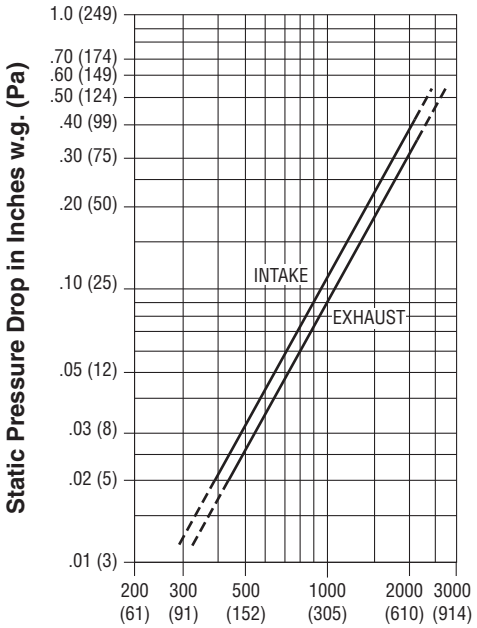
Height in Inches and Meters	Width in Inches and Meters								
	12 0.30	**18** 0.46	**24** 0.61	**30** 0.76	**36** 0.91	**42** 1.07	**48** 1.22	**54** 1.37	**60** 1.52
12 .30	**0.25** 0.02	**0.45** 0.04	**0.64** 0.06	**0.84** 0.08	**1.04** 0.10	**1.24** 0.11	**1.43** 0.13	**1.63** 0.15	**1.83** 0.17
18 .46	**0.44** 0.04	**0.78** 0.07	**1.13** 0.10	**1.47** 0.14	**1.81** 0.17	**2.16** 0.20	**2.50** 0.23	**2.85** 0.26	**3.19** 0.30
24 .61	**0.66** 0.06	**1.18** 0.11	**1.70** 0.16	**2.22** 0.21	**2.74** 0.25	**3.26** 0.30	**3.78** 0.35	**4.30** 0.40	**4.82** 0.45
30 .76	**0.85** 0.08	**1.51** 0.14	**2.18** 0.20	**2.85** 0.26	**3.52** 0.33	**4.18** 0.39	**4.85** 0.45	**5.52** 0.51	**6.18** 0.57
36 0.91	**1.02** 0.09	**1.83** 0.17	**2.63** 0.24	**3.44** 0.32	**4.24** 0.39	**5.05** 0.47	**5.85** 0.54	**6.65** 0.62	**7.46** 0.69
42 1.07	**1.21** 0.11	**2.16** 0.20	**3.12** 0.29	**4.07** 0.38	**5.02** 0.47	**5.97** 0.55	**6.93** 0.64	**7.88** 0.73	**8.83** 0.82
48 1.22	**1.40** 0.13	**2.51** 0.23	**3.61** 0.34	**4.71** 0.44	**5.82** 0.54	**6.92** 0.64	**8.03** 0.75	**9.13** 0.85	**10.23** 0.95
54 1.37	**1.58** 0.15	**2.83** 0.26	**4.07** 0.38	**5.32** 0.49	**6.56** 0.61	**7.80** 0.73	**9.05** 0.84	**10.29** 0.96	**11.54** 1.07
60 1.52	**1.78** 0.17	**3.18** 0.30	**4.58** 0.43	**5.98** 0.56	**7.37** 0.69	**8.77** 0.82	**10.17** 0.95	**11.57** 1.08	**12.97** 1.21
66 1.68	**1.96** 0.18	**3.49** 0.32	**5.03** 0.47	**6.57** 0.61	**8.11** 0.75	**9.65** 0.90	**11.19** 1.04	**12.73** 1.18	**14.27** 1.33
72 1.83	**2.19** 0.20	**3.92** 0.36	**5.64** 0.52	**7.36** 0.68	**9.09** 0.84	**10.81** 1.00	**12.54** 1.16	**14.26** 1.32	**15.98** 1.48
78 1.98	**2.36** 0.22	**4.22** 0.39	**6.08** 0.57	**7.94** 0.74	**9.80** 0.91	**11.66** 1.08	**13.52** 1.26	**15.38** 1.43	**17.24** 1.60
84 2.13	**2.56** 0.24	**4.57** 0.42	**6.58** 0.61	**8.60** 0.80	**10.61** 0.99	**12.62** 1.17	**14.64** 1.36	**16.65** 1.55	**18.66** 1.73
90 2.29	**2.74** 0.25	**4.89** 0.45	**7.04** 0.65	**9.20** 0.85	**11.35** 1.05	**13.51** 1.25	**15.66** 1.45	**17.81** 1.65	**19.97** 1.86
96 2.44	**2.93** 0.27	**5.23** 0.49	**7.53** 0.70	**9.84** 0.91	**12.14** 1.13	**14.44** 1.34	**16.74** 1.56	**19.05** 1.77	**21.35** 1.98

AIRFLOW / WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1704AD
	Free Area %	50%
	Free Area sq. ft. (sq. m.)	8.03 (0.75)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	991 fpm (302 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	7958 cfm (3755 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.11 in. w.g. (27 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

PRESSURE DROP (blades fully open)



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

PERFORMANCE DATA:
MODEL: 1706AD

FREE AREA in Square Feet and Square Meters

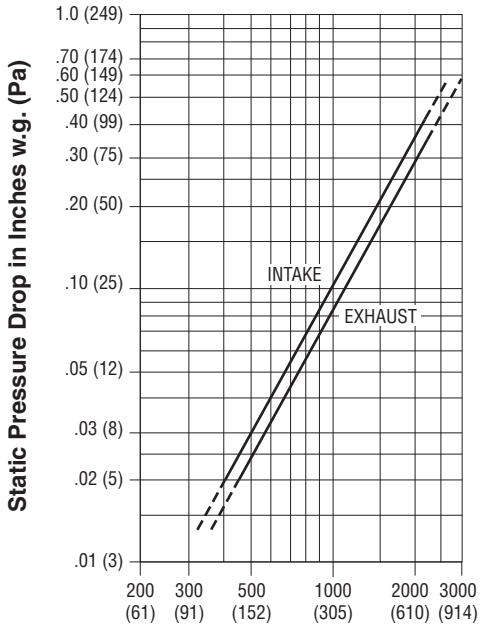
Height in Inches and Meters	Width in Inches and Meters								
	12 0.30	**18** 0.46	**24** 0.61	**30** 0.76	**36** 0.91	**42** 1.07	**48** 1.22	**54** 1.37	**60** 1.52
12 .30	**0.30** 0.03	**0.53** 0.05	**0.76** 0.07	**0.99** 0.09	**1.23** 0.11	**1.46** 0.14	**1.69** 0.16	**1.93** 0.18	**2.16** 0.20
18 .46	**0.49** 0.05	**0.88** 0.08	**1.26** 0.12	**1.65** 0.15	**2.03** 0.19	**2.42** 0.22	**2.80** 0.26	**3.19** 0.30	**3.57** 0.33
24 .61	**0.69** 0.06	**1.23** 0.11	**1.76** 0.16	**2.30** 0.21	**2.84** 0.26	**3.38** 0.31	**3.92** 0.36	**4.46** 0.41	**5.00** 0.46
30 .76	**0.88** 0.08	**1.57** 0.15	**2.26** 0.21	**2.95** 0.27	**3.65** 0.34	**4.34** 0.40	**5.03** 0.47	**5.72** 0.53	**6.41** 0.60
36 .91	**1.09** 0.10	**1.95** 0.18	**2.80** 0.26	**3.66** 0.34	**4.52** 0.42	**5.37** 0.50	**6.23** 0.58	**7.09** 0.66	**7.94** 0.74
42 1.07	**1.34** 0.12	**2.40** 0.22	**3.46** 0.32	**4.51** 0.42	**5.57** 0.52	**6.63** 0.62	**7.68** 0.71	**8.74** 0.81	**9.80** 0.91
48 1.22	**1.54** 0.14	**2.75** 0.26	**3.96** 0.37	**5.17** 0.48	**6.38** 0.59	**7.59** 0.71	**8.80** 0.82	**10.01** 0.93	**11.22** 1.04
54 1.37	**1.74** 0.16	**3.10** 0.29	**4.47** 0.41	**5.83** 0.54	**7.20** 0.67	**8.56** 0.80	**9.93** 0.92	**11.29** 1.05	**12.66** 1.18
60 1.52	**1.93** 0.18	**3.45** 0.32	**4.97** 0.46	**6.49** 0.60	**8.01** 0.74	**9.53** 0.89	**11.05** 1.03	**12.58** 1.17	**14.10** 1.31
66 1.68	**2.14** 0.20	**3.82** 0.35	**5.50** 0.51	**7.18** 0.67	**8.86** 0.82	**10.55** 0.98	**12.23** 1.14	**13.91** 1.29	**15.59** 1.45
72 1.83	**2.39** 0.22	**4.27** 0.40	**6.16** 0.57	**8.04** 0.75	**9.92** 0.92	**11.80** 1.10	**13.69** 1.27	**15.57** 1.45	**17.45** 1.62
78 1.98	**2.59** 0.24	**4.63** 0.43	**6.67** 0.62	**8.70** 0.81	**10.74** 1.00	**12.78** 1.19	**14.82** 1.38	**16.86** 1.57	**18.89** 1.76
84 2.13	**2.78** 0.26	**4.97** 0.46	**7.16** 0.67	**9.35** 0.87	**11.55** 1.07	**13.74** 1.28	**15.93** 1.48	**18.12** 1.68	**20.31** 1.89
90 2.29	**2.98** 0.28	**5.33** 0.49	**7.67** 0.71	**10.02** 0.93	**12.36** 1.15	**14.71** 1.37	**17.05** 1.58	**19.40** 1.80	**21.74** 2.02
96 2.44	**3.19** 0.30	**5.69** 0.53	**8.20** 0.76	**10.71** 0.99	**13.21** 1.23	**15.72** 1.46	**18.23** 1.69	**20.73** 1.93	**23.24** 2.16

AIRFLOW/ WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

	Model	1706AD
	Free Area %	55%
	Free Area sq. ft. (sq. m.)	8.80 (0.82)
INTAKE	Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)	977 fpm (298 m/min.)
INTAKE	Air Volume at Free Area Velocity shown	8598 cfm (4057 l/s)
INTAKE	Pressure Drop at Free Area Velocity shown	.10 in. w.g. (25 Pa)

NOTE: To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is **below** the point of beginning water penetration.

PRESSURE DROP (blades fully open)



Air Velocity in Feet (Meters) Per Minute Through Free Area

Louver test size: 48" x 48" (1219 x 1219 mm).
Standard air density @ 0.075 lbs/ft³.
Tested to AMCA Fig. 5.5 – 6.5.

HOW TO SPECIFY

MODEL 1704AD

FORMED STEEL ADJUSTABLE BLADE LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 4" (102) deep channel type (**or specifier to select:** flanged type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize **or** 1/2" [12.7] undersize), (**specifier to select, if required:** with extended sill,) constructed from formed 16 ga. (1.6) galvanized steel (**or specifier to select:** formed 304 stainless steel **or** formed 316 stainless steel). Blades shall be drainable style, to match frame constructed from formed 16 ga. (1.3) galvanized steel (**or specifier to select:** formed 16 ga. (1.6) galvanized steel **or** formed 18 ga. (1.3) galvanized steel **or** formed 304 stainless steel **or** formed 316 stainless steel) (**specifier to select, if required:** with PVC blade seals), fixed at 37 1/2 degrees on approximately 3 1/2" (89) centers. Concealed downspouts in jambs to drain water from louver for minimum water cascade from blade to blade, compression type cambered metal jamb seals (**or specifier to select:** no jamb seals). Plated steel axles and linkage, concealed in frame, with stainless steel sleeve type bearings. Manufacturer to provide hand locking louver quadrant (**or specifier to select:** electric actuator **or** pneumatic actuator). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Large louvers that require multiple sections for shipping shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized steel bird screen (**or specifier to select:** type 304 stainless steel bird screen **or** aluminum bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) or AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Submitted performance data to be based on tests in accordance with AMCA Standard 500-L. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1704AD.

MODEL 1706AD

FORMED STEEL ADJUSTABLE BLADE LOUVERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, extruded aluminum louvers meeting or exceeding the following criteria: Frame shall be 6" (152) deep channel type (**or specifier to select:** flanged type), 1/4" (6.3) undersize (**or specifier to select:** exact size **or** 3/8" [9.5] undersize or 1/2" [12.7] undersize), (**specifier to select, if required:** with extended sill,) constructed from formed 16 ga. (1.6) galvanized steel (**or specifier to select:** formed 304 stainless steel **or** formed 316 stainless steel). Blades shall be drainable style, to match frame constructed from formed 16 ga. (1.3) galvanized steel (**or specifier to select:** formed 16 ga. [1.6] galvanized steel **or** formed 18 ga. [1.3] galvanized steel **or** formed 304 stainless steel **or** formed 316 stainless steel) (**specifier to select, if required:** with PVC blade seals), fixed at 37 1/2 degrees on approximately 5" (127) centers. Concealed downspouts in jambs to drain water from louver for minimum water cascade from blade to blade, compression type cambered metal jamb seals (**or specifier to select:** no jamb seals). Plated steel axles and linkage, concealed in frame, with stainless steel sleeve type bearings. Manufacturer to provide hand locking louver quadrant (**or specifier to select:** electric actuator **or** pneumatic actuator). Factory assembled louver components to be mechanically fastened (**or specifier to select:** welded construction). Large louvers that require multiple sections for shipping shall be constructed with visible frames with downspouts when installed together on site. Louvers shall be equipped with removable 1/2" x 1/2" x 19 ga. (13 x 13 x 1.0) galvanized steel bird screen (**or specifier to select:** type 304 stainless steel bird screen **or** aluminum bird screen **and/or** aluminum insect screen **and/or** type 304 stainless steel insect screen **or** no screen).

Finish shall be standard mill (**or specifier to select:** prime coat **or** 204-R1 clear anodized to a min. depth of 0.4 mil, with 1 year warranty or 215-R1 clear anodized to a min. depth of 0.7 mil, with 5 year warranty **or** color anodized; color to be selected from standard Nailor anodizing colors **or** AAMA 2603 thermosetting polyester powder coat, with 1 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2604 high performance polyester powder coat, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** AAMA 2605 FEVE fluoropolymer powder coat, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 70% PVDF coating, with 5 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color) **or** Kynar 500/Hylar 5000 50% PVDF coating, with 10 year warranty; color to be (**specifier to select:** selected from Nailor standard color chart **or** custom color).

Performance data must be licensed by AMCA under the AMCA 511 Certified Ratings Program and shall bear the AMCA Certified Ratings seal for water penetration and air performance. Free area, water penetration and pressure drop data submitted shall be equal to or better than specified model. Standard of acceptance: Nailor Industries, Inc. Model 1706AD.

HOW TO ORDER

MODEL SERIES: 1704AD AND 1706AD
ADJUSTABLE FORMED STEEL LOUVERS

EXAMPLE: 1704AD - 48x36 - 16GA - U25 - CH - JSM - BSG - MI - HLLQ

1. **Models**
   - 1704AD 4" (102) Deep, Adjustable, Drainable Blade
   - 1706AD 6" (152) Deep, Adjustable, Drainable Blade
2. **Nominal Width x Height**
   inches (mm's)
3. **Construction**
   - 16GA 16 ga. Galvanized Steel (default)
   - 304 Type 304 Stainless Steel
   - 316 Type 316 Stainless Steel
4. **Sizing**
   - U25 Undersize 1/4" (6.3) (default)
   - U00 Exact Size
   - U38 Undersize 3/8" (9.5)
   - U50 Undersize 1/2" (12.7)
5. **Frame**
   - CH Channel (default)
   - FL Flanged
6. **Blade Seals**
   - – None (default)
   - BPV Extruded PVC
7. **Jamb Seals**
   - JSM Metallic (default)
   - JSN None
8. **Bird Screen**
   - BSG Galvanized Steel (default)
   - BSA Aluminum
   - BSSS Type 304 Stainless Steel
   - BSN None
9. **Insect Screen**
   - – None (default)
   - ISA Aluminum
   - ISSS Type 304 Stainless Steel
10. **Finish**
    - MI Mill Finish (default)
    - PC3S Powder Coat, Standard Color
    - PC3C Powder Coat, Custom Color
    - PC4S H. P. Powder Coat, Standard Color
    - PC4C H. P. Powder Coat, Custom Color
    - PC5S Fluoropolymer Powder Coat, Standard Color
    - PC5C Fluoropolymer Powder Coat, Custom Color
    - PPC Prime Coat

OPTIONS & ACCESSORIES:

11. **Welded Construction**
    - – None (default)
    - WE Welded Construction
12. **Sill Extensions**
    - – None (default)
    - ESI Extended Sill
13. **Filter Rack**
    - – None (default)
    - FR1 1" (25) Filter rack
    - FR2 2" (51) Filter rack
14. **Actuator/Operator**
    - HLLQ Hand Locking Louver Quadrant (default)
    - HRCO Hand Rotary Crank Operator
    - PCOI Pull Chain Operator (internal)
    - ACT Actuator
    - CACT Concealed Actuator
15. **Chain Operator**
    - – None (default)
    - PCE External
    - PCI Internal
16. **Chain**
    - CH Chain Length (specify ft.)
17. **Actuator Selected By**
    - AUTO Least Cost (Auto-select) (default)
    - BEL Belimo
    - HON Honeywell
    - MAN Manually Select
    - N/A Not Applicable
    - SIE Siemens
18. **Power Requirement**
    - 120 120 VAC
    - 230 230 VAC
    - 24 24V AC
    - PNU Pneumatic
19. **Spring Return**
    - NSPR Non-Spring Return
    - SPR Spring Return
20. **Control Type**
    - 2POS Two Position
    - FL Floating
    - MOD Modulating
    - MODF Modulating and Floating,
    - FMZS Modulating and Floating, Adjustable, 0/Span
21. **Fail Position (Spring Only)**
    - – None
    - CL Close
    - OP Open
22. **Auxiliary Switch Package**
    - – None
    - 300 Nailor MLS-300 Position Indicator
    - AUXS On Electric Actuator
23. **Actuator**

    Electric:

411	ML4115	120 VAC
811	ML8115	24 VAC
412	MS4120F10	120 VAC
812	MS8120F10	24 VAC
MS4	MS4X09F	120 VAC
MS8	MS8X09F	120 VAC
F12	FSNF120	120 VAC
F24	FSNF24	24 VAC
FA12	FSAF120	120 VAC
FA24	FSAF24	24 VAC
FL12	FSLF120	120 VAC
FL24	FSLF24	24 VAC

    Pneumatic:

296	331-2961
306	331-3060
482	331-4826

24a. **Sleeve**
- – None (default)
- SGLV Galvanized Steel
- SALU Aluminum
- S304 Type 304 Stainless Steel

24b. **Sleeve Length**

SL = Specify

12" (305) standard (default)

8" – 28" (203 – 711)

24c. **Sleeve Gauge**
- – None (default)
- 20G 20 Ga.
- 18G 18 Ga.
- 16G 16 Ga.
- 14G 14 Ga.
- 10G 10 Ga.

Notes:

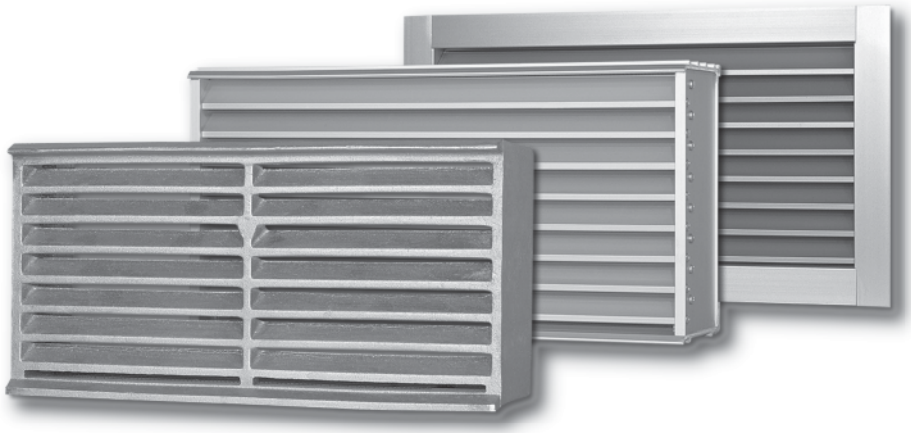
1. Standard color powder coat paint finishes require a color selection from the 21 color finishes on the "Nailor Louver Finishes and Color Guide".

Codes: LF00 Color to follow, LF01 Slate Blue, LF02 Medium Bronze, LF03 Sandstone, LF04 Light Gray, LF05 Charcoal, LF06 Bone White, LF07 Western Tan, LF08 Architectural Bronze, LF09 Regal Blue, LF10 Forest Green, LF11 Surrey Beige, LF12 Royal Brown, LF13 Barn Red, LF14 Burgandy, LF15 Clay, LF16 Almond, LF17 Coastal White, LF18 Vista Green, LF19 Black, LF20 Gloss Black, LF21 Campus Green.

2. Custom color powder coat paint finishes require color matching. A suitable paint chip must be supplied and Nailor will select or mix and formulate a powder coat paint that matches as closely as possible. We will forward a sample for approval.

Codes: LF00 Color to follow. You may alternatively enter a unique code and description.

- HEAVY DUTY CONSTRUCTION
- CAST OR EXTRUDED ALUMINUM
- EXCELLENT WEATHER PROTECTION
- VANDALISM RESISTANT
- SUITABLE FOR LOAD BEARING APPLICATIONS



Models 16BVC, 16BVE and 16BVF

Models:

16BVC Cast Aluminum

16BVE Extruded Aluminum

16BVF Extruded Aluminum with Flange

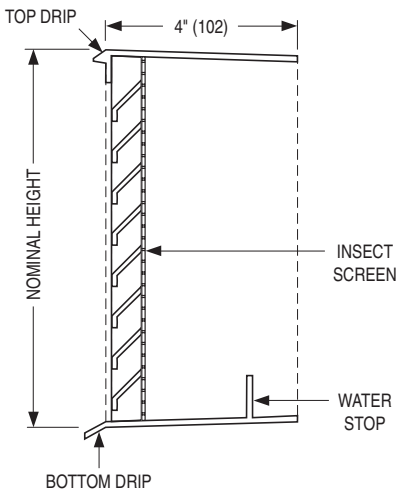
Nailor 16BV Series Brick Vents provide a permanent, secure means of ventilating foundations, crawl spaces and other utility areas. All models, designed with a louvered face, incorporate a rear water stop and full width weepage openings for minimal water penetration during severe weather. High corrosion resistant alloy cast or quality extruded aluminum construction resists potential damage due to vandalism, allowing for installation in accessible exterior areas. Suitable for load bearing applications, ideal for new construction. Standard insect screen prevents unwanted pests from entering through the vent.

Model 16BVC

Model 16BVC features corrosion resistant cast aluminum construction that is suitable for load bearing applications, ideal for new construction. Deep louvered blades exhibit a minimum 39% free area and provide for minimal through-viewing. A rear water stop minimizes water penetration, and top and bottom drips prevent water from staining brick.

STANDARD CONSTRUCTION:

Frame:	4" (102) deep, #319 cast aluminum, minimum .125" (3) thickness.
Blades:	#319 cast aluminum, minimum .125" (3) thickness, with cast face mullions on 8" (203) centers.
Screen:	7 x 7 aluminum mesh insect screen.
Finish:	Mill. Optional finishes are available.
Standard Sizes:	Width x Height
	8" x 2 1/4" (203 x 57)
	8 1/4" x 4 15/16" (210 x 125)
	8" x 7 7/8" (203 x 200)
	12" x 2 3/4" (305 x 70)
	12" x 3 1/2" (305 x 89)
	12" x 5" (305 x 127)
	12" x 7 3/4" (305 x 197)
	16 1/2" x 2 3/8" (419 x 60)
	16" x 4" (406 x 102)
	16" x 4 15/16" (406 x 125)
	16" x 6" (406 x 152)
	16" x 7 3/4" (406 x 197)



MODEL 16BVC

Model 16BVE

Model 16BVE features corrosion resistant extruded aluminum construction with top and bottom mortar ribs, ideal for new construction. Overlapping blades with storm lip exhibit a 35% free area and, combined with a rear frame water stop, minimize water penetration. Integral top and bottom drips prevent water from staining brick.

STANDARD CONSTRUCTION:

Frame: 4" (102) deep, Type 6063-T5 extruded aluminum, .125" (3.18) nominal wall thickness. Integral top and bottom mortar ribs.

Blades: 1" (25) deep on 1" (25) centers, Type 6063-T5 extruded aluminum, .125" (3.18) nominal wall thickness, fixed at 45 degrees, with integral storm lip.

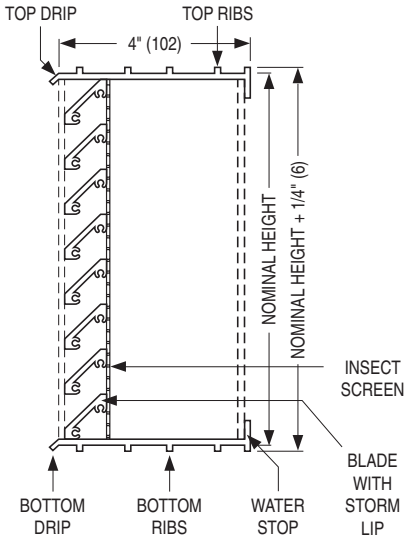
Screen: 18" x 14" (457 x 356) mesh aluminum insect screen.

Finish: 204-R1 clear anodized finish. Optional finishes are available.

Standard Size: Width x Height

See below. Non-standard sizes are also available.

Note: For Model 16BVE, **heights** shown below do not include top and bottom mortar ribs (add 1/4" [6]).



MODEL 16BVE

Model 16BVF

Model 16BVF features corrosion resistant extruded aluminum construction with a flanged frame that is ideal for use in renovations or existing openings. The 1" (25) flange provides an attractive finished appearance that conceals any rough edges in the opening. Overlapping blades with storm lip exhibit a 35% free area and, combined with a rear frame water stop, minimize water penetration.

STANDARD CONSTRUCTION:

Frame: 1 1/4" (32) deep, with integral 1" (25) flange, Type 6063-T5 extruded aluminum, .125" (3.18) nominal wall thickness.

Blades: 1" (25) deep on 1" (25) centers, Type 6063-T5 extruded aluminum, .125" (3.18) nominal wall thickness, fixed at 45 degrees, with integral storm lip.

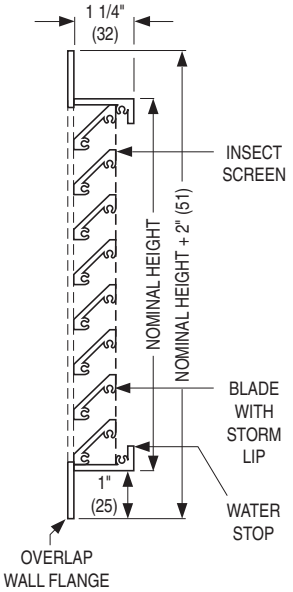
Screen: 18" x 14" (457 x 356) mesh aluminum insect screen.

Finish: 204-R1 clear anodized finish. Optional finishes are available.

Standard Size: Width x Height

See below. Non-standard sizes are also available.

Note: For Model 16BVF, **widths** shown below do not include blade fasteners (add 1/4" [6]).



MODEL 16BVF

Models 16BVE & 16BVF Standard Sizes (Width x Height)**:**

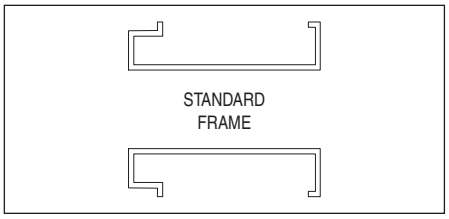
8 1/8" x 2 3/8" (206 x 60)	12" x 7 3/4" (305 x 197)	16 1/2" x 2 3/8" (419 x 60)	24" x 4 3/4" (610 x 121)
8 1/8" x 4 3/4" (206 x 121)	12" x 11 3/4" (305 x 298)	16 1/2" x 4 3/4" (419 x 121)	24" x 7 3/4" (610 x 197)
8 1/8" x 7 3/4" (206 x 197)	15 5/8" x 7 3/4" (397 x 197)	16 1/2" x 7 3/4" (419 x 197)	32" x 7 3/4" (813 x 197)
12" x 4 3/4" (305 x 121)	15 5/8" x 15 3/4" (397 x 400)	16 1/2" x 15 3/4" (419 x 400)	48" x 7 3/4" (1219 x 197)

Options and Accessories

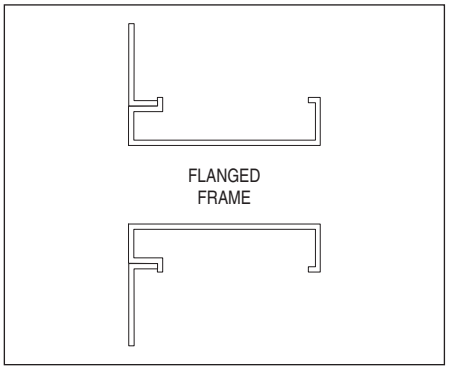
Nailor extruded aluminum and formed steel louvers are available with a variety of options and accessories to suit design specific applications. Selecting the proper accessories and options can save time and labor as well as enhance the visual aesthetics of a louver. Contact your Nailor representative for more information on Nailor custom louver manufacturing capabilities and additional features for your job specific requirements.

FRAME OPTIONS:

OPTION CODE **CH**
STANDARD CHANNEL FRAME

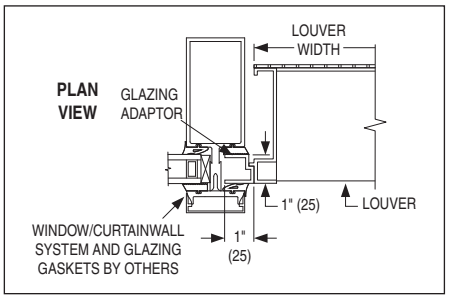


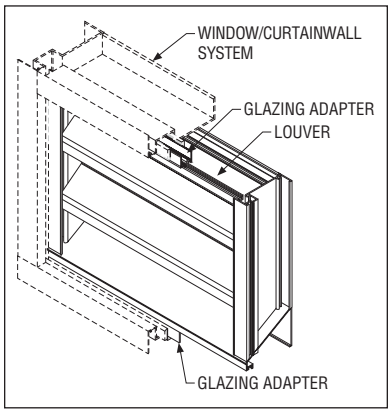
OPTION CODE **FL**
FLANGED FRAME



All Nailor extruded aluminum and formed steel louver models come standard with channel type frames and are available with an optional flanged frame. Nailor 2", 4", 5" and 6" (51, 102, 127 and 152) deep extruded aluminum louvers are also available with an optional glazing adaptor frame for easy installation into windows or curtain wall systems. When ordered, the flanged and glazing adapter type frames are factory mounted using mechanical fasteners.

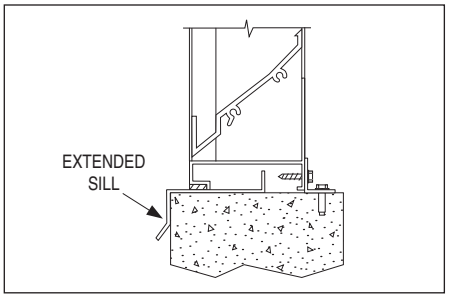
OPTION CODE **GA**
GLAZING ADAPTER (SIDE VIEW)





EXTENDED SILL:

OPTION CODE **ESI**
EXTENDED SILL



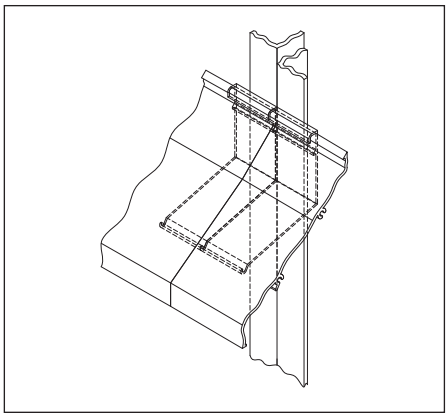
Sill extensions are available on all Nailor extruded aluminum and formed steel louver models and can provide additional deflection of water away from the louver opening. An extended sill option may also provide a transition between the louver and adjacent structures. The material and finish of the sill extension will match the frame and blades of the louver. When ordered, sill extensions are shipped loose for field installation.

Note: All louver options are available at an additional cost.

Options and Accessories

MULLION TYPES:

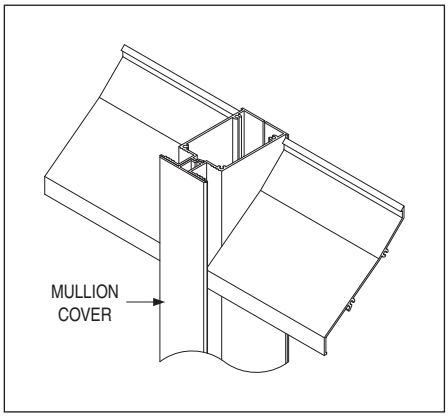
ARCHITECTURAL CONCEALED MULLION DETAIL



Architectural Concealed Mullions are available on all Nailor stationary non-drainable aluminum louvers, providing a continuous blade appearance without size limitations. Mullions are constructed of the same material as the louver.

Nailor stationary and adjustable/ combination drainable blade louvers feature concealed mullions up to 120" (3048) wide, with larger assemblies requiring separate visible frames with downspouts. Visible Mullions are provided with a Mullion Cover to enhance the architectural appearance of the louver. Mullions are constructed of the same material as the louver and finished to match.

VISIBLE MULLION DETAIL



FALSE MULLIONS

False mullions, an architectural feature simulating a mullion, are also available where required visually. They may be shipped loose for mounting to the louver at the installation site, or can be an integral extension of the louver frame, factory mounted. Mullions are constructed of the same material as the louver and finished to match.

SCREEN TYPES:

OPTION CODE **BSG**
BIRD SCREEN - GALV. STEEL (D)

OPTION CODE **BSA**
BIRD SCREEN - ALUMINUM

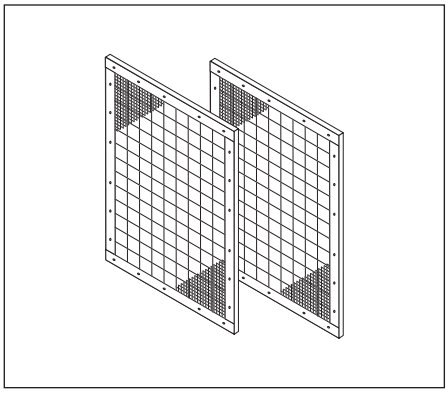
OPTION CODE **BSSS**
BIRD SCREEN - TYPE 304 STAINLESS STEEL

OPTION CODE **BSN**
BIRD SCREEN - NONE

OPTION CODE **00**
INSECT SCREEN - NONE (DEFAULT)

OPTION CODE **ISA**
INSECT SCREEN - ALUMINUM

OPTION CODE **ISSS**
BIRD SCREEN - TYPE 304 STAINLESS STEEL



Bird and Insect screens prevent the passage of undesirable elements through the louver while maintaining maximum airflow. All Nailor louvers come standard with a bird screen, either 3/4" x .051 (19 x 1.3) wire expanded and flattened aluminum or 1/2" mesh x 19 ga. (13 x 1.1) wire galvanized, dependent on louver construction, unless ordered otherwise. A variety of screen options are available to suit most applications: 1/2" mesh x 18 ga. (13 x 1.3) wire Type 304 stainless steel bird screens, 18 - 16 mesh, .011 (.30) wire aluminum insect screens and 18 - 16 mesh 0.11" (.30) wire Type 304 stainless steel insect screens may be ordered for all louver types.

Options and Accessories

WELDED CONSTRUCTION:

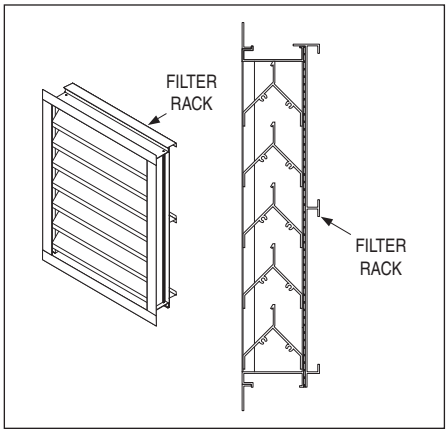
All Nailor louvers are mechanically fastened to provide a clean visual appearance when painted or anodized. Optional welded construction is available on all Nailor stationary louvers for applications that may be subject to vibration damage, i.e. when located in proximity to an air handler. Welded construction is not available when anodized finish is ordered.

OPTION CODE **WE**

FILTER RACK:

OPTION CODE **FR1**
1" (25) FILTER RACK

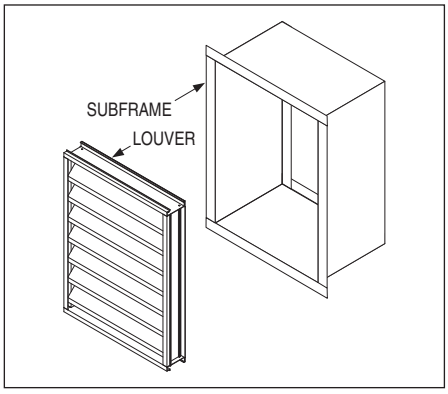
OPTION CODE **FR2**
2" (51) FILTER RACK



For applications where air filtration is required, Nailor offers 1" (25) or 2" (51) filter racks for standard filters, filters by others. Filters are easily accessible with a slide and lock in style design for quick service. Filter racks are constructed of the same material as the louver and factory installed with mechanical fasteners. All Nailor louvers are available with optional filter racks. Consult your Nailor representative for specific details and dimensional drawings for specific louver applications.

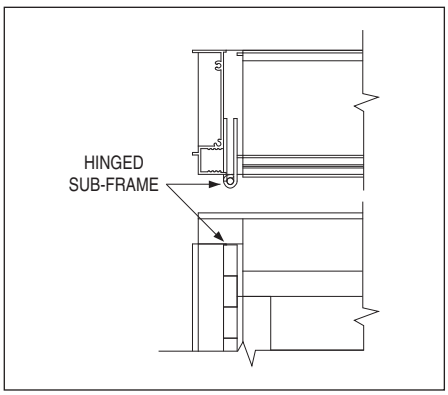
CHANNEL SUB-FRAME AND HINGES:

OPTION CODE **CSUB**
CHANNEL SUB-FRAME



Sub-frames are used as an auxiliary frame around a louver and by adding additional hardware you can enable a louver to be removable, hinged, latched, and for certain applications, restrained. All Nailor extruded aluminum stationary louvers are available with optional channel sub-frames; contact your Nailor representative for sub-frame requirements for steel stationary louvers.

OPTION CODE **HB**
HINGED BOTTOM
OPTION CODE **HL**
HINGED LEFT
OPTION CODE **HR**
HINGED RIGHT
OPTION CODE **HT**
HINGED TOP

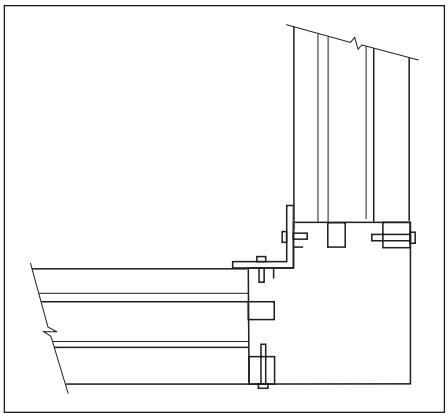


Some applications require access behind a louver for service and maintenance of other system components. When ordered with a channel sub-frame, hinges allow a louver to become an access door, providing easy access behind the louver. Hinges are available on top, bottom, and left or right orientations. Standard piano style hinges are factory mounted when ordered. All Nailor extruded aluminum stationary louvers are available with optional hinges; contact your Nailor representative for hinge requirements for steel stationary louvers.

Options and Accessories

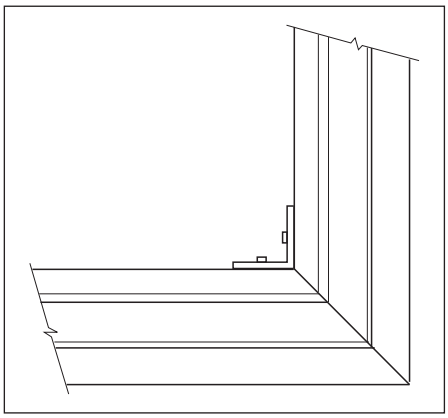
CORNER CONSTRUCTION:

OPTION CODE **SBCC**
BOX CORNER DETAIL



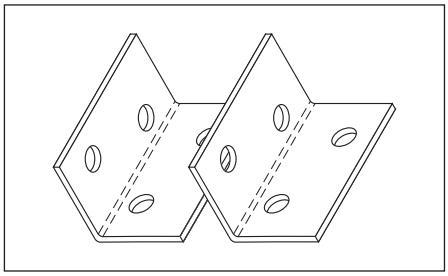
Louvers that follow the architectural line of a building's exterior around a corner may have either mitered or boxed corners, depending on the blade style of the louver selected. All Nailor extruded aluminum stationary J and K non-drainable louvers are available with optional mitered corners providing a desirable continuous look, and all Nailor extruded aluminum stationary drainable louvers are available with optional box corners only; contact your Nailor representative for corner requirements for steel stationary louvers.

OPTION CODE **SMCC**
MITERED CORNER DETAIL



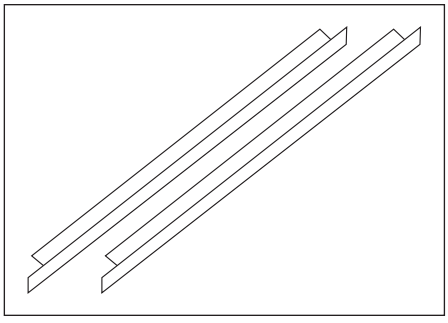
INSTALLATION ANGLES:

OPTION CODE **PACA**
MOUNTING CLIPS



Mounting clips and continuous angles are utilized to anchor a louver to an opening and provide a clean, easy, and speedy installation. When ordered, mounting clips and continuous angles are shipped loose for field assembly. All Nailor extruded aluminum stationary louvers are available with optional mounting clips and continuous angles; contact your Nailor representative for installation angle and mounting clip requirements for steel stationary louvers.

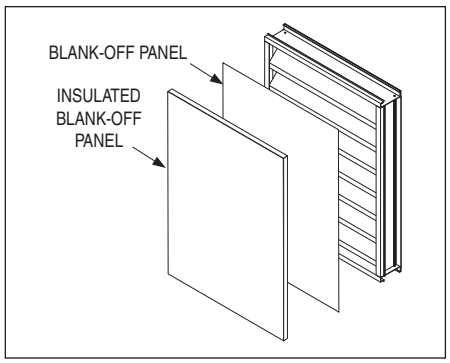
OPTION CODE **PAAA**
CONTINUOUS ANGLES



Options and Accessories

BLANK-OFF PANELS:

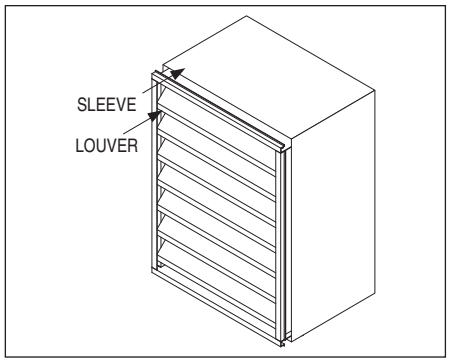
OPTION CODE **BA**
.040" ALUMINUM
OPTION CODE **BAI1**
.040" ALUMINUM W/1" (25) INSUL.
OPTION CODE **BAI2**
.040" ALUMINUM W/2" (51) INSUL.
OPTION CODE **BG**
20 GA. GALVANIZED STEEL
OPTION CODE **BGI1**
20 GA. GALVANIZED STEEL WITH 1" (25) INSULATION
OPTION CODE **BGI2**
20 GA. GALVANIZED STEEL WITH 2" (51) INSULATION



Certain louver applications may require that the airflow be controlled with a blank-off panel while still maintaining the louver's architectural appearance and aesthetic appeal. Blank-off panels can be a plain sheet of either galvanized steel or aluminum or a sandwich type panel in which 1" (25) or 2" (51) insulation attached. All Nailor extruded aluminum stationary louvers are available with blank-off panels; contact your Nailor representative Industries for blank-off panel requirements for steel stationary louvers.

SLEEVE TYPES:

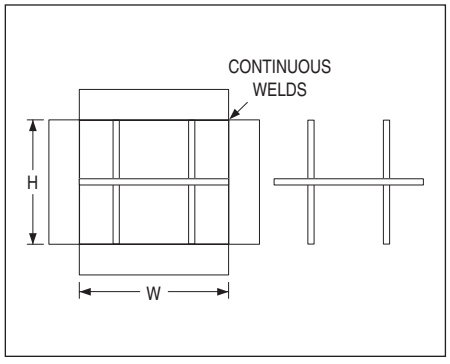
OPTION CODE **S304**
TYPE 304 STAINLESS STEEL
OPTION CODE **SALV**
ALUMINUM
OPTION CODE **SGLV**
GALVANIZED STEEL



A factory installed louver sleeve allows the units to ship directly to jobsite ready for installation, saving time, money and costly field fabrication and mounting, as well as helping to ensure proper installation. Sleeves are available in a variety of construction and thickness: Galvanized steel sleeve (20 ga. [1.0], 18 ga. [1.3], 16 ga. [1.6], 14 ga. [2.0], 12 ga. [2.7] or 10 ga. [3.5]), Aluminum sleeve (16 ga. [1.6], 14 ga. [2.0], 10 ga. [3.5]) or Type 304 stainless steel sleeve (20 ga. [1.0], 18 ga. [1.3], 16 ga. [1.6], 14 ga. [2.0], 12 ga. [2.7] or 10 ga. [3.5]). All Nailor louvers are available with factory installed sleeves.

SECURITY BARS:

OPTION CODE **SECB**
SECURITY BARS



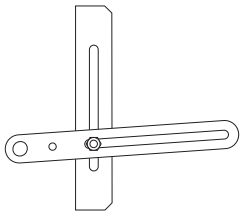
When combined with a sleeve, security bars provide maximum protection for installations where penetration through a wall needs to be secure. Available in a 2" (51) flat steel frame welded continuously at the corners, a variety of bar designs, bar material, construction types and bar spacing is available. Contact your Nailor representative for security bar requirements for all Nailor louvers.

Operator and Actuator Selection Guide for Louvers

The blades of an adjustable or combination louver can be operated by a variety of mechanisms. A standard hand locking louver quadrant crank operator is supplied for all Nailor adjustable and combination louvers unless otherwise ordered. Optional hand rotary louver quadrant operator, pull chain operator, and electric or pneumatic actuators are also available. Special actuator mounting options are available, contact your Nailor representative for details.

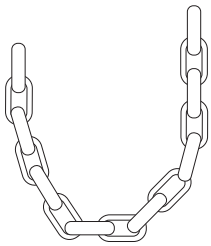
OPERATORS/ACTUATORS:

OPTION CODE **HLLQ**
HAND LOCKING LOUVER QUADRANT (STANDARD)

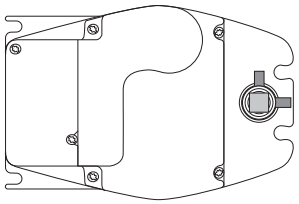


OPTION CODE **HRCO**
HAND ROTARY CRANK OPERATOR

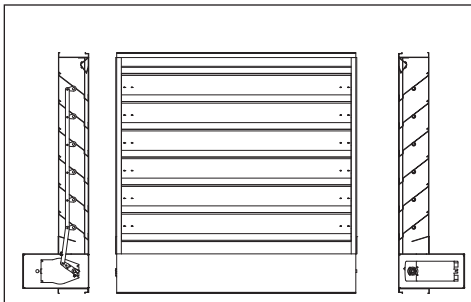
OPTION CODE **PCOI**
PULL CHAIN OPERATOR (INTERNAL)



OPTION CODE **ACT**
ACTUATOR



OPTION CODE **CACT**
CONCEALED ACTUATOR



Operator Codes & Standard Factory Mounting Locations:

Code	Description	Application	Standard Factory Mounted Position
HLLQ	Hand Locking Louver Quadrant	Manual Shut-off/ Balancing	External, Right hand, Out of air stream
HRCO	Hand Rotary Crank Operator	Manual Shut-off/ Balancing	Internal, Right hand, In air stream
PCOI	Pull Chain Operator	Inaccessible Installation	Internal, Right Hand, Includes 6 ft. (1.8 m) chain drop below louver
ACT	Actuator	Electric or Pneumatic Operation	Internal, Left hand, In air stream
CACT	Concealed Actuator	Electric or Pneumatic Operation	Concealed in enclosed box below louver, Left hand, Out of air stream

Actuator Selection Guide for Louvers

Electric - 2 Position Spring Return:

Maximum Damper ft.² (m²)					
Without Blade and/or Jamb Seals	With Blade and/or Jamb Seals	Application	Code	Manufacturer and Model No.	Voltage and Description
12 (1.11)	6 (0.56)	For **LOW** Torque Operations	411	Honeywell ML4115	120 VAC, FATPA
12 (1.11)	6 (0.56)		FL12	Belimo FSLF120	120 VAC
12 (1.11)	6 (0.56)		811	Honeywell ML8115	24 VAC, FATPA
12 (1.11)	6 (0.56)		FL24	Belimo FSLF24	24 VAC
20 (1.86)	10 (0.93)	For **MEDIUM** Torque Operations	F12	Belimo FSNF120	120 VAC
20 (1.86)	10 (0.93)		F24	Belimo FSNF24	24 VAC
24 (2.23)	12 (1.11)		MS4	Honeywell MS4X09	120 VAC, FATPA
24 (2.23)	12 (1.11)		MS8	Honeywell M8X09F	24 VAC, FATPA
60 (5.57)	40 (3.72)	For **HIGH** Torque Operations	FA12	Belimo FSAF120	120 VAC
60 (5.57)	40 (3.72)		FA24	Belimo FSAF24	24 VAC
60 (5.57)	40 (3.72)		412	Honeywell MS4120F10	120 VAC, FATPA
60 (5.57)	40 (3.72)		812	Honeywell MS8120F10	24 VAC, FATPA

Electric - 2 Position Spring Return with Auxiliary Switch(es):

Maximum Damper ft.² (m²)					
Without Blade and/or Jamb Seals	With Blade and/or Jamb Seals	Application	Code	Manufacturer and Model No.	Voltage and Description
12 (1.11)	6 (0.56)	For **LOW** Torque Operations	411S	Honeywell ML4115	120 VAC, FATPA with MLS300H*
12 (1.11)	6 (0.56)		FL1S	Belimo FSLF120-S**	120 VAC with Auxiliary Switch
12 (1.11)	6 (0.56)		811S	Honeywell ML8115	24 VAC, FATPA with MLS300H
12 (1.11)	6 (0.56)		FL2S	Belimo FSLF24-S	24 VAC with Auxiliary Switch
20 (1.86)	10 (0.93)	For **MEDIUM** Torque Operations	F12S	Belimo FSNF120-S	120 VAC with Auxiliary Switch
20 (1.86)	10 (0.93)		F24S	Belimo FSNF24-S	24 VAC with Auxiliary Switch
24 (2.23)	12 (1.11)		MS4S	Honeywell MS4X09F	120 VAC, FATPA with MLS300H
24 (2.23)	12 (1.11)		MS8S	Honeywell M8X09F	24 VAC, FATPA with MLS300H
60 (5.57)	40 (3.72)	For **HIGH** Torque Operations	FA1S	Belimo FSAF120-S	120 VAC with Auxiliary Switch
60 (5.57)	40 (3.72)		FA2S	Belimo FSAF24-S	24 VAC with Auxiliary Switch
60 (5.57)	40 (3.72)		412S	Honeywell MS4120F12	120 VAC, FATPA with MLS300H
60 (5.57)	40 (3.72)		812S	Honeywell MS8120F12	24 VAC, FATPA with MLS300H

Note: * MLS300H = Honeywell Auxiliary Switch Pack. ** -S = Belimo Auxiliary Switches.

Pneumatic - 2 Position Spring Return:

Air Pressure			Maximum Damper ft² (m²)			
Minimum PSI (kPa)	Maximum PSI (kPa)	Application	Without Blade and/or Jamb Seals	With Blade and/or Jamb Seals	Code	Manufacturer and Model No.
20 (138)	30 (207)	For **LOW** Torque Operations	20 (1.86)	10 (0.93)	482	Siemens #3
20 (138)	30 (207)	For **MEDIUM** Torque Operations	50 (4.65)	25 (2.32)	296	Siemens #4
20 (138)	30 (207)	For **HIGH** Torque Operations	84 (7.80)	42 (3.90)	306	Siemens #6

Note: Only Nailor Industries Inc. MLS300 Position Indicator Switch Pack available.

Extruded Aluminum Specialty Shape Louvers

Nailor Industries, Inc. offers the industry's largest selection of specialty shape louvers. In addition to their functional properties, louvers can provide aesthetic value to a structure's exterior by complimenting and accentuating architectural features like arches and angular rooflines. Nailor extruded aluminum stationary blade louvers are available in circular, semicircular, triangular and other geometric shapes and can be painted in all available finishes. Nailor specialty shape louvers are available in a variety of blade and frame designs to meet any architectural and mechanical design.

The following louver models are available in specialty shapes:

1602J, 1602K, 1604J, 1604JD, 1604KD, 1604D, 1604DD, 1604Y, 1606J, 1606JD, 1606KD, 1606D and 1606DD.

Note: Use of drainable blades is not recommended on certain shapes. Consult Nailor for specific applications.

STANDARD CONSTRUCTION:

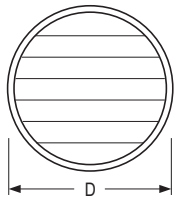
FRAME:	ASTM B211 Alloy 6063-T5 extruded or formed aluminum. Channel type standard. Frame profile may vary depending upon louver style and shape. Contact Nailor for specific details.
BLADES:	ASTM B211 Alloy 6063-T5 extruded aluminum. See applicable louver model submittal sheet for blade profile.
BLADE SUPPORT BRACKETS:	Concealed type, factory installed on rear of louver as necessary. Reinforced with 1" x 1" (25 x 25) vertical angle (adds approximately 1" [25] to overall louver depth).
MULLIONS:	All Nailor non-drainable specialty shape louvers feature concealed mullions providing architecturally appealing continuous blade line. Nailor drainable specialty shape louvers feature concealed mullions up to 120" W (3048) for the same visual aesthetics and larger assemblies require separate visible frames with downspouts. Consult Nailor for section details of specific sizes.
SCREEN:	3/4" x .051 (19 x 1.3) expanded, flattened aluminum bird screen in removable frame, inside (rear) mount (adds approximately 3/8" [10] to louver depth).
FINISH:	Mill.
MINIMUM SIZE:	Circular/Semi-circular: 20" (508) Dia.. Triangular/Trapezoidal: 20" W x 16" H (508 x 406). Contact Nailor for smaller sizes.
MAXIMUM SINGLE SECTION SIZE:	120" W x 84" H (3048 x 2134) or 84" H x 120" W (2134 x 3048). Larger louvers will require field assembly of smaller sections. Consult Nailor for section details of specific sizes.

PERFORMANCE:

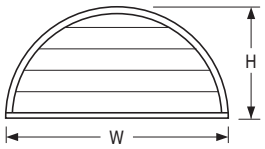
Standard louvers are tested for water penetration and pressure drop in a square configuration only. Specialty shape louvers are not tested and therefore not licensed to bear the AMCA seal. Performance of specialty shape louvers may vary from that of standard louvers and performance is typically decreased for specialty shaped louvers as compared to rectangular shaped louvers. Conservative air flows should be used when sizing louvers to help prevent water carry over.

Extruded Aluminum Specialty Shape Louvers

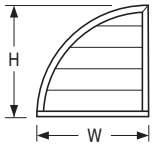
CIRCULAR & SEMICIRCULAR SHAPES



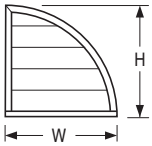
CA Circle (Round)



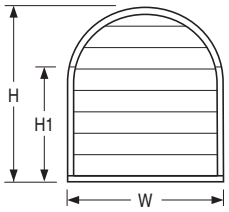
CB Semi-Circle



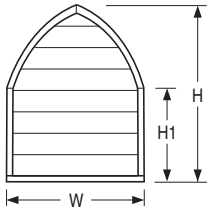
CC 1/4 Circle Left



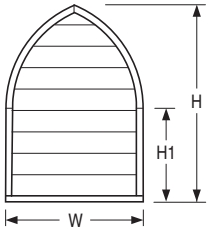
CD 1/4 Circle Right



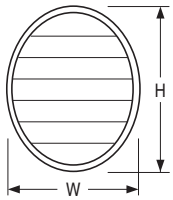
CE Arch Semi-Circular



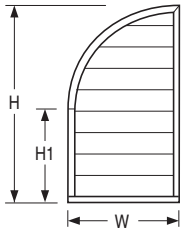
CFC Arch Custom (Dropped or Lancet)



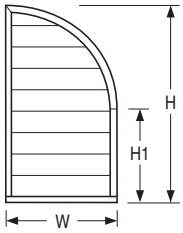
CFE Arch Equilateral



CG Oval

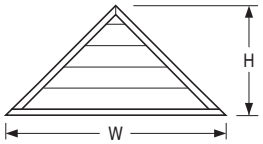


CH Arch 1/4 Circle Left

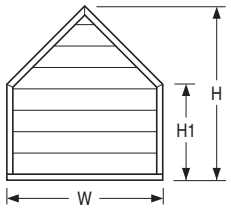


CJ Arch 1/4 Circle Right

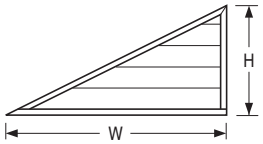
TRIANGULAR & TRAPEZOIDAL SHAPES



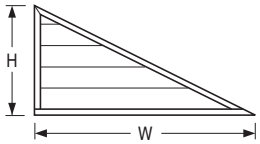
TA Triangle Isoceles



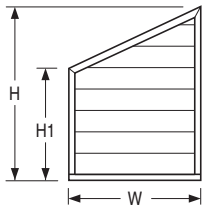
TB Arch Gable



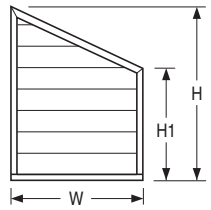
TC Triangle RA Left



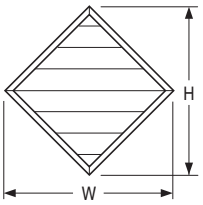
TD Triangle RA Right



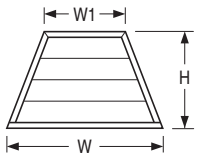
TE Quadrilateral Left



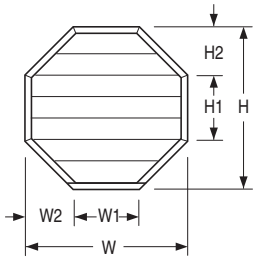
TF Quadrilateral Right



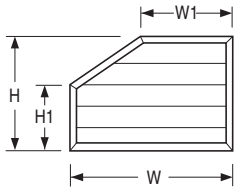
TG Diamond/Rhombus



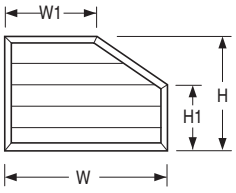
TH Trapezoid



TJ Octagon



TK Left Corner



TL Right Corner

Available Louver Finishes

Nailor offers 21 standard paint colors for architectural exterior use which meet or exceed AAMA specifications and performance requirements for color retention, chalk resistance, gloss retention, erosion, corrosion and chemical resistance as well as dry film thickness and hardness. Our state-of-the-art powder coat system provides an environment friendly finishing solution with more uniform coverage and coating thickness. The result is an exceptional finish that better resists scratching, fading and general wear. Additional liquid coat facilities for special requirements complete our ability to provide unmatched beauty and durability for any application. Nailor also offers 6 standard anodized finishes. Custom color matching is also available upon request. Contact your local Nailor representative.

See inside cover for available louver finishes color chart.

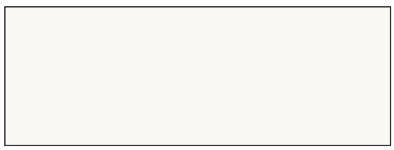
Note: Due to the printing process, colors shown approximate as closely as possible to the actual paint colors.

FINISH TYPE:	DESCRIPTION:
Fluoropolymer Powder Coat AAMA 2605 - Superior Finish (AKA: Powdura® 5000, Coraflon® Powder, Interpon® D3000-Fluoromax)	"Ultimate" - A next generation hyper durable powder coating, based on FEVE fluoropolymer resins and ceramic pigmentation that the industry has acknowledged as the foundation for superior performance coatings. They provide a hard surface that is resistant to scratching and scuffing, with superior color and gloss retention, when applied to a variety of exterior architectural applications. This technology represents the “ultimate” in environmentally friendly finishes, with Zero-VOC emissions. A new alternative to traditional 70% Kynar 500®/Hylar 5000® PVDF fluoropolymer liquid coatings.
High Performance Powder Coat AAMA 2604 - High Performance Finish (AKA: Powdura® 4000, Envirocron® Ultra DurablePowder, Dynadure™ 400, Interpon® D2000)	"Better" - A high performance polyester powder coating, based on “super durable” resins that utilize infrared reflective pigments, which provides excellent resistance to outdoor weathering. A harder and more environmentally friendly coating than other liquid paint counterparts and with Zero-VOC emissions. A good alternative to 50% Kynar 500®/Hylar 5000® liquid coatings.
Durable Powder Coat AAMA 2603 - Pigmented Organic Coatings (AKA: Powdura® 3000, Envirocron® Durable Powder, Dynadure™ 300, Interpon® D1000)	"Good" - A durable powder coat based on thermosetting polyester resin technology. Provides a good economical combination of physical and chemical resistance properties. Environmentally superior to liquid spray paints and Zero – VOC emissions.
Clear Anodize 215-R1 AA-M10C22A41 (0.7 mil. min.)	Architectural Class I. Clear, colorless and hard oxide aluminum coating that resists weathering and chemical attack. Recommended for severely corrosive and abrasive atmospheric exposure.
Clear Anodize 204-R1 AA-M10C22A31 (0.4 - 0.7 mil.)	Architectural Class II. Clear, colorless and hard oxide aluminum coating that resists weathering and chemical attack. Recommended for normal weather exposure.
Color Anodize AA-M10C22A44 (0.7 mil. min.)	Architectural Class I. "Two-step" aluminum coating process. Following a standard anodizing procedure, a second electrolytic process deposits colored metallic pigments which penetrate the aluminum oxide pores, producing a corrosion resistant, colorfast finish. Available in light, medium, dark bronze and black.
Prime Coat	Prime coat provides a stable base for painting of louvers in the field. Surface pretreatment includes degreasing and a chemical cleaning before an epoxy prime coat is applied. Finish coat should be field applied as soon as possible for best adhesion, after a thorough cleaning for dust etc. that can contaminate the final finish and cause premature flaking or peeling.

Contact your local representative for Color Guide and paint warranty information. Paint finish warranties are not applicable to steel products. Powdura® is a registered trademark of The Sherwin-Williams Company.
Coraflon® and Envirocron® are registered trademarks of PPG Industries Ohio, Inc. Interpon® is a registered trademark of Akzo Nobel Powder Coatings Ltd. Kynar 500® is a registered trademark of Arkema, Inc. Hylar 5000® is a registered trademark of Solvay Solexis, Inc.

Nailor® Industries Inc.

Louver Finishes & Color Guide

 Slate Blue LF01	 Medium Bronze LF02	 Sandstone LF03
 Light Gray LF04	 Charcoal LF05	 Bone White LF06
 Western Tan LF07	 Architectural Bronze LF08	 Legal Blue LF09
 Forest Green LF10	 Surrey Beige LF11	 Royal Brown LF12
 Barn Red LF13	 Burgundy LF14	 Clay LF15
 Almond LF16	 Coastal White LF17	 Vista Green LF18
 Black LF19	 Gloss Black LF20	 Campus Green LF21

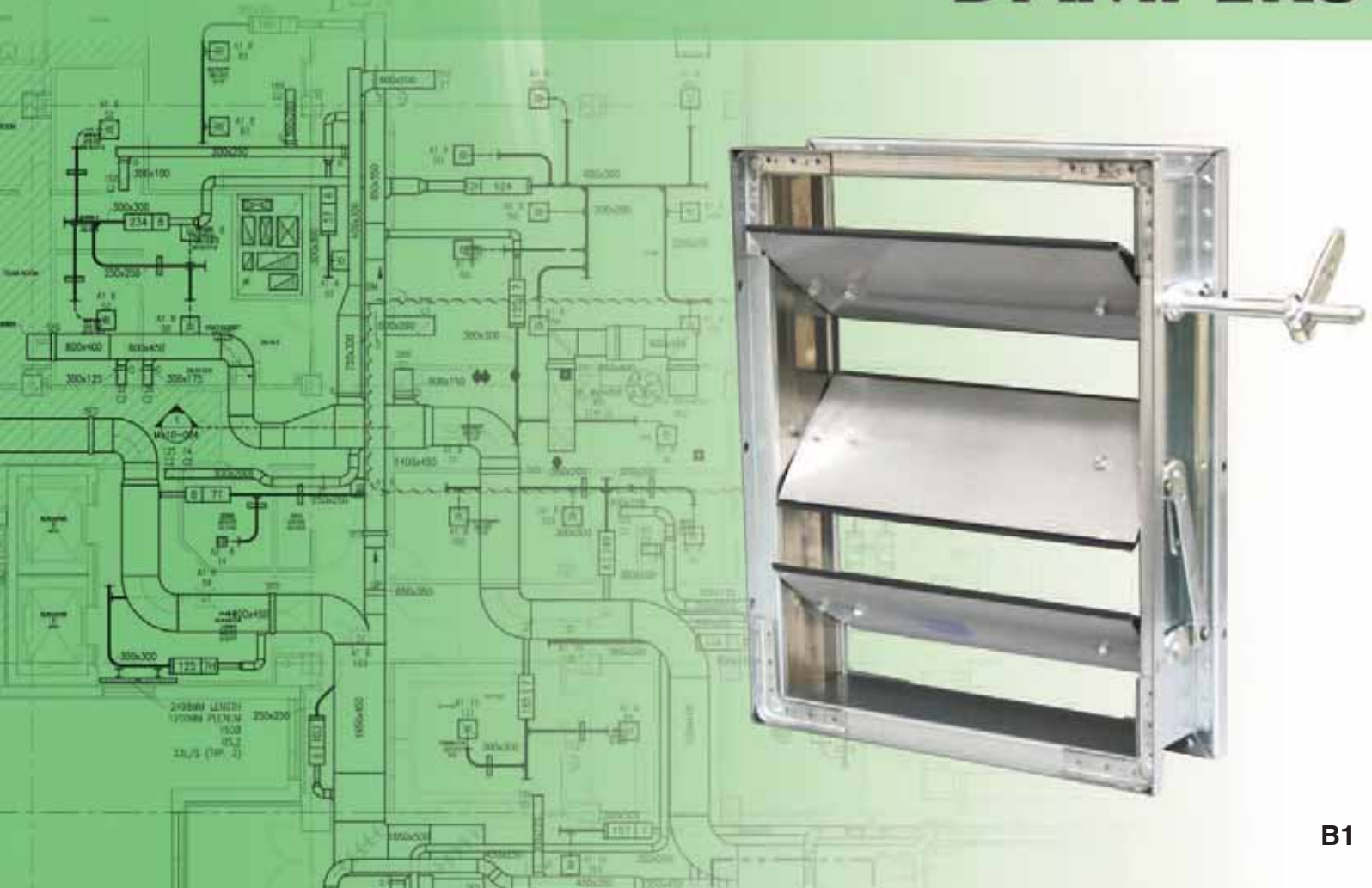
Nailor offers 21 standard paint colors selected for architectural exterior use which meet or exceed AAMA specifications and performance requirements for color retention, chalk resistance, gloss retention, erosion, corrosion and chemical resistance as well as dry film thickness and hardness. Our state-of-the-art powder coat system provides an environment friendly finishing solution with more uniform coverage and coating thickness. The result is an exceptional finish that better resists scratching, fading and general wear. Additional liquid coat facilities for special requirements complete our ability to provide unmatched beauty and durability for any application.

Custom color matching is also available upon request. Contact your local Nailor representative.

Note: Due to the printing process, colors shown approximate as closely as possible to the actual paint colors.

Nailor® Industries Inc.

CONTROL & BACKDRAFT DAMPERS



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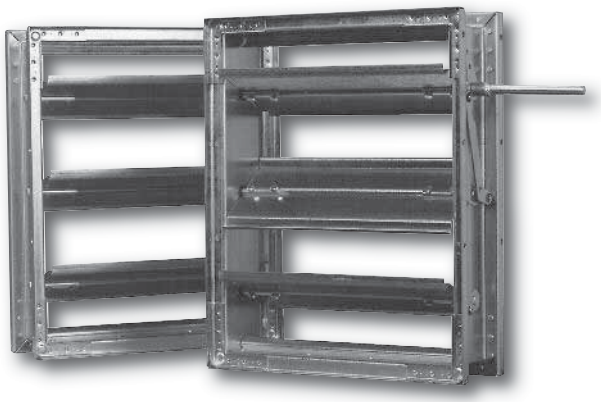
GENERAL PRODUCT OVERVIEW

With today's stringent design criteria for energy efficient 'green' building technology and indoor air quality, individual product engineering, testing and quality of workmanship are more important than ever before. At Nailor Industries, our continuous research and development, combined with our commitment to quality in manufacturing, have resulted in premium control damper products at a reasonable cost. Our standard performance control dampers meet the requirements of the majority of low to medium velocity and pressure commercial HVAC systems and our high performance control dampers offer unsurpassed leakage that meet the International Energy Conservation Code (IECC) maximum leakage for building envelope dampers criteria of 3 cfm/ft.^{2} @ 1" w.g. (15.2 L/s/m^2 @ 0.25 kPa) and offer low pressure drop characteristics suitable for use in high velocity, medium pressure commercial and industrial applications.

MODELS 1010 & 1020
LOW LEAKAGE CONTROL DAMPER
VEE GROOVE BLADE

Model 1010 and 1020 Low Leakage Control Dampers are Nailor's most popular choice for use in low to medium velocity and pressure commercial HVAC systems. They are low cost, high quality dampers that meet the frequently specified leakage criteria of less than 10 cfm per sq. ft. at 4" w.g. (0.5% at 2000 fpm). The design features include galvanized steel construction, a sturdy hat channel frame with die-formed corner gussets providing superior structural strength equivalent to 13 ga. (2.4) channel type frames, extruded PVC blade seals, a vee groove blade design that maximizes strength and optimizes airflow and a no-maintenance concealed linkage located out of the air stream for reduced pressure drop, air turbulence and noise. A variety of options are available to meet specific installation requirements and applications.

Models 1010 & 1020



Models 1012 & 1022

MODELS 1012 & 1022
STANDARD CONTROL DAMPER
VEE GROOVE BLADE

Model 1012 and 1022 Standard Control Dampers are the most economical choice for use in low to medium pressure and velocity commercial HVAC systems. They are high quality, low cost dampers that meet or exceed the majority of less stringent specification requirements. The design features include galvanized steel construction, a sturdy hat channel frame with die-formed corner gussets providing superior structural strength equivalent to 13 ga. (2.4) channel type frames, an interlocking vee groove blade design that maximizes blade strength and optimizes airflow and a no-maintenance concealed linkage located out of the air stream for reduced pressure drop, air turbulence and noise.

MODEL 1090
LOW LEAKAGE CONTROL DAMPER
ROUND DUCT

Model 1090 is an ultra-low leakage round control damper which has been designed for all types of round ductwork applications and is suitable for use in low to medium pressure and velocity commercial HVAC systems. The 1090 installs quickly and easily, saving money on installation costs. The design features a sturdy beaded casing for superior rigidity and a 14 ga. (2.0) equivalent laminated blade double bolted to the drive shaft for maximum strength. The damper can be used for two position or modulating control using electric or pneumatic actuators or can also be used as a manual balancing damper when used with the optional hand locking quadrant and positive shut-off is required.

Model 1090

MODELS 1110 & 1120
HIGH PERFORMANCE CONTROL DAMPER
STEEL AIRFOIL BLADE

Model 1110 and 1120 High Performance Control Dampers are Nailor's most economical airfoil blade control damper, suitable for use in low to medium pressure and velocity commercial HVAC systems. Design features include a steel airfoil blade for low pressure drop and reduced noise, sturdy galvanized steel hat channel frame with die-formed corner gussets for reinforcement and structural strength equivalent to 13 ga. (2.4) channel type frames and no-maintenance concealed linkage out of the air stream for reduced pressure drop and air turbulence. A variety of electric or pneumatic actuators are available for factory or field mounting. Models 1110 and 1120 Control Dampers are AMCA licensed for Air Leakage and Air Performance.

Models 1110 & 1120

Models 2010 & 2020

MODELS 2010 & 2020
HIGH PERFORMANCE CONTROL DAMPER
EXTRUDED ALUMINUM AIRFOIL BLADE

Models 2010 and 2020 High Performance Extruded Aluminum Airfoil Blade Control Dampers are ideal for use in high velocity, medium pressure commercial and industrial HVAC systems. Standard features include a rugged galvanized steel hat channel frame with superior structural strength, no-maintenance concealed linkage located out of the airstream, totally enclosed within the damper frame, and heavy duty extruded aluminum airfoil blades that combine superior rigidity and deflection resistance with low pressure drop. Unique compression type seals are keyed and locked into blade extrusion offering extraordinary leakage and pressure drop characteristics. Model 2020 Opposed Blade Control Damper is AMCA licensed for Air Leakage and Air Performance.

MODELS 2010-EAF & 2020-EAF
HIGH PERFORMANCE CONTROL DAMPER
EXTRUDED ALUMINUM AIRFOIL BLADE & FRAME

Models 2010-EAF and 2020-EAF High Performance Control Dampers feature an extruded aluminum airfoil blade and frame, ideal for use in high velocity, medium pressure commercial and industrial HVAC systems. Features include a heavy duty corrosion resistant extruded aluminum frame, no-maintenance concealed linkage located out of the airstream, enclosed within the damper frame, and heavy duty extruded aluminum airfoil blades that combine superior rigidity and deflection resistance with low pressure drop. Unique compression type seals are keyed and locked into blade extrusion offering extraordinary leakage and pressure drop characteristics. Model 2020-EAF Opposed Blade Control Damper is AMCA licensed for Air Leakage and Air Performance.

Model 2010-EAF

Model 2020-IBF

MODELS 2010-IB/IBF & 2020-IB/IBF • INSULATED
HIGH PERFORMANCE CONTROL DAMPER
INSULATED EXTRUDED ALUMINUM AIRFOIL BLADE

Models 2010-IB/-IBF and 2020-IB/-IBF are Nailor's premium Insulated High Performance Control Dampers suitable for use in high velocity, medium pressure commercial and industrial applications where thermal conductivity is a concern. These ultra-low leakage dampers feature an insulated blade (IB) or insulated blade and frame (IBF), making them ideal for use in low temperature applications. Standard features include a heavy duty extruded aluminum frame, no-maintenance concealed linkage located out of the airstream and heavy duty extruded aluminum airfoil blades with compression type seals, keyed and locked into blade extrusion offering extraordinary leakage and pressure drop characteristics. A variety of electric or pneumatic actuators are available for factory or field mounting. Model 2020-IBF Opposed Blade Control Damper is AMCA licensed for Air Leakage and Air Performance.

MODELS 1810 & 1820
MANUAL BALANCING DAMPERS
STEEL

Models 1810 and 1820 have been engineering and designed for manual balancing applications in low to medium pressure and velocity commercial HVAC systems. Ruggedly built, they provide a cost effective and reliable damper for reduced volume control and offer an economical manufactured product alternative to custom 'shop built' dampers that exceed the volume damper designs recommended by SMACNA. Features include a sturdy galvanized steel hat channel frame with die-formed corner gussets for reinforcement and superior structural strength, a vee groove blade design that maximizes strength and optimizes airflow and no-maintenance concealed linkage located out of the airstream, totally enclosed within the damper frame for reduced air turbulence, noise and pressure drop.

Models 1810 & 1820

Model 1870

MODEL 1870
MANUAL BALANCING DAMPER STEEL
SINGLE BLADE

Model 1870 Manual Balancing Damper is a ruggedly built, economical branch duct balancing damper designed for manual balancing applications with rectangular ductwork. The 1870 installs quickly and easily, saving time and money on installation costs. The low profile 18 ga. (1.3) frame and sills allow maximum free area and the ribbed forms in the blade and frame provides extra strength. A locking manual hand quadrant is provided with each damper.

MODEL 1890
MANUAL BALANCING DAMPER
ROUND DUCT

Model 1890 Manual Balancing Damper is a steel butterfly damper designed for all types of round ductwork balancing applications and is suitable for use in low pressure and velocity commercial HVAC systems. The design features a sturdy beaded casing ideal for round spiral ductwork connections, and a corrosion resistant steel blade that can be locked in any position with the hand quadrant that is supplied as standard with the damper. The 1890 installs quickly and easily and becomes part of the ductwork, saving time and money on installation costs and is an economical alternative to a shop built damper.

Model 1890

Model 1370

MODEL 1370
BACKDRAFT DAMPER
EXTRUDED ALUMINUM • LIGHT/MEDIUM DUTY

Model 1370 is an extruded aluminum gravity operated backdraft damper for use in light to medium duty commercial HVAC applications to pass airflow in one direction and to prevent airflow in the opposite direction. Standard features include a corrosion resistant extruded aluminum reinforced mitered corner frame that resists racking, aerodynamic extruded aluminum blades that overlap the jambs for maximum weather protection, extruded PVC blade seals that provide quiet closure as well as extra weather protection, corrosion resistant long life synthetic bearings and a concealed blade linkage for low pressure drop that provides smooth operation at system velocities of up to 1500 fpm (7.6 m/s).

MODEL 1380
HIGH PERFORMANCE BACKDRAFT DAMPER
EXTRUDED ALUMINUM • HEAVY DUTY

Model 1380 is a high performance extruded aluminum gravity operated backdraft damper for use in medium to heavy duty commercial and light industrial HVAC applications to pass airflow in one direction and to prevent airflow in the opposite direction. Corrosion resistant extruded aluminum construction highlights the model's features which include a heavy duty frame with reinforced mitered corners that resist racking, aerodynamic blades that overlap the jambs for maximum weather protection, extruded PVC blade seals that provide quiet closure as well as extra weather protection, corrosion resistant long life synthetic bearings and a concealed blade linkage for low pressure drop that provides smooth operation at system velocities of up to 2500 fpm (12.7 m/s).

Model 1380

Model 1370CB

MODEL 1370CB
COUNTERBALANCED BACKDRAFT DAMPER
EXTRUDED ALUMINUM • LIGHT/MEDIUM DUTY

Model 1370CB Counterbalanced Backdraft Damper is designed to automatically prevent the backflow of air while allowing for automatic air intake or exhaust/pressure relief in medium duty HVAC applications. Standard features include a corrosion resistant extruded aluminum reinforced mitered corner frame that resists racking, aerodynamic extruded aluminum blades that overlap the jambs for maximum weather protection, extruded PVC blade seals that provide quiet closure as well as extra weather protection, corrosion resistant long life synthetic bearings and a concealed blade linkage for low pressure drop that provides smooth operation at system velocities of up to 1500 fpm (7.6 m/s). Blade mounted counterweights are easily adjusted to desired opening pressure.

MODEL 1380CB
HIGH PERFORMANCE COUNTERBALANCED BACKDRAFT DAMPER • EXTRUDED ALUMINUM • HEAVY DUTY

Model 1380CB High Performance Counterbalanced Backdraft Damper is engineered and designed to automatically prevent the backflow of air while allowing for automatic air intake or exhaust/pressure relief in medium to heavy duty commercial and light duty industrial HVAC applications. Corrosion resistant extruded aluminum construction highlights the model's features which include a heavy duty frame with reinforced mitered corners that resist racking, aerodynamic blades that overlap the jambs for maximum weather protection, extruded PVC blade seals that provide quiet closure as well as extra weather protection, corrosion resistant long life synthetic bearings and an out of sight rear mounted blade linkage for that provides smooth operation at system velocities of up to 2500 fpm (12.7 m/s). Blade mounted counterweights are easily adjusted to desired opening pressure.

Model 1380CB

Model 1390CB

MODEL 1390CB
HIGH PERFORMANCE COUNTERBALANCED BACKDRAFT DAMPER • STEEL FRAME • HEAVY DUTY

Model 1390CB is a counterbalanced backdraft damper designed for pressure relief to automatically assist in maintaining and limiting desired pressures in medium to heavy duty commercial and light duty industrial HVAC or process air systems. The unique extruded aluminum blade design and fully adjustable counterbalance assembly offer pressure relief at extremely low pressure differentials. The rugged steel mitered corner frame is reinforced to resist racking, and ball bearings provide extreme sensitivity and ultra-smooth operation. Neoprene blade seals provide quiet closure as well as extra weather protection.

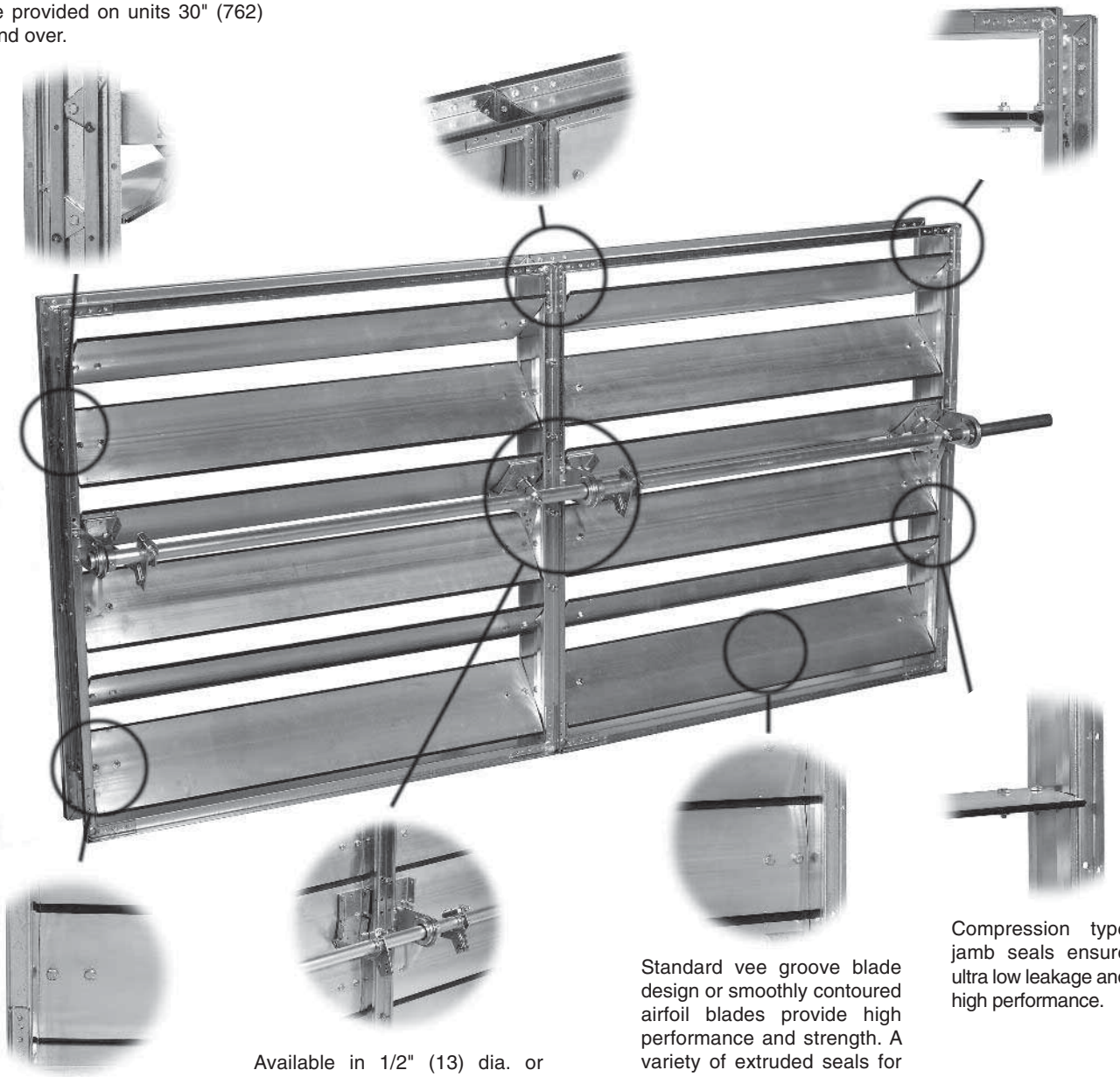
FEATURES OF NAILOR CONTROL DAMPERS

At Nailor Industries, we take pride in putting our years of experience in manufacturing premium quality dampers to work for you with every control damper we make. We've learned a lot since producing our first damper in 1971 and have incorporated that knowledge into the latest designs and features that are offered today. With Nailor dampers you're in control! We manufacture your control dampers with the remarkable quality features shown below and with a multitude of options you can select from to meet your specific requirements. With Nailor's fast lead times, your control dampers will be on site when you need them. Premium quality, reasonable cost and versatility are just some the standard features found on all Nailor products!

Nailor's robust blade linkage provides firm, precise blade connections for smooth operation, concealed in frame, out of airstream for reduced turbulence and pressure drop. Double linkage provided on units 30" (762) wide and over.

Rugged 16 ga. (1.6) hat channel frame design provides strength equivalent to heavier gauge U-channel frames.

Corners are mitered and reinforced with die-formed gussets for superior rigidity and strength that virtually eliminates racking.



Each axle is fastened to blade end with double thru-bolts providing superior no-slip axle connections. Choice of bearings to suit application.

Available in 1/2" (13) dia. or heavy duty 1" (25) dia. shaft. A robust linkage, bearing brackets and blade connections provide optimum operation on larger dampers.

Standard vee groove blade design or smoothly contoured airfoil blades provide high performance and strength. A variety of extruded seals for various applications provide low-leakage characteristics that lead the industry.

Compression type jamb seals ensure ultra low leakage and high performance.

Quality dampers by Nailor Industries . . . Now you're in control!

CONTROL DAMPER TESTING

All AMCA certified dampers are subject to the guidelines of the Certification Ratings Program and are tested in accordance with AMCA Standard 500-D, *Laboratory Methods of Testing Dampers for Rating*. All Nailor non-AMCA certified control, balancing and backdraft dampers are tested in an independent laboratory and testing is conducted in accordance with AMCA Standard 500-D.

There are three common test setups to test pressure drop referenced in AMCA 500-D: Fig. 5.2, Fig. 5.3 and Fig. 5.5 (see below). All Nailor control dampers are tested using the configuration shown below in Fig. 5.3, illustrating a fully ducted damper. All Nailor backdraft dampers are tested using the configuration shown in Fig. 5.5, illustrating a plenum mounted damper. Fig. 5.3 yields the lowest pressure drop of the three test configurations due to minimized entrance and exit losses of the upstream and downstream straight duct runs. Fig. 5.5 has the highest pressure drop due to extremely high entrance and exit losses due to the sudden changes of area in the system.

Pressure drop data within this section has been corrected to represent standard air at a density of 0.075 lb/ft^3 (1.2 kg/m^3) and this data is representative of laboratory conditions. The actual pressure drop of any HVAC system is a combination of many factors. This pressure drop information along with an analysis of other system influences should be used to estimate actual pressure losses for a damper installed in a given HVAC system.

With any damper application, the amount of air leakage through the damper should be considered. If the application requires low leakage characteristics, the damper should be provided with seals. Nailor Industries offers a variety of low leakage rated dampers with blade and jamb seals suitable for most commercial and light industrial HVAC applications.

The sealing performance of a closed damper is described by the airflow leakage rate through the damper for a given pressure differential across the damper. The established sealing performance is usually expressed (or plotted) as cfm per sq. ft. (m^3/s per m^2) through the face area of a damper versus measured pressure differential across the damper. The published sealing performance is calculated in accordance with AMCA Standard 500-D and is a statement of the worst-case performance based on testing various damper sizes.

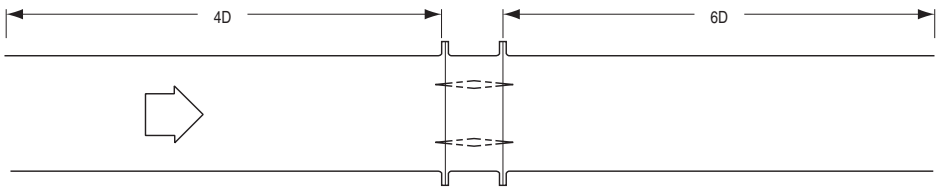


FIG. 5.3

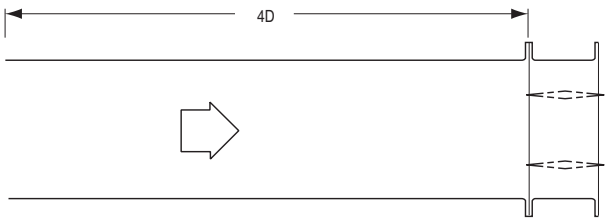


FIG. 5.2

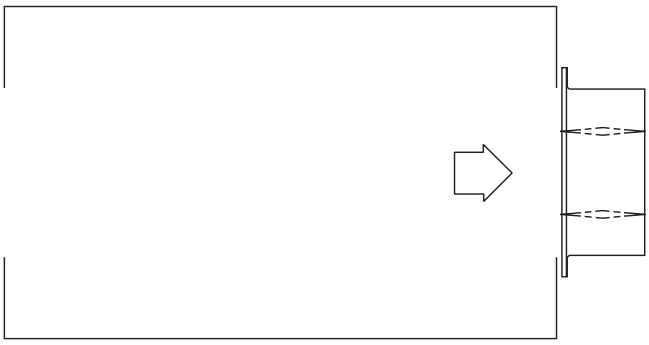


FIG. 5.5

- VEE GROOVE BLADE
- LOW LEAKAGE
- GALVANIZED STEEL

Models:

1010 Parallel Blade

1020 Opposed Blade

Model 1010 Model 1020

Model 1010 and 1020 low leakage control dampers are Nailor's most popular choice for use in low to medium velocity and pressure commercial HVAC systems. They are low cost, high quality dampers that meet the frequently specified leakage criteria of less than 10 cfm per sq. ft. at 4" w.g. (0.5% at 2000 fpm). Suitable for use in low to medium velocity and pressure commercial HVAC systems.

Design features include durable steel construction, a sturdy 16 ga. (1.6) galvanized steel hat channel frame with die-formed corner gussets providing superior structural strength equivalent to 13 ga. (2.4) channel type frames, an interlocking vee groove blade design that maximizes strength and optimizes airflow, double bolted no slip blade axle connections with corrosion resistant long life synthetic bearings, extruded PVC blade seals and compression type metallic jamb seals for low leakage requirements and a no-maintenance concealed linkage located within the side frame out of the air stream for reduced pressure drop, air turbulence and noise. A variety of electric or pneumatic actuators are available for factory or field mounting along with a comprehensive selection of options to meet specific installation requirements and applications.

STANDARD CONSTRUCTION:

Frame: 5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel with die-formed corner gussets. Low profile (flat top and bottom) on dampers 10" (254) high and under.

Blades: 6" (152) wide on 5 1/2" (140) centers. 16 ga. (1.6) galvanized steel vee groove design. Parallel or opposed action.

Linkage: Concealed type totally enclosed within the frame and out of the airstream. Plated steel.

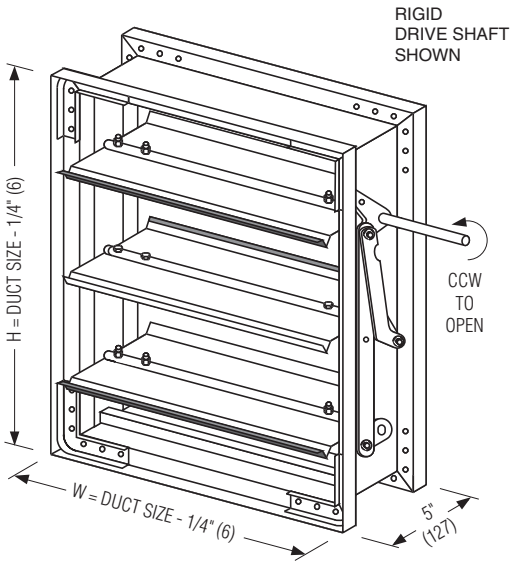
Bearings: 1/2" (13) dia. Celcon®.

Axles: 1/2" (13) dia. plated steel double bolted to blades.

Drive Shaft: 6" (152) long x 1/2" (13) dia. rigid shaft; or optional lock-on shaft with outboard support bracket (standard in Canada), on all single section dampers. A 1/2" (13) or 1" (25) dia. factory installed jackshaft is standard on all multiple section dampers.

Blade Seals: Dual durometer bulb type extruded PVC.

Jamb Seals: Compression type cambered metal.



Models 1010 and 1020 Sizes (Duct W x H):

Minimum		Maximum	
Single Section		Single Section	Multiple Section
Single Blade 6" x 4" (152 x 102)	Two Blades (parallel or opposed) 8" x 10" (203 x 254)	48" x 72" (1219 x 1829)	Unlimited

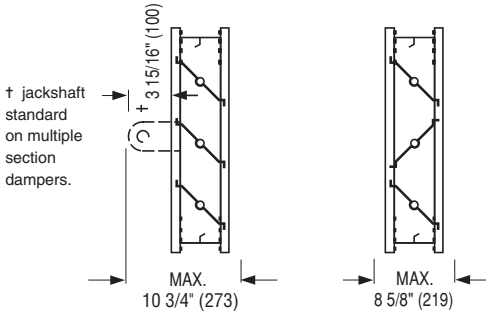
Temperature Range: -50°F to 180°F (-46°C to 82°C)

COMMON OPTIONS:

- Type 304 Stainless Steel construction.
- Heavier gauge frame construction.
- Front, rear or double flange frame (with or without bolt holes).
- Factory installed pneumatic and electric actuators.

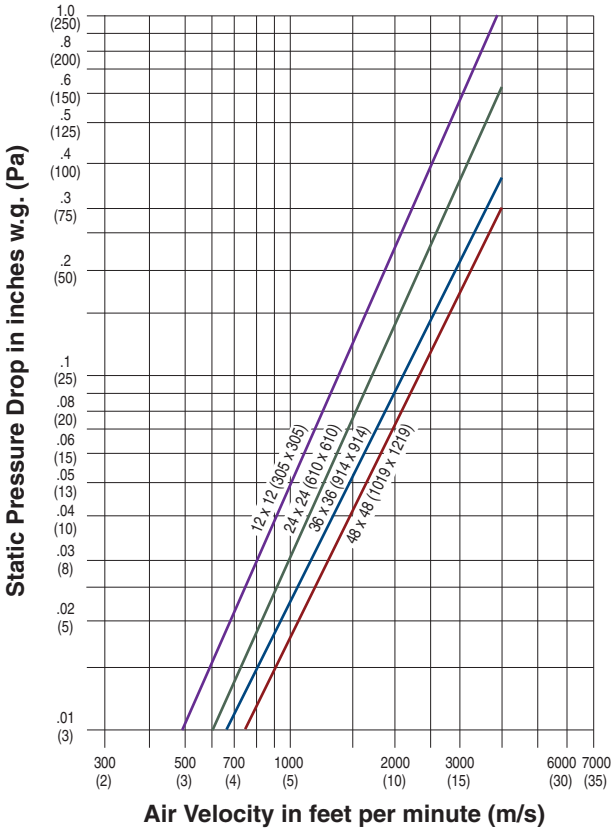
MODEL 1010
PARALLEL BLADE

MODEL 1020
OPPOSED BLADE



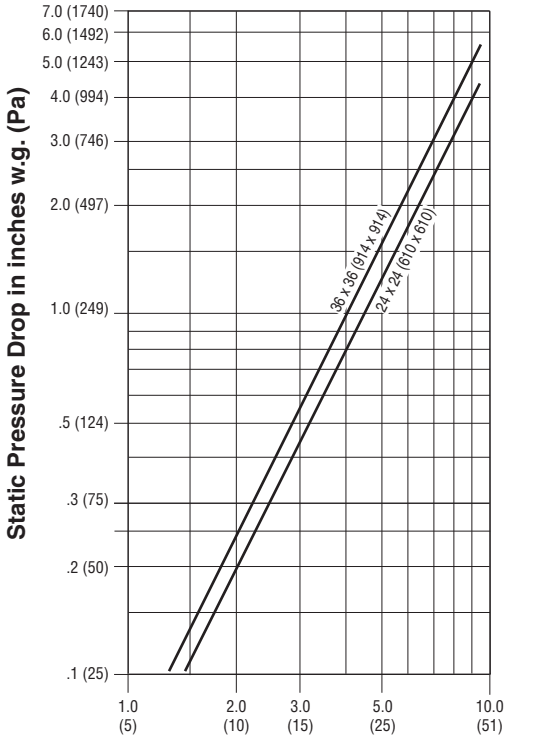
PERFORMANCE DATA:
MODELS: 1010 AND 1020

PRESSURE DROP (damper fully open):



Tested per AMCA standard 500-D, Fig. 5.3.

LEAKAGE (damper fully closed):



Tested per AMCA standard 500-D, Fig. 5.5.

DYNAMIC LIMITATIONS / LEAKAGE

Damper Width	Maximum System Pressure	Maximum System Velocity	Leakage *	
			% of Max. Flow	Cfm/ Sq. Ft.
48" (1219)	2.5" w.g.	2000 fpm	.18	3.5
36" (914)	3.0" w.g.	2000 fpm	.20	4.0
24" (610)	4.0" w.g.	2000 fpm	.23	4.5
12" (305)	5.0" w.g.	2000 fpm	.33	6.6

* Leakage information is based upon a pressure differential of 1" w.g. tested per AMCA standard 500-D, Fig. 5.5.

HOW TO SPECIFY

MODELS: 1010 AND 1020
LOW LEAKAGE CONTROL DAMPERS

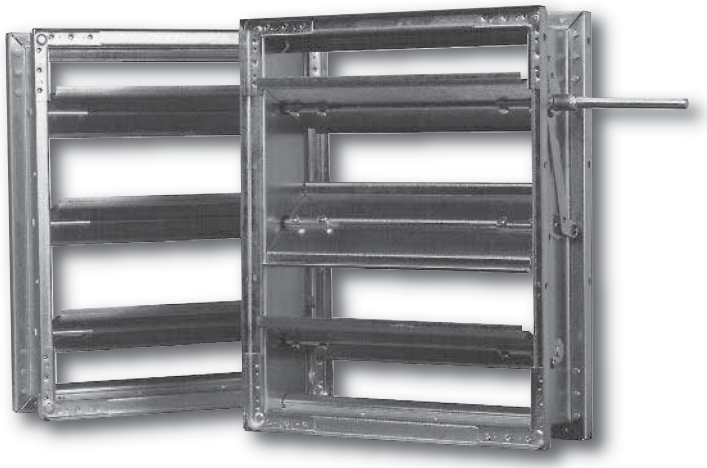
SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, low leakage control dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners and die-formed corner gussets for rigidity and structural strength equivalent to 13 ga. (2.4) channel type frames. Blades shall be of vee groove design, 16 ga. (1.6) galvanized steel, on maximum 6" (152) centers. Blade axles shall be 1/2" (13) dia. plated steel, double thru-bolted to blade at each end. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be Celcon® molded synthetic type. Blade linkage shall be no-maintenance, out of airstream and totally concealed within the frame. Jackshafts shall be supplied on all multiple section wide assemblies in order to evenly distribute torque. Blade seals shall be dual durometer bulb type extruded PVC, and jamb seals shall be compression type cambered metal, providing positive shut-off.
All submitted performance data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries **(specifier to select)** Model 1010 parallel blade **or** Model 1020 opposed blade control damper.

- VEE GROOVE BLADE
- GALVANIZED STEEL

Models:

1012 Parallel Blade

1022 Opposed Blade



Model 1012 Model 1022

Model 1012 and 1022 Control Dampers are the most cost-effective choice for use in low to medium pressure and velocity commercial HVAC systems where leakage and tight shut-off are not a major concern. The standard models are unsealed. They are high quality, low cost dampers that meet or exceed the majority of less stringent specification requirements and applications.

Design features include durable steel construction, a sturdy hat channel frame with die-formed corner gussets providing superior structural strength equivalent to 13 ga. (2.4) channel type frames, a vee groove blade design that maximizes blade strength and optimizes airflow, double bolted no slip blade axle connections with long life corrosion resistant synthetic bearings and a no-maintenance concealed linkage enclosed in the side frame out of the air stream for reduced pressure drop, air turbulence and noise. A variety of options are available to meet specific installation requirements and a wide selection of electric or pneumatic actuators are available for factory or field mounting.

STANDARD CONSTRUCTION:

Frame: 5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel with die-formed corner gussets. Low profile (flat top and bottom) on dampers 10" (254) high and under.

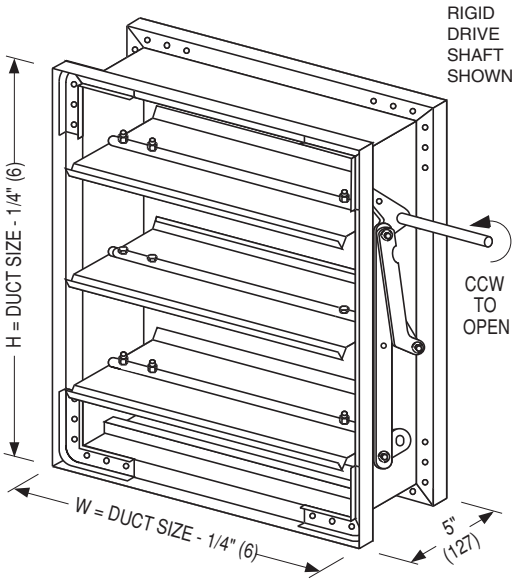
Blades: 6" (152) wide on 5 1/2" (140) centers. 16 ga. (1.6) galvanized steel vee groove design. Parallel or opposed action.

Linkage: Concealed type totally enclosed within the frame and out of the airstream. Plated steel.

Bearings: 1/2" (13) dia. Celcon®.

Axles: 1/2" (13) dia. plated steel double bolted to blades.

Drive Shaft: 6" (152) long x 1/2" (13) dia. rigid shaft; or optional lock-on shaft with outboard support bracket (standard in Canada), on all single section dampers. A 1/2" (13) or 1" (25) dia. factory installed jackshaft is standard on all multiple section dampers.



Models 1012 and 1022 Sizes (Duct W x H):

Minimum		Maximum	
Single Section		Single Section	Multiple Section
Single Blade 6" x 4" (152 x 102)	Two Blades (parallel or opposed) 8" x 10" (203 x 254)	48" x 72" (1219 x 1829)	Unlimited

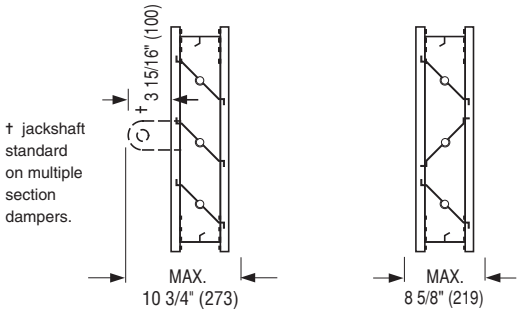
Temperature Range: -50°F to 180°F (-46°C to 82°C)

COMMON OPTIONS:

- Polyurethane blade seals & metallic jamb seals.
- Heavier gauge frame construction.
- Front, rear or double flange frame (with or without bolt holes).
- Factory installed pneumatic and electric actuators.

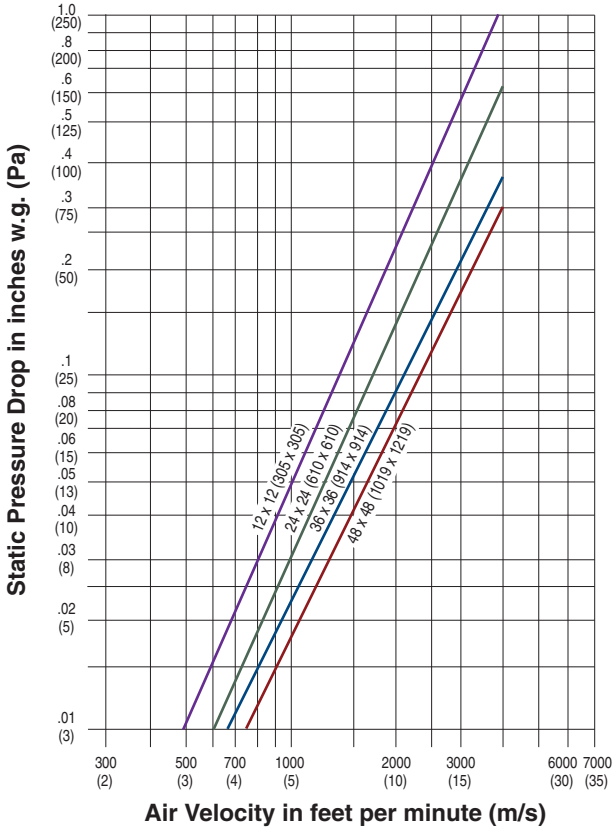
MODEL 1012
PARALLEL BLADE

MODEL 1022
OPPOSED BLADE



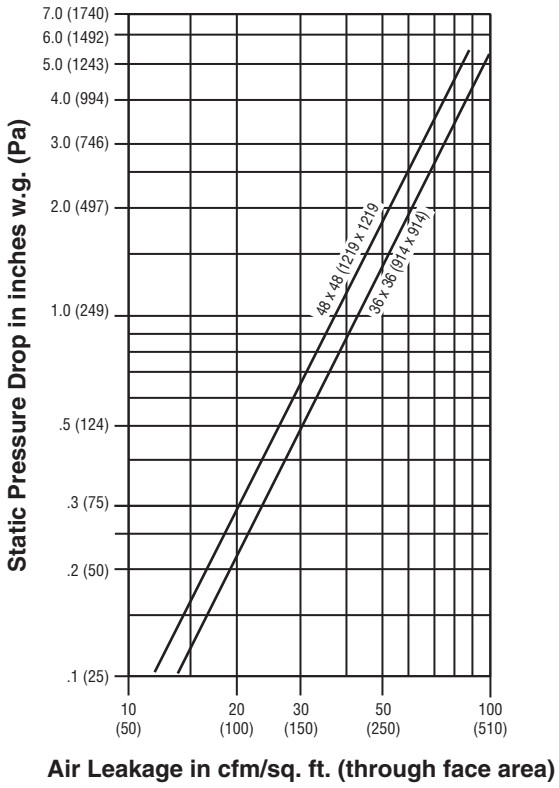
PERFORMANCE DATA:
MODELS: 1012 AND 1022

PRESSURE DROP (damper fully open):



Tested per AMCA standard 500-D, Fig. 5.3.

LEAKAGE (damper fully closed w/o seals):



Tested per AMCA standard 500-D, Fig. 5.5.

DYNAMIC LIMITATIONS / LEAKAGE

Damper Width	Maximum System Pressure	Maximum System Velocity	Leakage *			
			W/O Seals		W/Seals	
			% of Max. Flow	Cfm/ Sq. Ft.	% of Max. Flow	Cfm/ Sq. Ft.
48" (1219)	2.5" w.g.	2000 fpm	1.90	38	.48	9.5
36" (914)	3.0" w.g.	2000 fpm	2.15	43	.54	10.8
24" (610)	4.0" w.g.	2000 fpm	2.35	47	.57	11.3
12" (305)	5.0" w.g.	2000 fpm	3.10	62	.80	16.0

* Leakage information is based upon a pressure differential of 1" w.g. tested per AMCA standard 500-D, Fig. 5.5.

HOW TO SPECIFY

MODELS: 1012 AND 1022
STANDARD CONTROL DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, control dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners and die-formed corner gussets for rigidity and structural strength equivalent to 13 ga. (2.4) channel type frames. Blade shall be of vee groove design, 16 ga. (1.6) galvanized steel, on maximum 6" (152) centers. Blade axles shall be 1/2" (13) dia. plated steel, double thru-bolted to blade at each end. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be Celcon® molded synthetic type. Blade linkage shall be zero-maintenance, out of airstream and totally concealed within the frame. Jackshafts shall be supplied on all multiple section wide assemblies in order to evenly distribute torque. Standard of acceptance shall be Nailor Industries **(specifier to select)** Model 1012 parallel blade **or** Model 1022 opposed blade control damper.

HOW TO ORDER

MODELS: 1010, 1020, 1012 AND 1022
VEE BLADE CONTROL DAMPERS

EXAMPLE: 1020 - 24x24 - GLV - HC - 16G - LC - BC - BVP - JSS - DSR - DR - SMP - AUTO - 120 - SPR - 2POS - CL - 4X02

1. **Models**
   - 1010 Steel, Vee Blade, Parallel, Low Leakage
   - 1020 Steel, Vee Blade, Opposed, Low Leakage
   - 1012 Steel, Vee Blade, Parallel, Standard
   - 1022 Steel, Vee Blade, Opposed, Standard
2. **Duct Size**
   Width x Height (inches [mm's])
3. **Construction**
   - GLV Galvanized Steel (default)
   - 304 Type 304 Stainless Steel
   - ALS Aluminum with Stainless Steel Hardware
4. **Frame Type**
   - HC Hat Channel (default)
   - FD Double Flange
   - FDB Double Flange with Bolt Holes
   - FF Flanged Front
   - FFB Flanged Front with Bolt Holes
   - FR Flanged Rear
   - FRB Flanged Rear with Bolt Holes
5. **Frame Gauge**
   - 16G 16 ga. standard (default)
   - 14G 14 ga.
   - 13G 13 ga.
   - 12G 12 ga.
6. **Blade Linkage Style**
   - LC Concealed Linkage (default)
   - LF Face Linkage
7. **Bearings**
   - BC Celcon (default)
   - BO Oilite Bronze
   - BS Stainless Steel
8. **Blade Seals**
   - BVP Extruded PVC Seals (default 1010/1020)
   - – None (default 1012/1022)
   - BSP Polyurethane
9. **Jamb Seals**
   - JSS Stainless Steel (default 1010/1020)
   - – None (default 1012/1022)
   - JSM Metal
10. **Factory Actuator Mounting**
    - – None (default)
    - FMEN External Supplied by Nailor
    - FMEO External Supplied by Others
    - FMIN Internal Supplied by Nailor
    - FMIO Internal Supplied by Others
11. **Drive Shaft Option**
    - DSR Rigid (default USA, International)
    - DLO Lock-on Drive Shaft (default CAN)
    - JK Jackshaft
    - JK1 Jackshaft - 1" (25) dia.
    - JK5 Jackshaft - 1/2" (13) dia.
12. **Drive Location**
    - DR Right or Left Hand (default)
    - DI Internal

OPTIONS & ACCESSORIES:

13. **Optional Linkage**
    - – None (default)
    - SSL Type 304 Stainless Steel
14. **Thrust Bearings for Vertical Blades**
    (Single Section only)
    - – None (default)
    - BT Thrust Bearings

15a. **Side Mounting Plate**
- – None
- SMP Side Mounting Plate

15b. **Sleeve Length**
SL = Specify
- – None (default)
  12" – 28" (305 – 711)

16. **Sleeve Gauge**
    - – None (default)
    - 20G 20 ga. standard
    - 18G 18 ga.
    - 16G 16 ga.
    - 14G 14 ga.
    - 10G 10 ga.
17. **Sleeve Construction**
    - – None (default)
    - SGLV Galvanized Steel
    - S304 Type 304 Stainless Steel
    - SALU Aluminum
18. **Transition**
    - – None (default)
    - CR Round
    - CO Oval
19. **Hand-Locking Quadrant**
    - – None (default)
    - HL2 Quadrant with 2" (51) Bracket
    - HLQ Hand-Locking Quadrant
20. **Vertical Inter-Connect Kit**
    - – None (default)
    - VCK Vertical Inter-Connect Kit
21. **Chain Operator**
    - – None (default)
    - PCE External
    - PCI Internal
22. **Chain**
    - CH Chain Length (specify ft.)

OPTIONS & ACCESSORIES: (continued)

23. **Actuator Selected By**

AUTO	Least Cost (Auto-select)
BEL	Belimo
HON	Honeywell
MAN	Manually Select
N/A	Not Applicable
SIE	Siemens

24. **Power Requirement**

120	120 VAC
230	230 VAC
24	24V AC
PNU	Pneumatic

25. **Spring Return**

NSPR	Non-Spring Return
SPR	Spring Return

26. **Control Type**

2POS	Two Position
FL	Floating
MOD	Modulating
MODF	Modulating and Floating
FMZS	Modulating and Floating, Adj., 0/Span

27. **Fail Position (Spring Only)**

–	None
CL	Close
OP	Open

28. **Auxiliary Switch Package**

–	None
300	Nailor MLS-300 Position Indicator
AUXS	On Electric Actuator

29. **Actuator**

Electric:

411	ML4115	120 VAC
411S	ML4115	120 VAC w/MLS-300H
412	MS4120F10	120 VAC
412S	MS4120F12	120 VAC w/Aux. Sw.
462	MS4620F10	230 VAC
4X02	ML4X02	120 VAC
4X0S	ML4X02	120 VAC w/MLS-300H
4Y02	ML4Y02	230 VAC
4Y0S	ML4Y02	230 VAC w/MLS-300H
4Y1S	MS4Y09F	230 VAC w/MLS-300H
4YO	MS4Y09F	230 VAC
811	ML8115	24 VAC
811S	ML8115	24 VAC w/MLS-300H
812	MS8120F10	24 VAC
812S	MS8120F10	24 VAC w/Aux. Sw.
8X02	ML8X02	120 VAC
8X0S	ML8X02	120 VAC w/MLS-300H
AFC	Actuator from customer	
F12	FSNF120	120 VAC
F12S	FSNF120-S	120 VAC w/Aux. Sw.
F24	FSNF24	24 VAC
F24S	FSNF24-S	24 VAC w/Aux. Sw.
FA12	FSAF120	120 VAC
FA1S	FSAF120-S	120 VAC w/Aux. Sw.
FA24	FSAF24	24 VAC
FA2S	FSAF24-S	24 VAC w/Aux. Sw.
FL12	FSLF120	120 VAC
FL1S	FSLF120-S	120 VAC w/Aux. Sw.
FL24	FSLF24	24 VAC
FL2S	FSLF24-S	24 VAC w/Aux. Sw.
GD1	GGD121	24 VAC
GD2	GGD221	120 VAC
MS4	MS4X09F	120 VAC
MS4S	MS4X09F	120 VAC w/MLS-300H
MS8	MS8X09F	24 VAC
MS8S	MS8X09F	24 VAC w/MLS-300H
N60	MN6105A1011	24 VAC
N60S	MN6105A1201	24 VAC w/Aux. Sw.
N61	MN6110A1003	24 VAC
N61S	MN6110A1201	24 VAC w/Aux. Sw.
N70	MN7505A2001	24 VAC
N70S	MN7505A2209	24 VAC w/Aux. Sw.
N71	MN7510A2001	24 VAC
N71S	MN7510A2209	24 VAC w/Aux. Sw.
N75	MN7520A2007	24 VAC
N75S	MN7520A2205	24 VAC w/Aux. Sw.
S70	MS7505A2030	24 VAC
S70S	MS7505A2130	24 VAC w/Aux. Sw.
S71	MS7510A2008	24 VAC
S71S	MS7510A2206	24 VAC w/Aux. Sw.
S72	MS7520A2007	24 VAC
S72S	MS7520A2205	24 VAC w/Aux. Sw.

Pneumatic:

296	331-2961	25 psi
296P	331-2961PR	25 psi
306	331-3060	25 psi
306P	331-3060PR	24 V - 25 psi
482	331-4826	25 psi
482P	331-4826PR	24 V - 25 psi

26. **Side Mounting Plate**

–	None
SMP	Side Mounting Plate

Note:

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

- FOR ROUND DUCT
- LOW LEAKAGE
- GALVANIZED STEEL

Model:

1090 Single Blade, Round

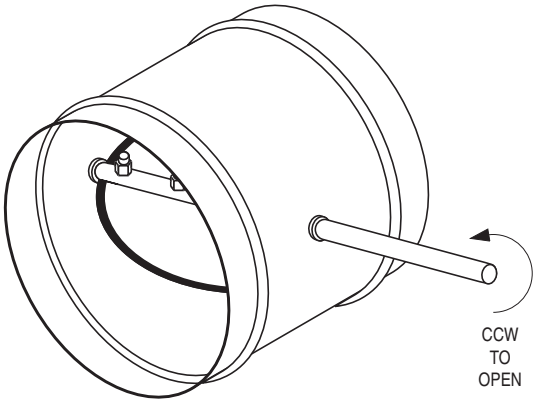
Model 1090
(shown w/ 2" (51) stand-off bracket)

Model 1090 is an ultra-low leakage steel butterfly control damper which has been designed for all types of round ductwork applications. Suitable for use in low to medium pressure and velocity commercial HVAC systems, the 1090 installs quickly and easily, saving money on installation costs.

Design features a sturdy beaded casing for superior rigidity, a 14 ga. (2.0) equivalent laminated blade double bolted to the drive shaft for maximum strength, long life corrosion resistant synthetic bearings and blade seals for low leakage requirements. The damper can be used for two position or modulating control using electric or pneumatic actuators and can also be used as a manual balancing damper or when positive shut-off is required by utilizing an optional hand locking quadrant. A variety of options are available to meet specific installation requirements and a comprehensive selection of electric or pneumatic actuators are available for factory or field mounting.

STANDARD CONSTRUCTION:

Frame:	20 ga. (1.0) corrosion-resistant steel with stiffening beads.
Blades:	2 x 20 ga. (1.0) corrosion-resistant steel laminated together, equivalent to 14 ga. (2.0). Open and close end stops. 90 degree rotation. CCW to open.
Bearings:	1/2" (13) dia. Celcon®.
Drive Shaft/Axle:	1/2" (13) dia. plated steel double bolted to blade. Axles extends approximately 6" (152) beyond the frame.
Blade Seal:	Cross-linked polyethylene.



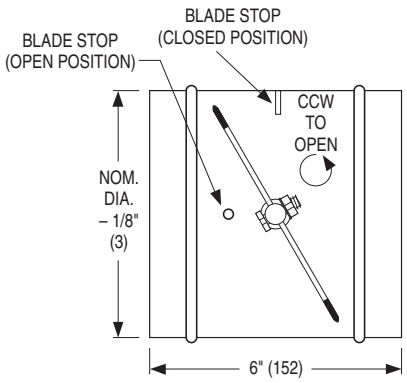
Model 1090 Sizes (Duct W x H):

Minimum	Maximum
Single Section	Single Section
4" (102) dia.	24" (610) dia.

Temperature Range: -50°F to 180°F (-46°C to 82°C)

COMMON OPTIONS:

- Type 304 Stainless Steel construction.
- Factory installed pneumatic and electric actuators.

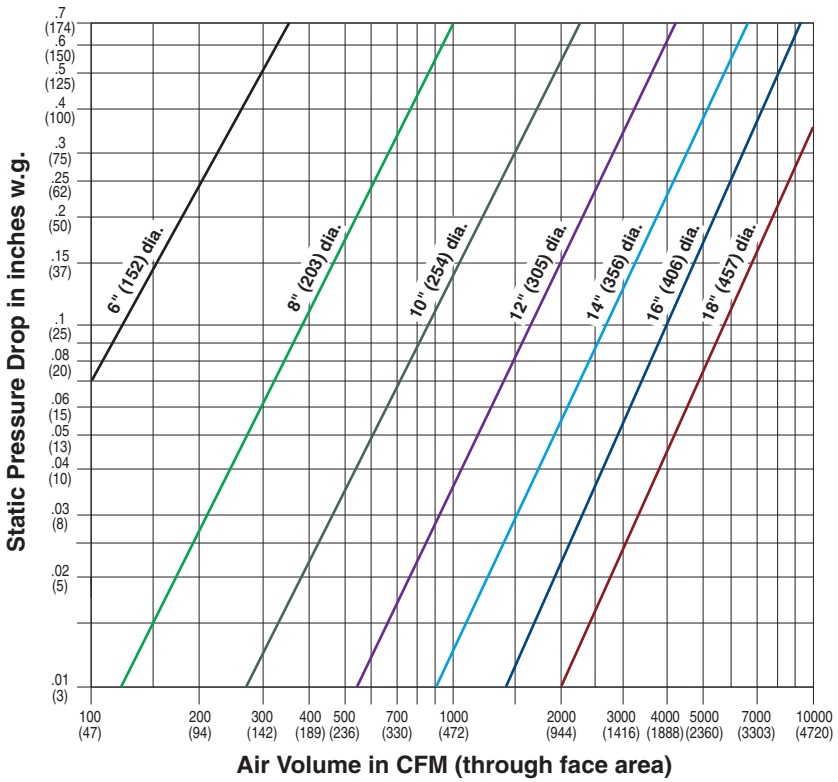


MODEL 1090
SINGLE BLADE, ROUND

PERFORMANCE DATA:

MODEL: 1090

PRESSURE DROP (damper fully open):



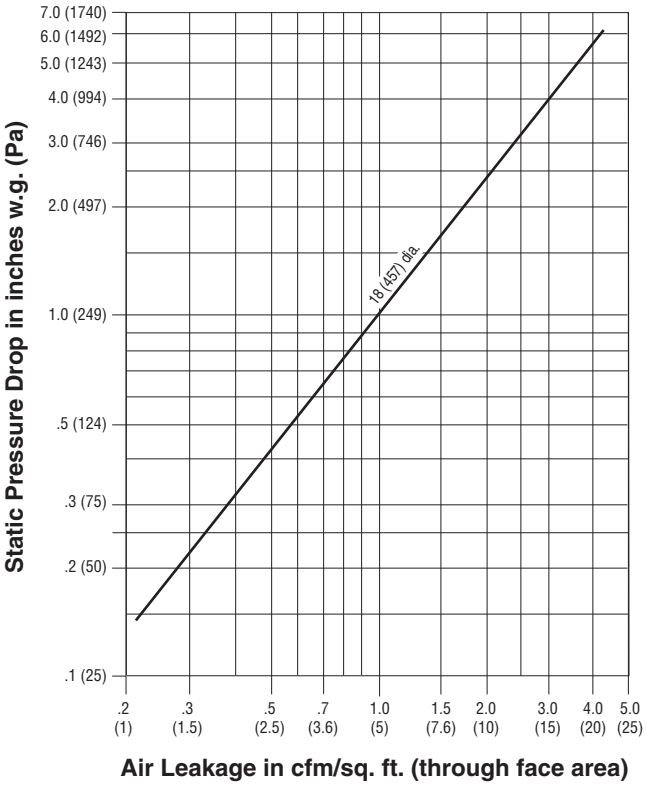
Tested per AMCA standard 500, Fig. 5.5.

MAXIMUM SYSTEM PRESSURE

Maximum Damper Diameter	Maximum System Pressure
24" (610)	6" w.g. (1.5 kPa)
18" (457)	6" w.g. (1.5 kPa)
12" (305)	8" w.g. (2 kPa)
6" (152)	10" w.g. (2.5 kPa)

Note: Maximum Face Velocity = 4000 fpm (20 m/s).

AIR LEAKAGE (damper fully closed):



Tested per AMCA standard 500-D, Fig. 5.5.

LEAKAGE: CLASS I

Less than 4 cfm/sq. ft. @ 1" w.g. (0.02 $m^3/s/m^2$ @ 250 kPa).

Less than 8 cfm/sq. ft. @ 4" w.g. (0.04 $m^3/s/m^2$ @ 1 kPa).

HOW TO ORDER OR TO SPECIFY

MODEL: 1090

LOW LEAKAGE ROUND CONTROL DAMPERS

EXAMPLE: 1090 - 12 - GLV - BC - 411

1. **Model**
   - 1090 Steel, Single Blade, Round
2. **Duct Size**
   - Diameter - inches (mm's)
3. **Construction**
   - GLV Galvanized Steel (default)
   - 304 Type 304 Stainless Steel
4. **Bearings**
   - BC Celcon (default)
   - BO Oilite Bronze
   - BS Stainless Steel
5. **Actuator**
   - – None (default)

   Electric:
   - 411 ML4115 120 VAC
   - 811 ML8115 24 VAC

   Pneumatic:
   - 482 331-4826 25 psi
6. **Hand-Locking Quadrant**
   - HL2 Quadrant with 2" (51) Bracket
   - HLQ Hand-Locking Quadrant

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, low leakage round dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Frame shall be constructed of 20 ga. (1.0) corrosion resistant steel with roll-formed stiffening beads up to 12" (305) dia.; 20 ga. (1.0) over 12" (305) dia.. Blade shall be 2 x 20 ga. (1.0) corrosion resistant steel laminated together, equivalent to 14 ga. (2.0). Blade seal shall be cross-linked polyethylene sandwiched in blade. Blade axle/drive shaft shall be 1/2" (13) dia. plated steel double bolted to blade. Bearings shall be Celcon® molded synthetic type. Hex, square friction-fit or press-fit axles are not acceptable. Open and closed end-stops shall provide maximum 90° rotation, counter clockwise to open. Submitted performance data shall show leakage of less than 10 cfm/sq. ft. @ 4" w.g. (0.05 $m^3/s/m^2$ @ 1 kPa). Standard of acceptance shall be Nailor Industries Model 1090.

- AMCA LICENSED
- STEEL AIRFOIL BLADE
- HIGH PERFORMANCE
- CLASS 1A LEAKAGE RATED
- GALVANIZED STEEL

Models:

1110 Parallel Blade
1120 Opposed Blade

Model 1110 Model 1120

Model 1110 and 1120 High Performance Control Dampers are Nailor's most economical steel airfoil blade control damper. Engineered for premium performance, they offer excellent leakage and pressure drop characteristics that meets the International Energy Conservation Code maximum leakage criteria for building envelope dampers of 3 cfm/ft.^{2} @ 1" w.g. (15.2 L/s/m^2 @ 0.25 kPa). Suitable for use in low to medium pressure and velocity commercial HVAC systems.

Design features include a sturdy galvanized steel hat channel frame with die-formed corner gussets for reinforcement and structural strength equivalent to 13 ga. (2.4) channel type frames, no-maintenance plated steel concealed linkage enclosed within the side frame out of the airstream and heavy duty 14 ga. (2.0) equivalent steel airfoil blades with extruded PVC blade seals, offering Class 1A leakage and low pressure drop characteristics. A variety of electric or pneumatic actuators are available for factory or field mounting along with a comprehensive selection of options to meet specific installation requirements and applications. Models 1110 Parallel Blade and 1120 Opposed Blade Control Dampers are AMCA licensed for Air Leakage and Air Performance.

STANDARD CONSTRUCTION:

Frame: 5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel with die-formed corner gussets. Low profile (flat top and bottom) on dampers 10" (254) high and under.

Blades: 6" (152) wide on 5 1/2" (140) centers. 20 ga. (1.0) galvanized steel formed into an airfoil cross-section. 14 ga. (2.0) equivalent thickness. Parallel or opposed action.

Linkage: Concealed side type totally enclosed within the frame and out of the airstream. Plated steel.

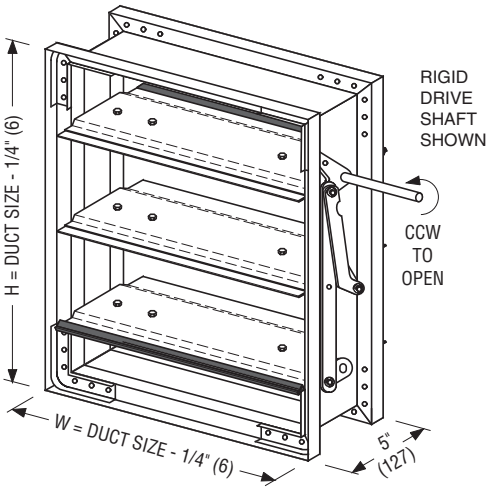
Bearings: 1/2" (13) dia. Oilite® self-lubricating bronze.

Axles: 1/2" (13) dia. plated steel double bolted to blades.

Drive Shaft: 6" (152) long x 1/2" (13) dia. rigid shaft; or optional lock-on shaft with outboard support bracket (standard in Canada), on all single section dampers. A 1/2" (13) or 1" (25) dia. factory installed jackshaft is standard on all multiple section dampers.

Blade Seals: Extruded PVC.

Jamb Seals: Cambered stainless steel.



Models 1110 and 1120 Sizes (Duct W x H):

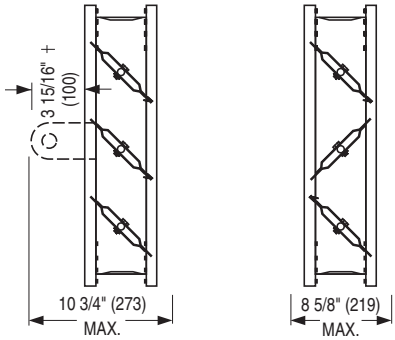
Minimum		Maximum	
Single Section		Single Section	Multiple Section
Single Blade 6" x 6" (152 x 152)	Two Blades (parallel or opposed) 6" x 10" (152 x 254)	48" x 72" (1219 x 1829)	Unlimited

Temperature Range: -50°F to 180°F (-46°C to 82°C)

MODEL 1110
PARALLEL BLADE

MODEL 1120
OPPOSED BLADE

† jackshaft standard on multiple section dampers. Jackshaft securely bolted to frame.



COMMON OPTIONS:

- Type 304 Stainless Steel construction.
- Heavier gauge frame construction.
- Front, rear or double flange frame (with or without bolt holes).
- Face and bypass configurations.
- Factory installed pneumatic and electric actuators.

PERFORMANCE DATA:
MODELS: 1110 AND 1120

DYNAMIC LIMITATIONS:

Damper Width		Maximum System Pressure	Maximum System Velocity
in.	mm		
48	1219	8.0" w.g.	4000 fpm
36	914	10.0" w.g.	4500 fpm
24	610	12.0" w.g.	5000 fpm
12	305	14.0" w.g.	6000 fpm

The 1100 Series with its standard maximum single section and multiple section sizing limitation may be used in applications with system pressures of up to 8.0" w.g.. The 1100 Series may also be used in systems with higher total pressures by reducing the damper section width as shown in the table.

LEAKAGE CLASS:

Damper Width	@ 1" w.g. (0.25 kPa)	@ 4" w.g. (1.0 kPa)
12" (305)	1A	1
24" (610)	1A	1
36" (914)	1A	1
48" (1219)	1A	1

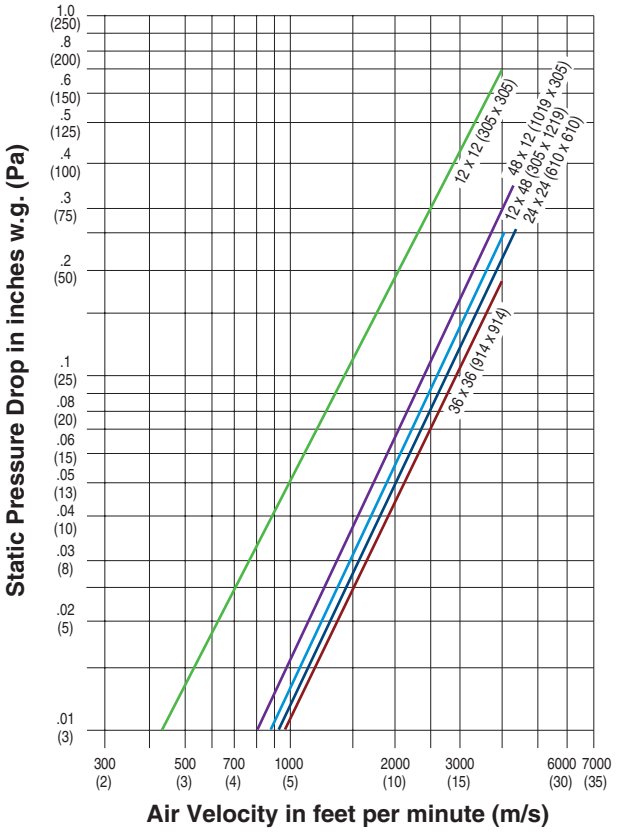
Maximum leakage permitted for Class rating is as follows:

Class 1A: 3 cfm/sq. ft. @ 1" w.g. (15.2 l/s/m² @ 0.25 kPa)

Class 1: 8 cfm/sq. ft. @ 4" w.g. (41 l/s/m² @ 1.0 kPa)

Leakage tested in accordance with AMCA Standard 500-D. Data based on a torque of 7" lbs./sq. ft. (minimum 20" lbs.) applied to hold the damper in closed position. Leakage class is based on operation between 50°F and 104°F (10°C and 40°C). Data corrected to standard air density of 0.075 lbs/ft³.

PRESSURE DROP (damper fully open):



Pressure drop tested per AMCA Standard 500-D, Figure 5.3. Data corrected to standard air density of 0.075 lbs/ft³.

Nailor Industries Inc. certifies that the Models 1110 and 1120 Dampers shown herein are licensed to bear the AMCA seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air leakage ratings and air performance ratings.

HOW TO SPECIFY OR TO ORDER

MODELS: 1110 AND 1120
LOW LEAKAGE CONTROL DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, ultra-low leakage control dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners and die-formed corner gussets for rigidity and structural strength equivalent to 13 ga. (2.4) channel type frames. Blades shall be 2 x 20 ga. (1.0) galvanized steel welded and formed airfoil design. Blades shall be on maximum 6" (152) centers. Blade seals shall be extruded PVC and jamb seals shall be compression type cambered stainless steel, providing positive shut-off. Blade axles shall be 1/2" (13) dia. plated steel, double thru-bolted to blade at each end. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be Oilite® self-lubricating bronze type. Blade linkage shall be zero-maintenance, out of airstream and totally concealed within the frame. Jackshafts shall be supplied on all multiple section assemblies in order to evenly distribute torque.
All submitted performance data to be based on tests in accordance with AMCA Standard 500-D. Dampers must comply with the requirements of AMCA 511 Certified Ratings Program and be qualified to bear the AMCA Seal for Air Leakage and Air Performance. Damper widths from 12" to 48" (305 to 1219) shall meet leakage Class 1A criteria of maximum 3 cfm/sq. ft. @ 1" w.g. (15.2 L/s/m^2 @ .25 kPa) and 8 cfm/sq. ft. @ 4" w.g. (40.6 L/s/m^2 @ 1 kPa). Standard of acceptance shall be Nailor Industries **(specifier to select)** Model 1110 parallel blade or Model 1120 opposed blade control damper.

MODELS: 1110 AND 1120
FABRICATED AIRFOIL BLADE CONTROL DAMPERS

EXAMPLE: 1110 - 24 x 24 - GLV - HC - 16G - CC - BO - BVP - JSS - FMEN - DR - SMP - AUTO - 120 - SPR - MOD - CL - 4X02

1. **Models**
   - 1110 Steel, Airfoil Blade, Parallel
   - 1120 Steel, Airfoil Blade, Opposed
2. **Duct Size**
   - Width x Height (inches [mm's])
3. **Construction**
   - GLV Galvanized Steel (default)
   - 304 Type 304 Stainless Steel
4. **Frame Type**
   - HC Hat Channel (default)
   - FD Double Flange
   - FDB Double Flange with Bolt Holes
   - FF Flanged Front
   - FFB Flanged Front with Bolt Holes
   - FR Flanged Rear
   - FRB Flanged Rear with Bolt Holes
5. **Frame Gauge**
   - 16G 16 ga. standard (default)
   - 14G 14 ga.
   - 13G 13 ga.
   - 12G 12 ga.
6. **Blade Linkage Style**
   - LC Concealed Linkage (default)
   - LF Face Linkage
7. **Bearings**
   - BC Celcon (default)
   - BO Oilite Bronze
   - BS Stainless Steel
8. **Blade Seals**
   - BVP Extruded PVC (default)
9. **Jamb Seals**
   - JSS Stainless Steel (default)
   - JSM Metallic
10. **Factory Actuator Mounting**
    - – None (default)
    - FMEN External Supplied by Nailor
    - FMEO External Supplied by Others
    - FMIN Internal Supplied by Nailor
    - FMIO Internal Supplied by Others
11. **Drive Shaft Option**
    - DSR Rigid (default USA, International)
    - DLO Lock-on Drive Shaft (default CAN)
    - JK Jackshaft
    - JK1 Jackshaft - 1" (25) dia.
    - JK5 Jackshaft - 1/2" (13) dia.
12. **Drive Location**
    - DR Right or Left Hand (default)
    - DI Internal

OPTIONS & ACCESSORIES:

13. **Optional Linkage**
    - – None (default)
    - SSL Type 304 Stainless Steel
14. **Thrust Bearings for Vertical Blades**
    (Single Section only)
    - – None (default)
    - BT Thrust Bearings

15a. **Side Mounting Plate**
- – None
- SMP Side Mounting Plate

15b. **Sleeve Length**
SL = Specify
- – None (default)
  12" – 28" (305 – 711)

16. **Sleeve Gauge**
    - – None (default)
    - 20G 20 ga. standard
    - 18G 18 ga.
    - 16G 16 ga.
    - 14G 14 ga.
    - 10G 10 ga.
17. **Sleeve Construction**
    - – None (default)
    - SGLV Galvanized Steel
    - S304 Type 304 Stainless Steel
    - SALU Aluminum
18. **Transition**
    - – None (default)
    - CR Round
    - CO Oval
19. **Hand Locking Quadrant**
    - – None (default)
    - HL2 Quadrant with 2" (51) Bracket
    - HLQ Hand Locking Quadrant
20. **Vertical Inter-Connect Kit**
    - – None (default)
    - VCK Vertical Inter-Connect Kit
21. **Chain Operator**
    - – None (default)
    - PCE External
    - PCI Internal
22. **Chain**
    - CH Chain Length (Specify ft.)

OPTIONS & ACCESSORIES: (continued)

23. **Actuator Selected By**

AUTO	Least Cost (Auto-select)
BEL	Belimo
HON	Honeywell
MAN	Manually Select
N/A	Not Applicable
SIE	Siemens

24. **Power Requirement**

120	120 VAC
230	230 VAC
24	24 VAC
PNU	Pneumatic

25. **Spring Return**

NSPR	Non-Spring Return
SPR	Spring Return

26. **Control Type**

2POS	Two Position
FL	Floating
MOD	Modulating
MODF	Modulating and Floating
FMZS	Modulating and Floating, Adj., 0/Span

27. **Fail Position (SPR Only)**

–	None
CL	Close
OP	Open

28. **Auxiliary Switch Package**

–	None
300	Nailor MLS-300 Position Indicator
AUXS	On Electric Actuator

29. **Actuator**

Electric:

411	ML4115	120 VAC
411S	ML4115	120 VAC w/MLS-300H
412	MS4120F10	120 VAC
412S	MS4120F12	120 VAC w/Aux. Sw.
462	MS4620F10	230 VAC
4X02	ML4X02	120 VAC
4X0S	ML4X02	120 VAC w/MLS-300H
4Y02	ML4Y02	230 VAC
4Y0S	ML4Y02	230 VAC w/MLS-300H
4YO	MS4Y09F	230 VAC
4Y1S	MS4Y09F	230 VAC w/MLS-300H
811	ML8115	24 VAC
811S	ML8115	24 VAC w/MLS-300H
812	MS8120F10	24 VAC
812S	MS8120F10	24 VAC w/Aux. Sw.
8X02	ML8X02	120 VAC
8X0S	ML8X02	120 VAC w/MLS-300H
AFC	Actuator from customer	
F12	FSNF120	120 VAC
F12S	FSNF120-S	120 VAC w/Aux. Sw.
F24	FSNF24	24 VAC
F24S	FSNF24-S	24 VAC w/Aux. Sw.
FA12	FSAF120	120 VAC
FA1S	FSAF120-S	120 VAC w/Aux. Sw.
FA24	FSAF24	24 VAC
FA2S	FSAF24-S	24 VAC w/Aux. Sw.
FL12	FSLF120	120 VAC
FL1S	FSLF120-S	120 VAC w/Aux. Sw.
FL24	FSLF24	24 VAC
FL2S	FSLF24-S	24 VAC w/Aux. Sw.
GD1	GGD121	24 VAC
GD2	GGD221	120 VAC
MS4	MS4X09F	120 VAC
MS4S	MS4X09F	120 VAC w/MLS-300H
MS8	MS8X09F	24 VAC
MS8S	MS8X09F	24 VAC w/MLS-300H
N60	MN6105A1011	24 VAC
N60S	MN6105A1201	24 VAC w/Aux. Sw.
N61	MN6110A1003	24 VAC
N61S	MN6110A1201	24 VAC w/Aux. Sw.
N70	MN7505A2001	24 VAC
N70S	MN7505A2209	24 VAC w/Aux. Sw.
N71	MN7510A2001	24 VAC
N71S	MN7510A2209	24 VAC w/Aux. Sw.
N75	MN7520A2007	24 VAC
N75S	MN7520A2205	24 VAC w/Aux. Sw.
S70	MS7505A2030	24 VAC
S70S	MS7505A2130	24 VAC w/Aux. Sw.
S71	MS7510A2008	24 VAC
S71S	MS7510A2206	24 VAC w/Aux. Sw.
S72	MS7520A2007	24 VAC
S72S	MS7520A2205	24 VAC w/Aux. Sw.

Pneumatic:

296	331-2961	25 psi
296P	331-2961PR	25 psi
306	331-3060	25 psi
306P	331-3060PR	24 V - 25 psi
482	331-4826	25 psi
482P	331-4826PR	24 V - 25 psi

Note:

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

- EXTRUDED ALUMINUM AIRFOIL BLADE
- PREMIUM PERFORMANCE
- CLASS 1A LEAKAGE RATED
- STEEL FRAME

Models:

2010 Parallel Blade

2020 Opposed Blade

Model 2010 Model 2020

Model 2010 and 2020 High Performance Control Dampers combine the performance of an extruded aluminum airfoil blade with the rugged durability of a steel frame. They offer unsurpassed Class 1A leakage and pressure drop characteristics for superior performance that meets the International Energy Conservation Code maximum leakage criteria for building envelope dampers of 3 cfm/ft.^{2} @ 1" w.g. (15.2 L/s/m^2 @ 0.25 kPa). Leakage rating is maintained with airflow in either direction, permitting right or left-hand drive installation. Suitable for use in high velocity, medium pressure commercial and industrial HVAC systems.

Standard features include heavy duty extruded aluminum airfoil blades that combine superior rigidity and deflection resistance with low pressure drop, a 16 ga. (1.6) galvanized steel hat channel frame with die-formed corner gussets for superior structural strength, a no-maintenance concealed linkage enclosed in the side frame out of the air stream for reduced pressure drop, air turbulence and noise, cambered stainless steel jamb seals and unique design compression type silicone seals that are keyed and locked into blade extrusion, providing the ultimate in ultra-low leakage and high performance. A comprehensive selection of options are available to meet specific installation requirements and a variety of electric or pneumatic actuators are available for factory or field mounting. Model 2020 opposed blade is AMCA licensed for Air Leakage and Air Performance.

STANDARD CONSTRUCTION:

Frame: 5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel with die-formed corner gussets for reinforced and extra strength.

Blades: Airfoil type 6063-T5 extruded aluminum on 5 1/2" (140) centers. Parallel or opposed action.

Linkage: Concealed side type totally enclosed within the frame and out of the air stream. Plated steel.

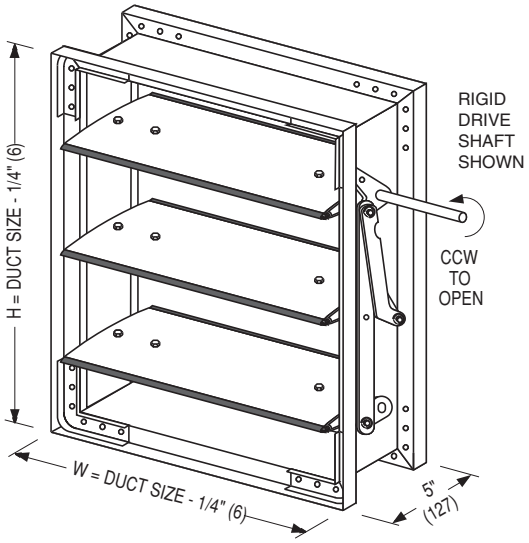
Bearings: 1/2" (13) dia. Oilite® self-lubricating bronze.

Axles: 1/2" (13) dia. plated steel double bolted to blades.

Drive Shaft: 6" (152) long x 1/2" (13) dia. rigid shaft; or optional lock-on shaft with outboard support bracket (standard in Canada), on all single section dampers. A 1/2" (13) or 1" (25) dia. factory installed jackshaft is standard on all multiple section dampers.

Blade Seals: Silicone. Mechanically locked in place.

Jamb Seals: Cambered stainless steel.



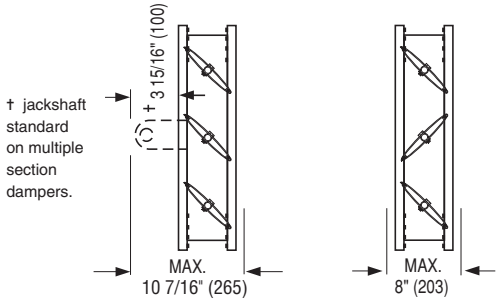
Models 2010 and 2020 Sizes (Duct W x H):

Minimum		Maximum	
Single Section		Single Section	Multiple Section
Single Blade 8" x 8" (203 x 203)	Two Blades (parallel or opposed) 8" x 12" (203 x 305)	60" x 72" (1524 x 1829)	Unlimited

Temperature Range: -50°F to 250°F (-46°C to 157°C)

MODEL 2010 PARALLEL BLADE

MODEL 2020 OPPOSED BLADE



COMMON OPTIONS:

- Type 304 Stainless Steel construction.
- Front, rear or double flange frame (with or without bolt holes).
- Face and bypass configurations.
- Factory installed pneumatic and electric actuators.

PERFORMANCE DATA:
MODELS: 2010 AND 2020

DYNAMIC LIMITATIONS:

Damper Width		Maximum System Pressure	Maximum System Velocity
in.	mm		
60	1524	5.0" w.g.	3000 fpm
48	1219	8.0" w.g.	4000 fpm
36	914	10.0" w.g.	4500 fpm
24	610	12.0" w.g.	5000 fpm
12	305	14.0" w.g.	6000 fpm

The 2000 Series with its standard maximum single section and multiple section sizing limitation may be used in applications with system pressures of up to 5.0" w.g.. The 2000 Series may also be used in systems with higher total pressures by reducing the damper section width as shown in the table.

LEAKAGE CLASS:

Damper Width	@ 1" w.g. (0.25 kPa)	@ 4" w.g. (1.0 kPa)
12" (305)	1A	1
24" (610)	1A	1
36" (914)	1A	1
48" (1219)	1A	1
60" (1524)	1A	1

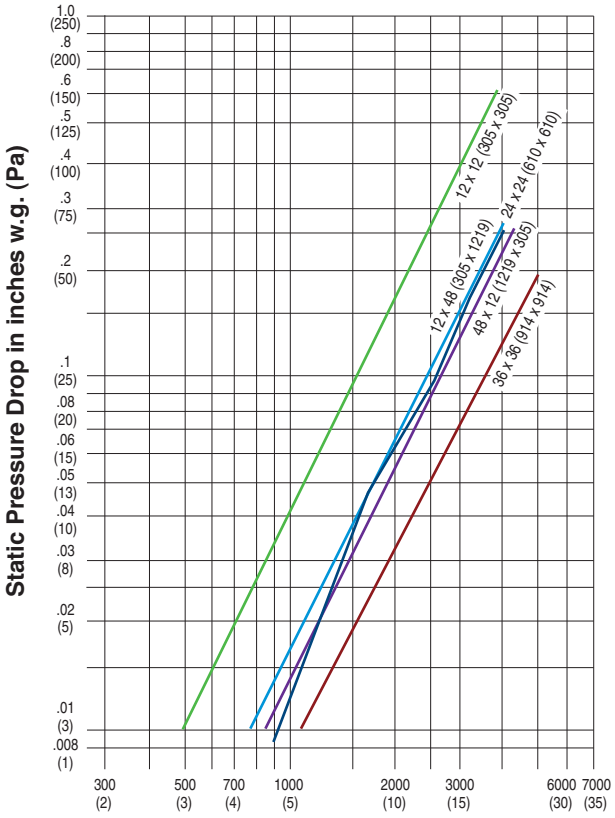
Maximum leakage permitted for Class rating is as follows:

Class 1A: 3 cfm/sq. ft. @ 1" w.g. (15.2 l/s/m² @ 0.25 kPa)

Class 1: 8 cfm/sq. ft. @ 4" w.g. (41 l/s/m² @ 1.0 kPa)

Leakage tested in accordance with AMCA Standard 500-D. Data based on a torque of 8" lbs./sq. ft. (minimum 20" lbs.) applied to hold the damper in closed position. Leakage class is based on operation between 50°F and 104°F (10°C and 40°C). Data corrected to standard air density of 0.075 lbs./ft.³

PRESSURE DROP (damper fully open):



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.³.

Nailor Industries Inc. certifies that the Model 2020 Damper shown herein is licensed to bear the AMCA seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air leakage ratings and air performance ratings. Model 2010 is not licensed to bear the AMCA seal.

HOW TO SPECIFY

MODELS: 2010 AND 2020

HIGH PERFORMANCE, ULTRA-LOW LEAKAGE CONTROL DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, high performance ultra-low leakage control dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners and die-formed corner gussets for rigidity and structural strength equivalent to 13 ga. (2.4) channel type frames. Blades shall be of Type 6063-T5 extruded aluminum airfoil design on maximum 6" (152) centers with integral structural reinforcing tube running full length of each blade. Blade seals shall be extruded silicone mechanically locked in extruded blade slots and shall be field replaceable. Adhesive or clip-on type blade seals are not acceptable. Jamb seals shall be compression type stainless steel. Blade axles shall be 1/2" (13) dia plated steel, double thru-bolted to blade at each end to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be Oilite® self-lubricating bronze type. Blade linkage shall be zero-maintenance, out of airstream and totally concealed within the frame. Jackshafts shall be supplied on all multiple section assemblies in order to evenly distribute torque.
(Specifier to select) Submitted performance data, to be based on tests in accordance with AMCA Standard 500-D. Damper widths from 12" to 60" (305 to 1524) shall meet leakage Class 1A criteria of maximum 3 cfm/sq. ft. @ 1" w.g. (15.2 L/s/m^2 @ .25 kPa) and 8 cfm/sq. ft. @ 4" w.g. (40.6 L/s/m^2 @ 1 kPa). Standard of acceptance shall be Nailor Industries Model 2010 high performance parallel blade control damper **or** Dampers must comply with the requirements of AMCA 511 Certified Ratings Program and be qualified to bear the AMCA Seal for Air Leakage and Air Performance. Standard of acceptance shall be Nailor Industries Model 2020 high performance opposed blade control damper.

- EXTRUDED ALUMINUM AIRFOIL BLADE AND FRAME
- PREMIUM PERFORMANCE
- CLASS 1A LEAKAGE RATED

Models:

2010-EAF Parallel Blade
2020-EAF Opposed Blade

Model 2020-EAF

Model 2010-EAF and 2020-EAF High Performance Control Dampers feature an extruded aluminum airfoil blade and frame, ideal for use in high velocity, medium pressure, commercial and industrial HVAC systems. They offer unsurpassed Class 1A leakage and pressure drop characteristics for superior performance that meets the International Energy Conservation Code maximum leakage criteria for building envelope dampers of 3 cfm/ft.^{2} @ 1" w.g. (15.2 L/s/m^2 @ 0.25 kPa).

Standard features include a heavy duty corrosion resistant extruded aluminum hat channel frame, extruded aluminum airfoil blade with outstanding pressure drop characteristics, superior rigidity and deflection resistance, no-maintenance plated steel concealed linkage enclosed within the side frame out of the airstream, long life self-lubricating bronze bearings, cambered stainless steel jamb seals and compression type silicone seals that are keyed and locked into blade extrusion, providing the ultimate in ultra-low leakage and high performance. A variety of electric or pneumatic actuators are available for factory or field mounting along with a comprehensive selection of options to meet specific installation requirements and applications. Model 2020-EAF opposed blade control damper is AMCA licensed for Air Leakage and Air Performance.

STANDARD CONSTRUCTION:

Frame: 5" x 7/8" x 0.125" (127 x 22 x 3.2) type 6063-T5 extruded aluminum frame.

Blades: Airfoil type 6063-T5 extruded aluminum on 5 1/2" (140) centers. Parallel or opposed action.

Linkage: Concealed side type totally enclosed within the frame and out of the air stream. Plated steel.

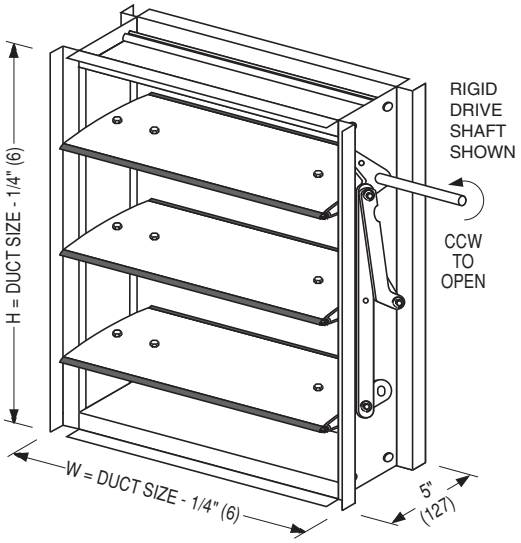
Bearings: 1/2" (13) dia. Oilite® self-lubricating bronze.

Axles: 1/2" (13) dia. plated steel double bolted to blades.

Drive Shaft: 6" (152) long x 1/2" (13) dia. rigid shaft; or optional lock-on shaft with outboard support bracket (standard in Canada), on all single section dampers. A 1/2" (13) or 1" (25) dia. factory installed jackshaft is standard on all multiple section dampers.

Blade Seals: Silicone. Mechanically locked in place.

Jamb Seals: Cambered stainless steel.



Models 2010-EAF and 2020-EAF Sizes (Duct W x H):

Minimum		Maximum	
Single Section		Single Section	Multiple Section
Single Blade 8" x 8" (203 x 203)	Two Blades (parallel or opposed) 8" x 12" (203 x 305)	60" x 72" (1524 x 1829)	Unlimited

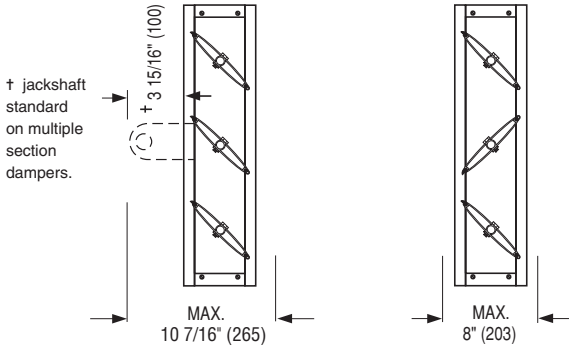
Temperature Range: -50°F to 250°F (-46°C to 157°C)

COMMON OPTIONS:

- Face and bypass configurations.
- Factory installed pneumatic and electric actuators.

MODEL 2010-EAF
PARALLEL BLADE

MODEL 2020-EAF
OPPOSED BLADE



PERFORMANCE DATA:
MODELS: 2010-EAF AND 2020-EAF

DYNAMIC LIMITATIONS:

Damper Width		Maximum System Pressure	Maximum System Velocity
in.	mm		
60	1524	5.0" w.g.	3000 fpm
48	1219	8.0" w.g.	4000 fpm
36	914	10.0" w.g.	4500 fpm
24	610	12.0" w.g.	5000 fpm
12	305	14.0" w.g.	6000 fpm

The 2000 Series with its standard maximum single section and multiple section sizing limitation may be used in applications with system pressures of up to 5.0" w.g.. The 2000 Series may also be used in systems with higher total pressures by reducing the damper section width as shown in the table.

LEAKAGE CLASS:

Damper Width	@ 1" w.g. (0.25 kPa)	@ 4" w.g. (1.0 kPa)
12" (305)	1A	1
24" (610)	1A	1
36" (914)	1A	1
48" (1219)	1A	1
60" (1524)	1A	1

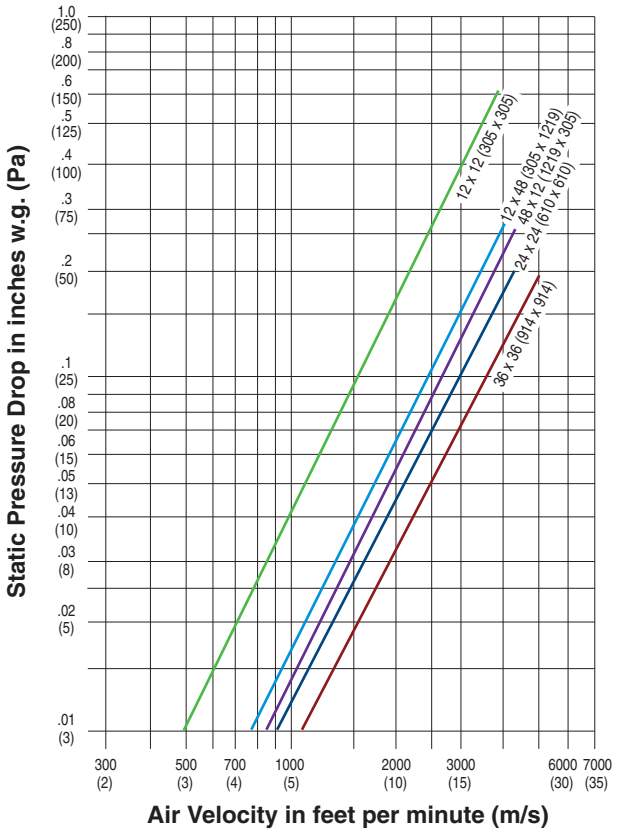
Maximum leakage permitted for Class rating is as follows:

Class 1A: 3 cfm/sq. ft. @ 1" w.g. (15.2 l/s/m² @ 0.25 kPa)

Class 1: 8 cfm/sq. ft. @ 4" w.g. (41 l/s/m² @ 1.0 kPa)

Leakage tested in accordance with AMCA Standard 500-D. Data based on a torque of 8" lbs./sq. ft. (minimum 20" lbs.) applied to hold the damper in closed position. Leakage class is based on operation between 50°F and 104°F (10°C and 40°C). Data corrected to standard air density of 0.075 lbs./ft.³

PRESSURE DROP (damper fully open):



Pressure drop tested per AMCA Standard 500-D, Figure 5.3. Data corrected to standard air density of 0.075 lbs/ft.³.

Nailor Industries Inc. certifies that the Model 2020-EAF Damper shown herein is licensed to bear the AMCA seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air leakage ratings and air performance ratings. Model 2010-EAF is not licensed to bear the AMCA seal.

HOW TO SPECIFY

MODELS: 2010-EAF AND 2020-EAF
HIGH PERFORMANCE CONTROL DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, ultra-low leakage dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Frame shall be constructed of type 6063-T5 extruded aluminum hat channel design of minimum 0.125" (3.2) thickness. Blades shall be of Type 6063-T5 extruded aluminum airfoil design on maximum 6" (152) centers with integral structural reinforcing tube running full length of each blade. Blade seals shall be extruded silicone mechanically locked in extruded blade slots and shall be field replaceable. Adhesive or clip-on type blade seals are not acceptable. Jamb seals shall be compression type stainless steel. Blade axles shall be 1/2" (13) dia plated steel, double thru-bolted to blade at each end to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be Oilite® self-lubricating bronze type. Blade linkage shall be zero-maintenance, out of airstream and totally concealed within the frame. Jackshafts shall be supplied on all multiple section assemblies in order to evenly distribute torque.
(Specifier to select) Submitted performance data, to be based on tests in accordance with AMCA Standard 500-D. Damper widths from 12" to 60" (305 to 1524) shall meet leakage Class 1A criteria of maximum 3 cfm/sq. ft. @ 1" w.g. (15.2 L/s/m^2 @ .25 kPa) and 8 cfm/sq. ft. @ 4" w.g. (40.6 L/s/m^2 @ 1 kPa). Standard of acceptance shall be Nailor Industries Model 2010-EAF high performance parallel blade control damper **or** Dampers must comply with the requirements of AMCA 511 Certified Ratings Program and be qualified to bear the AMCA Seal for Air Leakage and Air Performance. Standard of acceptance shall be Nailor Industries Model 2020-EAF high performance opposed blade control damper.

- INSULATED DAMPER
- EXTRUDED ALUMINUM AIRFOIL BLADE
- PREMIUM PERFORMANCE
- ULTRA-LOW LEAKAGE

Models:

2010-IB/-IBF Parallel Blade

2020-IB/-IBF Opposed Blade

Model 2020-IBF

Models 2010-IB/2010-IBF and 2020-IB/2020-IBF Insulated High Performance Control Dampers are ideal for use in high velocity, medium pressure commercial and industrial applications where thermal conductivity is a concern. These ultra-low leakage dampers limit thermal conductivity as well as air infiltration, making them ideal for use in low temperature applications. They offer unsurpassed leakage and pressure drop characteristics for superior performance that meets the International Energy Conservation Code maximum leakage criteria for building envelope dampers of 3 cfm/ft.^{2} @ 1" w.g. (15.2 L/s/m^2 @ 0.25 kPa).

Standard features include rugged extruded aluminum airfoil blades insulated with polyurethane foam, a 16 ga. (1.6) galvanized steel hat channel frame (-IBF models feature polystyrene foam insulated frames), no-maintenance plated steel concealed linkage enclosed within the side frame out of the airstream, long life self-lubricating bronze bearings, cambered stainless steel jamb seals and compression type silicone seals that are keyed and locked into the blade extrusion, providing low pressure drop and high performance. A variety of electric or pneumatic actuators are available for factory or field mounting along with a comprehensive selection of options to meet specific installation requirements and applications. Model 2020-IBF Opposed Blade Control Damper is AMCA licensed for Air Leakage and Air Performance.

STANDARD CONSTRUCTION:

Frame: 5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel with die-formed corner gussets for reinforcement and extra strength.

Blades: Airfoil type 6063-T5 extruded aluminum on 5 1/2" (140) centers. Parallel or opposed action.

Insulation: Blades: Polyurethane foam; R value 2.19 (IB/IBF models).
Frame: Polystyrene foam; (Included with IBF model only).

Linkage: Concealed side type totally enclosed within the frame and out of the airstream. Plated steel.

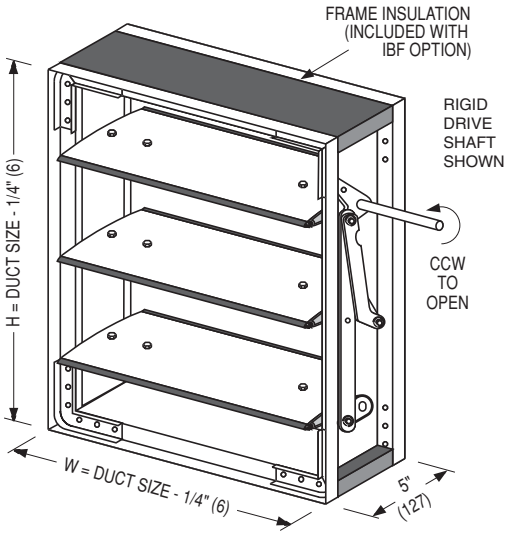
Bearings: 1/2" (13) dia. Oilite® self-lubricating bronze.

Axles: 1/2" (13) dia. plated steel double bolted to blades.

Drive Shaft: 6" (152) long x 1/2" (13) dia. rigid shaft; or optional lock-on shaft with outboard support bracket (standard in Canada), on all single section dampers. A 1/2" (13) or 1" (25) dia. factory installed jackshaft is standard on all multiple section dampers.

Blade Seals: Silicone. Mechanically locked in place.

Jamb Seals: Cambered stainless steel.



NOTE: IB MODEL: INSULATED BLADE ONLY
IBF MODEL: INSULATED BLADE AND FRAME

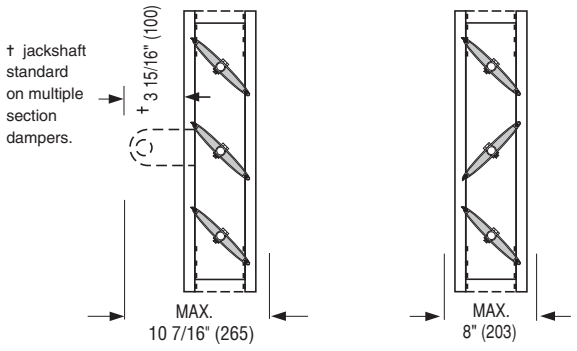
Models 2010-IB/-IBF and 2020-IB/-IBF Sizes (Duct W x H):

Minimum		Maximum	
Single Section		Single Section	Multiple Section
Single Blade 8" x 8" (203 x 203)	Two Blades (parallel or opposed) 8" x 12" (203 x 305)	60" x 72" (1524 x 1829)	Unlimited

Temperature Range: -50°F to 250°F (-46°C to 157°C)

MODELS 2010-IB/-IBF
PARALLEL BLADE

MODELS 2020-IB/-IBF
OPPOSED BLADE



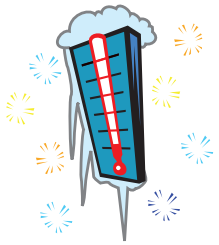
COMMON OPTIONS:

- Extruded Aluminum or Type 304 Stainless Steel construction.
- Front, rear or double flange frame (with or without bolt holes).
- Face and bypass configurations.
- Factory installed pneumatic and electric actuators.

PERFORMANCE DATA:

MODELS: 2010-IB/-IBF AND 2020-IB/-IBF

A WORD ABOUT INSULATED DAMPERS...



Air infiltration between the damper blades and frame is the most significant factor attributed to frost build-up on and around outside air dampers which can lead to damper/actuator damage and potential for further system damage such as coil freeze-ups etc. With an ultra-low mean leakage rate of 0.18 CFM/sq. ft. (0.91 l/s per sq. meter) at 1" w.g. (.25 kPa) static pressure combined with insulated blades and frame, the Nailor 2000-IBF Series provides the protection required for many applications in harsher climates…

NAILOR COMBINES THE LOWEST LEAKAGE MULTI-BLADE DAMPER, THAT IS AMCA LICENSED, WITH THE LOW HEAT CONDUCTIVITY DESIGN OF INSULATED BLADE AND FRAME.

This combination provides excellent protection for colder ambient conditions!

DYNAMIC LIMITATIONS:

Damper Width		Maximum System Pressure	Maximum System Velocity
in.	mm		
60	1524	5.0" w.g.	3000 fpm
48	1219	8.0" w.g.	4000 fpm
36	914	10.0" w.g.	4500 fpm
24	610	12.0" w.g.	5000 fpm
12	305	14.0" w.g.	6000 fpm

The 2000 Series with its standard maximum single section and multiple section sizing limitation may be used in applications with system pressures of up to 5.0" w.g.. The 2000 Series may also be used in systems with higher total pressures by reducing the damper section width as shown in the table.

LEAKAGE CLASS:

Damper Width	@ 1" w.g. (0.25 kPa)	@ 4" w.g. (1.0 kPa)
12" (305)	1A	1
24" (610)	1A	1
36" (914)	1A	1
48" (1219)	1A	1
60" (1524)	1A	1

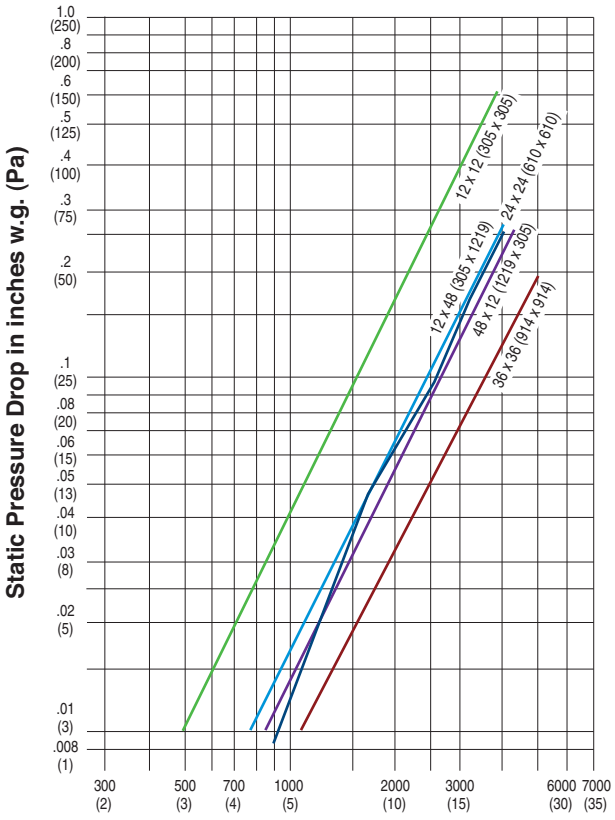
Maximum leakage permitted for Class rating is as follows:

Class 1A: 3 cfm/sq. ft. @ 1" w.g. (15.2 l/s/m² @ 0.25 kPa)

Class 1: 8 cfm/sq. ft. @ 4" w.g. (41 l/s/m² @ 1.0 kPa)

Leakage tested in accordance with AMCA Standard 500-D. Data based on a torque of 8" lbs./sq. ft. (minimum 20" lbs.) applied to hold the damper in closed position. Leakage class is based on operation between 50°F and 104°F (10°C and 40°C). Data corrected to standard air density of 0.075 lbs./ft.³

PRESSURE DROP (damper fully open):



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.³.

Nailor Industries Inc. certifies that the Model 2020-IBF Damper shown herein is licensed to bear the AMCA seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air leakage ratings and air performance ratings. Model 2010-IBF is not licensed to bear the AMCA seal.

HOW TO SPECIFY

MODELS: 2010-IB/-IBF AND 2020-IB/-IBF
HIGH PERFORMANCE, INSULATED CONTROL DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, ultra-low leakage insulated dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners and die-formed corner gussets for rigidity and structural strength equivalent to 13 ga. (2.4) channel type frames. Blades shall be of Type 6063-T5 extruded aluminum airfoil design on maximum 6" (152) centers with integral structural reinforcing tube running full length of each blade. Blades shall be internally insulated with polyurethane type foam having an R value of 2.19. Blade seals shall be extruded silicone mechanically locked in extruded blade slots. Adhesive or clip-on type blade seals are not acceptable. Jamb seals shall be compression type stainless steel. Blade axles shall be 1/2" (13) dia. plated steel, double thru-bolted to blade at each end to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be Oilite® self-lubricating bronze type. Blade linkage shall be zero-maintenance, out of airstream and totally concealed within the frame. Jackshafts shall be supplied on all multiple section assemblies in order to evenly distribute torque.
(Specifier to select) Submitted performance data, to be based on tests in accordance with AMCA Standard 500-D. Damper widths from 12" to 60" (305 to 1524) shall meet leakage Class 1A criteria of maximum 3 cfm/sq. ft. @ 1" w.g. (15.2 L/s/m² @ .25 kPa) and 8 cfm/sq. ft. @ 4" w.g. (40.6 L/s/m² @ 1 kPa). Standard of acceptance shall be Nailor Industries Model 2010-IB high performance parallel blade control damper **or** Dampers must comply with the requirements of AMCA 511 Certified Ratings Program and be qualified to bear the AMCA Seal for Air Leakage and Air Performance. Standard of acceptance shall be Nailor Industries Model 2020-IB high performance opposed blade control damper.
(Specifier include following for insulated frame) Frame shall be insulated with polystyrene type foam having an R value of 5.0, on minimum of three sides.
(Specifier to select) Standard of acceptance shall be Nailor Industries Model 2010-IBF high performance parallel blade control damper **or** Standard of acceptance shall be Nailor Industries Model 2020-IBF high performance opposed blade control damper.
Note: For Extruded Aluminum Frame (Option EAF) replace frame construction specification details with the following: Frame shall be constructed of Type 6063-T5 extruded aluminum hat channel design of minimum 0.125" (3.2) thickness.

HOW TO ORDER

MODELS: 2010 AND 2020
EXTRUDED ALUMINUM AIRFOIL BLADE CONTROL DAMPERS

EXAMPLE: 2020 - 24x24 - GLV - HC - BO - FMEN - DSR - DR - SMP - AUTO - 120 - SPR - 2POS - CL - AUXS - 411S

1. **Models**
   - 2010 Extruded Aluminum Airfoil Blade, Parallel
   - 2020 Extruded Aluminum Airfoil Blade, Opposed
2. **Duct Size**
   Width x Height (inches [mm's])
3. **Construction (Frame)**
   - GLV Galvanized Steel (default)
   - EAF Extruded Aluminum
   - SSF Type 304 Stainless Steel
4. **Frame Type**
   - HC Hat Channel (default)
   - FD Double Flange
   - FDB Double Flange with Bolt Holes
   - FF Flanged Front
   - FFB Flanged Front with Bolt Holes
   - FR Flanged Rear
   - FRB Flanged Rear with Bolt Holes
5. **Insulation**
   - – None (default)
   - IB Blades
   - IBF Blades and Frame
6. **Bearings**
   - BO Oilite Bronze (default)
   - BS Stainless Steel
7. **Factory Actuator Mounting**
   - – None (default)
   - FMEN External Supplied by Nailor
   - FMEO External Supplied by Others
   - FMIN Internal Supplied by Nailor
   - FMIO Internal Supplied by Others
8. **Drive Shaft Option**
   - DSR Rigid (default USA, International)
   - DLO Lock-on Drive Shaft (default CAN)
   - JK Jackshaft
   - JK1 Jackshaft - 1" (25) dia.
   - JK5 Jackshaft - 1/2" (13) dia.
9. **Drive Location**
   - DR Right or Left Hand (default)
   - DI Internal

OPTIONS & ACCESSORIES:

10. **Optional Linkage**
    - SSA Type 304 Stainless Steel Axles Only
    - SSL Type 304 Stainless Steel
11. **Thrust Bearings**
    - – None (default)
    - BT Thrust Bushings

12a. **Side Mounting Plate**
   - – None
   - SMP Side Mounting Plate

12b. **Sleeve Length**
   SL = Specify
   - – None (default)
   - 12" – 28" (305 – 711)

13. **Sleeve Gauge**
    - – None (default)
    - 20G 20 ga. standard
    - 18G 18 ga.
    - 16G 16 ga.
    - 14G 14 ga.
    - 10G 10 ga.

OPTIONS & ACCESSORIES: (continued)

14. **Sleeve Construction**
- – None (default)
- SGLV Galvanized Steel
- S304 Type 304 Stainless Steel
- SALU Aluminum

15. **Transition**
- – None (default)
- CR Round
- CO Oval

16. **Hand-Locking Quadrant**
- – None (default)
- HL2 Quadrant with 2" (51) Bracket
- HLQ Hand-Locking Quadrant

17. **Vertical Inter-Connect Kit**
- – None (default)
- VCK Vertical Inter-Connect Kit

18. **Chain Operator**
- – None (default)
- PCE External
- PCI Internal

19. **Chain**
- CH Chain Length (Specify ft.)

20. **Actuator Selected By**
- AUTO Least Cost (Auto-select)
- BEL Belimo
- HON Honeywell
- MAN Manually Select
- N/A Not Applicable
- SIE Siemens

21. **Power Requirement**
- 120 120 VAC
- 230 230 VAC
- 24 24 VAC
- PNU Pneumatic

22. **Spring Return**
- NSPR Non-Spring Return
- SPR Spring Return

23. **Control Type**
- 2POS Two Position
- FL Floating
- MOD Modulating
- MODF Floating and Modulating
- FMZS Floating and Modulating, Adj., 0/Span

24. **Fail Position (SPR Only)**
- – None
- CL Close
- OP Open

25. **Auxiliary Switch Package**
- – None
- 300 Nailor MLS-300 Position Indicator
- AUXS On Electric Actuator

26. **Actuator**

Electric:

411	ML4115	120 VAC
411S	ML4115	120 VAC w/MLS-300H
412	MS4120F10	120 VAC
412S	MS4120F12	120 VAC w/Aux. Sw.
462	MS4620F10	230 VAC
4X02	ML4X02	120 VAC
4X0S	ML4X02	120 VAC w/MLS-300H
4Y02	ML4Y02	230 VAC
4Y0S	ML4Y02	230 VAC w/MLS-300H
4YO	MS4Y09F	230 VAC
4Y1S	MS4Y09F	230 VAC w/MLS-300H
811	ML8115	24 VAC
811S	ML8115	24 VAC w/MLS-300H
812	MS8120F10	24 VAC
812S	MS8120F10	24 VAC w/Aux. Sw.
8X02	ML8X02	120 VAC
8X0S	ML8X02	120 VAC w/MLS-300H
AFC	Actuator from customer	
F12	FSNF120	120 VAC
F12S	FSNF120-S	120 VAC w/Aux. Sw.
F24	FSNF24	24 VAC
F24S	FSNF24-S	24 VAC w/Aux. Sw.
FA12	FSAF120	120 VAC
FA1S	FSAF120-S	120 VAC w/Aux. Sw.
FA24	FSAF24	24 VAC
FA2S	FSAF24-S	24 VAC w/Aux. Sw.
FL12	FSLF120	120 VAC
FL1S	FSLF120-S	120 VAC w/Aux. Sw.
FL24	FSLF24	24 VAC
FL2S	FSLF24-S	24 VAC w/Aux. Sw.
GD1	GGD121	24 VAC
GD2	GGD221	120 VAC
MS4	MS4X09F	120 VAC
MS4S	MS4X09F	120 VAC w/MLS-300H
MS8	MS8X09F	24 VAC
MS8S	MS8X09F	24 VAC w/MLS-300H
N60	MN6105A1011	24 VAC
N60S	MN6105A1201	24 VAC w/Aux. Sw.
N61	MN6110A1003	24 VAC
N61S	MN6110A1201	24 VAC w/Aux. Sw.
N70	MN7505A2001	24 VAC
N70S	MN7505A2209	24 VAC w/Aux. Sw.
N71	MN7510A2001	24 VAC
N71S	MN7510A2209	24 VAC w/Aux. Sw.
N75	MN7520A2007	24 VAC
N75S	MN7520A2205	24 VAC w/Aux. Sw.
S70	MS7505A2030	24 VAC
S70S	MS7505A2130	24 VAC w/Aux. Sw.
S71	MS7510A2008	24 VAC
S71S	MS7510A2206	24 VAC w/Aux. Sw.
S72	MS7520A2007	24 VAC
S72S	MS7520A2205	24 VAC w/Aux. Sw.

Pneumatic:

296	331-2961	25 psi
296P	331-2961PR	25 psi
306	331-3060	25 psi
306P	331-3060PR	24 V - 25 psi
482	331-4826	25 psi
482P	331-4826PR	24 V - 25 psi

Note:

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

- FOR MANUAL BALANCING
- STANDARD PERFORMANCE
- GALVANIZED STEEL

Models:

1810 Parallel Blade

1820 Opposed Blade

Model 1810 Model 1820

Models 1810 and 1820 have been engineering and designed for manual balancing applications, suitable for use in low to medium pressure and velocity commercial HVAC systems. Ruggedly built, they provide a cost effective and reliable volume control damper and offer an economical manufactured product alternative to custom 'shop built' dampers and exceed the volume damper designs recommended by SMACNA.

Standard design features include a sturdy 16 ga. (1.6) galvanized steel hat channel frame with die-formed corner gussets for reinforcement, an interlocking vee blade design that maximizes strength and optimizes airflow, double bolted no slip blade axle connections with long life corrosion resistant synthetic bearings and a no-maintenance concealed plated steel linkage located out of the airstream in the side frame for reduced air turbulence, noise and pressure drop.

STANDARD CONSTRUCTION:

Frame: 5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel with die-formed corner gussets. Low profile (flat top and bottom) on dampers 10" (254) high and under.

Blades: 6" (152) wide on 5 1/2" (140) centers. 16 ga. (1.6) galvanized steel vee groove blade design. Parallel or opposed action.

Linkage: Concealed type totally enclosed within the frame and out of the air stream. Plated steel.

Bearings: 1/2" (13) Dia. Celcon®.

Axles: 1/2" (13) dia. plated steel double bolted to blades.

Drive Shaft: 6" (152) long x 1/2" (13) dia. double bolted fixed driveshaft that can be easily removed; or optional 6" (152) long x 1/2" (13) dia. lock-on drive shaft (standard in Canada). Drive shaft on each damper section.

Models 1810 and 1820 Sizes (Duct W x H):

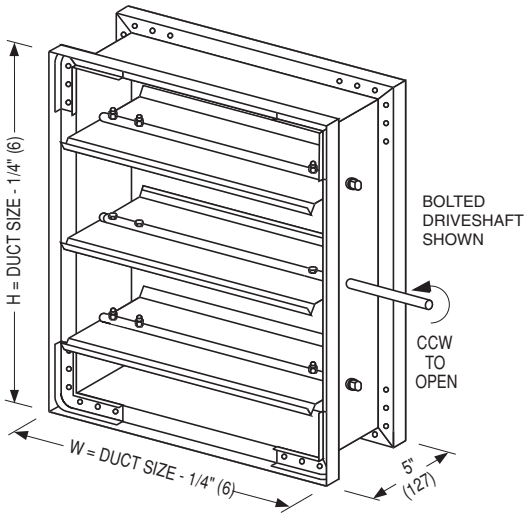
Minimum		Maximum	
Single Section		Single Section	Multiple Section
Single Blade 6" x 4" (152 x 102)	Two Blades (parallel or opposed) 8" x 10" (203 x 254)	48" x 72" (1219 x 1829)	96" x 144" (2438 x 3658)

Temperature Range: -50°F to 250°F (-46°C to 121°C)

1810/1820 Series - Maximum Performance Ratings	
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	2.5 in. w.g. (625 Pa)

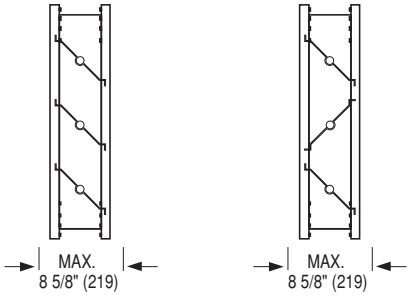
COMMON OPTIONS:

- Type 304 Stainless Steel construction.
- Round or oval duct transitions.
- Manual Hand Locking Quadrants with optional 2" (51) stand-off bracket.



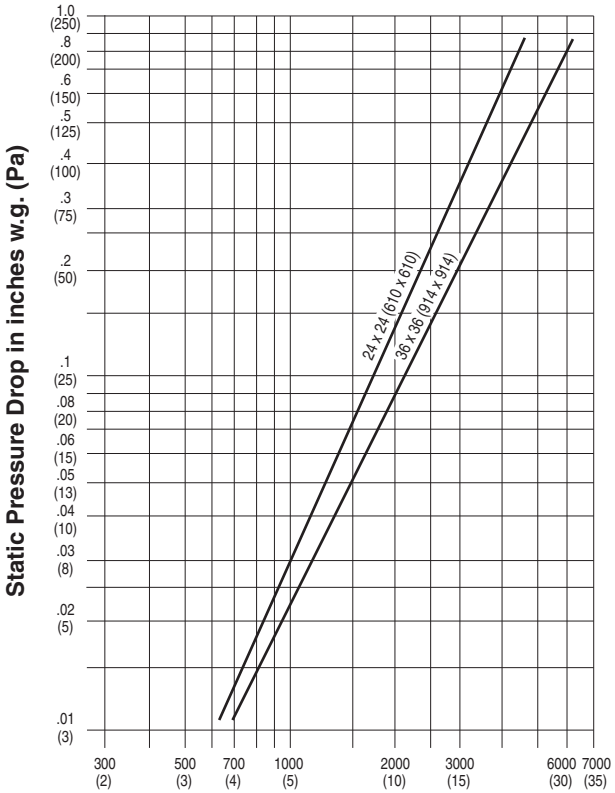
MODEL 1810
PARALLEL BLADE

MODEL 1820
OPPOSED BLADE



MODELS: 1810 AND 1820
MANUAL BALANCING DAMPERS

PRESSURE DROP (damper fully open):



Tested per AMCA standard 500-D, Fig. 5.3.

HOW TO ORDER OR TO SPECIFY

MODELS: 1810 AND 1820 - MANUAL BALANCING DAMPERS

EXAMPLE: 1810 - 24x24 - 304 - DLO - DR - BC - CR - HLQ

1. **Models**
   - 1810 Steel, Vee Blade, Parallel
   - 1820 Steel, Vee Blade, Opposed
2. **Duct Size**
   - Width x Height (inches [mm's])
3. **Construction**
   - GLV Galvanized Steel (default)
   - 304 Type 304 Stainless Steel
4. **Drive Shaft Option**
   - DSR Rigid (default USA, International)
   - DLO Lock-on Drive Shaft (default CAN)
5. **Drive Location**
   - DR Right or Left Hand
6. **Bearings**
   - BC Celcon (default)
   - BO Oilite Bronze
   - BS Stainless Steel

OPTIONS & ACCESSORIES:

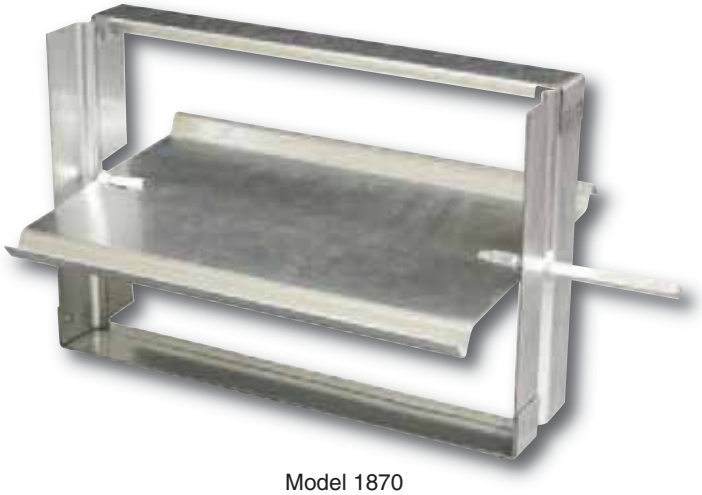
7. **Transition**
   - – None (default)
   - CR Round
   - CO Oval
8. **Hand Locking Quadrant**
   - – None (default)
   - HL2 Quadrant with 2" (51) Bracket
   - HLQ Hand Locking Quadrant

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, manual balancing dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners and die-formed corner gussets for rigidity and structural strength equivalent to 13 ga. (2.4) channel type frames. Blades shall be of vee groove design, 16 ga. (1.6) galvanized steel, on maximum 6" (152) centers. Blade axles shall be 1/2" (13) dia. plated steel, double thru-bolted to blade at each end. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be Celcon® molded synthetic type. Blade linkage shall be zero-maintenance, out of airstream and totally concealed within the frame. Provide each damper section with a hand locking quadrant for positive setting of blades at any position. Standard of acceptance shall be Nailor Industries **(specifier to select)** Model 1810 parallel blade **or** Model 1820 opposed blade manual balancing damper.

- FOR MANUAL BALANCING
- SINGLE BLADE
- GALVANIZED STEEL

Model:

1870 Single Blade



Model 1870

Model 1870 Manual Balancing Damper is a ruggedly built, economical branch duct balancing damper designed for manual balancing applications with rectangular ductwork. Model 1870 installs quickly and easily, becoming part of the ductwork saving time and money on installation costs. It offers an economical manufactured product alternative to custom 'shop built' dampers and meets the volume damper designs recommended by SMACNA. The low profile 18 ga. (1.3) frame and sills allow maximum free area and the ribbed forms in the blade and frame provides extra strength. A locking hand quadrant is provided with each damper for manual operation.

STANDARD CONSTRUCTION:

Frame:	3" wide x 18 ga. (76 wide x 1.3) galvanized steel.
Blades:	20 ga. (1.0) galvanized steel up to 24" x 12" (610 x 305). 18 ga. (1.3) galvanized steel above 24" x 12" (610 x 305).
Shaft:	1/4" (6) square plated steel.
Quadrant:	Plated steel with locking operator (shipped loose).

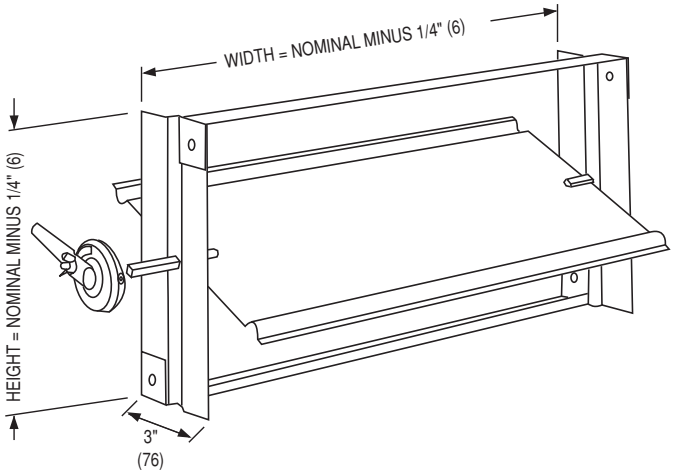
Model 1870 Sizes (Duct W x H):

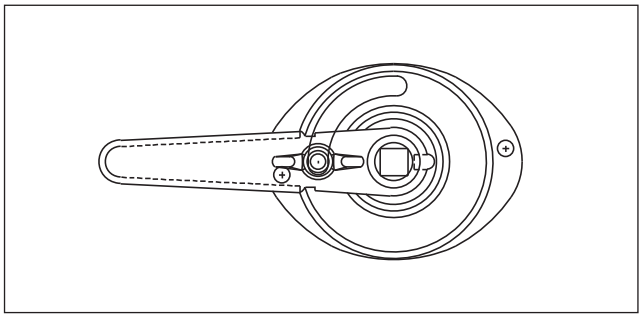
Minimum	Maximum
Single Section	Single Section
4" x 4" (102 x 102).	36" x 12" (914 x 305).

Note: For larger sizes: refer to Models 1810 and 1820.

Temperature Range: -50°F to 180°F (-46°C to 82°C)

1870 Series - Maximum Performance Ratings	
Maximum Velocity	1500 fpm (7.6 m/s)
Maximum Pressure	2 in. w.g. (500 Pa)





LOCKING QUADRANT

- MANUAL BALANCING DAMPER
- FOR ROUND DUCT
- GALVANIZED STEEL

Model:

1890 Single Blade Balancing Damper

Model 1890

Model 1890 Manual Balancing Damper is a steel butterfly damper designed for all types of round ductwork balancing applications and is suitable for use in low pressure and velocity commercial HVAC systems. The 1890 installs quickly and easily and becomes part of the ductwork, saving time and money on installation costs and is an economical alternative to a "shop built" damper. The design features a sturdy corrosion resistant beaded casing ideal for round spiral ductwork connections and a corrosion resistant steel blade that can be locked in any position with the hand quadrant that is supplied as standard with the damper. A variety of options are available to meet specific requirements and applications.

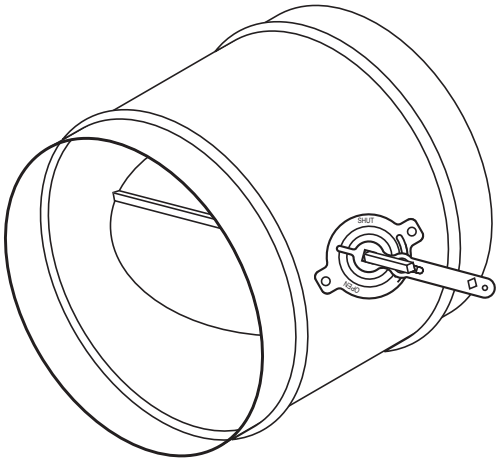
STANDARD CONSTRUCTION:

Frame: 22 ga. (.86) corrosion-resistant steel with stiffening beads up to 12" (305) dia. 20 ga. (1.0) over 12" (305).

Blades: 22 ga. (.86) corrosion-resistant steel up to 12" (305) dia. 20 ga. (1.0) over 12" (305).

Drive Shaft/Axle: 1/4" (6) dia. plated steel bolted to blade.

Quadrant: Plated steel with locking operator (factory installed).

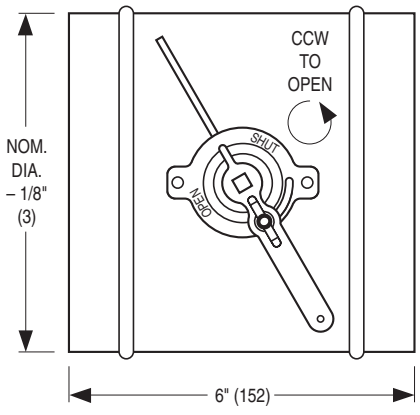


Model 1890 Sizes (Duct W x H):

Minimum	Maximum
Single Section	Single Section
4" (102) dia.	20" (508) dia.

Temperature Range: -50°F to 250°F (-46°C to +121°C)

1890 Series - Maximum Performance Ratings	
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	2 in. w.g. (500 Pa)



HOW TO ORDER OR TO SPECIFY

MODEL: 1870

MANUAL BALANCING DAMPERS

EXAMPLE: 1870 - 18 x 10 - DR - SB

1. **Model**
   1870 Steel, Single Blade
2. **Duct Size**
   Width x Height (inches [mm's])
3. **Drive Location**
   DR Right or Left Hand (default)
4. **Stand-Off Bracket**
   – None (default)
   SB 2" (51) Stand-Off Bracket
   (for Externally Insulated Duct)

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, single blade manual balancing dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Frame shall be constructed of 18 ga. (1.3) galvanized steel with structural ribs for maximum strength and low profile for maximum free area. Blades shall be constructed of 20 ga. (1.0) galvanized steel up to 24" x 12" (610 x 305); 18 ga. (1.3) galvanized steel above 24" x 12" (610 x 305), with structural ribs for extra strength. Blade shafts to be 1/4" (6) square plated steel, complete with a hand locking quadrant for positive setting of blade at any position. Standard of acceptance shall be Nailor Industries Model 1870.

MODEL: 1890

ROUND BALANCING DAMPERS

EXAMPLE: 1890 - 12 - A38Q - BO - SB

1. **Model**
   1890 Steel, Single Blade, Round
2. **Duct Size**
   Diameter - inches (mm's)
3. **Optional Axles/Quadrant**
   A14Q 1/4" (6.35) Square Axle
   (w/Hand-Locking Quadrant) (default)
   A38 3/8" (10) Square Axle
   (No Lock Quadrant)
   A38Q 3/8" (10) Square Axle
   (w/Hand-Locking Quadrant)
4. **Bearings**
   BO Oilite Bronze
5. **Stand-Off Bracket.**
   – None (default)
   SB 2" (51) Stand-Off Bracket
   (for Externally Insulated Duct)

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, round balancing dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Frame shall be constructed of 22 ga. (0.86) corrosion resistant steel with roll-formed stiffening beads up to 12" (305) dia.; 20 ga. (1.0) over 12" (305) dia.. Blades shall be constructed of 22 ga. (0.86) corrosion resistant steel up to 12" (305) dia.; 20 ga. (1.0) over 12" (305) dia. Blade shaft shall be 1/4" (6) square plated steel, complete with a hand locking quadrant for positive setting of blade at any position. Standard of acceptance shall be Nailor Industries Model 1890.

Options and Accessories

Nailor control dampers are available with a variety of options and accessories to suit the majority of commercial and light industrial applications and installations. With short lead times and marginal effect on costs, Nailor control dampers can be custom tailored to suit virtually any requirement.

MATERIAL OPTIONS:

OPTION CODE **304**
STAINLESS STEEL CONSTRUCTION

1000/1100 Series
All parts of damper (except blade seals) will be constructed of 304 stainless steel. Provides higher corrosion resistance against harsh atmospheric and process elements. Consult your Nailor representative for specific application suitability.

OPTION CODE **ALS**
ALUMINUM CONSTRUCTION WITH STAINLESS STEEL HARDWARE

2000 Series
Damper will be constructed with aluminum frame and blades with stainless steel linkage, bearings, axles and related hardware. Suitable for use in high humidity applications such as swimming pool areas etc.

OPTION CODE **EAF**
EXTRUDED ALUMINUM FRAME

2000 Series
Rugged Type 6063-T5 extruded aluminum frame for premium performance. See Models 2010-EAF/2020-EAF for further details.

OPTION CODE **SSF**
STAINLESS STEEL FRAME

2000 Series
Damper frame will be constructed from 304 stainless steel, fully welded with corner reinforcing brackets. Provides an extra rigid frame that is more corrosion resistant than galvanized steel.

BEARING OPTIONS:

OPTION CODE **BC**
CELCON® BEARINGS

Synthetic type Celcon® bearings provide long life and corrosion free operation. Standard bearing for all 1000 and 1800 series dampers.

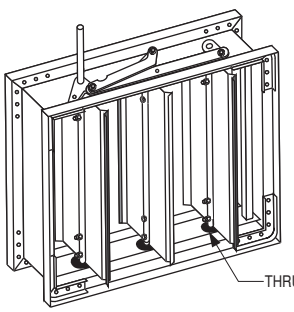
OPTION CODE **BO**
OILITE® BRONZE BEARINGS

Bronze sintered (oil impregnated) self-lubricating oilite bearings provide long time lubrication making them ideal for use in applications where proper maintenance is uncertain or difficult.

OPTION CODE **BS**
STAINLESS STEEL BEARINGS

304 grade stainless steel bearings provide corrosion resistance in a wide variety of corrosive media. In higher heat applications, provides good oxidation resistance.

OPTION CODE **BT**
THRUST BEARINGS



For use when damper is mounted with blades running vertically. Installed against lower blade edge to reduce friction due to weight of blades. When ordering, specify which side of damper will be bottom.

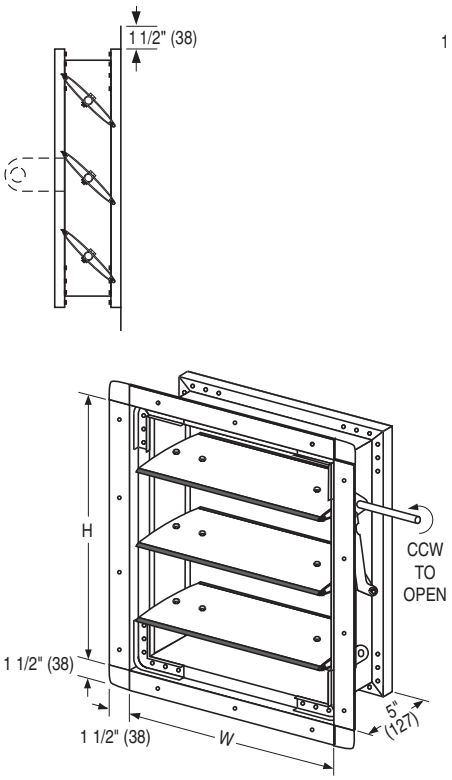
FLANGED FRAME OPTIONS:

Available as an option on Series 1000, 1100 and 2000 steel hat channel frame control dampers, the 1 1/2" (38) flanged frames allow for direct fastening to wall or unit housings as well as flanged ductwork. Damper inside dimension can be sized to match ductwork inside dimension, providing a smooth transition that produces lower pressure drop and less turbulence across the damper. Flange frames are also available with optional 9/32" (7) dia. bolt holes on 6" (152) centers for fast, convenient installation.

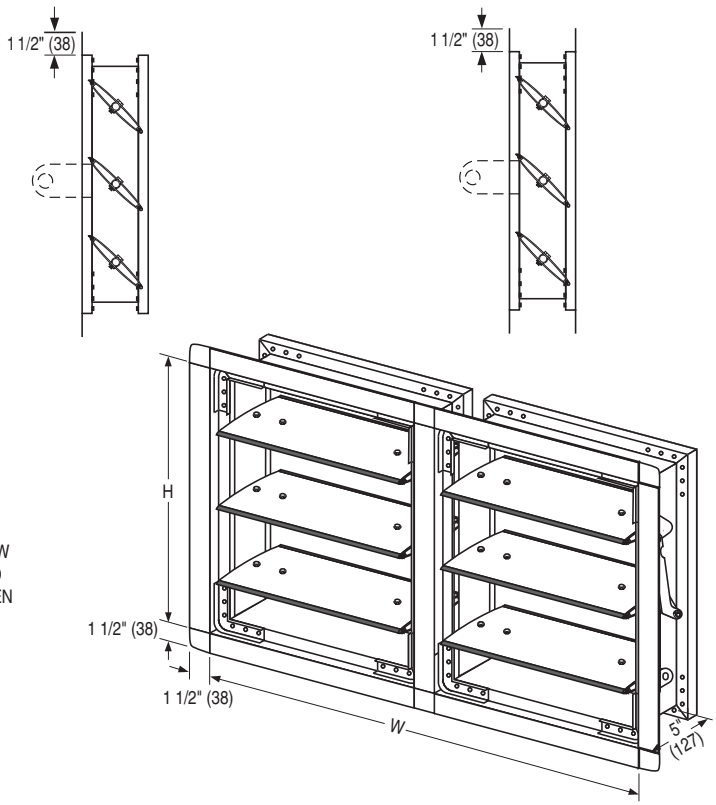
OPTION CODES	
FF	FLANGED FRONT
FFB	FLANGED FRONT WITH BOLT HOLES

OPTION CODES	
FR	FLANGED REAR
FRB	FLANGED REAR WITH BOLT HOLES

OPTION CODES	
FD	DOUBLE FLANGE
FDB	DOUBLE FLANGE WITH BOLT HOLES



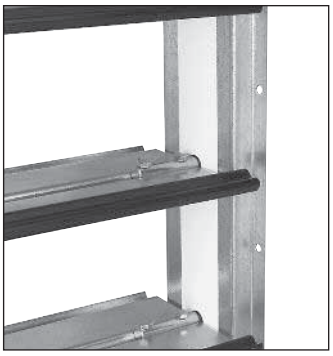
SINGLE SECTION DAMPER
SHOWN WITH **FRB** OPTION:
FLANGED REAR FRAME WITH 9/32" (7) DIA.
BOLT HOLES ON 6" (152) CENTERS.



MULTIPLE SECTION DAMPER
SHOWN WITH **FR** OPTION:
FLANGED REAR FRAME
(JACKSHAFT NOT SHOWN)

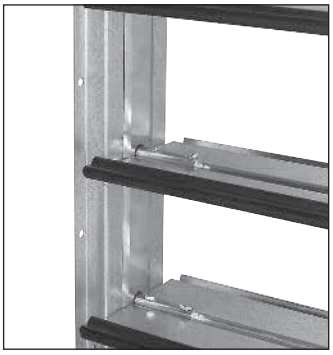
JAMB SEAL OPTIONS:

OPTION CODE **JSM**
METALLIC JAMB SEALS



Standard compression type metallic jamb seal used for reducing air leakage between blade ends and frame. Standard jamb seals on Models 1010 and 1020.

OPTION CODE **JSS**
STAINLESS STEEL JAMB SEALS

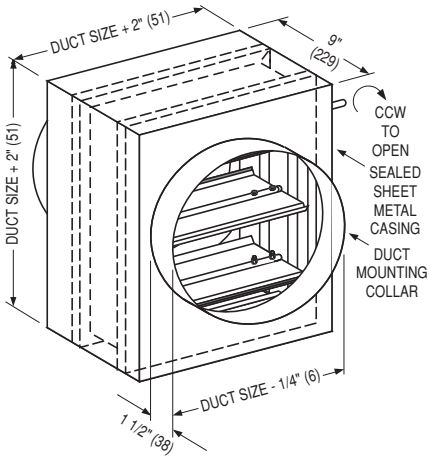


Compression type cambered stainless steel jamb seal for reducing air leakage between blade ends and frame. Provides higher resistance to corrosion and heat than our standard metallic jamb seal. Standard on Model Series 1100 and 2000 dampers.

ROUND/OVAL TRANSITIONS:

OPTION CODE **CR**
TRANSITION ENCLOSURE FOR ROUND DUCT.

OPTION CODE **CO**
TRANSITION ENCLOSURE FOR OVAL DUCT



TYPE CR (FOR ROUND DUCT) SHOWN

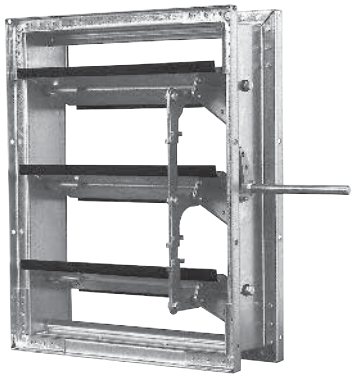
The CR transition enclosure option allows for connection of multi-blade control dampers to round ductwork. The CO transition enclosure option allows for connection of multi-blade control dampers to oval ductwork. Casing and collars are constructed from 20 ga. (1.0) galvanized steel (18 ga. (1.3) on sizes 36" x 36" (914 x 914) and up) and are tack welded and caulked against leakage.

MAXIMUM SIZE:
Single section: 46" (1168) dia.
For larger sizes contact factory.

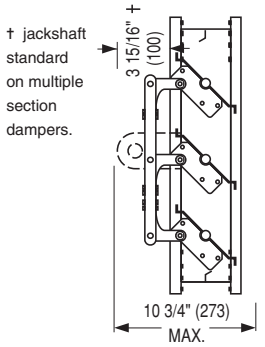
BLADE LINKAGE OPTION:

OPTION CODE **LF**
FACE LINKAGE

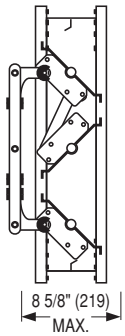
Nailor's robust plated steel linkage, uniquely installed directly to face of blades with integral heavy-duty brackets. Provides positive blade to blade connection while providing 'in the airstream' accessibility to linkage without removing damper from duct.



Model 1010 with Face Linkage (LF) option.



Parallel Blade
(Model 1010 Shown)



Opposed Blade
(Model 1020 Shown)

LINKAGE MATERIAL OPTIONS:

OPTION CODE **SSL**
STAINLESS STEEL LINKAGE

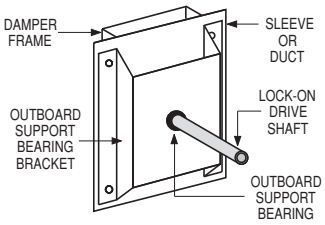
All linkage, axles and bearings will be of Type 304 Stainless Steel. Provides better resistance to corrosion and resistance to oxidation in higher heat applications.

OPTION CODE **SSA**
STAINLESS STEEL AXLES ONLY

Blade axles only will be of Type 304 Stainless Steel. Provides better resistance to corrosion and good resistance to oxidation in higher heat applications.

DRIVE SHAFT OPTION:

OPTION CODE **DLO**
LOCK-ON DRIVE SHAFT



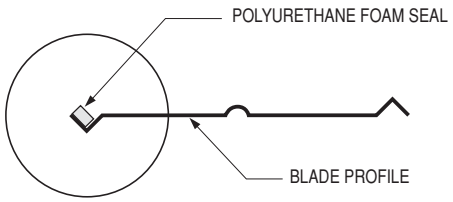
Shipped loose and can be installed before or after damper is mounted in duct. Unique spring clip locks shaft onto damper drive for firm connection. Each lock-on drive shaft is shipped complete with an outboard support bracket with bearing that can be fastened to outside of duct for extra support. Lock-on drive shafts are standard on dampers manufactured for Canada.

Note: **OPTION CODE DSR rigid drive shaft** (welded) is provided as standard on most control damper models. In Canada, **DSR** is available as an option.

BLADE SEAL OPTION:

FOR MODELS 1012 AND 1022 ONLY

OPTION CODE **BSP**
POLYURETHANE FOAM BLADE SEAL

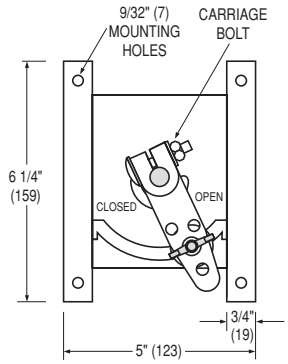


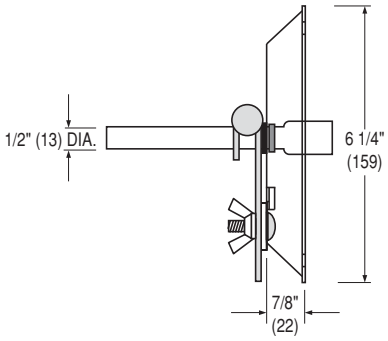
Available on Models 1012 and 1022 as an economical alternative to extruded seals, the polyurethane foam seal adheres to blade edge with self-adhesive backing. Suitable for light duty use in applications involving low static pressures and velocities.

MANUAL LOCKING QUADRANTS:

FOR USE WITH 1/2" (13) DIA. DRIVE SHAFT

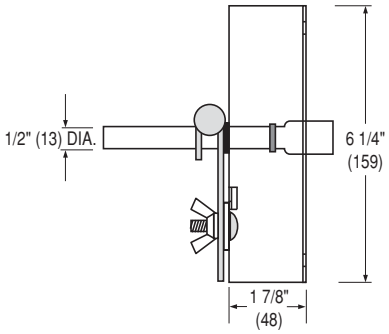
OPTION CODE **HLQ**
HAND LOCKING QUADRANT FOR 1/2" (13) DIA. DRIVES





Standard hand locking quadrant designed for use with Model Series 1000, 1100, 1810/1820 and 2000 dampers. Supplied as standard with Celcon® bearing, the HLQ mounts directly over a 1/2" (13) dia. drive shaft and is secured to shaft with a carriage bolt. 16 ga. galvanized steel bracket with 1" (25) stand-off is provided with pre-drilled mounting holes for convenient installation that ensures the mounting screws do not interfere with any damper side linkage that may be hidden in damper frame. Quadrant handle and hardware are plated steel. A heavy-duty wing nut locks the quadrant in desired position.

OPTION CODE **HL2**
HAND LOCKING QUADRANT WITH 2" (51) STAND-OFF

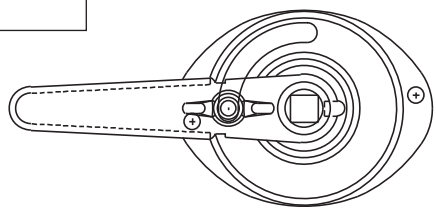


The HL2 hand locking quadrant is similar to the standard HLQ locking quadrant for use with 1/2" (13) dia. shafts (see above) but is supplied with a 2" (51) stand-off bracket that allows for use with externally insulated ductwork.

MANUAL LOCKING QUADRANTS:

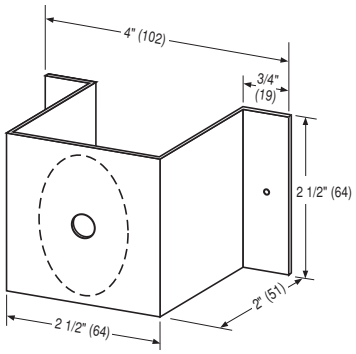
FOR USE WITH 1/4" (6) SQUARE DRIVE SHAFT

OPTION CODE **HLQ**
HAND LOCKING QUADRANT FOR 1/4" (6) SQUARE DRIVES



Suitable for light duty use on 1/4" (6) square drive shafts, this HLQ is supplied as standard on Models 1870 and 1890 balancing dampers. Constructed of plated steel, the quadrant slides directly over shaft and mounts easily with two mounting screws. A wing nut assembly locks the handle firmly in desired position.

OPTION CODE **SB**
HAND LOCKING QUADRANT WITH 2" (51) STAND-OFF BRACKET



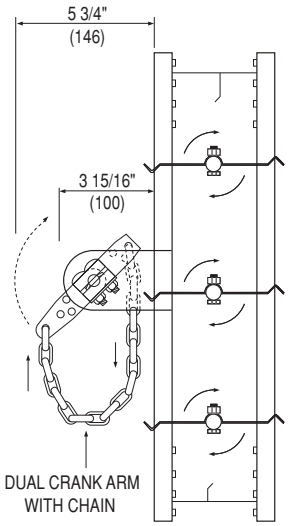
Option SB provides the above HLQ for 1/4" (6) square drive shafts with a 2" (51) stand-off bracket that allows the quadrant to be used on externally insulated ductwork.

(QUADRANT NOT SHOWN)

MANUAL PULL-CHAIN OPERATORS:

OPTION CODE **PCE**
EXTERNAL CHAIN OPERATOR

OPTION CODE **PCI**
INTERNAL CHAIN OPERATOR



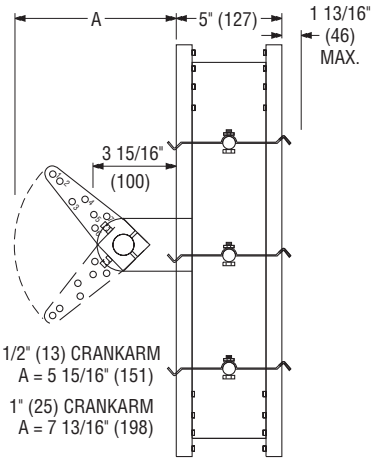
Nailor's manual pull-chain operator is ideal for use in applications that require remote manual operation from below a damper that is otherwise generally inaccessible. Suitable for use on Series 1000, 1100, and 2000 dampers.
Option PCE External Pull Chain Operator provides a dual crank arm type linkage securely fastened to a rugged jackshaft that extends past the damper frame (out of airstream). Operator can be adapted for right or left handed drive (right hand drive standard).
Option PCI Internal Pull Chain Operator provides the same strong linkage and jackshaft mounted within the face of the damper (in airstream). Units come complete with strong closed loop steel chain (please specify length) that loops down for convenient two-way operation and can be fastened to wall to maintain damper blade position. Both PCE and PCI options provide firm, smooth operation of dampers that are above the rest!

JACKSHAFTS AND ACCESSORIES:

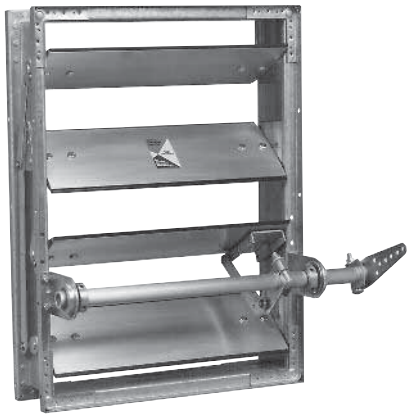
OPTION CODE **JK5**
1/2" (13) DIA. JACKSHAFT

OPTION CODE **JK1**
1" (25) DIA. JACKSHAFT

JK5 and **JK1** jackshafting may be ordered as an option on Series 1000, 1100 and 2000 single section dampers in order to offset the mounting position of an external actuator (ie: for mounting of damper within a wall) or for internal factory mounting of an actuator (in the airstream).

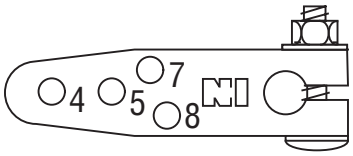


TYPICAL JACKSHAFT

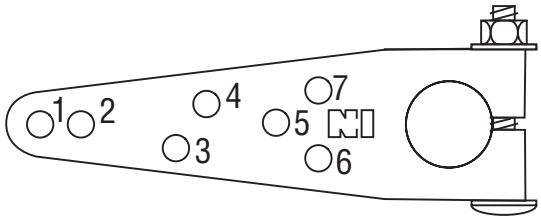


MODEL 2020 SHOWN WITH OPTIONAL JK1 JACKSHAFT AND 1" (25) DIA. CRANK ARM

OPTIONAL CRANK ARM DETAILS:



1/2" (13) DIA. CRANK ARM PART NO. CD005



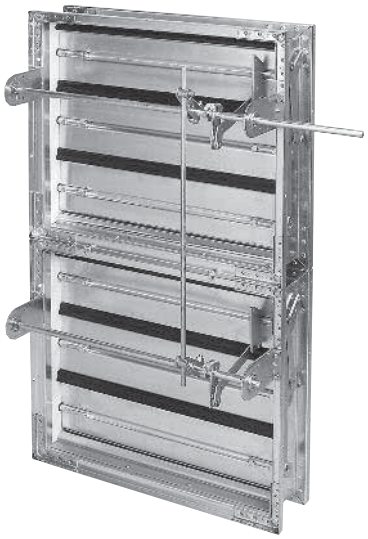
1" (25) DIA. CRANK ARM PART NO. CD010

Hole No.	Crank Arm Radius
8	1 3/8" (35)
7	1 9/16" (40)
6	1 9/16" (40)
5	2" (51)
4	2 13/16" (72)
3	3 3/16" (81)
2	4 1/4" (108)
1	4 3/4" (121)

Other **drive accessories** such as Swivel for 5/16" (8) dia. Rod (Part No. CD006) and 1" to 3/4" (25 to 19) Jackshaft Reducer (Part No. CD075) are available. Contact your Nailor representative for assistance.

VERTICAL INTERCONNECTION OF DAMPER SECTIONS:

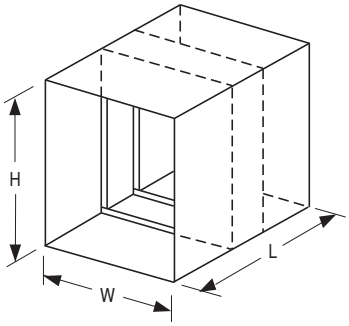
OPTION CODE **VCK**
VERTICAL INTERCONNECTION KIT



Nailor 1000, 1100 and 2000 Series control dampers that are two sections in height (single section wide) can be connected together for operation by a single actuator by utilizing **Option VCK Vertical Inter-Connection Kit.** Standard kit consists of factory mounted 1/2" (13) diameter jackshafts on each section, with crankarms, swivels and 5/16" (8) diameter connecting rod for smooth, positive operation. Specify drive location when ordering.

SLEEVE OPTIONS:

OPTION CODE **SL**
SLEEVE



TYPE 'A'
BLADES AND FRAME IN AIRSTREAM

Nailor control dampers are available in factory furnished sleeves in lengths up to 36" (914). Sleeves are constructed out of 20 ga. through 10 ga. (1.0 through 3.5) galvanized steel. When dampers are installed in factory sleeves, the "L" dimension specifies the location of damper within the sleeve. Factory furnished sleeves ensure proper fit and allow for direct shipment of dampers to jobsite eliminating the need for costly shop handling and provide for convenient, fast installation. Standard sleeve length is 12" (305) and standard "L" dimension is 4" (102).

FACE & BYPASS MIXING DAMPERS:

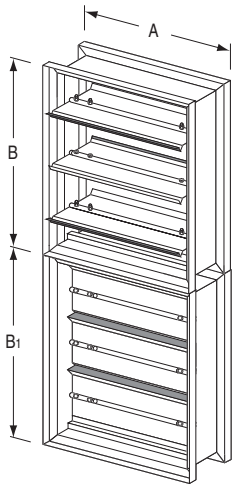
OPTION CODE **FBV**
VERTICAL

OPTION CODE **FBH**
HORIZONTAL

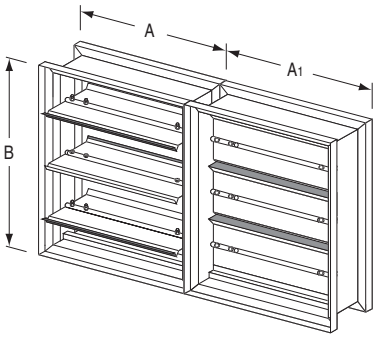
OPTION CODE **FBR**
RIGHT ANGLE

Face and bypass dampers are standard control dampers assembled either (FBV) one over the other, (FBH) beside each other or (FBR) at right angle from each other. The units are interconnected for simultaneous blade action, typically causing one damper to open while the other closes. The Nailor FBR option utilizes an inter-connected linkage that eliminates ball joints, crank arms and connecting rods with no adjustment required. The top section is fully open when the bottom section is fully closed.

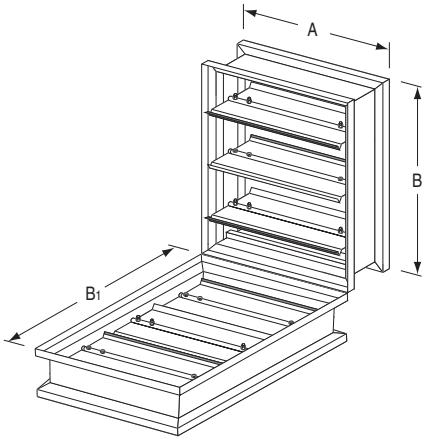
Dampers larger than maximum single section sizes are assembled of equal single section dampers (refer to the damper submittal document for maximum section sizes) and may be coupled for operation in a variety of ways. Large multiple section damper assemblies require an engineering analysis of how the dampers are to be operated (type, quantity and location of actuators) before the best method of coupling sections can be determined. Special assembly drawings are normally prepared and forwarded for customer approval on large damper assemblies.



FBV
VERTICAL



FBH
HORIZONTAL



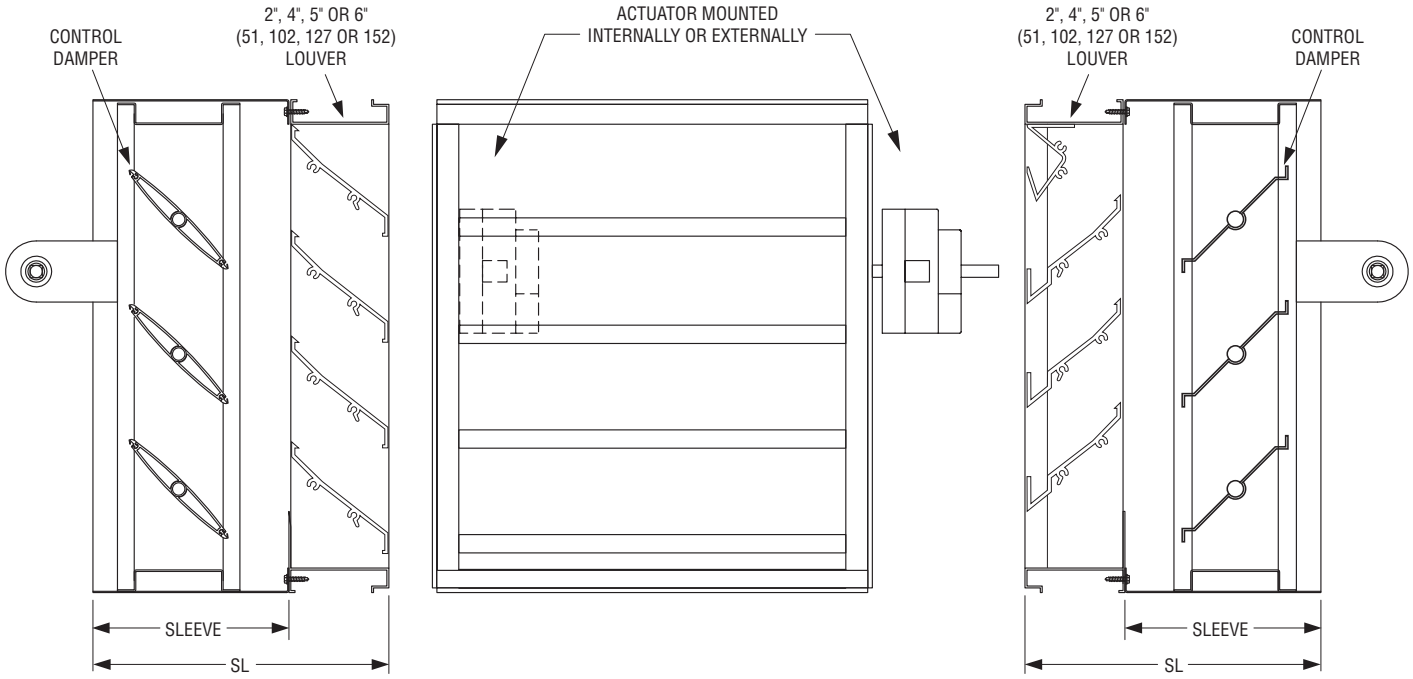
FBR
RIGHT ANGLE

TAKE CONTROL OF PERFORMANCE:

LOUVER/DAMPER COMBINATIONS IN A COMMON SLEEVE

Since 1971, Nailor Industries has been a global leader in the engineering and manufacturing of Air Control products. Our Control Damper product line features some of the industry's best performing products, with a reputation for reliability and affordability. Our Louver product line features a growing number of aesthetically pleasing and mechanically enduring models, proven to perform under the most demanding conditions.

Our capabilities as a world class manufacturer allow for an endless possibility of Control Damper and Louver combinations, suitable for just about any application or installation requirement. Using the skilled craftsmanship of Nailor's Sheet Metal Workers International Association (S.M.W.I.A) manufacturing personnel, we can construct and ship, a wide variety of Control Damper and Louver combinations, mounted in a common sleeve, ready for a fast and easy field installation. This option reduces field labor costs, materials costs, and shipping & handling costs, and offers an out of the box solution from our factory to your job site! In addition, factory mounted actuators assures proper installation and actuator selection, further reducing installation and handling costs.



Airfoil Blade Control Damper with Architectural Blade Louver.

Internally or Externally Factory Mounted Actuators.

Vee Blade Control Damper with Drainable Blade Louver.

Consult Nailor for specific applications and performance requirements for a custom solution today!

STANDARD MULTIPLE SECTION CONTROL DAMPER DRIVE ARRANGEMENTS:

Maximum single section size is 48" wide x 72" high (1219 x 1829) for all models except 2000 series which is 60" wide x 72" high (1524 x 1829). Dampers larger than the maximum single section size are fabricated in multiple section assemblies. These assemblies consist of sections of equal size which are coupled together with a jackshaft. The jackshaft runs parallel to the "W" dimension. Maximum Section Size for all Multiple Section Dampers is 48" wide x 72" high (1219 x 1829).

A. 1/2" (13) Diameter Jackshaft:
- Used on two sections wide with a maximum of 32 sq. ft. with blade and jamb seals; or a maximum of 40 sq. ft. without seals.

B. 1" (25) Diameter Jackshaft:
- Used on two sections wide over 32 sq. ft. with blade and jamb seals; or over 40 sq. ft. without seals.
- Used on assemblies of more than two sections wide, regardless of area.

Use the details on page B50 and B51 to determine how multiple section dampers with standard construction and sizes up to 240" wide x 144" high (6086 x 3658) will be manufactured. Details do not apply if the control damper has any of the following non-standard features such as unequal section sizes or Face and Bypass arrangement. For sizes larger than 240" x 144" (6096 x 3658), consult factory.

HOW TO DETERMINE YOUR DAMPER CONFIGURATION

1. Calculate the damper area in square feet:

$$\text{Area} = \frac{(\text{W in. wide} \times \text{H in. high})}{144} = \_\_\_\_\_ \text{ sq. ft.}$$

2. Based on the W and H dimensions and the area of your damper, determine the appropriate assembly detail using the chart on page B50.

Example: Model 1020, 96" wide x 96" high.

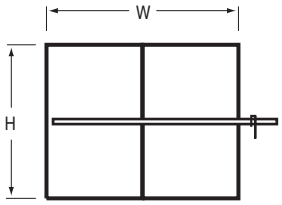
$$\text{Area} = \frac{(96 \times 96)}{144} = 64 \text{ sq. ft.}$$

From chart and drawings, damper configuration is per detail 22Q. Your damper will be built this way.

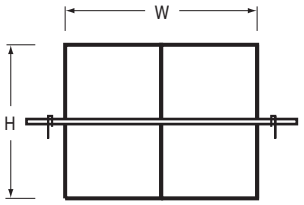
Multiple section assemblies require bracing to support the weight of the assembly and to hold against system pressure. Appropriate bracing must support the damper horizontally at least once for every 8 ft. (2438) of damper width. Vertical assemblies and higher system pressures require more bracing.

The maximum shipping size is 96" x 72" (2438 x 1829) or two sections wide. Larger units are shipped in sections for field assembly. Refer to the Control Damper Installation Instructions on pages B50 and B51 for joining multiple sections.

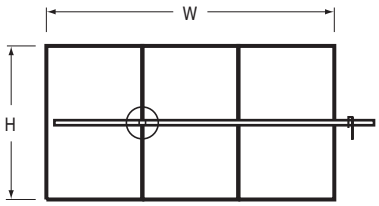
Dimension W Width in inches (mm)							
Dimension "H" Height in inches (mm) ⇩	All Model Series	1000 and 1100 Series Only	2000 Series Only		All Model Series		
	48" (1219) and under	Over 48" (1219) Thru 96" (2438)	Over 48" (1219) Thru 60" (1524)	Over 60" (1524) Thru 96" (2438)	Over 96" (2438) Thru 144" (3658)	Over 144" (3658) Thru 192" (4877)	Over 192" (4877) Thru 240" (6069)
72" (1829) and under	–	Detail 21 S or D	–	Detail 21 S or D	Detail 31 S or D	Detail 41 S or D	Detail 51 S or D
Over 72" (1829) Thru 144" (3658)	Detail 12 S or D	Detail 22 S, D or Q	Detail 22 S, D or Q		Detail 32 D or Q	Detail 42 D or Q	Detail 52 S or D



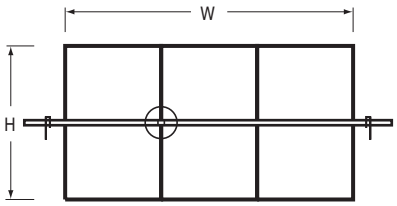
DETAIL 21S
25 SQ. FT. (2.3 SQ. M) AND UNDER WITH SEALS
48 SQ. FT. (4.5 SQ. M) AND UNDER NO SEALS



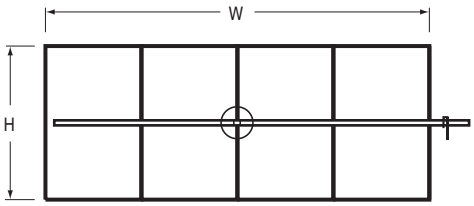
DETAIL 21D
OVER 25 THRU 48 SQ. FT. (OVER 2.3 THRU 4.5 SQ. M) WITH SEALS



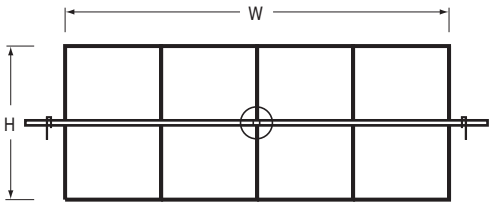
DETAIL 31S
25 SQ. FT. (2.3 SQ. M) AND UNDER WITH SEALS
50 SQ. FT. (4.6 SQ. M) AND UNDER NO SEALS



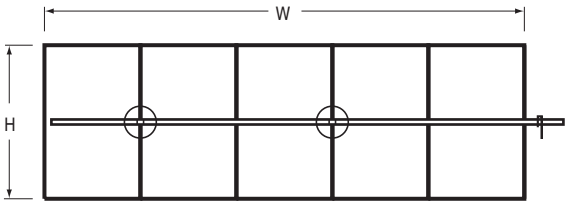
DETAIL 31D
OVER 25 THRU 50 SQ. FT. (OVER 2.3 THRU 4.6 SQ. M) WITH SEALS
OVER 50 THRU 72 SQ. FT. (OVER 4.6 THRU 6.7 SQ. M) NO SEALS



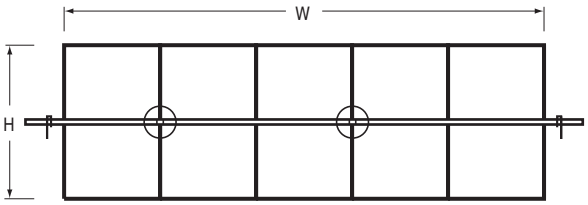
DETAIL 41S
25 SQ. FT. (2.3 SQ. M) AND UNDER WITH SEALS
50 SQ. FT. (4.6 SQ. M) AND UNDER NO SEALS



DETAIL 41D
OVER 25 THRU 96 SQ. FT. (OVER 2.3 THRU 8.9 SQ. M) WITH SEALS
OVER 50 THRU 96 SQ. FT. (OVER 4.6 THRU 8.9 SQ. M) NO SEALS

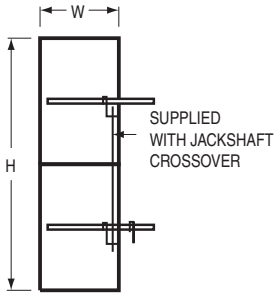


DETAIL 51S
25 SQ. FT. (2.3 SQ. M) AND UNDER WITH SEALS
50 SQ. FT. (4.6 SQ. M) AND UNDER NO SEALS

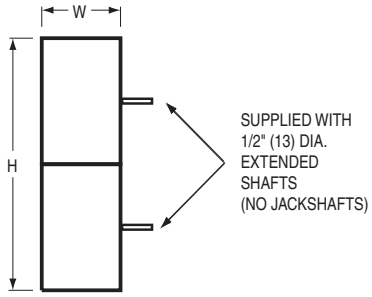


DETAIL 51D
OVER 25 THRU 120 SQ. FT. (OVER 2.3 THRU 11.1 SQ. M) WITH SEALS
OVER 50 THRU 120 SQ. FT. (OVER 4.6 THRU 11.1 SQ. M) NO SEALS

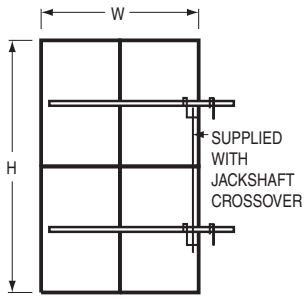
NOTE: ⊕ INDICATES LOCATION OF JACKSHAFT COUPLING.



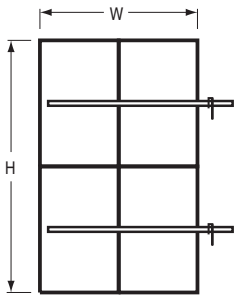
DETAIL 12S
25 SQ. FT. (2.3 SQ. M) AND UNDER WITH SEALS
48 SQ. FT. (4.5 SQ. M) AND UNDER NO SEALS



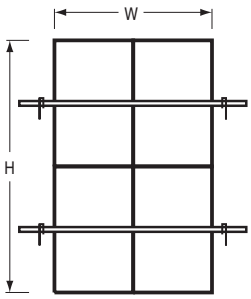
DETAIL 12D
OVER 25 THRU 48 SQ. FT. (OVER 2.3 THRU 4.5 SQ. M) WITH SEALS



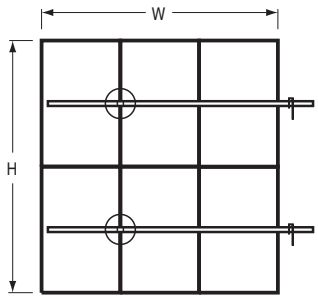
DETAIL 22S
OVER 24 THRU 25 SQ. FT. (OVER 2.2 THRU 2.3 SQ. M) WITH SEALS
OVER 24 THRU 50 SQ. FT. (OVER 2.2 THRU 4.6 SQ. M) NO SEALS



DETAIL 22D
OVER 25 THRU 50 SQ. FT. (OVER 2.3 THRU 4.6 SQ. M) WITH SEALS
OVER 50 THRU 96 SQ. FT. (OVER 4.6 THRU 8.9 SQ. M) NO SEALS

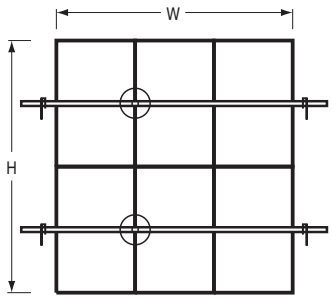


DETAIL 22Q
OVER 50 THRU 96 SQ. FT. (OVER 4.6 THRU 8.9 SQ. M) WITH SEALS

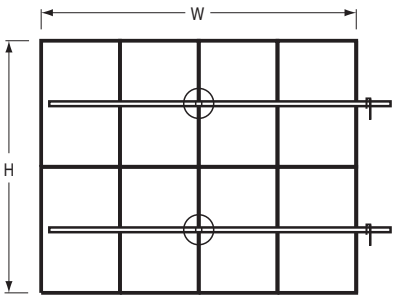


DETAIL 32D
OVER 48 THRU 50 SQ. FT. (OVER 4.5 THRU 4.6 SQ. M) WITH SEALS
OVER 48 THRU 100 SQ. FT. (OVER 4.5 THRU 9.3 SQ. M) NO SEALS

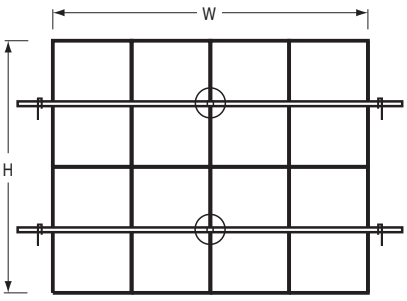
NOTE: ⊕ INDICATES LOCATION OF JACKSHAFT COUPLING.



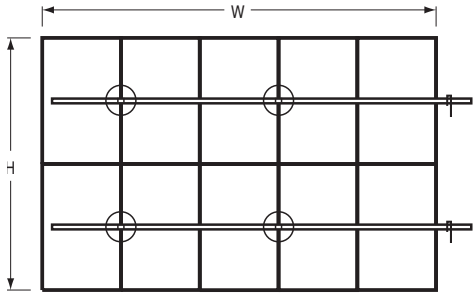
DETAIL 32Q
OVER 50 THRU 144 SQ. FT. (OVER 4.6 THRU 13.4 SQ. M) WITH SEALS
OVER 100 THRU 144 SQ. FT. (OVER 9.3 THRU 13.4 SQ. M) NO SEALS



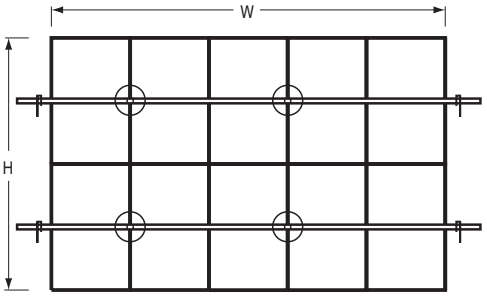
DETAIL 42D
OVER 72 THRU 100 SQ. FT. (OVER 6.7 THRU 9.3 SQ. M) NO SEALS



DETAIL 42Q
OVER 72 THRU 192 SQ. FT. (OVER 6.7 THRU 17.8 SQ. M) WITH SEALS
OVER 100 THRU 192 SQ. FT. (OVER 9.3 THRU 17.8 SQ. M) NO SEALS



DETAIL 52D
OVER 96 THRU 100 SQ. FT. (OVER 8.9 THRU 9.3 SQ. M) NO SEALS



DETAIL 52Q
OVER 96 THRU 240 SQ. FT. (OVER 8.9 THRU 22.3 SQ. M) WITH SEALS
OVER 100 THRU 240 SQ. FT. (OVER 9.3 THRU 22.3 SQ. M) NO SEALS

- BACKDRAFT DAMPER
- EXTRUDED ALUMINUM
- GRAVITY OPERATED
- LIGHT/MEDIUM DUTY

Model:

1370 Backdraft Damper

Model 1370

Model 1370 is an extruded aluminum gravity operated backdraft damper for use in light to medium duty commercial HVAC applications to pass airflow in one direction and to prevent airflow in the opposite direction, suitable for use in fan discharge applications.

Standard features include a corrosion resistant extruded aluminum reinforced mitered corner frame that resists racking, aerodynamic extruded aluminum blades that overlap the jambs for maximum weather protection, extruded PVC blade seals that provide quiet closure as well as extra weather protection, corrosion resistant long life synthetic bearings and a concealed blade linkage for low pressure drop that provides smooth operation at system velocities of up to 1500 fpm (7.6 m/s). A variety of frames and screens are available for specific application requirements.

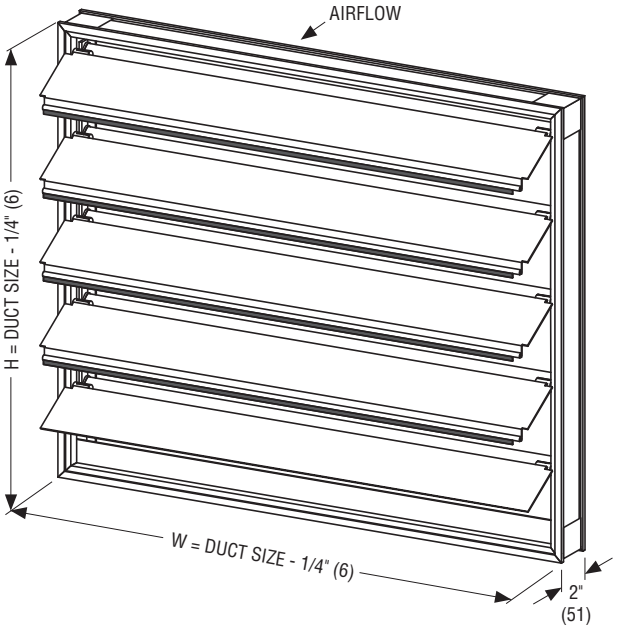
STANDARD CONSTRUCTION:

Frame:	2" (51) wide x .090" (2.3) nominal wall thickness type 6063-T5 extruded aluminum. Corners are mitered.
Blades:	.050" (1.3) nominal wall thickness type 6063-T5 extruded aluminum on 3 5/8" (92) centers.
Linkage:	Concealed in jamb.
Bearings:	Synthetic type.
Blade Seals:	Extruded PVC.
Finish:	Mill.

Model 1370 Sizes (Duct W x H):

Minimum	Maximum	
Single Section	Single Section	Multiple Section
6" x 6" (152 x 152)	40" x 48" (1016 x 1219)	Unlimited

1370 Series - Maximum Performance Ratings	
Maximum System Velocity	1500 fpm (7.6 m/s)
Maximum Spot Velocity	2500 fpm (12.7 m/s)
Maximum Back Pressure	6 in. w.g. (1.5 kPa)
Maximum Temperature	200°F (93°C)

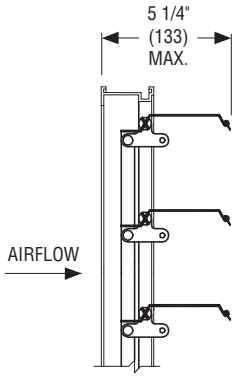


MODEL 1370

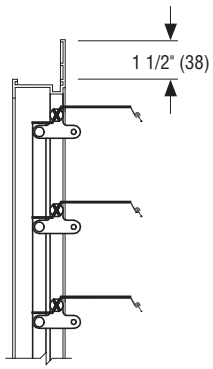
COMMON OPTIONS:

- Vertical or Horizontal mount.
- Front or rear flange frame (with or without bolt holes).
- Rear mounted bird and insect screens.

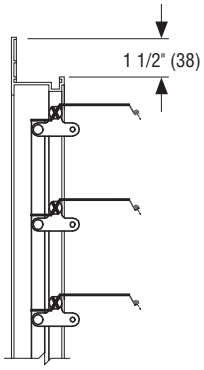
FRAME OPTIONS:



Channel Frame (Duct Mount) (Standard CF)

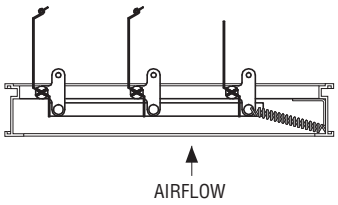


Front Flange (on discharge side) (Option FF)



Rear Flange (on intake side) (Option FR)

MOUNTING OPTION:



Horizontal Mount – Airflow up only (Option HMU) (Available on all frame styles)

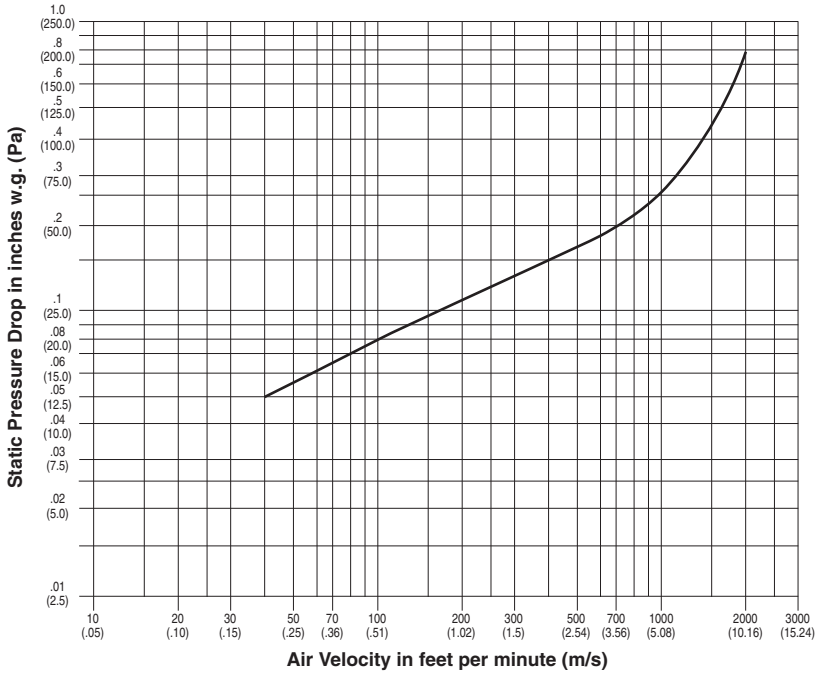
PERFORMANCE DATA:
MODEL: 1370

Damper Width	Maximum Back Pressure	Maximum System Velocity	Operational Data		Leakage*	
			Blades Begin Opening	Blades Fully Open	% of Maximum Flow	Cfm per Sq. Ft.
40" (1016)	3.0" w.g.	1500 fpm	.05" w.g. (12 Pa)	.20" w.g. (50 Pa)	1.00	15
36" (914)	4.0" w.g.	1500 fpm			1.00	15
24" (610)	5.0" w.g.	1500 fpm			1.20	18
12" (305)	6.0" w.g.	1500 fpm			2.67	40

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 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, Figure 5.5.

- BACKDRAFT DAMPER
- EXTRUDED ALUMINUM
- GRAVITY OPERATED
- HEAVY DUTY

Model:

1380 Backdraft Damper

Model 1380

Model 1380 is a high performance extruded aluminum gravity operated backdraft damper for use in medium to heavy duty commercial and light duty industrial HVAC applications to pass airflow in one direction and to prevent airflow in the opposite direction, suitable for use in fan discharge applications.

Standard features include a heavy duty corrosion resistant extruded aluminum reinforced mitered corner frame that resists racking, aerodynamic extruded aluminum blades that maximize airflow and overlap the jambs for maximum weather protection, extruded PVC blade seals that provide quiet closure as well as extra weather protection, corrosion resistant long life synthetic bearings and a rear mounted blade linkage that provides smooth operation at system velocities of up to 2500 fpm (12.7 m/s).

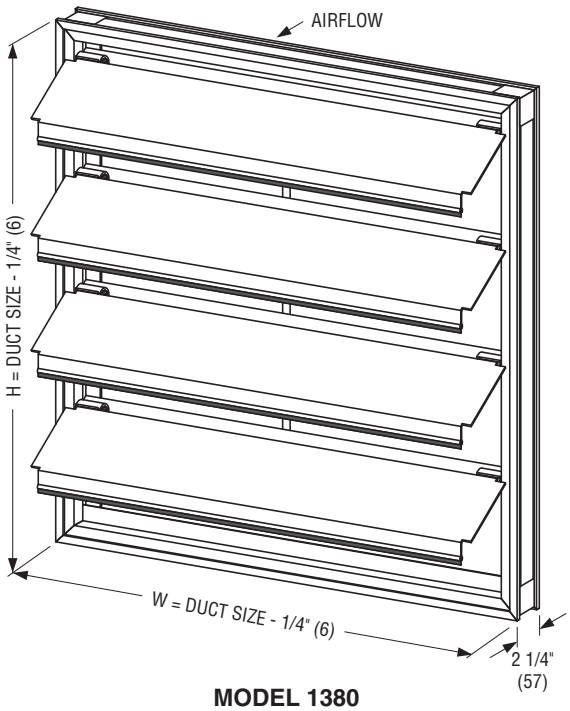
STANDARD CONSTRUCTION:

Frame:	2 1/4" (57) duct mount type, .125" (3.2) nominal wall thickness type 6063-T5 extruded aluminum. Corners are mitered.
Blades:	.070" (1.8) nominal wall thickness type 6063-T5 extruded aluminum on 5 1/2" (140) centers.
Linkage:	Center mounted on rear of blades.
Bearings:	Synthetic type.
Blade Seals:	Extruded PVC.
Finish:	Mill.

Model 1380 Sizes (Duct W x H):

Minimum	Maximum	
Single Section	Single Section	Multiple Section
6" x 6" (152 x 152)	40" x 52" (1016 x 1321)	Unlimited

1380 Series - Maximum Performance Ratings	
Maximum System Velocity	2500 fpm (12.7 m/s)
Maximum Spot Velocity	3500 fpm (17.8 m/s)
Maximum Back Pressure	16 in. w.g. (4 kPa)
Maximum Temperature	200°F (93°C)

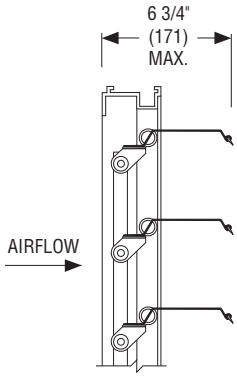


MODEL 1380
(VM Vertical Mount standard)

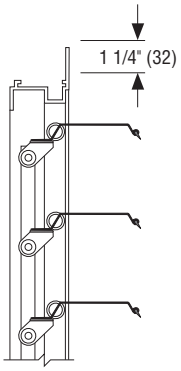
COMMON OPTIONS:

- Vertical or Horizontal mount.
- Front or rear flange frame (with or without bolt holes).
- Rear mounted bird and insect screens.

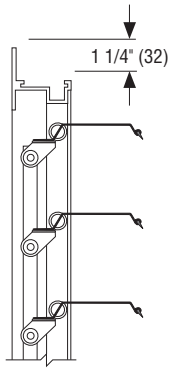
FRAME OPTIONS:



Channel Frame (Duct Mount) (Standard CF)

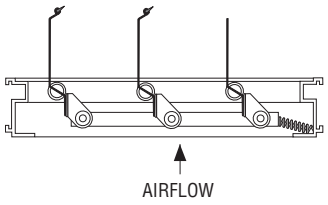


Front Flange (on discharge side) (Option FF)



Rear Flange (on intake side) (Option FR)

MOUNTING OPTION:



Horizontal Mount – Airflow up only (Option HMU) (Available on all frame styles)

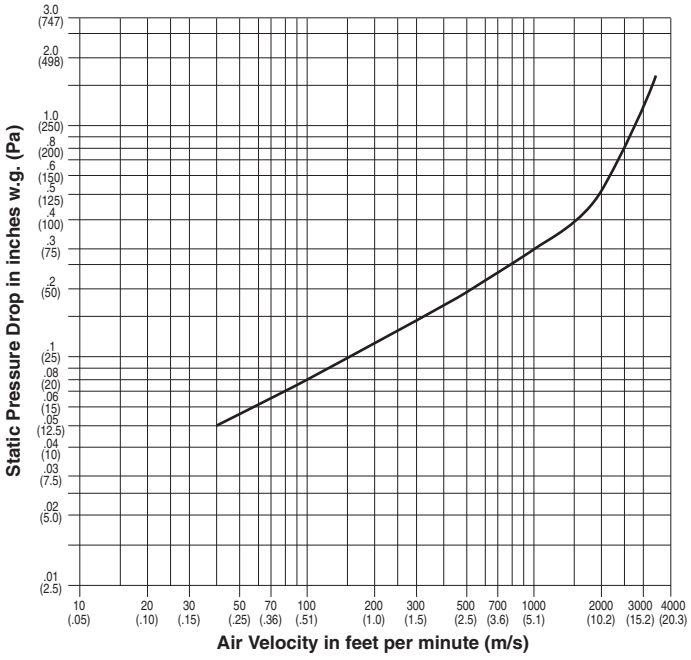
PERFORMANCE DATA:
MODEL: 1380

Damper Width	Maximum Back Pressure	Maximum System Velocity	Operational Data		Leakage*	
			Blades Begin Opening	Blades Fully Open	% of Maximum Flow	Cfm per Sq. Ft.
48" (1219)	4.0" w.g.	2500 fpm	.08" w.g. (20 Pa)	.30" w.g. (75 Pa)	0.60	15
36" (914)	8.0" w.g.	2500 fpm			0.60	15
24" (610)	12.0" w.g.	2500 fpm			0.72	18
12" (305)	16.0" w.g.	2500 fpm			1.00	25

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 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, Figure 5.5.

- COUNTERBALANCED BACKDRAFT DAMPER
- EXTRUDED ALUMINUM
- STANDARD PERFORMANCE
- LIGHT/MEDIUM DUTY

Model:

1370CB Counterbalanced Backdraft Damper

Model 1370CB

Model 1370CB Counterbalanced Backdraft Damper is designed to automatically prevent the backflow of air while allowing for automatic air intake or exhaust/pressure relief in medium duty HVAC applications. Suitable for use in fan discharge applications and relief air applications in exterior walls where in excellent weather protection is required.

Standard features include a corrosion resistant extruded aluminum reinforced mitered corner frame that resists racking, aerodynamic extruded aluminum blades that overlap the jambs for maximum weather protection, extruded PVC blade seals that provide quiet closure as well as additional weather protection, corrosion resistant long life synthetic bearings and a concealed blade linkage located out of the airstream for low pressure drop that provides smooth operation at system velocities of up to 1500 fpm (7.6 m/s). Blade mounted steel counterweights are easily adjusted to desired opening pressure. A variety of frame types and mounting options are available to suit specific installations and applications.

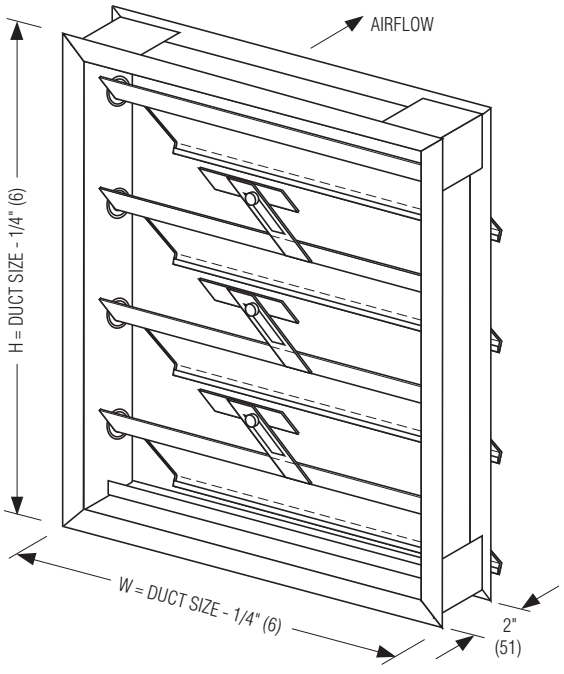
STANDARD CONSTRUCTION:

Frame:	2" (51) wide x .090" (2.3) nominal wall thickness type 6063-T5 extruded aluminum. Corners are mitered.
Blades:	.050" (1.3) nominal wall thickness type 6063-T5 extruded aluminum on 3 5/8" (92) centers.
Linkage:	Concealed in jamb.
Bearings:	Synthetic type.
Blade Seals:	Extruded PVC.
Counterbalance:	Adjustable, plated steel weights mounted internally (in the airstream).
Finish:	Mill.

Model 1370CB Sizes (Duct W x H):

Minimum	Maximum	
Single Section	Single Section	Multiple Section
6" x 7" (152 x 178)	40" x 48" (1016 x 1219)	Unlimited

1370CB Series - Maximum Performance Ratings	
Maximum System Velocity	1500 fpm (7.6 m/s)
Maximum Spot Velocity	2500 fpm (12.7 m/s)
Maximum Back Pressure	6 in. w.g. (1.5 kPa)
Maximum Temperature	200°F (93°C)

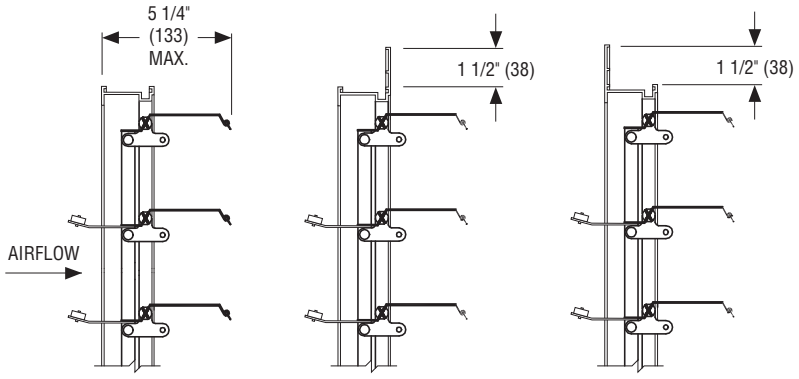


MODEL 1370CB

COMMON OPTIONS:

- Vertical or Horizontal mount.
- Front or rear flange frame (with or without bolt holes).

FRAME OPTIONS:

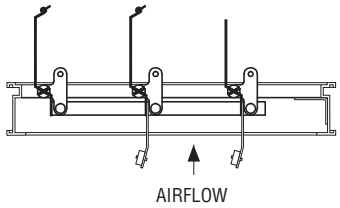


Channel Frame (Duct Mount) (Standard CF)

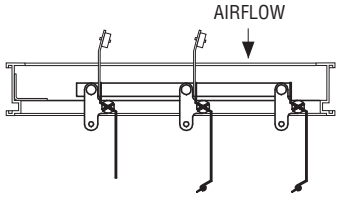
Front Flange (on discharge side) (Option FF)

Rear Flange (on intake side) (Option FR)

MOUNTING OPTIONS:



Horizontal Mount – Airflow up (Option HMU) (Available on all frame styles)



Horizontal Mount – Airflow down (Option HMD) (Available on all frame styles)

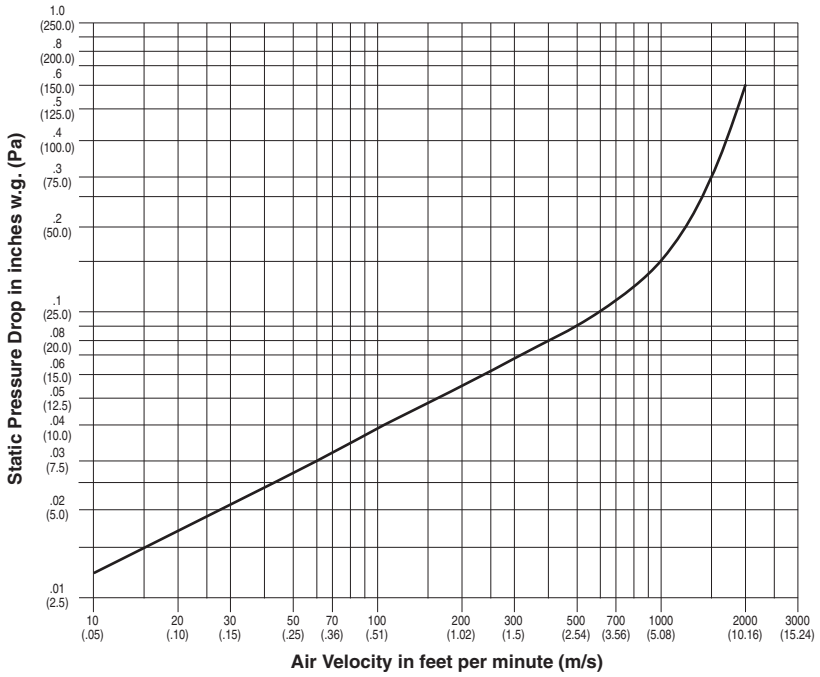
PERFORMANCE DATA:
MODEL: 1370CB

Damper Width	Maximum Back Pressure	Maximum System Velocity	Operational Data		Leakage*	
			Blades Begin Opening	Blades Fully Open	% of Maximum Flow	Cfm per Sq. Ft.
40" (1016)	3.0" w.g.	1500 fpm	.01" w.g. (2 Pa)	.10" w.g. (25 Pa)	1.00	15
36" (914)	4.0" w.g.	1500 fpm			1.00	15
24" (610)	5.0" w.g.	1500 fpm			1.20	18
12" (305)	6.0" w.g.	1500 fpm			2.67	40

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 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, Figure 5.5.

- COUNTERBALANCED BACKDRAFT DAMPER
- EXTRUDED ALUMINUM
- HIGH PERFORMANCE
- HEAVY DUTY

Model:

1380CB Counterbalanced Backdraft Damper

Model 1380CB

Model 1380CB High Performance Counterbalanced Backdraft Damper is engineered and designed to automatically prevent the backflow of air while allowing for automatic air intake or exhaust/pressure relief in medium to heavy duty commercial and light duty industrial HVAC applications. Suitable for use in fan discharge applications and relief air applications in exterior walls where in excellent weather protection is required.

Standard features include a corrosion resistant extruded aluminum reinforced mitered corner frame that resists racking, aerodynamic extruded aluminum blades that overlap the jambs for maximum weather protection, extruded PVC blade seals that provide quiet closure as well as additional weather protection, corrosion resistant long life synthetic bearings and an out of sight rear mounted blade linkage for that provides smooth operation at system velocities of up to 2500 fpm (12.7 m/s). Blade mounted steel counterweights are easily adjusted to desired opening pressure. A variety of frame types and mounting options are available to suit specific installations and applications.

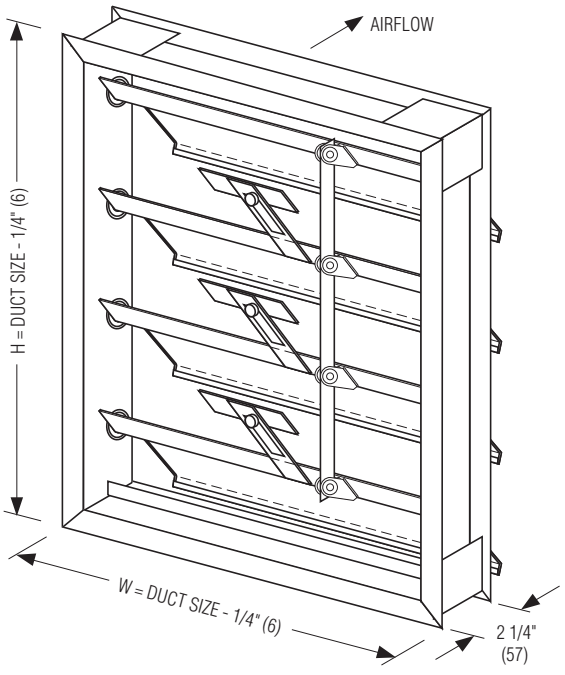
STANDARD CONSTRUCTION:

Frame:	2 1/4" (51) deep channel type, .125" (3.2) nominal wall thickness type 6063-T5 extruded aluminum. Corners are mitered.
Blades:	.070" (1.8) nominal wall thickness type 6063-T5 extruded aluminum.
Linkage:	Non-adjustable, face mounted on rear of blades.
Bearings:	Synthetic, sleeve type.
Blade Seals:	Extruded PVC.
Counterbalance:	Adjustable, plated steel weights mounted internally (in the airstream).
Finish:	Mill.

Model 1380CB Sizes (Duct W x H):

Minimum	Maximum	
Single Section	Single Section	Multiple Section
6" x 10" (152 x 254)	48" x 52" (1219 x 1321)	Unlimited

1380CB Series - Maximum Performance Ratings	
Maximum System Velocity	2500 fpm (12.7 m/s)
Maximum Spot Velocity	3500 fpm (17.8 m/s)
Maximum Back Pressure	16 in. w.g. (4 kPa)
Maximum Temperature	200°F (93°C)

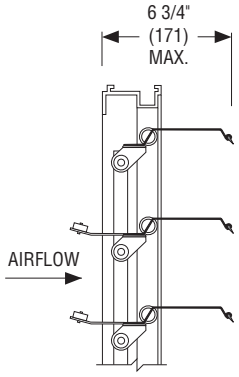


MODEL 1380CB

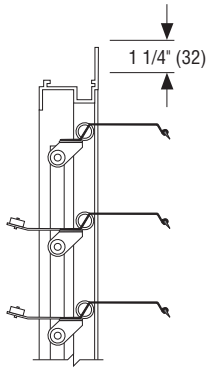
COMMON OPTIONS:

- Vertical or Horizontal mount.
- Front or rear flange frame (with or without bolt holes).

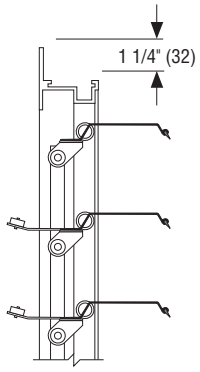
FRAME OPTIONS:



Hat Channel Frame (Duct Mount) (Standard CF)

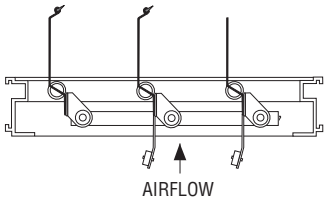


Front Flange (on discharge side) (Option FF)

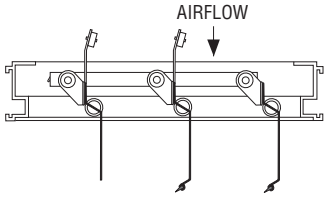


Rear Flange (on intake side) (Option FR)

MOUNTING OPTIONS:



Horizontal Mount – Airflow up (Option HMU) (Available on all frame styles)



Horizontal Mount – Airflow down (Option HMD) (Available on all frame styles)

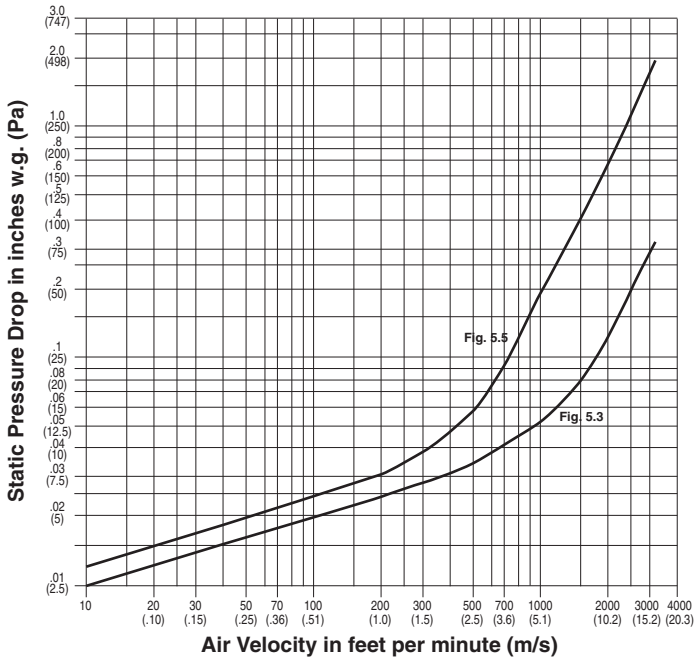
PERFORMANCE DATA:
MODEL: 1380CB

Damper Width	Maximum Back Pressure	Maximum System Velocity	Operational Data		Leakage*	
			Blades Begin Opening	Blades Fully Open	% of Maximum Flow	Cfm per Sq. Ft.
48" (1219)	4.0" w.g.	2500 fpm	.01" w.g. (2 Pa)	.05" w.g. (12 Pa)	0.60	15
36" (914)	8.0" w.g.	2500 fpm			0.60	15
24" (610)	12.0" w.g.	2500 fpm			0.72	18
12" (305)	16.0" w.g.	2500 fpm			1.00	25

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 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, Figure 5.3 and Figure 5.5.

HOW TO SPECIFY

MODEL: 1370
BACKDRAFT DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, backdraft dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Frame shall be constructed of .090" (2.3) type 6063-T5 extruded aluminum with welded mitered corners and concealed reinforcing brackets. Blades shall be .050" (1.3) type 6063-T5 extruded aluminum on maximum 3 5/8" (92) centers with extruded PVC blade seals mechanically fastened to blade edge. Adhesive type seals are not acceptable. Bearings shall be long life synthetic type. Blade linkage shall be concealed in frame for low pressure drop. Standard of acceptance shall be Nailor Industries Model 1370.

MODEL: 1380
HIGH PERFORMANCE BACKDRAFT DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, backdraft dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Frame shall be constructed of .125" (3.2) type 6063-T5 extruded aluminum with welded mitered corners and concealed reinforcing brackets. Blades shall be .070" (1.8) type 6063-T5 extruded aluminum on maximum 5 1/2" (140) centers with extruded PVC blade seals mechanically fastened to blade edge. Adhesive type seals are not acceptable. Bearings shall be long life synthetic type. Blade linkage shall be plated steel tie bar with stainless steel pivot pins. Standard of acceptance shall be Nailor Industries Model 1380.

MODEL: 1370CB
COUNTERBALANCED BACKDRAFT DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, counterbalanced backdraft dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Frame shall be constructed of .090" (2.3) type 6063-T5 extruded aluminum with welded mitered corners and concealed reinforcing brackets. Blades shall be .050" (1.3) type 6063-T5 extruded aluminum on maximum 3 5/8" (92) centers with extruded PVC blade seals mechanically fastened to blade edge. Adhesive type seals are not acceptable. Bearings shall be long life synthetic type. Blade linkage shall be concealed in frame. Counterbalances shall be of plated steel, mounted on rear of blades, internally in the airstream, and shall be field adjustable. Standard of acceptance shall be Nailor Industries Model 1370CB.

MODEL: 1380CB
HIGH PERFORMANCE COUNTERBALANCED BACKDRAFT DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, counterbalanced backdraft dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Frame shall be constructed of .125" (3.2) type 6063-T5 extruded aluminum with welded mitered corners and concealed reinforcing brackets. Blades shall be .070" (1.8) type 6063-T5 extruded aluminum on maximum 5 1/2" (140) centers with extruded PVC blade seals mechanically fastened to blade edge. Adhesive type seals are not acceptable. Bearings shall be long life synthetic type. Blade linkage shall be plated steel tie bar with stainless steel pivot pins. Counterbalances shall be of plated steel, mounted on rear of blades, internally in the airstream, and shall be field adjustable. Standard of acceptance shall be Nailor Industries Model 1380CB.

HOW TO ORDER

MODELS: 1370, 1380, 1370CB AND 1380CB
BACKDRAFT DAMPERS AND COUNTERBALANCED BACKDRAFT DAMPERS

EXAMPLE: 1370 - 24 x 24 - HMU - FFB - MI - GBS

1. **Models**
   - 1370 Extruded Aluminum, Light/Medium Duty
   - 1380 Extruded Aluminum, Heavy Duty
   - 1370CB Counterbalanced, Extruded Aluminum, Light/Medium Duty
   - 1380CB Counterbalanced, Extruded Aluminum, Heavy Duty
2. **Duct Size**
   Width x Height (inches [mm's])
3. **Mounting**
   - VM Vertical Mount (default)
   - HMD Horizontal Mount (Air Down) (Models 1370CB and 1380CB only)
   - HMU Horizontal Mount (Air Up)
4. **Frame Type**
   - CF Channel (default)
   - FF Front Flange
   - FFB Front Flange with Bolt Holes
   - FR Rear Flange
   - FRB Rear Flange with Bolt Holes
5. **Finish**
   - MI Mill
6. **Bird Screen**
   (not available on Models 1370CB & 1380CB)
   - – None (default)
   - AIS Aluminum Insect Screen
   - GBS Galvanized Steel Bird Screen

Note:

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

- EXTRUDED ALUMINUM BLADES
- STEEL FRAME
- HIGH PERFORMANCE
- HEAVY DUTY
- EXTERNAL COUNTERWEIGHT

Model:

1390CB Counterbalanced Backdraft Damper

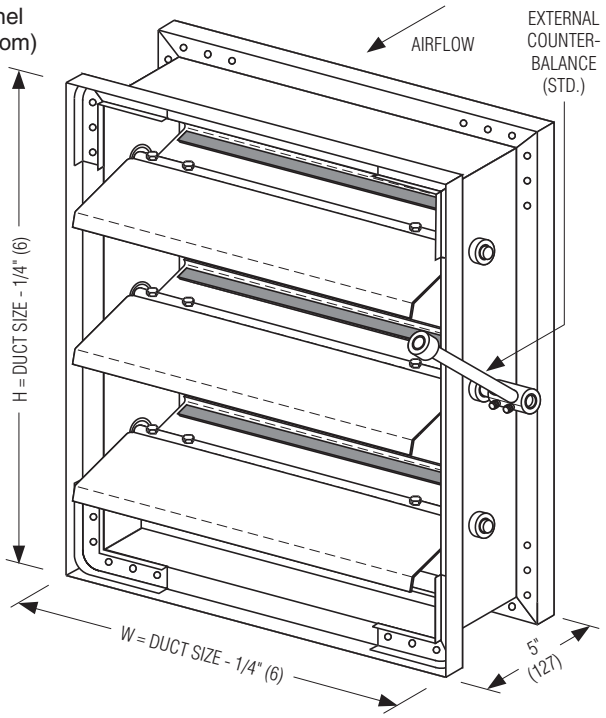
Model 1390CB

Model 1390CB Counterbalanced Backdraft Damper is engineer and designed for pressure relief to automatically assist in maintaining and limiting desired pressures in medium to heavy duty commercial and light duty industrial HVAC or process air systems. The unique extruded aluminum blade design and fully adjustable counterbalance assembly offers pressure relief at extremely low pressure differentials.

Standard features include a ruggedly built, heavy duty 16 ga. (1.6) steel frame with mitered corners reinforced to resist racking, ball bearings pressed into the frame that provide extreme sensitivity and ultra-smooth operation and neoprene blade seals that provide quiet closure as well as extra weather protection. A variety of frame types, mounting and balancing options are available to suit specific installations and applications.

STANDARD CONSTRUCTION:

Frame:	5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel with die-formed corner gussets. Low profile (flat top and bottom) for 12" (305) high and under.
Blades:	.070" (1.8) nominal wall thickness type 6063-T5 extruded aluminum on 5 1/2" (140) centers.
Linkage:	Non-adjustable, face mounted on rear of blades. Plated steel.
Axles:	1/2" (13) dia. plated steel.
Bearings:	Ball bearing type, pressed into frame.
Blade Seals:	Neoprene.
Counterbalance:	Adjustable, externally mounted (standard). Counter-balance assembly may be rotated through 360° to assist opening or closure.
Finish:	Mill.



MODEL 1390CB

Model 1390CB Sizes (Duct W x H):

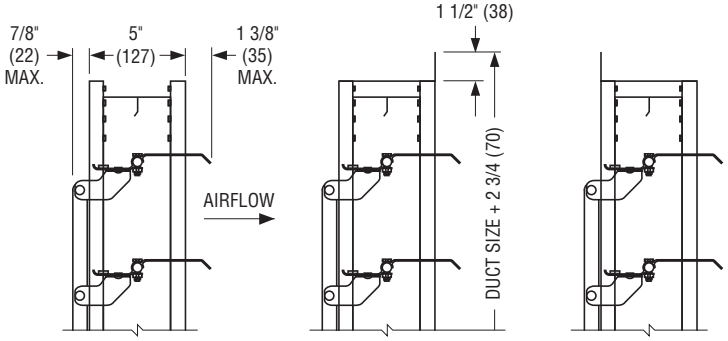
Minimum	Maximum	
Single Section	Single Section	Multiple Section
6" x 10" (152 x 254)	48" x 60" (1219 x 1524)	96" (2438) wide x unlimited height

1390CB Series - Maximum Performance Ratings	
Maximum System Velocity	2500 fpm (12.7 m/s)
Maximum Spot Velocity	3500 fpm (17.8 m/s)
Maximum Back Pressure	16 in. w.g. (4 kPa)
Maximum Temperature	200°F (93°C)

COMMON OPTIONS:

- Extruded Aluminum frame construction.
- Vertical or Horizontal mount.
- Front or rear flange frame (with or without bolt holes).

FRAME OPTIONS:

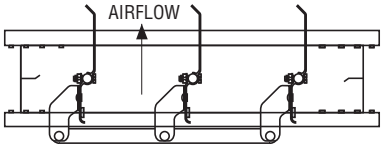


Hat Channel Frame (Duct Mount) (Standard HC)

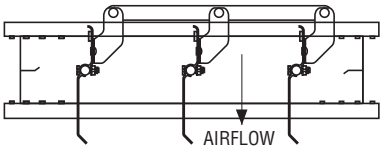
Front Flange (on discharge side) (Option FF)

Rear Flange (on intake side) (Option FR)

MOUNTING OPTIONS:



Horizontal Mount – Airflow up (Option HMU)



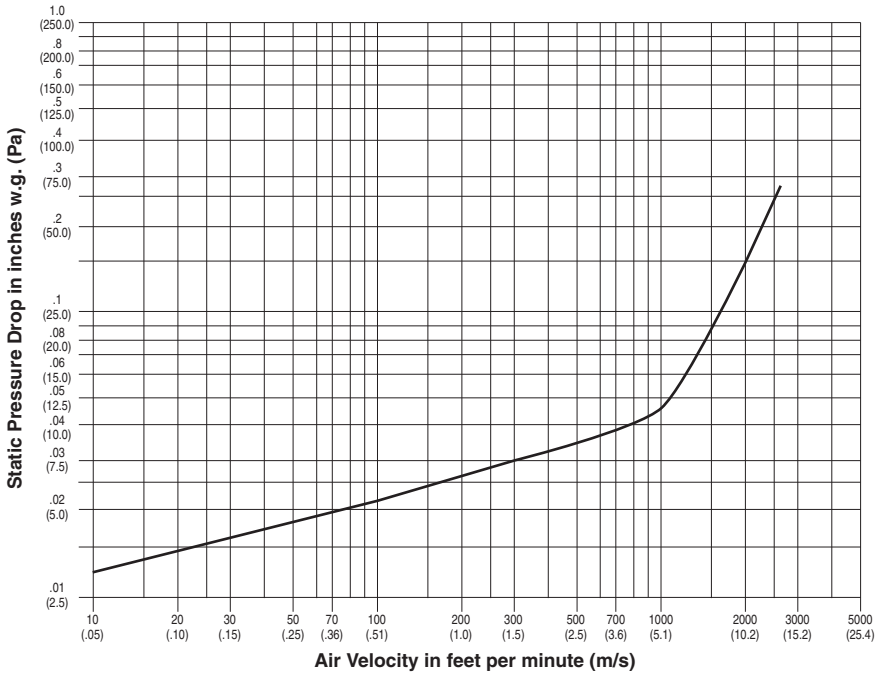
Horizontal Mount – Airflow down (Option HMD)

PERFORMANCE DATA:
MODEL: 1390CB

Damper Width	Maximum Back Pressure	Maximum System Velocity	Operational Data		Leakage*	
			Blades Begin Opening	Blades Fully Open	% of Maximum Flow	Cfm per Sq. Ft.
48" (1219)	4.0" w.g.	2500 fpm	.01" w.g. (2 Pa)	.06" w.g. (15 Pa)	1.48	37.0
36" (914)	8.0" w.g.	2500 fpm			1.68	42.0
24" (610)	12.0" w.g.	2500 fpm			2.04	51.0
12" (305)	16.0" w.g.	2500 fpm			3.36	84.0

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 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, Figure 5.3.

HOW TO ORDER OR TO SPECIFY

MODEL: 1390CB

HEAVY DUTY COUNTERBALANCED BACKDRAFT DAMPERS

EXAMPLE: 1390CB - 12x24 - HMD - FFB - MI - CBE

1. **Model**
   - 1390CB Heavy Duty, Counterbalanced, Steel Frame
2. **Duct Size**
   - Width x Height (inches [mm's])
3. **Mounting**
   - VM Vertical Mount (default)
   - HMD Horizontal Mount (Air Down)
   - HMU Horizontal Mount (Air Up)
4. **Frame Type**
   - HC Hat Channel (default)
   - FF Front Flange
   - FFB Front Flange with Bolt Holes
   - FR Rear Flange
   - FRB Rear Flange with Bolt Holes
5. **Finish**
   - MI Mill
6. **Counterbalancing**
   - CBE Adjustable, External Mount
   - CBI Adjustable, Internal Mount
7. **Extruded Aluminum Frame**
   - – Standard, Steel Frame (default)
   - EAF Extruded Aluminum Frame

OTHER ACCESSORIES:

Note:

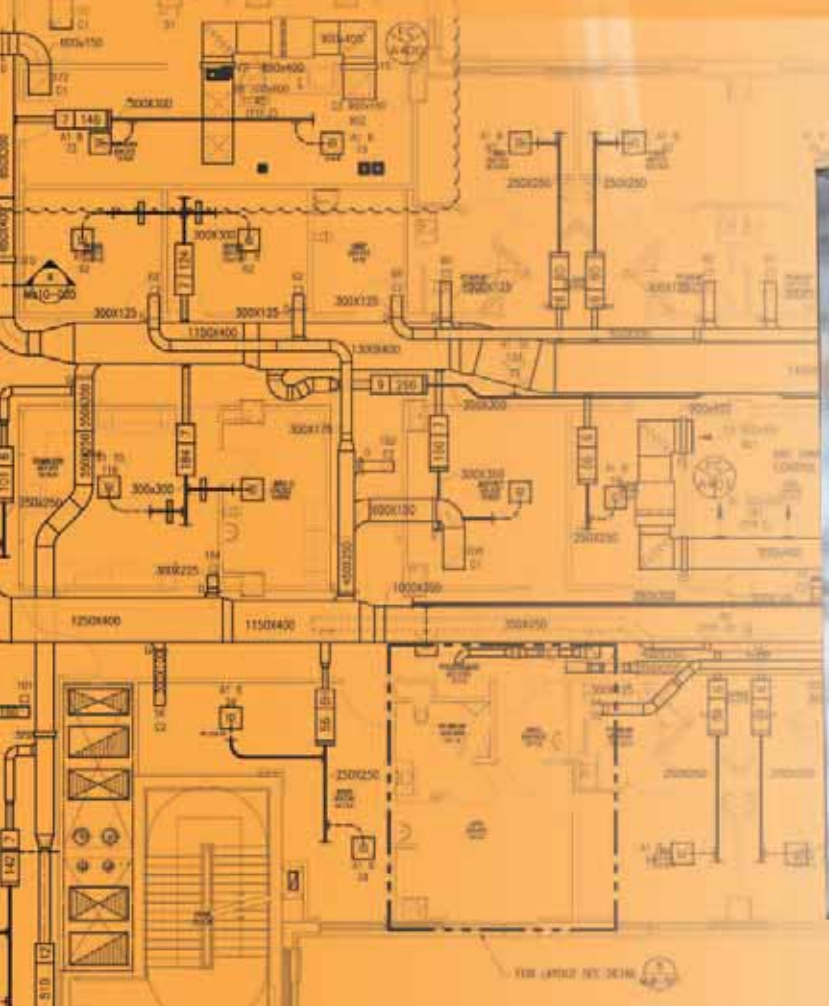
1. Not all variants and options are available on all models. Refer to individual model for selection availability.

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, heavy duty counterbalanced backdraft dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners and die-formed corner gussets for rigidity. Blades shall be .070" (1.8) extruded aluminum on maximum 5 1/2" (140) centers with neoprene seals. Blade axles shall be 1/2" (13) dia. plated steel bolted to blades at each end. Bearings shall be ball bearing type, pressed into the frame. Blade linkage/tie bar shall be plated steel, non-adjustable, face mounted on rear of blades. Counterbalance shall be of plated steel, externally mounted, out of airstream, and shall be fully adjustable in the field to assist opening or closing. Standard of acceptance shall be Nailor Industries Model 1390CB.

Nailor® Industries Inc.

INTRODUCTION TO LIFE SAFETY DAMPERS



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Testing With Underwriter's Laboratories

Established in 1894, Underwriter's Laboratories Inc. (UL) is a recognized testing facility referred to by the National Fire Protection Association (NFPA) and International Building Code (IBC), as well as associated building codes throughout the country. UL Standards 555 for Fire Dampers, 555S for Smoke Dampers and 555C for Ceiling Dampers, provide strict testing criteria, drawing upon past investigations and determinations in cooperation with such agencies as NFPA and other life-safety minded organizations.

UL 555 Safety Standard For Fire Dampers

First published in 1968, UL 555 Safety Standard for Fire Dampers provides testing standards and follow-up service guidelines in order to ensure that fire dampers perform as intended during a fire emergency. Early editions of UL 555 did not include closure against air flow and pressure testing. Fire dampers not designed for use in dynamic air flow conditions may not close when the HVAC system continues to operate during alarm. Currently, UL 555 evaluates fire dampers for use as either:

1) **Fire Dampers for Static Systems** - For HVAC systems that are automatically shut down in the event of a fire ("Fans Off").

2) **Fire Dampers for Dynamic Systems** - For HVAC systems that remain operational in the event of a fire ("Fans On").

3) **Combination Fire/Smoke Dampers** - For locations in HVAC systems where a fire damper and a smoke damper are required. Combination Fire/Smoke Dampers must also comply with UL 555S requirements.

4) **Corridor Dampers** - For locations in HVAC systems where air ducts penetrate or terminate at openings in the ceilings of interior corridors when permitted by the authority having jurisdiction.

Per the latest edition of UL 555, all fire dampers must undergo the following testing procedures:

Test	Fire Damper Type		
	Static Fire Dampers	Dynamic Fire Dampers	Combination Fire/Smoke
1. Fire Endurance and Hose Stream	✔	✔	✔
2. Cycling	✔	✔	✔
3. Salt-Spray Exposure	✔	✔	✔
4. Spring Closing Force	✔	*N/A*	*N/A*
5. Dynamic Closure	*N/A*	✔	✔
6. Operation (UL 555S)	*N/A*	*N/A*	✔
7. Leakage (UL 555S)	*N/A*	*N/A*	✔

Photograph of actual UL 555 fire test conducted successfully at Underwriters Laboratories Inc., Northbrook Illinois.

UL 555 includes the following criteria for all fire dampers, designed to meet the latest requirements put forth by NFPA Standard 90A and IBC building codes, including:

1) **Openings through closed damper** – The standard limits the maximum size of openings through the damper blades, and between the damper blades and the sleeve when the damper is in the closed position.

2) **Heat responsive devices** – The standard includes temperature rating requirements for the heat responsive device(s) used in the fire dampers:

Static Fire Dampers: Minimum 160°F (71°C) / Maximum 212°F (100°C).
Dynamic Fire Dampers: Minimum 160°F (71°C) / Maximum 350°F (177°C).
Combination Fire/ Smoke Dampers: Minimum 160°F (71°C) / Maximum 350°F (177°C).
Reopenable Combination Fire/Smoke Dampers:
Primary Device: Minimum 160°F (71°C) / Maximum 212°F (100°C).
Secondary Device: Minimum to be greater than primary device / Maximum not to exceed 350°F (177°C) or Elevated Temperature rating of damper.

3) Sleeves – The standard includes dimensional requirements for the sleeve if provided with the damper.

4) Corrosion protection – Ferrous components of the fire damper shall be made of stainless steel or shall be corrosion protected.

5) Actuators – Actuators, if used shall be securely attached to the damper, factory mounted.

UL 555 Safety Standard For Fire Dampers (continued)

Per the latest edition of UL 555, Fire Dampers must undergo the following testing procedures:

- **Fire Endurance/Hose Stream Test:** This test specifically determines whether the damper will prevent the passage of flames through and around the damper sleeve. After the full duration fire exposure test, the damper is subjected to a hose stream test. The conditions of acceptance for the fire exposure and hose stream test require:

1) The damper shall completely close and latch upon activation of the heat responsive device,

2) There shall be no flaming on the unexposed surface, subject to some exceptions relating to nonmetallic or organic component used in the damper,

3) The damper shall remain in place within the opening during the fire endurance and hose stream tests, and 4) any openings through the damper shall be limited to 3/8" (10) in the vertical plane and 1/32" (1) in the horizontal plane.

- **Cycling Test:** This test is intended to demonstrate that the fire damper will operate as intended for the life of the damper. The dampers are required to be cycled open and closed 250 times for dampers without actuators and 20,000 times for dampers with actuators. (Damper must be tested for 100,000 full stroke operations if it is intended for use as a volume control damper).
- **Salt-Spray Exposure Test:** This test is intended to demonstrate that the smoke damper will completely close following exposure to a corrosive environment. The damper is fouled with salt and dust prior to the testing to simulate and determine the effects and impact the environmental exposure has on the damper's ability to perform.

- **Spring Closing Force Test:** Static dampers are also subjected to a spring closure test which is intended to demonstrate that the spring closure mechanism is capable of closing the damper.

- **Dynamic Closure Test:** Heated Airflow and Pressure Test - If a fire damper is intended to be used in a dynamic system which continues to move air during a fire, then additional operational testing at the maximum airflow and pressure differential are conducted. Dynamic dampers are subjected to a closure test which is intended to demonstrate the dampers will close and latch automatically under the highest airflow and pressure conditions recommended by the manufacturer, with a minimum airflow of 2000 fpm (10 m/s) and 4 in. w.g. (1 kPa). Airflow and pressure ratings higher than the minimum are established in increments of 1000 fpm (5 m/s) and in increments of 2 in. w.g. (0.5 kPa). Actual test airflows and velocities build in a safety factor, the test airflow is to be 400 fpm (2.0 m/s) higher than the rated airflow and the test pressure is to be 0.5 inches of water (0.12 kPa) higher than the rated pressure. See Table 1.0 from UL 555 below.

Rated Airflow and Pressure		Minimum Test Airflow and Pressure	
Airflow, fpm (m/s)	Pressure, in. w.g. (kPa)	Airflow, fpm (m/s)	Pressure, in. w.g. (kPa)
2000 (10)	4 (1.0)	2400 (12)	4.5 (1.1)
3000 (15)	4 (1.0)	3400 (17)	4.5 (1.1)
4000 (20)	4 (1.0)	4400 (22)	4.5 (1.1)
2000 (10)	6 (1.5)	2400 (12)	6.5 (1.6)
3000 (15)	6 (1.5)	3400 (17)	6.5 (1.6)
4000 (20)	6 (1.5)	4400 (22)	6.5 (1.6)
2000 (10)	8 (2.0)	2400 (12)	8.5 (2.1)
3000 (15)	8 (2.0)	3400 (17)	8.5 (2.1)
4000 (20)	8 (2.0)	4400 (22)	8.5 (2.1)

Table 1.0 – Test Airflow and Pressure Conditions

- **Duct Impact Test:** This test is intended to demonstrate whether the duct will separate from a damper sleeve constructed in some manner other than that specified in the Construction section of the standard without creating visible openings in or around the damper assembly.

- **Hydrostatic Strength Test (Pneumatic Actuators):** This test is intended to demonstrate the pneumatic actuator will withstand an overpressure condition without rupture.

Fire dampers which are listed and labeled to UL 555 are required by the Standard to be marked with the manufacturer's name or identification, the model number, the words "Fire Damper for Static Systems" "Fire Damper for Dynamic Systems" or "Combination Fire and Smoke Damper" as appropriate, the hourly fire rating, the intended mounting position (vertical, horizontal or both), the top or bottom of the damper, reference to the installation instructions, and for dynamic dampers, the maximum air flow and the maximum pressure rating. In addition, the fire damper shall be supplied with legible installation and operating instructions (IOM). These instructions contain all the pertinent details to properly install the damper as well as limitations on the installation of the product such as the type of floor or wall construction that is required for the correct installation.

UL 555S Safety Standard for Smoke Dampers

Despite all of the damage fire can impose on structures and occupants, it is the products of incomplete combustion, or smoke, which has the most devastating effect on human life. Approximately 80% of all deaths resulting from fires can be attributed to the effects of toxic smoke on the human body. First published in 1983, UL 555S was developed to provide criteria for smoke damper performance, including leakage, as part of an ongoing industry wide effort to reduce the number of fatalities caused by fire and smoke. Today's HVAC systems and building designs can utilize smoke dampers twofold: to impede the spreading of smoke within HVAC systems that are designed to automatically shut down should a fire occur; and to help control pressure differentials across smoke barriers in buildings that utilize the HVAC system as part of an engineered smoke management system. UL 555S evaluates smoke dampers for use as either:

1) **Smoke Dampers** - For use where HVAC ducts pass through smoke barriers.
2) **Combination Fire & Smoke Dampers** - For locations in HVAC systems where a fire damper and smoke damper are required.

The construction requirements of the UL 555S standard include the following specific requirements for all smoke dampers:

1) **Corrosion Protection** - Ferrous components of the smoke damper shall be made of stainless steel or shall be corrosion protected.
2) **Actuators** - Actuators shall be factory mounted and shall be securely attached to the dampers.
3) **Combination Fire & Smoke Dampers** must also comply with UL 555 requirements for Fire Dampers.

Per the latest edition of UL 555S, Smoke Dampers must undergo the following testing procedures:

- **Leakage Test:** This test determines the amount of leakage through the closed smoke damper and therefore the leakage classification at a specified pressure differential. Smoke Dampers are tested for leakage following the Operation Test. Combination Fire & Smoke Dampers are subjected to the UL 555 Dynamic Closure Test and are tested for leakage following the Dynamic Closure Test. Minimum airflow and closed damper pressure rating is 2000 fpm (10 m/s) and 4 in. w.g. (1.0 kPa). Higher airflow ratings must be in increments of 1000 fpm (5 m/s), and higher pressure ratings must be in increments of 2 in. w.g. (.5 kPa). Leakage Classification is determined as shown in the following chart:

UL 555S Leakage Classifications:

Leakage Class	Leakage in cfm/ft.^{2} (m^3/s/m^2)				
	@ 4 in. w.g. (1.0 kPa)	@ 6 in. w.g. (1.5 kPa)	@ 8 in. w.g. (2.0 kPa)	@ 10 in. w.g. (2.5 kPa)	@ 12 in. w.g. (3.0 kPa)
I	8 (0.041)	9.5 (0.048)	11 (0.056)	12.5 (0.064)	14 (0.071)
II	20 (0.102)	24 (0.123)	28 (0.143)	31.5 (0.160)	35 (0.179)
III	80 (0.408)	96 (0.489)	112 (0.571)	125 (0.640)	140 (0.714)

- **Operation Test:** This test determines that the damper/actuator operates properly under the conditions of maximum specified airflow and closed pressure differential. The airflow (velocity) ratings are established in increments of 1000 cfm/ft^2 of damper area (FPM), with the minimum being 2000 cfm/ft^2. For damper/actuators with an Elevated Temperature rating, heated air is introduced to the test system to ensure the damper functions at the elevated temperature of 250°F (121°C) or higher, as specified, for a minimum of 15 minutes. The damper must then close within 75 seconds. The damper is allowed to cool and the open/close procedure is repeated three times at ambient temperatures. The heat is re-introduced and one additional cycle is conducted at the heated airflow. Externally mounted actuators are also exposed to the elevated temperature inside a heated enclosure. This ensures that the damper and more importantly, the actuator, can still function properly as surrounding temperatures increase due to fire conditions. In most cases, it is the actuator that limits the assembly's ability to function as intended due to increased electrical resistance.
- **Cycling Test:** The damper/actuator is cycled (opened/closed) 20,000 times to ensure the damper can function properly after repeated operation. Dampers intended for use as a volume control (modulating) damper shall be cycled 100,000 full strokes.
- **Temperature Degradation Test:** This test is intended to demonstrate the smoke damper will operate at the manufacturer's specified elevated temperature, subject to a minimum elevated temperature of 250°F (121°C). The damper and actuator assembly are exposed to the elevated temperatures for 30 minutes and then immediately cycled three times.
- **Salt-Spray Exposure Test:** Same requirements as detailed in UL 555.
- **Accelerating Aging Test:** This test is intended to demonstrate nonmetallic components such as gaskets and sealants maintain their performance characteristics after an accelerated aging exposure.

Actuators used with Smoke Dampers are also subject to the following UL 555S test procedures:

- **Hydrostatic Strength Test (Pneumatic Actuators):** Same requirements as detailed in UL 555.
- **Long Term Holding Test:** This test is intended to measure the ability of an actuator to return to its resting (non-powered) position after being held in a nominal (powered) position for 6 months.

Extended Airflow Ratings: Fire, Smoke and Fire/Smoke Dampers

Fire, Smoke and Combination Fire/Smoke Dampers can be tested and listed for higher operational pressures and velocities above 2000 fpm @ 4 in. w.g. (10 m/s @ 1 kPa), the minimum requirement in UL 555 and UL 555S as described in the Dynamic Closure Test. Maximum airflow ratings are marked in increments of 1000 fpm (5 m/s) and maximum closure pressure ratings are marked in increments of 2 in. w.g. (0.5 kPa). The ratings listed on a damper label represent the maximum airflow and closure pressure rating tested for that damper. The airflow rating required for a particular damper is not necessarily the same as the normal design airflow of the HVAC system the damper is to be installed in. The designer and authority having jurisdiction would need to evaluate an HVAC system using various combinations of opened or closed dampers to determine what the worst-case airflow and pressure would be at a particular under different fire scenarios. Therefore, the listed ratings for the installed damper should exceed the maximum expected airflow/pressure from the analyzed scenarios. It is essential that the proper airflow rating for a damper is selected to meet system requirements. If a particular system design does not call for fans on during a fire emergency, selecting a damper that is designed to close under 4000 fpm air velocity and 8 in. w.g. duct pressure may adversely affect the performance of that damper and its ability to close without airflow. Some damper designs employ different construction methods to assist with closure under airflow, and the absence of airflow may impede the damper's ability to fully close.

Nailor Industries uses a 2 digit code to designate the airflow rating for a damper. These codes can be found on performance charts and ordering procedures throughout this catalog as well as in Nailor Industries selection and pricing software. See chart below for details.

Nailor UL Velocity Pressure Rating		
Code	**Imperial**	**Metric**
24	2000 fpm @ 4 in. w.g.	10 m/s @ 1 kPa
34	3000 fpm @ 4 in. w.g.	15 m/s @ 1 kPa
36	3000 fpm @ 6 in. w.g.	15 m/s @ 1.5 kPa
46	4000 fpm @ 6 in. w.g.	20 m/s @ 1.5 kPa
48	4000 fpm @ 8 in. w.g.	20 m/s @ 2 kPa

UL 555C Safety Standard for Ceiling Dampers

Time can be a building occupant and fire fighter's biggest ally, or worst enemy. Typically, the longer a fire burns, the more intense the radiative heat transfer becomes, weakening structural building components and igniting peripheral mediums. Ceiling radiation dampers are intended to limit the transfer of radiant heat into a concealed space when installed in the ceiling membrane of a fire-resistance rated floor/ceiling or roof/ceiling assembly. These dampers are designed to protect the continuity of the assembly, allowing for fire rescue and firefighting operations. To determine their worthiness as a life safety device, which requires a full scale fire test, certain ceiling dampers and fire-rated diffusers are investigated either as part of the fire-resistance-rated floor-ceiling or roof-ceiling assembly per UL 263: Fire Tests of Building Construction and Materials. Standard ceiling dampers are tested in accordance with requirements in UL 555C: Standard for Safety for Ceiling Dampers. This is a smaller scale fire test, where the damper is compared to a reference hinge plate type damper for performance. These dampers do not have an hourly rating, but are permitted to be used in any UL Fire rated Floor/Ceiling or Roof/Ceiling design that permits duct work penetrations and protection with a generic hinge plate damper.

The construction requirements of the UL 555C standard include the following specific requirements for all ceiling dampers:

1) Component springs used in a ceiling damper shall be of a material having spring properties equivalent to stainless steel.

2) **Corrosion protection** – Ferrous components of the ceiling damper shall be made of either 300 Series stainless steel, hot dipped mill galvanized coated, zinc-coated, zinc-iron alloy coated, cadmium coated or epoxy/alkyd-resin coated.

Per the latest edition of UL 555C, Ceiling Dampers must undergo the following testing procedures:

- **Fire Endurance Test:** Similar requirements as detailed in UL 555, UL 555C requires the fire exposure for the ceiling damper to be controlled in accordance with the Standard Time-Temperature Curve (See Fig. 1.0 on page C8).

- **Closing Reliability Test:** Similar in concept to the Cycling Test for UL 555 and UL 555S, a ceiling damper shall close and latch automatically (when a latch is provided) from the open position during each of 250 operations and cannot show evidence of damage which would impair the fire performance of the ceiling damper throughout the test. If the ceiling damper is actuated, the damper/actuator is cycled (opened/closed) 20,000 times to ensure the damper can function properly after repeated operation. Dampers intended for use as a volume control (modulating) damper shall be cycled 100,000 full strokes.

- **Salt-Spray Exposure Test:** Same requirements as detailed in UL 555 and UL 555S.

- **Spring Closing Force Test:** Same requirements as detailed in UL 555.

Nailor Ceiling Dampers have been subjected to the rigorous testing procedures of either UL 555C or UL 263 and are UL Classified under Category CABS/CABS7.

UL Category Code (CCN)

A UL Category Code (CCN) is an alphabetic or alphanumeric code used to identify product categories covered by UL's Listing, Classification, & Recognition Services (for example: EMME, CABS, BZZU, etc...). The information below is for selected product categories you will encounter in the Nailor Life Safety products literature and provides a general description of the UL marking authorized for products in that category. For a more in depth review of the scope and limitations of UL Certifications, please refer to the UL website.

BXUV - Fire-resistance Ratings - ANSI/UL 263 (Floor/Ceiling and Roof/Ceiling Assemblies)

Fire-rating Classifications based upon the test method and acceptance criteria in UL 263: Fire Tests of Building Construction and Materials for various Floor/Ceiling and Roof/Ceiling designs, including (but not limited to) Nailor design numbers L550, L562, L574, L579, L585, L592, M501, M503, P531, P538, P545, P547, P549 and P552, where Nailor ceiling dampers can be used. Consult the UL Fire Resistance Directory for illustrations of designs and fire resistance ratings.

BZZU.R10053 - Ceiling Air Diffusers

Ceiling air diffusers investigated for use in fire-resistance designs as detailed in Fire-resistance Ratings - ANSI/UL 263. These diffusers have been investigated for use in fire-resistive floor-ceiling and/or roof-ceiling assemblies in lieu of duct outlets protected by hinged plate dampers and are approved for exposed grid systems only (T-bar ceilings), not gypsum board ceilings. These are a fire-rated diffuser package that both ensures compliance and saves on field labor assembly of components. Supply diffusers typically consist of a steel diffuser, a thermal blanket and a ceiling damper, provided as a factory assembly. See the Nailor Air Distribution catalog for more details.

CABS.R9660 - Ceiling Dampers

CABS7.R9660 - Ceiling Firestop Flap Assemblies Certified for Canada

Ceiling dampers investigated for use in fire-resistance designs as detailed in Fire-resistance Ratings - ANSI/UL 263. This category covers ceiling dampers classified under UL 555C, Nailor models 0714, 0716, 0716A, 0716-4, 0720, 0722 and 0722A, for either (A) use in lieu of hinged-door-type dampers in Floor-Ceiling or Roof-Ceiling designs that contain air ducts and specify the use of a hinged-door-type damper over each duct outlet, or (B) use in specific Floor-Ceiling and/or Roof-Ceiling designs as marked on the damper. A duct with a hinged plate damper must be a specified component of the design for a ceiling damper to be an acceptable option unless the ceiling damper is certified for use in the design. Nailor ceiling damper models 0755, 0755A, 0756, 0756D, 0757, 0757D, 0758, 0759, 0760, 0761, 0762 and 0763 are approved for use in the Floor/Ceiling and Roof/Ceiling designs numbers listed above under category BXUV.

EMME.R9492 - Dampers for Fire Barrier & Smoke Applications

EMME7.R9492 - Dampers for Fire Barrier & Smoke Applications Certified for Canada

This category covers fire dampers (curtain type and multi-blade), smoke dampers, combination fire/smoke dampers and corridor dampers, a large range of Nailor Life Safety Dampers found in Section E, Section F and Section G of this catalog. Fire dampers are categorized as either for use in dynamic systems or static systems. Smoke dampers are identified as leakage class designation I, II or III (although all Nailor smoke and fire/smoke dampers are rated Class I or II). Combination fire/smoke and corridor dampers are rated for both a fire-resistance and leakage class rating.

BZGU.R12231 - Air Terminal Units (Slot Diffusers)

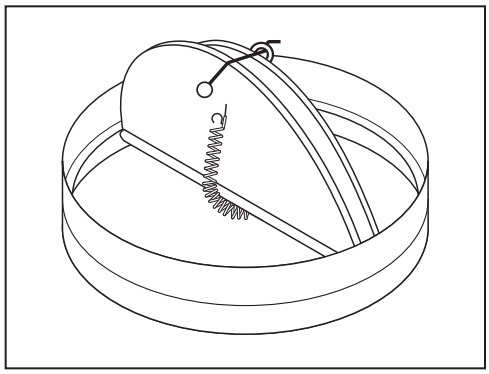
BZGU7.R12231 - Air Terminal Units Certified for Canada (Slot Diffusers)

This category covers air terminal units investigated for use in fire-resistance designs. Air terminal units are designed to regulate the flow and distribute conditioned air within a building, and are ceiling mounted at the ends of ducted air systems. They are designed to be compatible with acoustical ceilings but are independently supported. The basic standard used to investigate products in this category is UL 263.

CLOSER LOOK: CEILING DAMPERS

Ceiling dampers (also known as ceiling radiation dampers, or firestop flaps in Canada) are used to limit the passage of heat through duct or air transfer openings that penetrates the ceiling membrane of a fire-resistive floor/ceiling or roof/ceiling assembly. Before you can fully understand the application of and classification for ceiling dampers, it is important to understand how fire-resistant-rated assemblies are tested and expected to perform. By understanding what the assembly is trying to do, it will provide guidance on what type of opening protection is required, and help to show the importance of properly selecting and installing dampers.

As stated in the International Building Code (IBC), fire-resistance ratings are established for building elements, components or assemblies by using the test procedures specified in ASTM E 119: Standard Test Methods for Fire Tests of Building Construction and Materials or UL 263. The ASTM E 119 and UL 263 tests evaluate the ability of an assembly to contain a fire, maintain its structural ability or to do both for the period of time it will be rated for. Understanding the performance criteria for the ASTM E 119 and UL 263 fire-resistant rated assemblies is important since it gives the code user a better appreciation of the level of protection that these assemblies provide. These tests measure and evaluate heat transfer through membrane elements which protect framing or surfaces and help ensure the assembly can serve its purpose. As a result, these tests also show that openings and penetrations remove some of this protection and therefore it is important that these weakened points be properly protected so the fire-resistant rated assemblies perform their intended function and can minimize or prevent the spread of fire and the potential for structural failure.



Nailor Model 0722 - Ceiling Radiation Damper

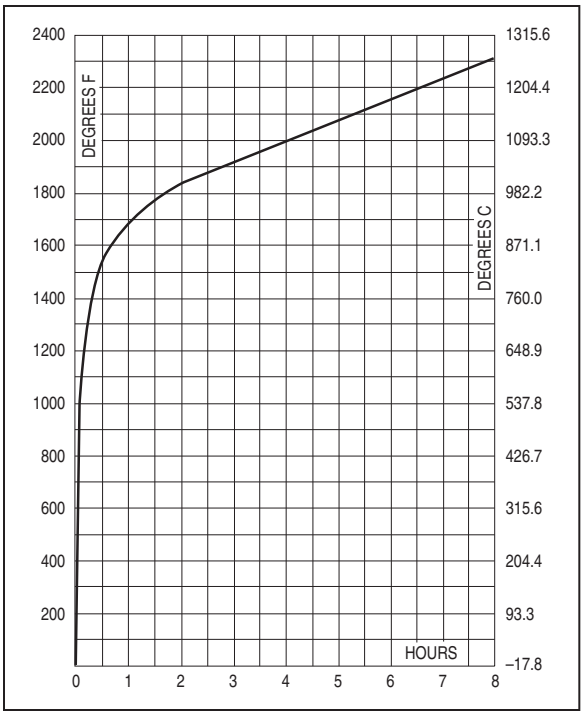


Fig. 1.0 - Time Temperature Curve

The ASTM E 119 and UL 263 tests are conducted using the time temperature curve, shown in Fig. 1.0. The temperatures used in the test standard are not intended to be indicative of any specific fire type but are intended to provide a consistent and reproducible means so that various building elements, components and assemblies can have their performance evaluated and compared to both the test and to each other.

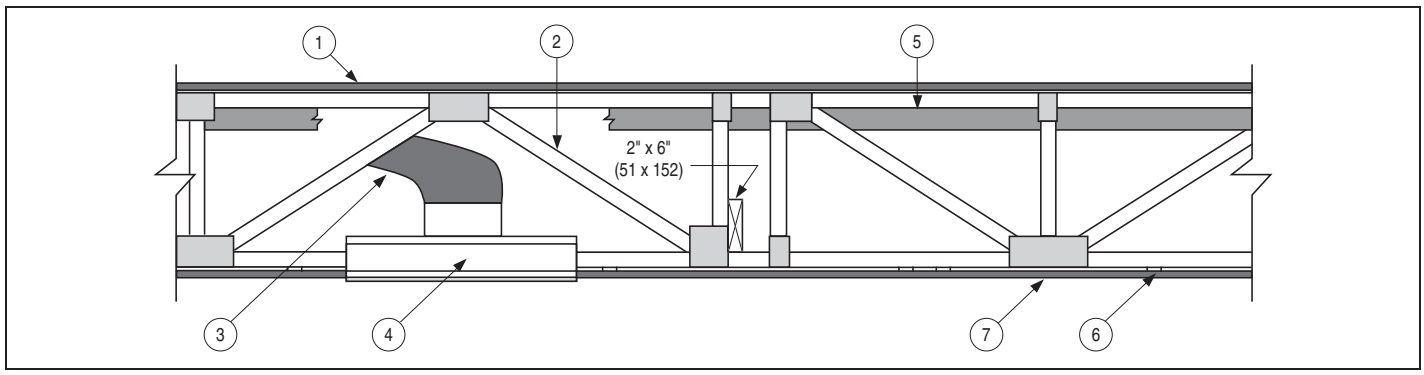
When reviewing a building code's requirements as related to fire-resistance rated assemblies, it is important that one understands each of the specific test standards and the distinction between a fire-resistance rating and a fire-protection rating. Each of the test standards used in the evaluation of the assemblies, components or penetrations has its own pass/fail criteria which are used to determine compliance or acceptance in meeting the requirements of the standard. The easiest way to understand the fundamental difference between a fire-resistance rating and a fire-protection rating is to look at the fire-resistance rating requirements found within the ASTM E 119 standard for a wall assembly and those of the fire-protection rating for a fire damper found within UL 555. While the purpose of a wall or ceiling assembly with a fire-resistance rating is to (1) to support any applied structural load, (2) to limit flames or hot gases from reaching the unexposed side and spreading the fire to the area on the opposite side, and (3) limiting the temperature rise on the unexposed side so combustible materials on that unexposed are not ignited by the increased radiant heat, the purpose of a fire-protection rating is generally to simply limit the direct passage of flame, not to limit the temperature rise on the unexposed side.

It is critical to use the proper damper at any location. Where a building code is specifically calling for a ceiling damper, it is not acceptable to install a horizontal fire damper in its place. Since ceiling dampers and fire dampers have different design and test criteria, a fire damper must not be used in place of a ceiling damper and vice versa. Because standard ceiling dampers are investigated to UL 555C and must be labeled as such, it will be easy to distinguish between a ceiling damper (UL 555C, UL Category Code CABS/CABS7) and a fire damper (UL 555, UL Category Code EMME/EMME7).

Difficulty and confusion often arises because there are numerous methods of constructing a fire resistive floor/ceiling or roof/ceiling assembly. Unlike fire dampers in a wall assembly, ceiling dampers do not come with the labeled hourly ratings that would allow them to be used interchangeably in any location that will accept the specified hourly rating. The process of selecting a ceiling damper will depend on the specific design of the floor/ceiling or roof/ceiling assembly. Engineers, contractors, installers and inspectors need to be aware of the type of rated ceiling the ceiling damper will be installed in. Where applicable and installed per their specific installation instructions, UL 555C rated ceiling dampers provide appropriate protection for air inlet or outlet penetrations in the ceiling membrane of floor/ceiling and roof/ceiling assemblies with fire resistance ratings of up to 3 hours. Use of these dampers eliminates the need to use hinged plate dampers or other alternate protection methods for the specific floor/ceiling and roof/ceiling designs shown in the UL Fire Resistance Directory (FRD).

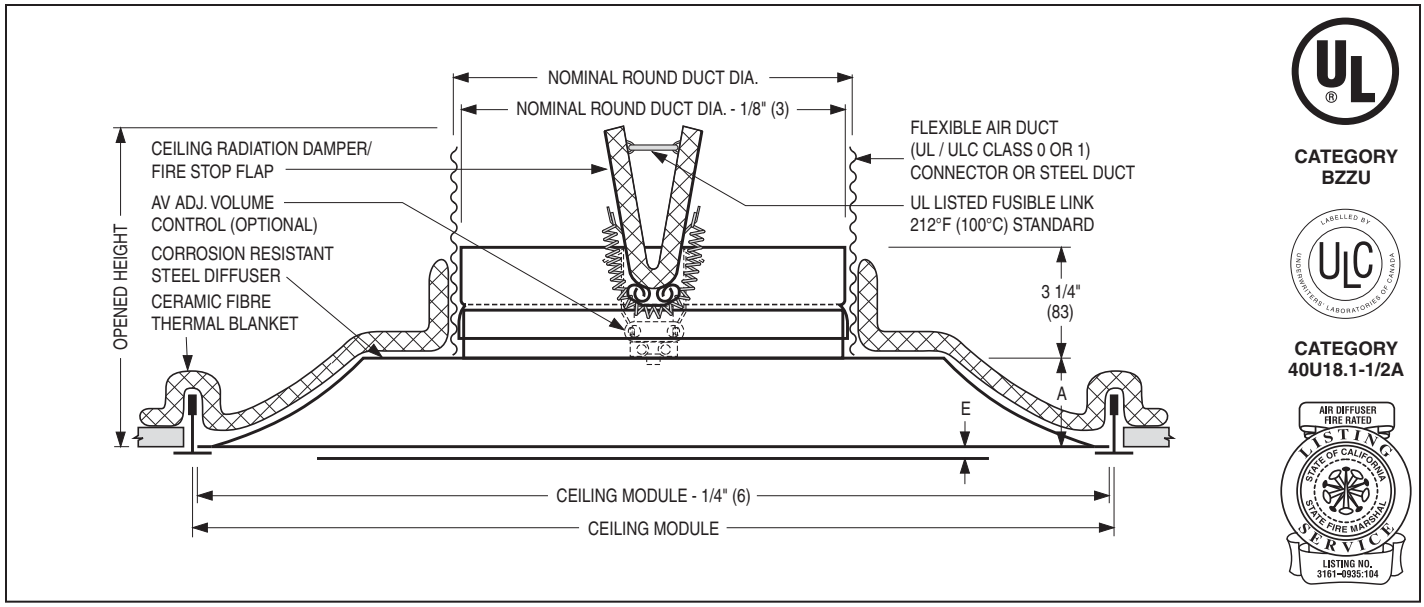
CLOSER LOOK: CEILING DAMPERS (continued)

Another commonly misunderstood construction method in terms of selecting the proper ceiling damper is the Wood Truss (or joist) Ceiling construction. Various methods for constructing wood truss floor/ceiling and roof/ceiling designs have been tested and evaluated using the fire-rating classifications criteria in UL 263. Standard ceiling dampers, where permitted, are only intended for use in those fire-resistive designs that indicate the use of a hinged door type damper in the assembly's initial testing and determination of it being a fire-resistive assembly. The UL 555C classification of the standard ceiling damper does not cover the product for general installation in any floor or ceiling assembly that was not initially tested with a hinged door type damper over the duct outlet. Wood truss ceilings have not been tested with plate dampers and therefore UL 555C classified ceiling dampers are not approved. As listed in the UL Fire Resistance Directory, these designs have specific manufacturer's components called out in their listings. These components must be used in that specific floor/ceiling and roof/ceiling design otherwise the integrity of the design may be compromised. Wood truss fire-rated ceiling designs in UL category BXUV are proprietary. Many however are very similar and can be substituted for each other to allow a product engineering approval where necessary. If a Nailor assembly number is not the specified design, work must be done with the architect and engineer to specify a new or alternate Nailor design number. A UL 555C classified ceiling damper cannot be substituted for a UL 263 classified wood truss ceiling damper assembly and still maintain the UL fire-resistive rating for the assembly.



BXUV.L550 Wood Truss Ceiling Assembly - 1 Hour UL 263 Fire Resistance Rating

Fire rated ceiling air diffusers (classifies under UL Category Code BZZU) also serve a similar function as ceiling dampers, but are tested and approved as an assembly, and assure code compliance. All system components (ducts, duct drops, hanger wires, sleeves, grilles and diffuser pan) must be constructed of steel, however the diffuser core may be non-ferrous. In installations where the opening in the ceiling membrane is larger than the ceiling damper (more than 1" [25] in any dimension), a Thermal Blanket (i.e. Nailor Model 0725 or 0725) must be installed that covers the exposed surface of the air inlet or outlet device. The thermal blanket rests upon and protects exposed portions of the air device. A wide variety of Fire Rated Diffusers Packages (diffuser, thermal blanket and ceiling damper) are available in the Nailor Air Distribution catalog, along with a wide selection of grilles and registers. These fire rated packages have been investigated using the time-temperature fire exposure and will have a label indicating so and are classified under the UL Category Code BZZU.



Nailor Models 4410-UNI/4420-UNI Fire Rated Ceiling Diffuser Package

ACTUATOR SELECTION FOR NAILOR FIRE/SMOKE DAMPERS

Smoke and combination fire/smoke dampers utilize electric or pneumatic actuators to operate the damper blades. Combination fire/smoke dampers employ a heat sensor that, when subjected to a fixed elevated temperature (165°F [74°C], 212°F [100°C], 250°F [121°C] or 350°F [177°C]), interrupts power to the actuator allowing the actuator return spring to close the damper to prevent the passage of flame and subsequently smoke. Smoke dampers do not utilize a heat sensor and simply open and close in response to an alarm signal and/or a signal from the Firefighters' Smoke Control Station (FSCS) in order to prevent smoke from passing through smoke barrier openings, to control smoke spread by creating pressure differentials within the building or to exhaust smoke from the building. Combination fire/smoke dampers can also be opened or closed from an alarm signal or the FSCS but will lock closed when the sensor is exposed to its closure temperature rating. Smoke control system design requires the use of 'spring return' type actuators so that dampers fail to the desired position upon interruption of power. The majority of applications generally require dampers that fail closed when the power is interrupted; this is a normally closed (NC) actuator connection. Occasionally, an application may require the damper to open upon interruption of power to the actuator; this is a normally open (NO) actuator connection. Nailor smoke dampers can be ordered with either fail closed or fail open operation but combination fire/smoke dampers must fail closed upon interruption of power.

FACTORY MOUNTING OF ACTUATORS

Per the latest editions of UL Standards 555 and 555S, smoke and fire/smoke damper actuators must be factory mounted. This ensures correct actuator selection (meeting damper performance requirements) and installation that is in accordance with UL procedures and requirements. All damper/actuator assemblies are cycled in the factory to ensure correct operation and therefore minimize the likelihood of problems in the field.

ACTUATOR MOUNTING CONFIGURATIONS

Damper actuators can be factory mounted using a choice of different methods, or on larger multi-section dampers, a combination of methods. Actuators are commonly mounted external to the damper (out of the air stream), however, internally mounted (in the air stream) actuators are sometimes acceptable, particularly on large multiple section dampers.

A) **Externally mounted on a damper sleeve:** Combination fire/smoke dampers are required to be installed in a sleeve. This is the preferred and most functional option due to ease of electrical connection, testing and service. The standard Nailor sleeve is 16" (406) in length, with optional non-standard lengths available.

B) **Externally mounted on a damper side plate:** As smoke dampers are not required to be mounted in a sleeve, a side mounting plate is an effective and economical method of factory mounting the actuator externally. For installation, an opening the width of the damper side plate is cut into the duct and the side plate then fills that opening.

C) **Internally mounted with a jackshaft:** Internal mounting should only be used in applications with space constraints and it cannot be avoided. There are limitations on damper sizes (See Minimum Damper Size Requirements: Internal Actuator Mounting on page C13), internally mounted actuators are more difficult to test and maintain and that internal actuator mounting may significantly reduce the damper free area, creating a higher pressure drop.

ACTUATOR MODEL SELECTIONS

Dampers and actuators are tested and qualified together under UL 555 and UL 555S to ensure proper operation. Accordingly, the appropriate actuator must be chosen from the selection of UL tested and listed actuators available from Nailor for the particular damper model being used. Consult the "HOW TO ORDER" page of the selected damper model for a list of acceptable actuators. All Nailor damper/actuator assemblies have been qualified at a minimum velocity of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa) and at an elevated temperature of 250°F (121°C) or 350°F (177°C), depending upon mounting configuration. This is the maximum operational temperature of the damper/actuator assembly.

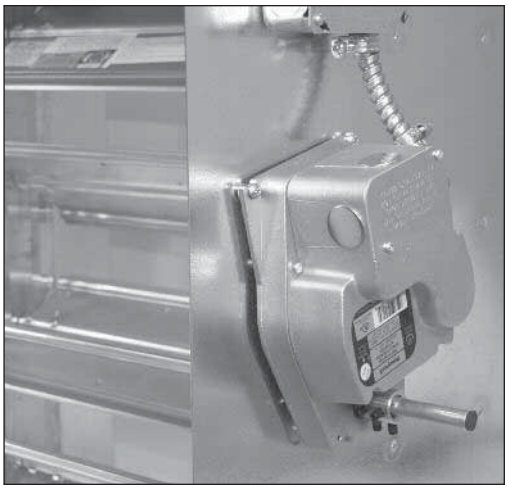
Nailor has tested and qualified actuators from major manufacturers such as Honeywell, Belimo and Siemens for use with smoke and combination fire/smoke dampers. See page C16 for Nailor's Quick Select Guide for UL Qualified Actuators for use in a) 2 position applications (open/closed) where the damper commonly remains in one position until de-energized due to fire or smoke detection or b) for use where a secondary 'dual function' capability for open/closed volume control or a modulation capability as part of the daily HVAC operation is required.

WHAT IS CONTROLLED CLOSURE?

Controlled closure is a term used when a damper is caused to close in a non-abrupt or non-instantaneous fashion via the return spring that is commonly built into today's fire/smoke damper actuators. Under normal (non-emergency) HVAC system operation power is applied to the actuator circuit to open the damper and hold it open. The actuator is wired in series with a heat responsive device that "trips" at a pre-set high temperature (fire condition) and cuts power to the actuator allowing the actuator return spring to close the damper in a "controlled" manner. A smoke detector or alarm system (by others) that cuts the power to the actuator circuit may also be incorporated into the system.

WHY CONTROLLED CLOSURE?

Traditionally, combination fire/smoke dampers have utilized a fusible link that melts under fire conditions, separating the actuator from the blades, allowing an independent spring mounted on the damper jackshaft to "snap" the damper closed instantaneously. This instantaneous closure, under certain conditions, can result in costly damage to the ductwork as the inertia of the air in motion creates extreme pressures, both negative and positive, not normally encountered or designed for in the HVAC system. With controlled closure via the actuator return spring, the damper closes in a regulated or controlled manner, usually within 15 seconds to meet common building code criteria. This permits time for upstream and downstream duct pressures to equalize more, providing a more gradual change in pressure as the damper closes, eliminating any potentially damaging instantaneous pressure differentials.



HOW DOES IT WORK?

Electric Actuator with ERL (Electric Resettable Link):

Fire Conditions: Nailor's ERL (Electric Resettable Link) detects an abnormally high temperature, 250°F (121°C) standard (165°F [74°C], 212°F [100°C] or 350°F [177°C] available), and interrupts power to the actuator allowing the actuator return spring to close the damper (controlled closure). An over-center knee-lock linkage locks the damper closed as required by NFPA 90A and UL 555. Upon a return to normal conditions, the damper may be reopened by pressing the ERL manual reset button located on the damper sleeve.
Smoke, Testing or Power Failure Conditions: If smoke is detected or during system testing or if there is a power failure, power is interrupted to the actuator, allowing the actuator return spring to close the damper (controlled closure). Upon a return to normal conditions, power is restored to the actuator and the damper automatically reopens.

CONTROLLED CLOSURE WITH NAILOR COMBINATION FIRE/SMOKE DAMPERS

Pneumatic Actuator with PRL (Pneumatic Replaceable Link):

Fire Conditions: Nailor's PRL (Pneumatic Replaceable Link) detects an abnormally high temperature, 212°F [100°C] standard,165°F [74°C] or 280°F [138°C] available), and allows the pneumatic actuator return spring to close the damper (controlled closure). An over-center knee-lock linkage locks the damper closed as required by NFPA 90A and UL 555. Upon a return to normal conditions, the damper may be reopened by replacing the fusible link on the PRL located on the damper sleeve.
Smoke, Testing or Power Failure Conditions: An EP (Electro-Pneumatic) switch (by others) must be utilized to interconnect the smoke detector with the pneumatic actuator. If smoke is detected or when system testing or if there is a power failure, the EP switch allows the pneumatic actuator return spring to close the damper (controlled closure). Upon a return to normal conditions, air pressure is restored to the actuator and the damper automatically reopens.

DTO (formerly MLS-400) Dual Temperature Override Sensor:

Fire Conditions: A 3 position master control switch (by others) must be utilized for reopenability. With the master control switch in "normal" position, Nailor's primary (low limit) heat sensor detects an abnormally high temperature, 165°F (74°C), and cuts power to the actuator allowing the actuator return spring to close the damper (controlled closure). The primary heat sensor can be bypassed to reopen the damper for smoke management purposes by placing the master control switch to the "reopen" position. The damper remains operational until the secondary (high limit) heat sensor's temperature is reached (250°F [121°C] standard, 350°F [177°C] optional) at which time power is cut to the actuator allowing the actuator return spring to close the damper (controlled closure) and lock it closed as required by NFPA 90A and UL 555. Upon a return to normal conditions, the damper may be reopened by pressing the sensor manual reset button located on the damper sleeve.
Smoke, Testing or Power Failure Conditions: If smoke is detected or during system testing or if there is a power failure, power is interrupted to the actuator, allowing the actuator return spring to close the damper (controlled closure). Upon a return to normal conditions, power is restored to the actuator and the damper automatically reopens. To close the damper for smoke management purposes place the master control switch (by others) to the "closed" position.

ACTUATOR SPACE ENVELOPE REQUIREMENTS & SLEEVE DIMENSIONAL DATA FOR COMBINATION FIRE/SMOKE DAMPERS

Nailor recommends that actuators are externally mounted whenever possible. Internal actuator mounting (in the airstream) should be avoided if possible as actuators are more difficult to access for field power connection, testing and service. Externally mounted actuators require space outside of the damper sleeve.

Nailor mounts all actuators in the horizontal plane as standard when there is not sufficient room to mount the actuator vertically on the damper sleeve without overhang. This is done for two reasons:

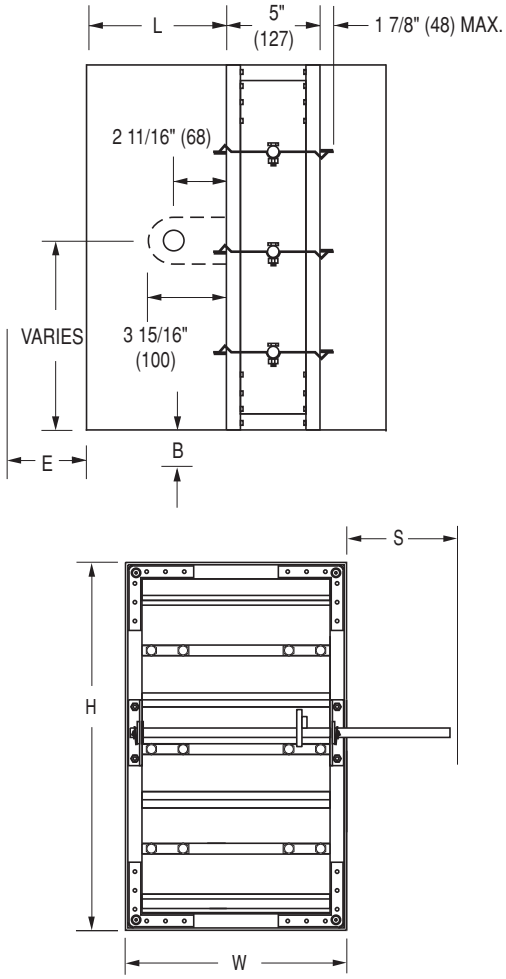
1. To eliminate the overhang of actuators either above or below the damper sleeve, which may impede field installation where space is limited. For this reason, actuators extend ahead of the damper sleeve end, in the direction of the connecting ductwork. The 'S' and 'E' dimensions in the diagram below illustrate the clearance requirements for the various available actuators.
2. To provide maximum clearance for installation of retaining angles.

On dampers 12" (305) in height and under, the ERL heat sensor junction box is mounted on the underside of the damper sleeve as standard, represented by the 'B' dimension in the diagram below, and is 2 1/4" (57) maximum. On dampers over 12" (305) in height, the ERL heat sensor junction box is normally located on the side of the sleeve, above the actuator.

For a 16" (406) sleeve, the standard location of a damper mounted within in a factory sleeve is 8" (203), represented by the 'L' dimension on the diagram below. The damper can be positioned at other locations within the sleeve, between a range of 8" to 11" (203 to 279).

For non-standard mounting arrangements, contact your Nailor representative.

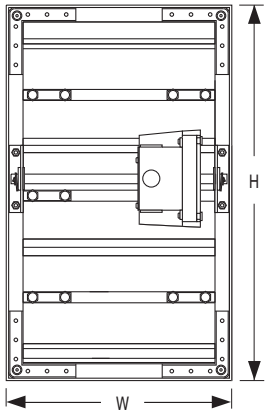
Actuator Type/Model	S Dimension	E Dimension
Electric		
ML4X02 120 VAC Honeywell	5 3/4" (146)	1 9/16" (40)
ML8X02 24 VAC Honeywell	5 3/4" (146)	1 9/16" (40)
ML4Y02 230 VAC Honeywell	5 3/4" (146)	1 9/16" (40)
FSLF120 120 VAC Belimo	5 3/4" (146)	5/8" (16)
FSLF24 24 VAC Belimo	5 3/4" (146)	5/8" (16)
FSLF230 230 VAC Belimo	5 3/4" (146)	5/8" (16)
ML4115 120 VAC Honeywell	5 3/4" (146)	1 9/16" (40)
ML8115 24 VAC Honeywell	5 3/4" (146)	1 9/16" (40)
MS4X09F 120 VAC Honeywell	5 3/4" (146)	1 9/16" (40)
MS8X09F 120 VAC Honeywell	5 3/4" (146)	1 9/16" (40)
MS4Y09F 230 VAC Honeywell	5 3/4" (146)	1 9/16" (40)
FSNF120 120 VAC Belimo	5 3/4" (146)	2 7/8" (73)
FSNF24 24 VAC Belimo	5 3/4" (146)	2 7/8" (73)
FSNF230 230 VAC Belimo	5 3/4" (146)	2 7/8" (73)
MS4120F 120 VAC Honeywell	5 3/4" (146)	3 4/5" (97)
MS8120F 24 VAC Honeywell	5 3/4" (146)	3 4/5" (97)
MS4620F 230 VAC Honeywell	5 3/4" (146)	3 4/5" (97)
GGD221 120 VAC Siemens	5 3/4" (146)	3 3/4" (95)
GGD121 24 VAC Siemens	5 3/4" (146)	3 3/4" (95)
GGD321 230 VAC Siemens	5 3/4" (146)	3 3/4" (95)
FSAF-BAL 24 VAC/DC Belimo	5 3/4" (146)	3 1/3" (84)
MS7510 24 VAC Honeywell	5 3/4" (146)	2 7/8" (73)
FSAF-SR 24 VAC/DC Belimo	5 3/4" (146)	3 1/3" (84)
Pneumatic		
331-2961 Siemens #4	7" (178)	11 1/2" (292)
331-3060 Siemens #6	9 1/4" (235)	15 1/2" (394)
331-4826 Siemens #4 w/Pos. Relay	7" (178)	11 1/2" (292)



INTERNAL ACTUATOR MOUNTING MINIMUM SIZE REQUIREMENTS

Internal (in the airstream) actuator mounting should only be specified where space constraints dictate. There are limitations on smaller sizes and with the MLS-300N and DTO (MLS-400) accessories. Damper free area is also greatly reduced and hence pressure drop will increase significantly on smaller sizes.
A general guideline for internal actuator mounting on traditional combination fire/smoke dampers is as follows:

Actuator Type	Minimum Damper Size	
	Without accessories	With MLS-300N or DTO
Electric	10" W x 8" H (254 x 203)	10" W x 12" H (254 x 305)
Pneumatic	10" W x 10" H (254 x 254)	10" W x 12" H (254 x 305)

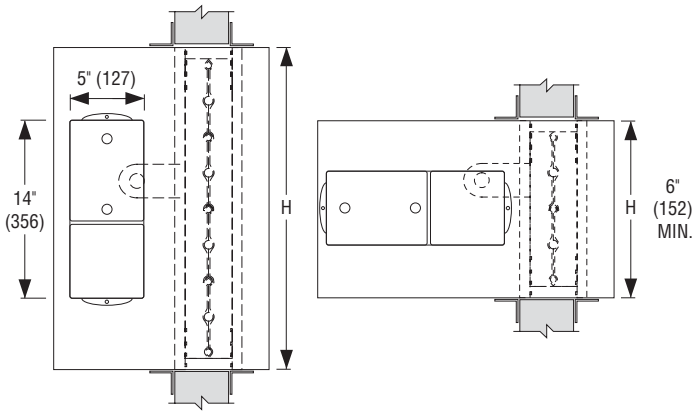


FACTORY MOUNTED DUCT SMOKE DETECTOR MINIMUM SIZE REQUIREMENTS

Factory Mounted Duct Smoke Detector Minimum Size Requirements								
Duct Smoke Detector Type	Actuator Type	Actuator Mounting	Min. Sleeve Length (SL)	Min. Damper Position (L)	Minimum Damper Size			
					Type A		Type C (CO/CSR; CR)	
					Without Accessories	w/ MLS-300N or DTO (MLS-400)	Without Accessories	w/ MLS-300N or DTO (MLS-400)
DSD-LF Low Flow	Electric	External	23" (584)	9" (229)	6" W x 6" H (152 x 152)	6" W x 6" H (152 x 152)	4" W x 4" H; 4" dia. (102 x 102; 102 dia.)	4" W x 4" H; 4" dia. (102 x 102; 102 dia.)
	Pneumatic[2]							
DSD-LF Low Flow	Electric	Internal	–	–	–	–	–	–
	Pneumatic[2]							
DSD-NF No Flow[3]	Electric	External	17" (432)	9" (229)	10" W x 10" H (254 x 254)	10" W x 10" H[3] (254 x 254)	8" W x 8" H; 8" dia. (203 x 203; 203 dia.)	8" W x 8" H; 8" dia. (203 x 203; 203 dia.)
	Pneumatic[2]							
DSD-NF No Flow[3]	Electric	Internal	17" (432)	9" (229)	10" W x 23" H (254 x 584)	12" W x 23" H (305 x 584)	8" W x 21" H (203 x 533)	10" W x 21" H (254 x 533)
	Pneumatic[2]							

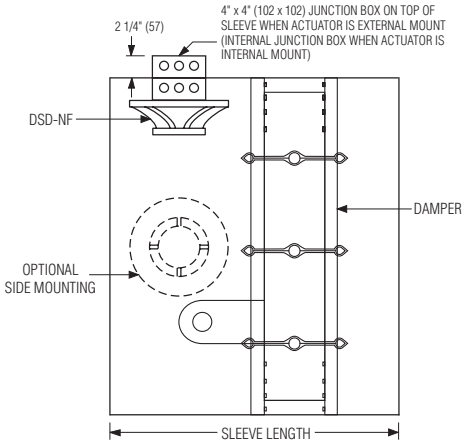
NOTES:

1. Dimensions shown above are for Vertical and Horizontal Mounting.
2. An Electro-Pneumatic (EP) Switch is required when a Duct Smoke Detector is selected on a damper with a pneumatic actuator.
3. For Damper Heights ≤ 10" (254), DSD-NF No Flow Smoke Detector is mounted on the underside of the damper sleeve next to the ERL/DTO junction box. Allow for 2 1/4" (57) clearance for junction box on bottom.
4. DSD-LF and DSD-NF available as a factory mounted option on Model Series 1210, 1260, 1280, 1220 and 1270 dampers with Type A or Type C (CSR, CO, CR) sleeves only. Smoke detectors can be ordered as a seperate item, shipped loose for field installation where required.



Height ≥ 20" (508) **Height < 20" (508)**

DSD-LF Low Flow Duct Smoke Detector



DSD-NF No Flow Duct Smoke Detector

For further guidance and application on a job specific basis, contact your Nailor representative.

ACTUATOR REPLACEMENT/FIELD MODIFICATIONS OF UL CLASSIFIED DAMPERS

FIELD MODIFICATIONS OR REPAIRS

UL Classified dampers are manufactured in accordance with UL Follow-Up Procedures (as part of their Follow-Up Services program) which include arbitrary visits by UL representatives to the manufacturing facilities in order to verify that the classified products are being manufactured correctly. As long as the manufacturer adheres to the Follow-Up Procedures stringent production guidelines, it can continue to apply UL labels to the product.

However, once a UL Classified damper assembly leaves the manufacturer's factory it no longer falls under the scrutiny of the UL Follow-Up Services and any modification or repair work performed on the classified product is subject to the approval of the local Authority Having Jurisdiction (AHJ). Typically, the AHJ is a local authoritative body familiar with local fire and building codes, authorized to approve proper application and installation of building construction products. The AHJ may consult with the certification organization (i.e. UL) or the manufacturer of the product or other information sources for advice or assistance in determining the acceptability of the product, installation or repair. If a modification is significant enough in the AHJ's opinion, he may request, at a cost, a UL Field Evaluation to determine if it meets UL safety requirements before he gives approval.

ACTUATOR REPLACEMENT IN THE FIELD

Although UL Classified damper/actuator assemblies are designed and rigorously tested to provide many years of service, occasionally field reparation by replacing a non-functioning actuator may become necessary. Electric actuators, being electronic devices, are susceptible to damage from incorrect field wiring, accidental voltage spikes and a variety of other abuses that can cause them to fail. Pneumatic actuators, by inherent design, are less likely to fail due to abuse, but none the less, can fail due to exposure to extreme temperatures, line pressures, etc.

Although fire/smoke damper actuators are required to be factory mounted, when an actuator fails the assembly need not be returned to the manufacturer for repair. Replacement actuators may be field installed by anyone acceptable to the AHJ. It is the responsibility of the AHJ to determine that the correct actuator is used and that it is installed properly in accordance with the manufacturer's installation instructions. A UL Field Inspection or Evaluation is not required in order to approve the installation of a replacement actuator.

NAILOR INDUSTRIES . . . . YOUR AUTHORIZED REPLACEMENT ACTUATOR SOURCE

Contact your Nailor representative for guidance in ordering the correct replacement actuator for your specific damper. Nailor can provide manufacturer's installation instructions for all types of dampers.

2 Position: Power Open/Fail Closed (Damper Normally Closed [NC])

	Model	Voltage/ Air Pressure
	ELECTRIC	
For **Low Torque** Operations	ML4X02 Honeywell	120 VAC
	ML8X02 Honeywell	24 VAC
	ML4Y02 Honeywell	230 VAC
	ML4115 Honeywell	120 VAC
	ML8115 Honeywell	24 VAC
For **Medium Torque** Operations	MS4X09F Honeywell	120 VAC
	MS8X09F Honeywell	24 VAC
	MS4Y09F Honeywell	230 VAC
	FSNF120 Belimo	120 VAC
	FSNF24 Belimo	24 VAC
For **High Torque** Operations	MS4120F Honeywell	120 VAC
	MS8120F Honeywell	24 VAC
	MLS4620F Honeywell	230 VAC
	GGD121 Siemens	24 VAC
	GGD221 Siemens	120 VAC
	PNEUMATIC	
For **Low/ Med. Torque** Operations	331-2961 Siemens #4	25 psi
For **Medium/ High Torque** Operations	331-3060 Siemens #6	25 psi

Modulating: Fail Closed (Damper Normally Closed [NC])

	Model	Voltage/ Air Pressure
	ELECTRIC	
For **All** Operations	MS7510A Honeywell	24 VAC
	FSAF24-SR Belimo	24 VAC/VDC
	PNEUMATIC	
For **All** Operations	331-2961PR Siemens #4 w/ Pos. Relay	25 psi

Balancing: Fail Closed (Damper Normally Closed [NC])

	Model	Voltage/ Air Pressure
	ELECTRIC	
For **All** Operations	FSAF24-BAL Belimo	24 VAC/VDC

Smoke Dampers Only: 2 Position: Power Closed/Fail Open (Damper Normally Open [NO])

	Model	Voltage/ Air Pressure
	ELECTRIC	
For **All** Operations	MS4120F Honeywell	120 VAC
	MS8120F Honeywell	24 VAC
	MLS4620F Honeywell	230 VAC

All actuators listed here have been UL approved for specific damper sizes and a velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @1 kPa). Higher velocity/pressure ratings (up to 4000 fpm and 8" w.g. [20 m/s and 2 kPa]) are available with size and model restrictions.

ACTUATOR SELECTION CHECK LIST:

- ☑ **Type of Actuator:** Electric **or** Pneumatic.
- ☑ **Power Requirements:** 24, 120 or 230 Volt AC (Electric) or 25 psi Air Pressure (Pneumatic).
- ☑ **Operation Type:** 2 Position (Open/Closed), Modulating or Balancing (Volume Control).
- ☑ **Application:** (Smoke dampers only) Damper to Fail Closed (NC) or Damper to Fail Open (NO).
- ☑ **UL Limitations:** Confirm damper size, airflow velocity, pressure rating and elevated temperature requirements. Nailor will auto-select optimum actuator.
- ☑ **Mounting Position:** External Mount (LH or RH) with sleeve/side mounting plate or Internal Mount (Consult "Actuator Space Envelope Requirements").
- ☑ **Accessories:** MLS-300N Position Indicator Switch Pack or DTO Dual Temperature Sensor/Switch Pack, Electric-Pneumatic Switch, Damper Test Switch, Damper Control Panel, Duct Smoke Detector, if required.

Note: Nailor Actuator Quick Select Guide is for informational purposes only.
Please see the information provided for specific models and consult your Nailor representative for additional information.

QUICK SELECT GUIDE

Nailor Industries offers a full line of damper products dedicated to fire protection and smoke protection/management. All models shown have been tested by Underwriter's Laboratories and are listed or classified for use as indicated. Each model meets the requirements of the National Fire Protection Association (NFPA) Standard 90A and other NFPA Standards specific to each model, as well as requirements put forth by the International Building Code (IBC), National Building Code of Canada (NBC) and associated local building codes. In addition, many products are approved for use by the California State Fire Marshall and the City of New York Board of Standards and Appeals (BSA) and Materials and Equipment Acceptance (MEA) index. Nailor products have been tested and listed or classified in accordance with the following UL Safety Standard procedures, and each damper bears a relative label identifying the same.

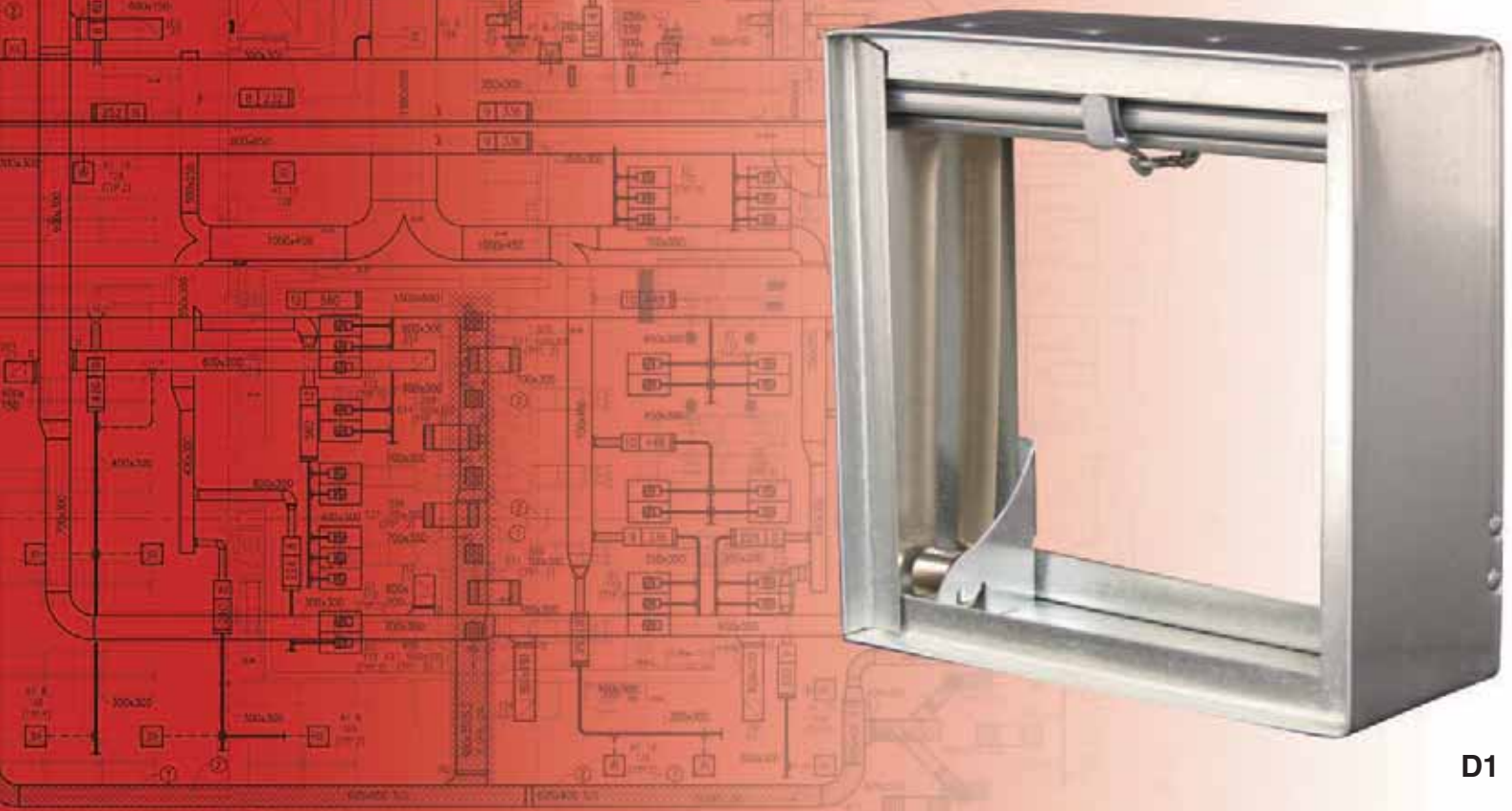
Model Series	Damper Type	UL Classification	UL File #	City of New York MEA or BSA #	California State Fire Marshall Listing #
Dynamic Fire Dampers - For Use in Dynamic or Static Systems					
D0100	Curtain Type, Steel	1 1/2 hour label for walls & floors	R9492	460-88-SA	3225-0935:0113
D0114	Curtain Type, Steel with Integral Sleeve	1 1/2 hour label for walls & floors	R9492	460-88-SA	3225-0935:0113
D0500	Curtain Type, Steel	3 hour label for walls & floors	R9492	460-88-SA	3225-0935:0113
D0114HY	Hybrid, Steel with Integral Sleeve	1 1/2 hour label for walls & partitions	R9492	460-88-SA	3225-0935:0113
D0100G	Curtain Type, Steel with Integral Grille Mounting Tabs and Sleeve	1 1/2 hour label for walls & floors	R9492	460-88-SA	3225-0935:0113
D0110GOW	Curtain Type, Steel, Out of Wall, with Integral Grille Mounting Flanges and Sleeve	1 1/2 hour label for walls & floors	R9492	460-88-SA	3225-0935:0113
D1250	Multi-Blade, Steel Vee Groove	1 1/2 hour label for walls & floors	R9492	460-88-SA	3225-0935:0101
D1200	Multi-Blade, Steel Airfoil	1 1/2 hour label for walls & floors	R9492	366-03-M	3225-0935:0101
D1200-3	Multi-Blade, Steel Airfoil	3 hour label for walls & floors	R9492	366-03-M	3225-0935:0101
D1200SS	Multi-Blade, Stainless Steel Airfoil	1 1/2 hour label for walls	R9492	366-03-M	3225-0935:0101
D1200SS-3	Multi-Blade, Stainless Steel Airfoil	3 hour label for walls	R9492	366-03-M	3225-0935:0101
D1201-DOW	Multi-Blade, Steel Airfoil, Out of Wall, for Through Penetrations (Ducted Both Ends)	1 1/2 hour label for walls & floors	R9492	—	3225-0935:0101
D1201-OW	Multi-Blade, Steel Airfoil, Out of Wall, Grille Mount with Damper Access	1 1/2 hour label for walls & floors	R9492	—	3225-0935:0101
1290F	True Round, Steel	1 1/2 hour label for walls & floors	R9492	366-03-M	3225-0935:0101
1290F-SS	True Round, Stainless Steel	1 1/2 hour label for walls & floors	R9492	366-03-M	3225-0935:0101
Static Fire Dampers - For Use in Static Systems Only					
0100	Curtain Type, Steel	1 1/2 hour label for walls & floors	R9492	460-88-SA	3225-0935:0100
0114	Curtain Type, Steel with Integral Sleeve	1 1/2 hour label for walls & floors	R9492	460-88-SA	3225-0935:0100
0500	Curtain Type, Steel	3 hour label for walls & floors	R9492	460-88-SA	3225-0935:0100
0200	Curtain Type, Steel, Thinline Frame	1 1/2 hour label for walls & floors	R9492	460-88-SA	3225-0935:0100
0570	Curtain Type, Steel, Thinline Frame	3 hour label for walls & partitions	R9492	460-88-SA	3225-0935:0100
0310	Curtain Type, Steel, Wide Frame	1 1/2 hour label for walls & floors	R9492	460-88-SA	3225-0935:0100
0540	Curtain Type, Steel, Wide Frame	3 hour label for walls & partitions	R9492	460-88-SA	3225-0935:0100
0100G	Curtain Type, Steel with Integral Grille Mounting Tabs and Sleeve	1 1/2 hour label for walls & floors	R9492	460-88-SA	3225-0935:0100
0200G	Curtain Type, Steel, Thinline Frame with Integral Grille Mounting Tabs and Sleeve	1 1/2 hour label for walls & floors	R9492	460-88-SA	3225-0935:0100
0110GOW	Curtain Type, Steel, Out of Wall, with Integral Grille Mounting Flanges and Sleeve	1 1/2 hour label for walls & floors	R9492	460-88-SA	3225-0935:0100
0130GC	Curtain Type, Steel, Garbage Chute Applications	1 1/2 hour label for floors	R9492	460-88-SA	3225-0935:0100
1200	Multi-Blade, Steel Airfoil	1 1/2 hour label for walls & floors	R9492	366-03-M	3225-0935:0101
1200-3	Multi-Blade, Steel Airfoil	3 hour label for walls & floors	R9492	366-03-M	3225-0935:0101
1200SS	Multi-Blade, Stainless Steel Airfoil	1 1/2 hour label for walls	R9492	366-03-M	3225-0935:0101
1200SS-3	Multi-Blade, Stainless Steel Airfoil	3 hour label for walls	R9492	366-03-M	3225-0935:0101

Model Series	Damper Type	UL Classification	UL File #	City of New York MEA or BSA #	California State Fire Marshall Listing #
Smoke Dampers					
1260	Multi-Blade, Steel Vee Groove	Leakage Class I or II @ 250°F or 350°F	R9492	460-88-SA	3230-0935:0107
1210	Multi-Blade, Steel Airfoil	Leakage Class I or II @ 250°F or 350°F	R9492	366-03-M	3230-0935:0107
1280	Multi-Blade, Aluminum Airfoil	Leakage Class I or II @ 250°F or 350°F	R9492	366-03-M	3230-0935:0107
1210SS	Multi-Blade, Stainless Steel Airfoil	Leakage Class I or II @ 250°F	R9492	366-03-M	3230-0935:0107
1210M	Multi-Blade, Steel Airfoil, Modulating (Volume Control)	Leakage Class I @ 250°F	R9492	366-03-M	3230-0935:0107
1210BAL	Multi-Blade, Steel Airfoil, Balancing	Leakage Class I @ 250°F	R9492	366-03-M	3230-0935:0107
1210VB	Multi-Blade, Steel Airfoil, Vertical	Leakage Class I or II @ 250°F	R9492	366-03-M	3230-0935:0107
1290S	True Round, Steel	Leakage Class I @ 350°F	R9492	366-03-M	3230-0935:0107
1290S-SS	True Round, Stainless Steel	Leakage Class I @ 350°F	R9492	366-03-M	3230-0935:0107
Combination Fire & Smoke Dampers					
1270	Multi-Blade, Steel Vee Groove	1 1/2 hour label Leakage Class I or II @ 250°F or 350°F	R9492	460-88-SA	3225-0935:0106
1220	Multi-Blade, Steel Airfoil	1 1/2 hour label Leakage Class I or II @ 250°F or 350°F	R9492	366-03-M	3225-0935:0106
1220-3	Multi-Blade, Steel Airfoil	3 hour label Leakage Class I or II @ 250°F or 350°F	R9492	366-03-M	3225-0935:0106
1220SS	Multi-Blade, Stainless Steel Airfoil	1 1/2 hour label for Leakage Class I or II @ 250°F	R9492	366-03-M	3225-0935:0106
1220SS-3	Multi-Blade, Stainless Steel Airfoil	3 hour label for Leakage Class I or II @ 250°F	R9492	366-03-M	3225-0935:0106
1220BAL	Multi-Blade, Steel Airfoil, Balancing	1 1/2 hour label Leakage Class I @ 250°F	R9492	366-03-M	3225-0935:0106
1220BAL-3	Multi-Blade, Steel Airfoil, Balancing	3 hour label Leakage Class I @ 250°F	R9492	366-03-M	3225-0935:0106
1220M	Multi-Blade, Steel Airfoil, Modulating (Volume Control)	1 1/2 hour label Leakage Class I @ 250°F	R9492	366-03-M	3225-0935:0106
1220M-3	Multi-Blade, Steel Airfoil, Modulating (Volume Control)	3 hour label for Leakage Class I @ 250°F	R9492	366-03-M	3225-0935:0106
1271G	Multi-Blade, Steel Vee Groove, with Integral Grille Mounting Tabs and Sleeve	1 1/2 hour label Leakage Class I or II @ 250°F or 350°F	R9492	366-03-M	3225-0935:0106
1221G	Multi-Blade, Steel Airfoil, with Integral Grille Mounting Tabs and Sleeve	1 1/2 hour label for walls & floors Leakage Class I or II @ 250°F or 350°F	R9492	366-03-M	3225-0935:0106
1221VB	Multi-Blade, Steel Airfoil, Vertical	1 1/2 hour label for Leakage Class I or II @ 250°F	R9492	366-03-M	3225-0935:0106
1221-DOW	Multi-Blade, Steel Airfoil, Out of Wall, for Through Penetrations (Ducted Both Ends)	1 1/2 hour label Leakage Class I @ 250°F or 350°F	R9492	366-03-M	3225-0935:0106
1221-OW	Multi-Blade, Steel Airfoil, Out of Wall, Grille Mount with Damper Access	1 1/2 hour label Leakage Class I @ 250°F or 350°F	R9492	366-03-M	3225-0935:0106
1290FS	True Round, Steel	1 1/2 hour label for Leakage Class I @ 250°F or 350°F	R9492	366-03-M	3225-0935:0106
1290FS-SS	True Round, Stainless Steel	1 1/2 hour label for Leakage Class I @ 250°F or 350°F	R9492	366-03-M	3225-0935:0106
1271C-1	Multi-Blade, Steel Vee Groove, Tunnel Corridor Combination Fire/Smoke Damper with Steel Grille	1 hour label for corridors Leakage Class I or II @ 250°F or 350°F	15441 & R9492	—	3225-0935:0106
1271C-2	Multi-Blade, Steel Vee Groove, Tunnel Corridor Combination Fire/Smoke Damper, Ducted Installation	1 hour label for corridors Leakage Class I or II @ 250°F or 350°F	15441 & R9492	—	3225-0935:0106
1271C-3	Multi-Blade, Steel Vee Groove, Tunnel Corridor or Combination Fire/Smoke Damper	1 hour label for corridors 1 1/2 hour label for walls & floors Leakage Class I or II @ 250°F or 350°F	R9492	—	3225-0935:0106
1221C-1	Multi-Blade, Steel Airfoil, Tunnel Corridor Combination Fire/Smoke Damper with Steel Grille	1 hour label for corridors Leakage Class I @ 250°F or 350°F	R9492	—	3225-0935:0106
1221C-2	Multi-Blade, Steel Airfoil, Tunnel Corridor Combination Fire/Smoke Damper, Ducted Installation	1 hour label for corridors Leakage Class I @ 250°F or 350°F	R9492	—	3225-0935:0106
1221C-3	Multi-Blade, Steel Airfoil, Tunnel Corridor or Combination Fire/Smoke Damper	1 hour label for corridors 1 1/2 hour label for walls & floors Leakage Class I @ 250°F or 350°F	R9492	—	3225-0935:0106

Model Series	Damper Type	UL Classification	UL File #	City of New York MEA or BSA #	California State Fire Marshall Listing #
Ceiling Dampers					
0714	Rectangular/Square, Single Hinged Blade	3 hour Ceiling Damper	R9660	460-88-SA	3225-0935:0102
0716	Rectangular/Square, Butterfly Blade Style	3 hour Ceiling Damper	R9660	460-88-SA	3225-0935:0102
0716A	Rectangular/Square, Butterfly Blade Style, with Adjustable Volume Control	3 hour Ceiling Damper	R9660	480-88-SA	3225-0935:0102
0716-4	Rectangular/Square, Low Profile, Dual Butterfly Blades Style	3 hour Ceiling Damper	R9660	460-88-SA	3225-0935:0102
0716-4A	Rectangular/Square, Low Profile, Dual Butterfly Blade Style, with Adjustable Volume Control	3 hour Ceiling Damper	R9660	480-88-SA	3225-0935:0102
0720	Rectangular/Square, Low Profile, Curtain Type	3 hour Ceiling Damper	R9660	366-03-M	3225-0935:0102
0722A	Round, Butterfly Blade Style, with Adjustable Volume Control	3 hour Ceiling Damper	R9660	480-88-SA	3225-0935:0102
0722-LE 0722-SE	Round, Butterfly Blade Style, with Extended Frame	3 hour Ceiling Damper	R9660	480-88-SA	3225-0935:0102
0722A-LE 0722A-SE	Round, Butterfly Blade Style, with Extended Frame and Adjustable Volume Control	3 hour Ceiling Damper	R9660	480-88-SA	3225-0935:0102
0725/0726	Thermal Blanket for Round/Rectangular/Square Diffusers	3 hour Thermal Blanket Accessory	R9660	—	3225-0935:0102
0755/ 0755A	For Specific Wood Truss Ceiling Assemblies	1 hour ceiling damper for use in UL design # L550/L562/L574/L579/L585/M503 and # P531/P538/P545/P547/P552	R9660	—	3226-0935:0114
0756	For Specific Wood Truss Ceiling Assemblies, Grille Mount, Steel Plenum, Side Inlet(s)	1 hour ceiling damper for use in UL design # L550/L562/L574/L579/L585/M503 and # P531/P538/P545/P547/P552	R9660	—	3226-0935:0114
0756D	For Specific Wood Truss Ceiling Assemblies, Ducted, Steel Plenum, Side Inlet(s)	1 hour ceiling damper for use in UL design # L550/L562/L574/L579/L585/M503 and # P531/P538/P545/P547/P552	R9660	—	3226-0935:0114
0757	For Specific Wood Truss Ceiling Assemblies, Grille Mount, Steel or Fiberglass Plenum by Others	1 hour ceiling damper for use in UL design # L550/L562/L574/L579/L585/M503 and # P531/P538/P545/P547/P552	R9660	—	3226-0935:0114
0757D	For Specific Wood Truss Ceiling Assemblies, Ducted, Steel or Fiberglass Plenum by Others	1 hour ceiling damper for use in UL design # L550/L562/L574/L579/L585/M503 and # P531/P538/P545/P547/P552	R9660	—	3226-0935:0114
0758/0759 0760/0761 0762	For Specific Wood Truss Ceiling Assemblies	1 hour ceiling damper for use in UL design # L550/L574/L579/L585/M503 and # P531/P545/P547/P552	R9660	—	3226-0935:0114
0763	For Specific Wood Truss Ceiling Assemblies, Insulated Steel Plenum by Others	1 hour ceiling damper for use in UL design # L550/L574/L579/L585/M503 and # P531/P545/P547/P552	R9660	—	3226-0935:0115

Nailor® Industries Inc.

CURTAIN FIRE DAMPERS



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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

MODEL SERIES D0100G (1 1/2 HR.)
INTEGRAL SLEEVE FOR GRILLE MOUNT

Model Series D0100G Dynamic Curtain Fire Dampers are designed for use in conjunction with a steel grille when ductwork terminates at an opening in a fire rated wall/partition. This unique product utilizes special grille mounting tabs on the sleeve that eliminates the requirement for unsightly retaining angles which commonly protrude from behind the grille. A steel grille installs over and completely conceals the mounting tabs for a clean, aesthetic finish. The fire damper is offset in the sleeve to accommodate a single or double deflection supply air grille, single deflection supply air register or a return air grille or register. Countersunk screw holes in the grille frame will match to mounting tabs when a Nailor grille is ordered in conjunction with the damper assembly.

Model D0110G

Model D0110GOW

MODEL SERIES D0110GOW (1 1/2 HR.)
OUT OF WALL • INTEGRAL SLEEVE FOR GRILLE MOUNT

Model D0110GOW is an "out of wall or floor" integral sleeve dynamic curtain type fire damper specifically designed for supply or return ducts that terminate at a grille or register. UL approved for use where local building codes require the protection of HVAC ductwork penetrations in walls, partitions or floors that have a fire resistance rating of up to 2 hours. The design provides sufficient damper off-set to accommodate most commercial grille/register designs while ensuring an approved installation in any fire partition or wall no matter how narrow. This model is particularly suited for use in common steel stud drywall partition designs as narrow as 3 1/2" (89), where a traditional "within the plane of the wall" fire damper installation is not possible.

STATIC CURTAIN FIRE DAMPERS

MODEL SERIES 0100/01X4 (1 1/2 HR.)

Series 0100V/H and 01X4V/H Static Curtain Fire Dampers, for use in static "fans off" systems where the HVAC system shuts down in the event of a fire, are UL approved to provide protection of HVAC ductwork penetrations in walls, partitions or floors that have a fire resistance rating of 2 hours or less. The design features corrosion resistant steel frame and blades for performance that lasts and a choice of transition styles to suit duct size. Model Series 01X4V/H includes an integral sleeve to make jobsite installation fast and easy.

Model 0110V

Model 0210V

MODEL SERIES 0200V/H (1 1/2 HR.)
THINLINE FRAME

Series 0200V/H Thinline Frame Static Curtain Fire Dampers are UL approved for use where building codes require the protection of HVAC ductwork penetrations in walls, partitions or floors that have a fire resistance rating of 2 hours or less, classified for use only in static "fans off" systems where the HVAC system is automatically shut down in the event of a fire alarm. Series 0200 Thinline Frame Dampers are only 2" (51) deep making them ideal for installation in narrow fire rated partitions, transfer duct openings, behind grilles or in any other application where space is limited.

MODEL 0310V/H (1 1/2 HR.)
WIDE FRAME

Model 0310V/H Wide Frame Static Curtain Fire Damper is UL approved for use where local building codes require the protection of HVAC ductwork penetrations in walls, partitions or floors that have a fire rating of 2 hours or less, classified for use only in static "fans off" systems where the HVAC system is automatically shut down in the event of a fire alarm. The wide frame allows for fewer blades and is ideal for use when maximum free area is desired in situations where space or design does not yield room for a Type B damper style.

Model 0310V

Model 0510V

MODELS 0510V/H, 0520V/H, 0530V/H (3 HR.)
STANDARD FRAME

Models 0510V/H, 0520V/H and 0530V/H Standard Frame Static Curtain Fire Dampers, for use in static "fans off" systems where the HVAC system shuts down in the event of a fire, are UL approved to provide protection of HVAC ductwork penetrations in walls, partitions or floors that have a fire resistance rating of 4 hours or less. The 0500V/H Series features corrosion resistant steel frame and blades for performance that will last and a choice of transition styles and factory installed sleeves to suit duct size, making installation fast and simple.

MODELS 0570V, 0580V, 0590V (3 HR.)
THINLINE FRAME

Models 0570V, 0580V and 0590V Thinline Static Curtain Fire Dampers are UL approved for use where building codes require the protection of HVAC ductwork penetrations in vertical fire separations (walls or partitions) that have a fire resistance rating of 4 hours or less, classified for use in static "fans off" systems where the HVAC system is automatically shut down in the event of a fire alarm. These thinline dampers are only 2" (51) deep, making them ideal for installation in narrow fire rated partitions, transfer duct openings, behind grilles or any other application where room is limited. They feature corrosion resistant steel frame and blades for lasting performance and a choice of transition styles and factory installed sleeves to suit duct size, making installation fast and simple.

Model 0570V

Model 0540V

MODEL 0540V (3 HR.)
WIDE FRAME

Model 0540V Wide Frame Static Curtain Fire Damper is UL approved for use where building codes require the protection of HVAC ductwork penetrations in vertical fire separations (walls or partitions) that have a fire resistant rating of 4 hours or less. The 0540 is classified for use in static "fans off" systems where the HVAC system is automatically shut down in the event of a fire and is ideal for applications where maximum free area is desired, in situations where space or design does not yield room for a Type B damper style. The design includes corrosion resistant steel frame and blades for lasting performance and is available with factory installed sleeve for fast and simple installation.

MODEL SERIES 0100G (1 1/2 HR.)
INTEGRAL SLEEVE FOR GRILLE MOUNT

Series 0100G Integral Sleeve Static Curtain Type Fire Dampers are designed for use in conjunction with a steel grille when ductwork terminates at an opening in a fire rated separation. The 0100G Series is 1 1/2 hour UL labeled for use in 2 hour fire separations or less and is classified for use in static "fans off" systems where the HVAC system shuts down in the event of a fire alarm. This unique product utilizes special grille mounting tabs on the sleeve that eliminate the requirement for unsightly retaining angles which commonly protrude from behind the grille. The steel grille installs over and completely conceals the mounting tabs for a clean, aesthetic finish.

Model 0110G

Model 0210G

MODEL SERIES 0200G (1 1/2 HR.)
THINLINE FRAME • INTEGRAL SLEEVE FOR GRILLE MOUNT

Model Series 0200G Thinline Frame Integral Sleeve Static Curtain Fire Dampers are engineered and designed for use in conjunction with a steel grille when ductwork terminates at an opening in a fire rated wall/partition. The 0200G Thinline Frame Series is 1 1/2 hour UL labeled for use in 2 hour fire separations or less and classified for use in static "fans off" systems where the HVAC system shuts down in the event of a fire alarm. This unique product utilizes special grille mounting tabs on the sleeve that eliminate the requirement for unsightly retaining angles which commonly protrude from behind the grille. A steel grille installs over and completely conceals the mounting tabs for a clean, aesthetic finish. The 2" (51) deep thinline fire damper is offset in the sleeve to accommodate a single or double deflection grille or register.

MODEL 0110GOW (1 1/2 HR.)
OUT OF WALL • INTEGRAL SLEEVE FOR GRILLE MOUNT

Model 0110GOW is an "out of wall or floor" integral sleeve static curtain type fire damper, specifically designed for supply or return ducts that terminate at a grille or register for use where local building codes require the protection of HVAC ductwork penetrations in walls, partitions or floors that have a fire resistance rating of up to 2 hours. The 0110GOW is classified for use only in static "fans off" systems where the HVAC system is automatically shut down in the event of a fire alarm. The 0110GOW design provides sufficient damper off-set to accommodate most commercial grille/register designs while ensuring an approved installation in any fire partition or wall no matter how narrow. This model is particularly suited for use in common steel stud drywall partition designs, as narrow as 3 1/2" (89) where a traditional "within the plane of the wall" fire damper installation is not possible.

Model 0110GOW

Model 0130GC

MODEL 0130GC
GARBAGE CHUTE CURTAIN FIRE DAMPER

Model 0130GC has been specially designed for garbage chute applications. The damper casing is oversized to ensure that the blade stack, fusible link and closure springs are unobstructed from falling waste. The round collar is slightly oversized for direct attachment to the outside of the garbage chute. The design features corrosion resistant steel construction and 100% free area and is available in three standard sizes, 20" dia. (508), 22" dia. (559) and 24" dia. (610), as well as custom sizes.

CURTAIN FIRE DAMPER BASICS:

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

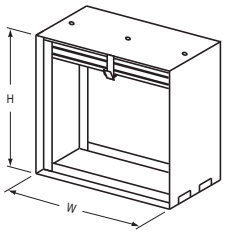
"A device, installed in an air distribution system, that is designed to close automatically upon detection of heat, to interrupt migratory airflow, and to restrict the passage of flame."

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

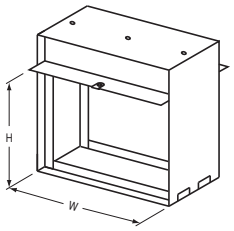
Curtain type fire dampers are generally available in three configuration as follows:

TYPE 'A'



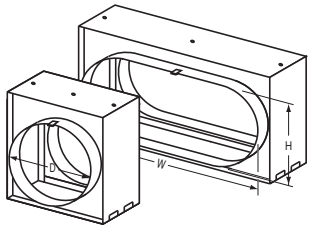
Blades and frame in the airstream.

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.

DYNAMIC CURTAIN TYPE FIRE DAMPERS (For use in **dynamic** "fans on" systems.)

MINIMUM AND MAXIMUM UL CLASSIFIED SIZES

Model/ Series	Type	Velocity/ Pressure Rating	Single Section				Multiple Section Assembly	
			Minimum Size (W x H)		Maximum Size (W x H)		Maximum Size (W x H)	
			Installation		Installation		Installation	
			Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
D0110	A	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	6" x 6" (152 x 152)	6" x 6" (152 x 152)	36" x 36" (914 x 914)	24" x 24" (610 x 610)	① 72" x 24" or 36" x 48" (1829 x 610 or 914 x 1219)	—
D0110	A	3000 fpm @ 4" w.g. (15 m/s @ 1 kPa)	6" x 6" (152 x 152)	—	24" x 24" (610 x 610)	—	—	—
D0110	A	4000 fpm @ 4" w.g. (20 m/s @ 1 kPa)	6" x 6" (152 x 152)	—	24" x 24" (610 x 610)	—	—	—
D0120	B	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	6" x 4" (152 x 102)	6" x 4" (152 x 102)	36" x 32" (914 x 813)	24" x 21" (610 x 533)	① 72" x 21" or 36" x 45" (1829 x 533 or 914 x 1143)	—
D0120	B	3000 fpm @ 4" w.g. (15 m/s @ 1 kPa)	6" x 4" (152 x 102)	—	24" x 21" (610 x 533)	—	—	—
D0120	B	4000 fpm @ 4" w.g. (20 m/s @ 1 kPa)	6" x 4" (152 x 102)	—	24" x 21" (610 x 533)	—	—	—
D0130	CR, Round	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	4" (102) dia.	4" (102) dia.	31" (787) dia.	20" (508) dia.	① 34" (864) dia.	—
D0130	CR, Round	3000 fpm @ 4" w.g. (15 m/s @ 1 kPa)	4" (102) dia.	—	20" (508) dia.	—	—	—
D0130	CR, Round	4000 fpm @ 4" w.g. (20 m/s @ 1 kPa)	4" (102) dia.	—	20" (508) dia.	—	—	—
D0130	CO, Oval	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	5" x 4" (127 x 102)	5" x 4" (127 x 102)	34" x 31" (864 x 787)	22" x 20" (559 x 508)	① 70" x 20" (1778 x 508)	—
D0130	CO, Oval	3000 fpm @ 4" w.g. (15 m/s @ 1 kPa)	5" x 4" (127 x 102)	—	22" x 20" (559 x 508)	—	—	—
D0130	CO, Oval	4000 fpm @ 4" w.g. (20 m/s @ 1 kPa)	5" x 4" (127 x 102)	—	22" x 20" (559 x 508)	—	—	—
D0140	CSR, Sq./Rect.	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	4" x 4" (102 x 102)	4" x 4" (102 x 102)	34" x 31" (864 x 787)	22" x 20" (559 x 508)	① 70" x 20" (1778 x 508)	—
D0140	CSR, Sq./Rect.	3000 fpm @ 4" w.g. (15 m/s @ 1 kPa)	4" x 4" (102 x 102)	—	22" x 20" (559 x 508)	—	—	—
D0140	CSR, Sq./Rect.	4000 fpm @ 4" w.g. (20 m/s @ 1 kPa)	4" x 4" (102 x 102)	—	22" x 20" (559 x 508)	—	—	—
D0114HY	A	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	8" x 25" (203 x 635)	—	36" x 60" (914 x 1524)	—	72" x 60" (1829 x 1524)	—
D0124HY	B	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	8" x 22" (203 x 559)	—	36" x 54" (914 x 1372)	—	72" x 54" (1829 x 1372)	—
D0134HY	CR, Round	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	22" (559) dia.	—	34" (864) dia.	—	53" (1346) dia.	—
D0134HY	CO, Oval	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	6" x 22" (152 x 559)	—	34" x 53" (864 x 1346)	—	70" x 53" (1778 x 1346)	—
D0114-12/14/16	A	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	6" x 6" (152 x 152)	6" x 6" (152 x 152)	36" x 36" (914 x 914)	24" x 24" (610 x 610)	—	—
D0114-12/14/16	A	3000 fpm @ 4" w.g. (15 m/s @ 1 kPa)	6" x 6" (152 x 152)	—	24" x 24" (610 x 610)	—	—	—
D0114-12/14/16	A	4000 fpm @ 4" w.g. (20 m/s @ 1 kPa)	6" x 6" (152 x 152)	—	24" x 24" (610 x 610)	—	—	—

Damper Types: Type A: Blades and frame in airstream. **Type B:** Blades out of airstream for minimal restriction of airflow. **Type CR:** Round enclosure with blades and frame out of airstream for maximum free area. **Type CO:** Oval enclosure with blades and frame out of airstream for maximum free area. **Type CSR:** Square or rectangular enclosure with blades and frame out of airstream for maximum free area.

Note: Larger sizes may become available as they are tested and approved by Underwriters Laboratories. Contact your Nailor representative or consult www.nailor.com for the latest available sizes.

① Individual sections of multiple section assembly not to exceed 24" (610) in width, up to 48" (1219) wide. Assemblies larger than 48" (1219) in width will be made up of individual sections not to exceed 18" (457) wide.

DYNAMIC CURTAIN TYPE FIRE DAMPERS (For use in **dynamic** "fans on" systems.)

MINIMUM AND MAXIMUM UL CLASSIFIED SIZES

Model/ Series	Type	Velocity/ Pressure Rating	Single Section				Multiple Section Assembly	
			Minimum Size (W x H)		Maximum Size (W x H)		Maximum Size (W x H)	
			Installation		Installation		Installation	
			Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
D0124-12/14/16	B	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	6" x 4" (152 x 102)	6" x 4" (152 x 102)	36" x 32" (914 x 813)	24" x 21" (610 x 533)	—	—
D0124-12/14/16	B	3000 fpm @ 4" w.g. (15 m/s @ 1 kPa)	6" x 4" (152 x 102)	—	24" x 21" (610 x 533)	—	—	—
D0124-12/14/16	B	4000 fpm @ 4" w.g. (20 m/s @ 1 kPa)	6" x 4" (152 x 102)	—	24" x 21" (610 x 533)	—	—	—
D0134-12/14/16	CR, Round	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	4" (102) dia.	4" (102) dia.	31" (787) dia.	20" (508) dia.	—	—
D0134-12/14/16	CR, Round	3000 fpm @ 4" w.g. (15 m/s @ 1 kPa)	4" (102) dia.	—	20" (508) dia.	—	—	—
D0134-12/14/16	CR, Round	4000 fpm @ 4" w.g. (20 m/s @ 1 kPa)	4" (102) dia.	—	20" (508) dia.	—	—	—
D0110G	A	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	6" x 6" (152 x 152)	6" x 6" (152 x 152)	24" x 24" (610 x 610)	24" x 24" (610 x 610)	—	—
D0110G	A	3000 fpm @ 4" w.g. (15 m/s @ 1 kPa)	6" x 6" (152 x 152)	—	24" x 24" (610 x 610)	—	—	—
D0110G	A	4000 fpm @ 4" w.g. (20 m/s @ 1 kPa)	6" x 6" (152 x 152)	—	24" x 24" (610 x 610)	—	—	—
D0120G	B	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	6" x 4" (152 x 102)	6" x 4" (152 x 102)	24" x 21" (610 x 533)	24" x 21" (610 x 533)	—	—
D0120G	B	3000 fpm @ 4" w.g. (15 m/s @ 1 kPa)	6" x 4" (152 x 102)	—	24" x 21" (610 x 533)	—	—	—
D0120G	B	4000 fpm @ 4" w.g. (20 m/s @ 1 kPa)	6" x 4" (152 x 102)	—	24" x 21" (610 x 533)	—	—	—
D0130G	CR, Round	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	4" (102) dia.	4" (102) dia.	20" (508) dia.	20" (508) dia.	—	—
D0130G	CR, Round	3000 fpm @ 4" w.g. (15 m/s @ 1 kPa)	4" (102) dia.	—	20" (508) dia.	—	—	—
D0130G	CR, Round	4000 fpm @ 4" w.g. (20 m/s @ 1 kPa)	4" (102) dia.	—	20" (508) dia.	—	—	—
D0110GOW	A	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	6" x 6" (152 x 152)	6" x 6" (152 x 152)	24" x 24" (610 x 610)	24" x 24" (610 x 610)	① 36" x 24" (914 x 610)	—
D0110GOW	A	3000 fpm @ 4" w.g. (15 m/s @ 1 kPa)	6" x 6" (152 x 152)	—	24" x 24" (610 x 610)	—	—	—
D0110GOW	A	4000 fpm @ 4" w.g. (20 m/s @ 1 kPa)	6" x 6" (152 x 152)	—	24" x 24" (610 x 610)	—	—	—
D0510	A	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	6" x 6" (152 x 152)	6" x 6" (152 x 152)	36" x 36" (914 x 914)	24" x 24" (610 x 610)	① 72" x 24" or 36" x 48" (1829 x 610 or 914 x 1219)	—
D0510	A	3000 fpm @ 4" w.g. (15 m/s @ 1 kPa)	6" x 6" (152 x 152)	—	24" x 24" (610 x 610)	—	—	—
D0510	A	4000 fpm @ 4" w.g. (20 m/s @ 1 kPa)	6" x 6" (152 x 152)	—	24" x 24" (610 x 610)	—	—	—
D0520	B	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	6" x 4" (152 x 102)	6" x 4" (152 x 102)	36" x 32" (914 x 813)	24" x 21" (610 x 533)	① 72" x 21" or 36" x 45" (1829 x 533 or 914 x 1143)	—
D0520	B	3000 fpm @ 4" w.g. (15 m/s @ 1 kPa)	6" x 4" (152 x 102)	—	24" x 21" (610 x 533)	—	—	—
D0520	B	4000 fpm @ 4" w.g. (20 m/s @ 1 kPa)	6" x 4" (152 x 102)	—	24" x 21" (610 x 533)	—	—	—

① Individual sections of multiple section assembly not to exceed 24" (610) in width, up to 48" (1219) wide. Assemblies larger than 48" (1219) in width will be made up of individual sections not to exceed 18" (457) wide.

DYNAMIC CURTAIN TYPE FIRE DAMPERS (For use in **dynamic** "fans on" systems.)

MINIMUM AND MAXIMUM UL CLASSIFIED SIZES

Model/ Series	Type	Velocity/ Pressure Rating	Single Section				Multiple Section Assembly	
			Minimum Size (W x H)		Maximum Size (W x H)		Maximum Size (W x H)	
			Installation		Installation		Installation	
			Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
D0530	CR, Round	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	4" (102) dia.	4" (102) dia.	31" (787) dia.	20" (508) dia.	① 34" (864) dia.	—
D0530	CR, Round	3000 fpm @ 4" w.g. (15 m/s @ 1 kPa)	4" (102) dia.	—	20" (508) dia.	—	—	—
D0530	CR, Round	4000 fpm @ 4" w.g. (20 m/s @ 1 kPa)	4" (102) dia.	—	20" (508) dia.	—	—	—
D0530	CO, Oval	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	5" x 4" (127 x 102)	5" x 4" (127 x 102)	34" x 31" (864 x 787)	22" x 20" (559 x 508)	① 70" x 20" (1778 x 508)	—
D0530	CO, Oval	3000 fpm @ 4" w.g. (15 m/s @ 1 kPa)	5" x 4" (127 x 102)	—	22" x 20" (559 x 508)	—	—	—
D0530	CO, Oval	4000 fpm @ 4" w.g. (20 m/s @ 1 kPa)	5" x 4" (127 x 102)	—	22" x 20" (559 x 508)	—	—	—
D0530	CSR, Sq./Rect.	2000 fpm @ 4" w.g. (10 m/s @ 1 kPa)	4" x 4" (102 x 102)	4" x 4" (102 x 102)	34" x 31" (864 x 787)	22" x 20" (559 x 508)	① 70" x 20" (1778 x 508)	—
D0530	CSR, Sq./Rect.	3000 fpm @ 4" w.g. (15 m/s @ 1 kPa)	4" x 4" (102 x 102)	—	22" x 20" (559 x 508)	—	—	—
D0530	CSR, Sq./Rect.	4000 fpm @ 4" w.g. (20 m/s @ 1 kPa)	4" x 4" (102 x 102)	—	22" x 20" (559 x 508)	—	—	—

① Individual sections of multiple section assembly not to exceed 24" (610) in width, up to 48" (1219) wide. Assemblies larger than 48" (1219) in width will be made up of individual sections not to exceed 18" (457) wide.

STATIC CURTAIN TYPE FIRE DAMPERS (For use in **static** "fans off" systems.)

MINIMUM AND MAXIMUM UL CLASSIFIED SIZES

Model/ Series	Type	Single Section				Multiple Section Assembly	
		Minimum Size (W x H)		Maximum Size (W x H)		Maximum Size (W x H)	
		Installation		Installation		Installation	
		Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
0110	A	4" x 4" (102 x 102)	4" x 4" (102 x 102)	60" x 60" (1524 x 1524)	60" x 60" (1524 x 1524)	120" x 120" (3048 x 3048)	① 102" x 60" (2591 x 1524)
0120	B	4" x 3" (102 x 76)	4" x 4" (102 x 102)	60" x 54" (1524 x 1372)	60" x 54" (1524 x 1372)	120" x 114" (3048 x 2896)	① 102" x 54" (2591 x 1372)
0130	CR, Round	3" (76) dia.	4" (102) dia.	53" (1346) dia.	53" (1346) dia.	112" (2845) dia.	53" (1346) dia.
0130	CO, Oval	4" x 3" (102 x 76)	5" x 4" (127 x 102)	58" x 53" (1473 x 1346)	58" x 53" (1473 x 1346)	118" x 112" (2997 x 2845)	① 100" x 53" (2540 x 1346)
0140	CSR, Sq./Rect.	3" x 3" (76 x 76)	4" x 4" (102 x 102)	58" x 53" (1473 x 1346)	58" x 53" (1473 x 1346)	118" x 112" (2997 x 2845)	① 100" x 53" (2540 x 1346)
0114-12/14/16	A	4" x 4" (102 x 102)	4" x 4" (102 x 102)	48" x 48" (1219 x 1219)	48" x 48" (1219 x 1219)	—	—
0124-12/14/16	B	4" x 3" (102 x 76)	4" x 4" (102 x 102)	48" x 43" (1219 x 1092)	48" x 43" (1219 x 1092)	—	—
0134-12/14/16	CR, Round	3" (76) dia.	4" (102) dia.	42" (1067) dia.	42" (1067) dia.	—	—
0100G	A, B, CR	4" x 4" (102 x 102)	4" x 4" (102 x 102)	24" x 24" (610 x 610)	24" x 24" (610 x 610)	—	—
0200G	A, B, CR	4" x 4" (102 x 102)	4" x 4" (102 x 102)	24" x 24" (610 x 610)	24" x 24" (610 x 610)	—	—
0110GOW	A	4" x 4" (102 x 102)	4" x 4" (102 x 102)	36" x 24" (914 x 610)	36" x 24" (914 x 610)	—	—
0210	A	4" x 4" (102 x 102)	4" x 4" (102 x 102)	41" x 36" or 36" x 60" (1041 x 914 or 914 x 1524)	41" x 36" (1041 x 914)	—	—
0220	B	4" x 3" (102 x 76)	4" x 3" (102 x 76)	41" x 30" or 36" x 50" (1041 x 762 or 914 x 1270)	41" x 30" (1041 x 762)	—	—
0230	CR, Round	3" (76) dia.	3" (76) dia.	34" (864) dia.	34" (864) dia.	—	—
0230	CO, Oval	4" x 3" (102 x 76)	4" x 3" (102 x 76)	39" x 29" (991 x 737)	39" x 29" (991 x 737)	—	—
0240	CSR, Sq./Rect.	3" x 3" (76 x 76)	3" x 3" (76 x 76)	39" x 29" or 34" x 49" (991 x 737 or 864 x 1245)	39" x 29" (991 x 737)	—	—
0310	A	4" x 4" (102 x 102)	4" x 4" (102 x 102)	60" x 48" or 24" x 60" (1524 x 1219 or 610 x 1524)	48" x 48" (1219 x 1219)	—	—
0510	A	4" x 4" (102 x 102)	4" x 4" (102 x 102)	48" x 48" (1219 x 1219)	36" x 36" (914 x 914)	② 108" x 72" (2743 x 1829)	72" x 36" (1829 x 914)
0520	B	4" x 3" (102 x 76)	4" x 4" (102 x 102)	48" x 43" (1219 x 1092)	36" x 32" (914 x 813)	② 108" x 68" (2743 x 1727)	72" x 32" or 64" x 36" (1829 x 813 or 1626 x 914)
0530	CR, Round	3" (76) dia.	4" (102) dia.	42" (1067) dia.	31" (767) dia.	66" (1676) dia.	34" (864) dia.
0530	CO, Oval	4" x 3" (102 x 76)	5" x 4" (127 x 102)	46" x 42" (1168 x 1067)	34" x 31" (864 x 787)	② 106" x 66" (2692 x 1676)	70" x 31" (1778 x 787)
0530	CSR, Sq./Rect.	3" x 3" (76 x 76)	4" x 4" (102 x 102)	46" x 42" (1168 x 1067)	34" x 31" (864 x 787)	② 106" x 66" (2692 x 1676)	70" x 31" (1778 x 787)
0540	A	4" x 4" (102 x 102)	—	60" x 48" or 24" x 60" (1524 x 1219 or 610 x 1524)	—	—	—
0570	A	4" x 4" (102 x 102)	—	36" x 60" (914 x 1524)	—	—	—
0580	B	4" x 3" (102 x 76)	—	36" x 50" (914 x 1270)	—	—	—
0590	CR, Round	3" (76) dia.	—	34" (864) dia	—	—	—
0590	CO, Oval	4" x 3" (102 x 76)	—	34" x 49" (864 x 1245)	—	—	—
0590	CSR, Sq./Rect.	3" x 3" (76 x 76)	—	34" x 49" (864 x 1245)	—	—	—

① Maximum individual sections not to exceed 34" x 60" (864 x 1524).
② Maximum individual sections not to exceed 36" x 36" (914 x 914).

- STANDARD FRAME
- 1 1/2 HOUR RATING
- FOR USE IN DYNAMIC SYSTEMS
- UL 555 CLASSIFIED

Models:

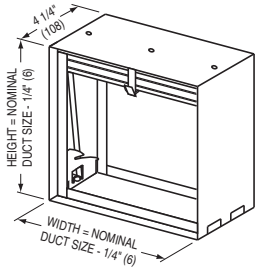
D0110 Type A
D0120 Type B
D0130 Type CR/CO, Round/Oval
D0140 Type CSR, Square/Rectangular

Model D0110

Series D0100 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 2 hours or less. Classified for use in dynamic systems where the HVAC system remains operative in the event of a fire, the D0100 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.

QUALIFICATIONS:

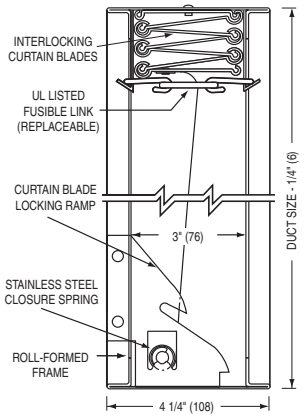
- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER. 1 1/2 hr. label (File # R9492).**
- **Meets all the requirements of UL and NFPA 80, 90A and 101 for fire dampers in dynamic HVAC systems, as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York Board of Standards and 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).**



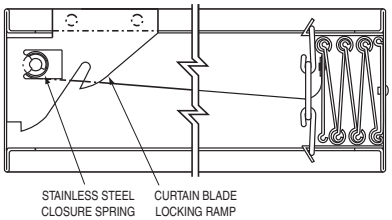
MODEL D0110: TYPE A

STANDARD CONSTRUCTION:

	D0110 (Type A)	D0120 (Type B)	D0130 (Type CR/CO)	D0140 (Type CSR)
Frame:	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
Blades:	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
Enclosure:	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
Fusible Link: (UL Listed)	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
Blade Closure:	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
Mounting:	Vertical or Horiz.	Vertical or Horiz.	Vertical or Horiz.	Vertical or Horiz.
Integral Sleeve: 22 ga. (0.85) x 12" (305) long. 22 ga. (0.85) x 14" (356) long. 22 ga. (0.85) x 16" (406) long	See Model D0114-12 D0114-14 D0114-16	See Model D0124-12 D0124-14 D0124-16	See Model D0134-12 D0134-14 D0134-16	Specify SL Option



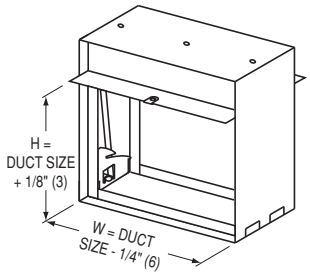
VERTICAL MOUNT



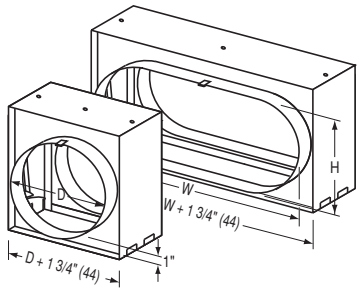
HORIZONTAL MOUNT

For MIN./MAX. UL SIZES see chart on page D8.

DIMENSIONAL DATA:

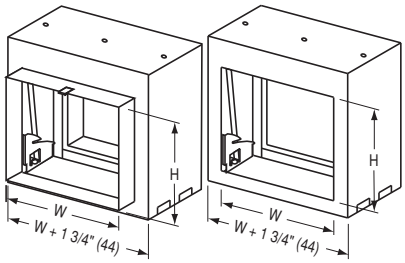


MODEL D0120: TYPE B



MODEL D0130: TYPE CR

MODEL D0130: TYPE CO



MODEL D0140: TYPE CSR WITH COLLAR (STANDARD)

MODEL D0140: TYPE CSR WITHOUT COLLAR

For overall damper dimensions see sizing chart on page D53.

PERFORMANCE DATA:

MODEL SERIES: D0100 - 1 1/2 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^2 x .00545 = Free Area (sq ft.)

D0100 Series - Maximum Performance Ratings	
UL 555 Fire Resistance Rating	1 1/2 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.

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

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

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

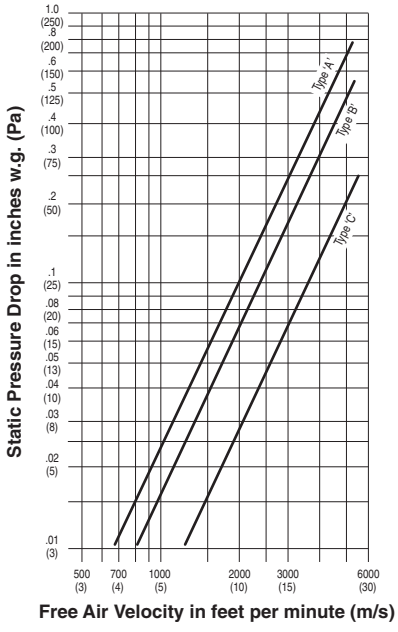
1700 fpm located on the 'A' curve shows a pressure drop of .07 in. wg.

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



- INTEGRAL SLEEVE
- STANDARD FRAME
- 1 1/2 HOUR RATING
- FOR USE IN DYNAMIC SYSTEMS
- UL 555 CLASSIFIED

MODEL SERIES D01X4-1X:

Series D01X4-1X Integral Sleeve Curtain Fire Dampers ensure proper damper mounting in sleeve and can be shipped direct to job site for immediate installation, eliminating costly and inconvenient shop handling. 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. Classified for use in dynamic systems where the HVAC system remains operative in the event of a fire. All models in the series are constructed with 22 ga. (0.85) roll-formed G60 galvanized steel integral sleeve available in 12" (305), 14" (356) or 16" (406) length. Optional 'Quick-Set' retaining angles are available to complete the installation package.

QUALIFICATIONS:

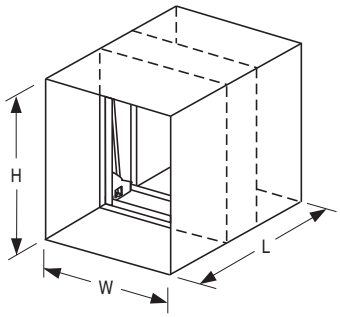
- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER. 1 1/2 hr. label (File # R9492).**
- **Meets all the requirements of UL and NFPA 80, 90A and 101 for fire dampers in dynamic HVAC systems, as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York Board of Standards and 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:

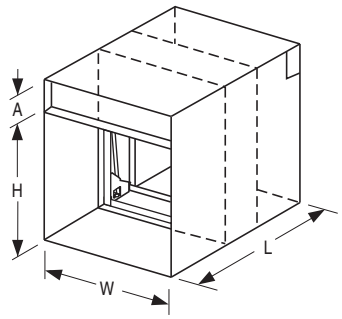
INTEGRAL SLEEVE/FRAME:	22 ga. (0.85) roll-formed G60 galvanized steel. D01X4 - 12 Length 12" (305) D01X4 - 14 Length 14" (356) D01X4 - 16 Length 16" (406)
BLADES:	Curtain type interlocking blades, 22 ga. (0.85) roll-formed G60 galvanized steel.
FUSIBLE LINK:	165°F (74°C) standard. UL Listed. 212°F (100°C) available.
BLADE CLOSURE:	Vertical and Horizontal mount. Stainless steel closure springs and galvanized steel locking ramps.

D01X4-1X Series - Maximum Performance Ratings	
UL 555 Fire Resistance Rating	1 1/2 Hour
Maximum Velocity	4000 fpm (20 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)

DIMENSIONAL DATA:

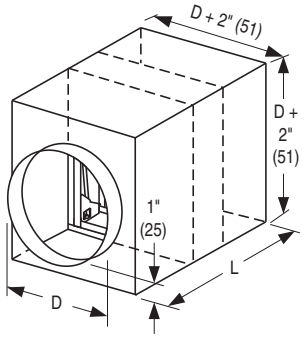


Model: D0114-1X
Type A – Blades and frame in the airstream.
Min. size - 6" x 6" (152 x 152)
Max. size - 36" x 36" (914 x 914)



Model: D0124-1X
Type B – Blades out of airstream.
Min. size - 6" x 4" (152 x 102)
Max. size - 36" x 32" (914 x 813)

Duct Height (H)	Dim. 'A'
4" – 17" (102 – 432)	2" (51)
18" – 27" (457 – 686)	3" (76)
28" – 32" (711 – 813)	4" (102)



Model: D0134-1X
Type CR – Round transition collars.
Blades partially in airstream
Min. size - 4" dia. (102)
Max. size - 31" dia. (787)

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 MSE	24V Microswitch 120/24V Microswitch with Enclosure

HOW TO SPECIFY

MODEL SERIES: D0100 - 1 1/2 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 1 1/2 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 D0100 Dynamic Curtain Fire Dampers.

MODEL SERIES: D01X4-1X - 1 1/2 HOUR LABEL
INTEGRAL SLEEVE DYNAMIC CURTAIN FIRE DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Integral Sleeve 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 1 1/2 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.
Damper shall be provided from the factory in an integral 22 ga. (0.85) galvanized steel sleeve of (**specifier select length**) 12" (305) **or** 14" (356) **or** 16" (406) in length with Nailor 'Quick-Set' retaining angles 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 D01X4-1X Integral Sleeve Dynamic Curtain Fire Dampers.

- HYBRID DESIGN WITH INTEGRAL SLEEVE
- 1 1/2 HOUR RATING
- FOR USE IN DYNAMIC SYSTEMS
- VERTICAL MOUNT
- UL 555 CLASSIFIED

Models:

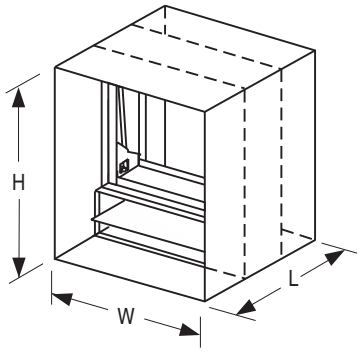
D0114HY Type A
D0124HY Type B
D0134HY Type CR/CO, Round/Oval

Model D0114HY

Series D01X4HY Hybrid Fire Dampers are designed for larger duct sizes that exceed the size limitations of dynamic curtain fire dampers and are a more economical solution than a multi-blade fire damper. The D01X4HY Hybrid Dynamic Fire Dampers are UL approved for use where local building codes require the protection of HVAC ductwork penetrations in walls and partitions that have a fire resistance rating of up to 2 hours. The D01X4HYs are classified for use in dynamic "fans on" systems where the HVAC system remains operative in the event of a fire and damper closure under airflow is assured. Integral sleeve fire dampers offer convenience and labor savings. The costly requirement to field or shop fabricate custom sleeves is eliminated and dampers ship directly from the manufacturer to the job site – saving time and money. Optional "Quick-Set" retaining angles complete the installation package. Factory fabricated, sized and shipped with damper, they install quickly, provide further labor savings and eliminate the need for any field fabrication.

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER. 1 1/2 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: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**



MODEL D0114HY: TYPE A

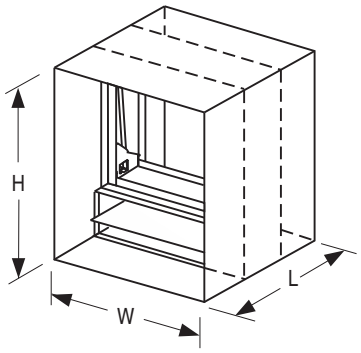
STANDARD CONSTRUCTION:

	D0114HY (Type A)	D0124HY (Type B)	D0134HY (Type C)
Frame:	5" (127) deep max., roll-formed galvanized steel	5" (127) deep max., roll-formed galvanized steel	5" (127) deep max., roll-formed galvanized steel
Blades:	Min. 22 ga. (0.85) roll-formed galvanized steel	Min. 22 ga. (0.85) roll-formed galvanized steel	Min. 22 ga. (0.85) roll-formed galvanized steel
Sleeve/ Enclosure:	12" (305) long x 20 ga. (1.0) std. 14" (356) or 16" (406) long available	12" (305) long x 20 ga. (1.0) std. 14" (356) or 16" (406) long available; Type B duct connections	12" (305) long x 20 ga. (1.0) std. 14" (356) or 16" (406) long available: Type C duct connections
Fusible Link: (UL Listed)	165°F (74°C) standard 212°F (100°C) available	165°F (74°C) standard 212°F (100°C) available	165°F (74°C) standard 212°F (100°C) available
Mounting:	Vertical mount only	Vertical mount only	Vertical mount only

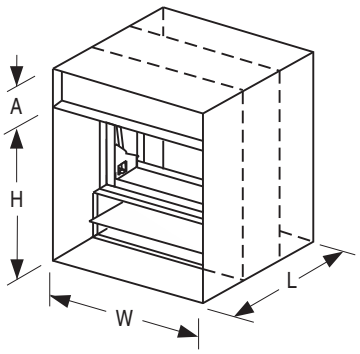
For MIN./MAX. UL SIZES see chart on page D8.

DIMENSIONAL DATA:

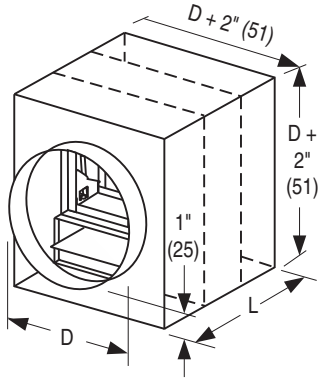
Duct Height (H)	Dim. 'A'
22" – 25" (559 – 533)	2" (51)
26" – 35" (660 – 889)	3" (76)
36" – 44" (914 – 1118)	4" (102)
45" – 53" 1143 – 1346)	5" (127)
54" (1372)	6" (152)



Model: D0114HY
Type A
Max. size: 72" x 60" (1829 x 1524)



Model: D0124HY
Type B
Max. size: 72" x 54" (1829 x 1372)



Model: D0134HY
Type CR – Round transition collars (shown)
Type CO - Oval transition collars
CR Max. size - 53" dia. (1346)
CO Max. size - 70" x 53" (1778 x 1346)

OPTIONS & ACCESSORIES:

	CODE	DESCRIPTION
QUICK-SET ANGLE	QS1/QS2	Single set or Pair of "Quick-Set" Retaining Angles
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: D01X4HY - 1 1/2 HOUR LABEL
HYBRID DYNAMIC CURTAIN FIRE DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Integral Sleeve Hybrid 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 1 1/2 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 an 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 vertical mounting.
Damper shall be provided from the factory in an integral 20 ga. (1.0) galvanized steel sleeve of (**specifier select length**) 12" (305) **or** 14" (356) **or** 16" (406) in length with Nailor 'Quick-Set' retaining angles to ensure proper installation in accordance with damper manufacturer's instructions. Blades shall be constructed of minimum 22 ga. (0.85) roll formed G60 galvanized steel. Damper shall be complete with 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 D0104HY Integral Sleeve Hybrid Dynamic Curtain Fire Dampers Dynamic.

- 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.

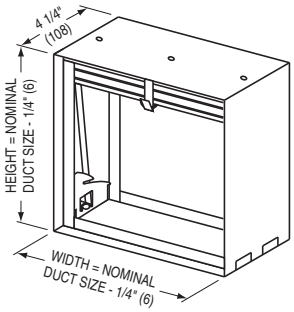
QUALIFICATIONS:

- **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).**

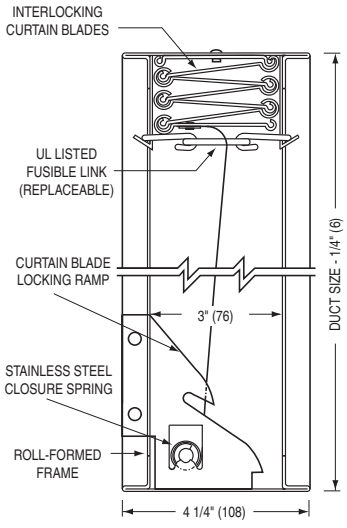
STANDARD CONSTRUCTION:

	D0510 (Type A)	D0520 (Type B)	D0530 (Type CR/CO)	D0530 (Type CSR)
Frame:	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
Blades:	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
Enclosure:	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
Fusible Link: (UL Listed)	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
Blade Closure:	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
Mounting:	Vertical or Horiz.	Vertical or Horiz.	Vertical or Horiz.	Vertical or Horiz.
Available Sleeve:	Galvanized steel; Specify SL option	Galvanized steel; Specify SL option	Galvanized steel; Specify SL option	Galvanized steel; Specify SL option

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

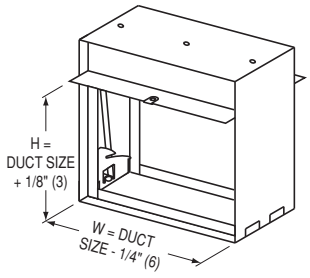


MODEL D0510: TYPE A

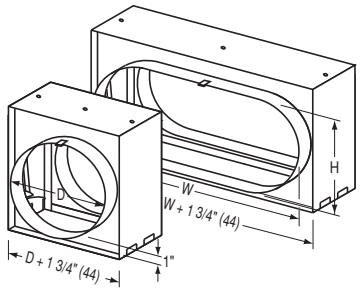


VERTICAL MOUNT

DIMENSIONAL DATA:

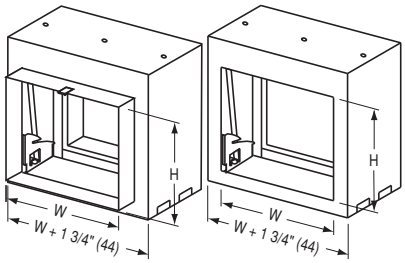


MODEL D0520: TYPE B



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 Height in inches (mm)	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)
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 Height in inches (mm)	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)
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^2 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.

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

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

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

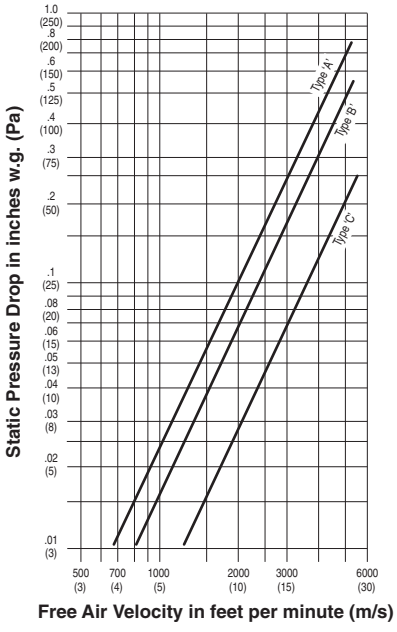
1700 fpm located on the 'A' curve shows a pressure drop of .07 in. wg.

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



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 MSE	24V Microswitch 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.

- INTEGRAL SLEEVE FOR USE WITH GRILLE
- 1 1/2 HOUR RATING
- FOR USE IN DYNAMIC SYSTEMS
- UL 555 CLASSIFIED

Models:

D0110G Type A

D0120G Type B

D0130G Type CR, Round

Model D0110G

Series D0100G Integral Sleeve Curtain Fire Dampers are designed for use in conjunction with a steel grille when ductwork terminates at an opening in a fire rated wall/partition. The D0100G Series is 1 1/2 hour UL labeled for use in 2 hour fire separations or less and are classified for use in dynamic systems where the HVAC system remains operative in the event of a fire.

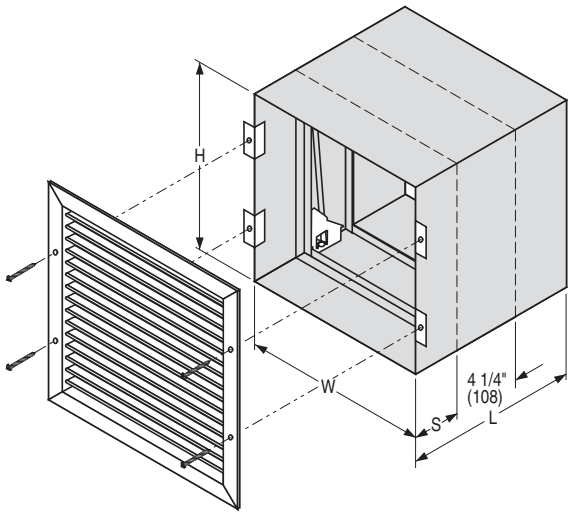
This unique product utilizes special grille mounting tabs on the sleeve that eliminate the requirement for unsightly retaining angles which commonly protrude from behind the grille. A steel grille installs over and completely conceals the mounting tabs for a clean, aesthetic finish. The fire damper is offset in the sleeve to accommodate a steel single or double deflection supply air grille, single deflection supply air register or a return air grille or register. Countersunk screw holes in the grille frame will match to mounting flanges when Nailor grille is ordered in conjunction with the damper assembly. Features include stainless steel closure springs for assured closure under airflow, corrosion resistant steel frame, blades and sleeve for lasting performance, and a choice of transition styles and accessories making installation fast and simple.

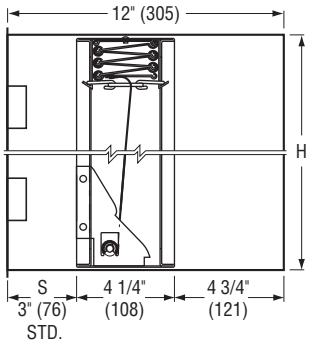
QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER. 1 1/2 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:

	D0110G (Type A)	D0120G (Type B)	D0130G (Type CR)
Frame:	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
Blades:	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
Standard Sleeve:	12" (305) long x 22 ga. (0.85) steel with 3/4" (19) wide grille mounting flanges	12" (305) long x 22 ga. (0.85) steel with 3/4" (19) wide grille mounting flanges; Type B duct connection on one end	12" (305) long x 22 ga. (0.85) steel with 3/4" (19) wide grille mounting flanges; Type C duct connection on one end
Fusible Link: (UL Listed)	165°F (74°C) std. 212°F (100°C) avail.	165°F (74°C) std. 212°F (100°C) available	165°F (74°C) std. 212°F (100°C) available
Blade Closure:	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
Mounting:	Vertical or Horiz.	Vertical or Horiz.	Vertical or Horiz.
Optional Grille:	Steel grille with correctly located countersunk screw holes; Select model from Nailor Air Distribution Catalog	Steel grille with correctly located countersunk screw holes; Select model from Nailor Air Distribution Catalog	Steel grille with correctly located countersunk screw holes; Select model from Nailor Air Distribution Catalog



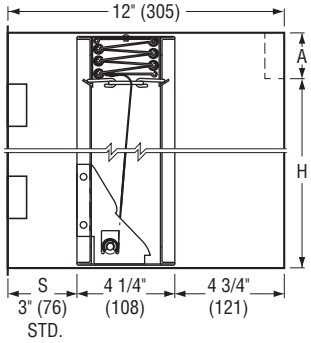


MODEL D0110G: TYPE A

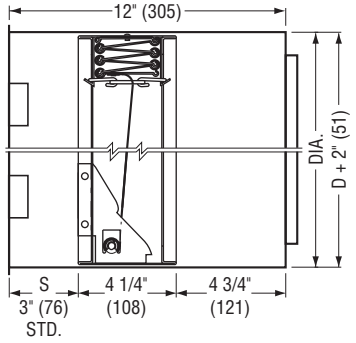
For MIN./MAX. UL SIZES see chart on page D9.

DIMENSIONAL DETAILS:

Duct Height (H)	Dim. 'A'
4" – 17" (102 – 432)	2" (51)
18" – 24" (457 – 610)	3" (76)
25" – 32" (635 – 813)	4" (102)



MODEL D0120G: TYPE B DUCT CONNECTION ON ONE END



MODEL D0130G: TYPE CR ROUND DUCT CONNECTION ON ONE END

HOW TO DETERMINE SLEEVE LENGTH / DAMPER POSITION:

To calculate sleeve length, determine wall thickness, add S dimension (3" [76] standard) and then add 3" (76) minimum for rear retaining angles and duct connection. Front of assembly fits flush with wall. Damper offset (dimension 'S') should accommodate grille selection depth, but fire damper blade centerline must remain within the plane of the wall or floor. The standard design shown above requires a minimum wall thickness of 5 1/8" (130).

FOR NON-STANDARD SLEEVE LENGTH, SPECIFY LENGTH.

FOR NON STANDARD DAMPER POSITION IN SLEEVE, SPECIFY DIMENSION 'S'.

OPTIONS & ACCESSORIES:

	CODE	DESCRIPTION
QUICK-SET ANGLE	QS1	Single set of "Quick-Set" Retaining Angles for Rear Side
HEMMED SLEEVE	HM1	Sleeve End Hemmed for Slip and Drive Connection for Rear Side
FLANGED SLEEVE	TDF1	Sleeve End Flanged for Breakaway Connection for Rear Side
MICROSWITCH	MS	24V Microswitch
	MSE	120/24V Microswitch with Enclosure

HOW TO SPECIFY

MODEL SERIES: D0100G - 1 1/2 HOUR LABEL
INTEGRAL SLEEVE DYNAMIC CURTAIN FIRE DAMPERS FOR GRILLE MOUNT

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Integral Sleeve Dynamic Curtain Fire Dampers for use with a grille 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 1 1/2 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 vertical mounting.

Damper shall be provided from the factory in an integral 22 ga. (0.85) galvanized steel sleeve of appropriate length with Nailor 'Quick-Set' retaining angles to ensure proper installation in accordance with damper manufacturer's instructions and 3/4" (19) wide grille mounting tabs specially designed for use with a 26 ga. (0.50) steel grille. Frame shall be constructed of 22 ga. (0.85) roll formed G60 galvanized steel and 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 D0100G Integral Sleeve Dynamic Curtain Fire Dampers for use with a grille.

- INTEGRAL "OUT OF WALL" SLEEVE FOR USE WITH GRILLE
- 1 1/2 HOUR RATING
- FOR USE IN DYNAMIC SYSTEMS
- UL 555 CLASSIFIED

Model:
D0110GOW Type A

Model D0110GOW

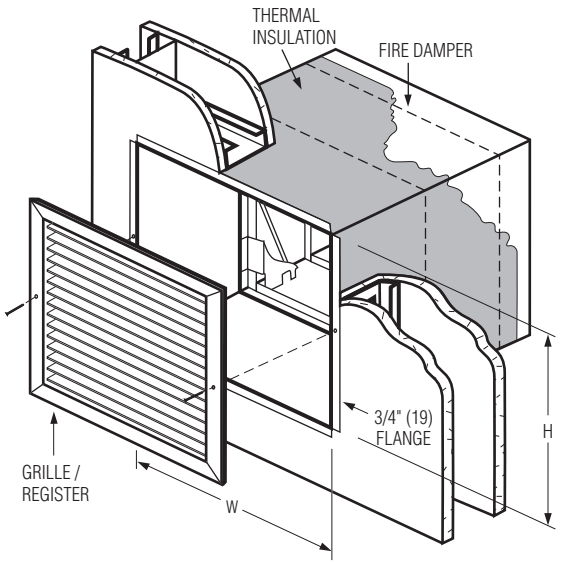
Model D0110GOW is an "out of wall or floor" integral sleeve dynamic curtain type fire damper, specifically designed for supply or return ducts that terminate at a grille or register for use where local building codes require the protection of HVAC ductwork penetrations in walls, partitions or floors that have a fire resistance rating of up to two hours. The D0110GOW design provides sufficient damper off-set to accommodate most commercial aluminum or steel grille and register designs while ensuring an approved installation in any fire partition or wall no matter how narrow. This model is ideally suited for use in common steel stud drywall partition designs, as narrow as 3 1/2" (89) where a traditional "within the plane of the wall" fire damper installation is not possible.

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER. 1 1/2 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).**

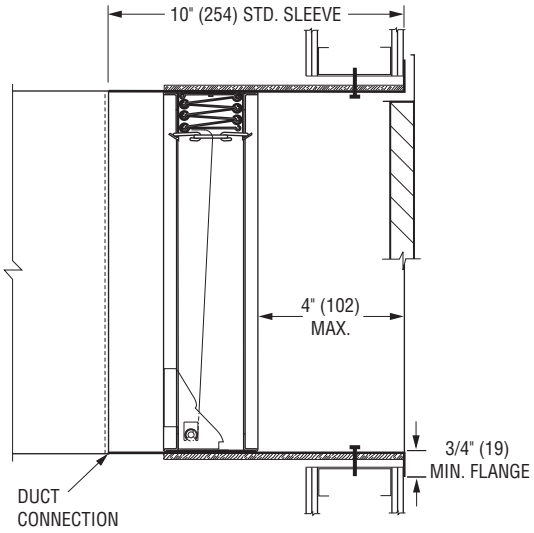
STANDARD CONSTRUCTION:

	D0110GOW (Type A)
Frame:	4 1/4" (108) wide, 22 ga. (0.85) roll-formed galv. steel
Blades:	Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel
Standard Sleeve:	10" (254) long x 16 ga. (1.6) galvanized steel with 3/4" (19) wide grille mounting flanges; intumescent thermal insulation on all four sides
Fusible Link: (UL Listed)	165°F (74°C) std. 212°F (100°C) avail.
Blade Closure:	Stainless steel closure springs and galvanized steel locking ramps
Mounting:	Vertical or Horizontal
Optional Grille:	Steel or aluminum grille or register; Select model from Nailor Air Distribution Catalog

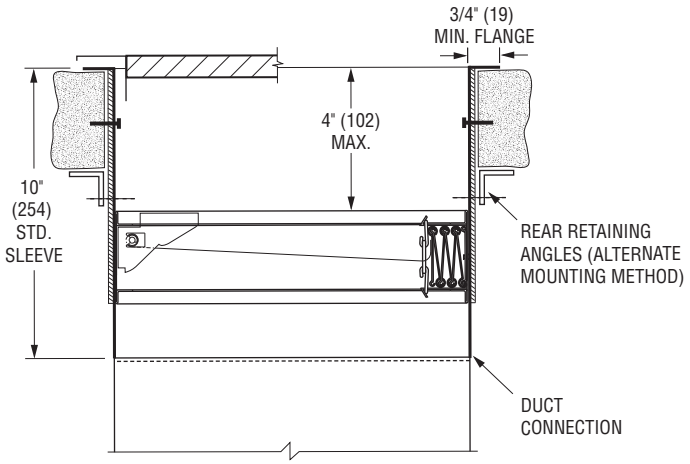


MODEL D0110GOW

DIMENSIONAL DATA:



Vertical Mount



Horizontal Mount

OPTIONS & ACCESSORIES:

	CODE	DESCRIPTION
QUICK-SET ANGLE	QS1	Single set of "Quick-Set" Retaining Angles for Rear Side
HEMMED SLEEVE	HM1	Sleeve End Hemmed for Slip and Drive Connection for Rear Side
FLANGED SLEEVE	TDF1	Sleeve End Flanged for Breakaway Connection for Rear Side
MICROSWITCH	MS MSE	24V Microswitch 120/24V Microswitch with Enclosure

HOW TO SPECIFY

MODEL SERIES: D0110GOW - 1 1/2 HOUR LABEL
"OUT OF WALL" INTEGRAL SLEEVE DYNAMIC CURTAIN FIRE DAMPERS FOR GRILLE MOUNT

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, "Out of Wall" Integral Sleeve Dynamic Curtain Fire Dampers for use with a grille 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 1 1/2 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 4000 at 4" w.g. (20 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.
Damper shall be provided from the factory in an integral 16 ga. (1.61) galvanized steel sleeve of appropriate length with intumescent thermal insulation on four sides and 3/4" (19) wide grille mounting flanges specially designed for use with a steel or aluminum grille with Nailor 'Quick-Set' retaining angles to ensure proper installation in accordance with damper manufacturer's instructions. Frame shall be constructed of 22 ga. (0.85) roll formed G60 galvanized steel and 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 D0110GOW "Out of Wall" Integral Sleeve Dynamic Curtain Fire Dampers for use with a grille.

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.

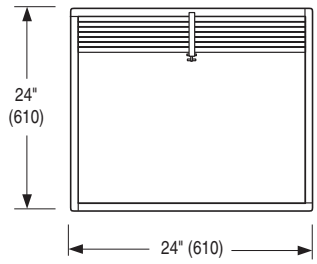
All Nailor dynamic curtain type fire dampers have been tested to a minimum of 2000 fpm (10 m/s) and 4" w.g. (1 kPa) static pressure.

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.

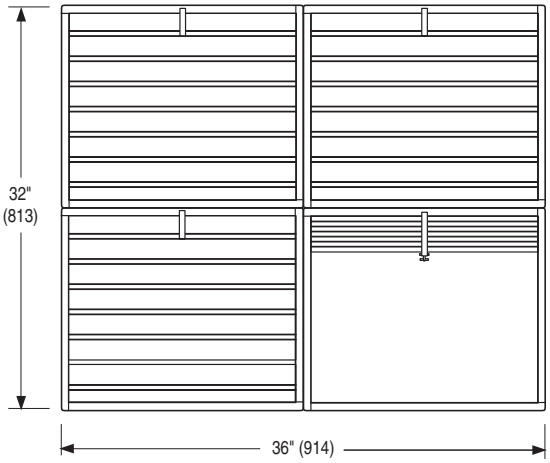
Check the maximum system pressure that could occur against a closed damper. Nailor dynamic fire dampers have been tested and are rated to close against 4" w.g.



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 FRAME
- 1 1/2 HOUR RATING
- FOR USE IN STATIC SYSTEMS
- UL 555 CLASSIFIED

Models:

0110V/H Type A
0120V/H Type B
0130V/H Type CR/CO, Round/Oval
0140V/H Type CSR, Square/Rectangular

Model 0110V

Series 0100V/H Static Curtain Fire Dampers are UL approved to provide protection of HVAC ductwork penetrations in walls, partitions or floors that have a fire resistance rating of 2 hours or less for use only in static "fans off" systems where the HVAC system shuts down in the event of a fire. The 0100V/H Series features corrosion resistant steel frame and blades for performance that lasts, and a choice of transition styles and factory installed sleeves to suit duct size, making installation fast and simple.

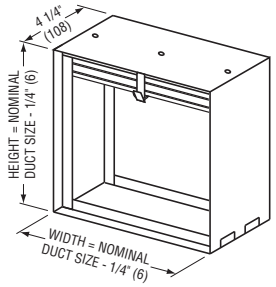
QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED FIRE DAMPER. 1 1/2 hr. label (File # R9492).**
- **Meets all the requirements of UL and NFPA 80, 90A and 101 for fire dampers in static 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. 3225-0935:0100.**

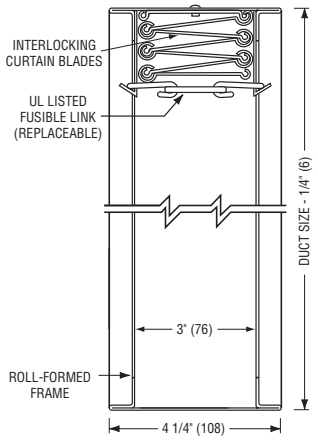
STANDARD CONSTRUCTION:

	0110V/H (Type A)	0120V/H (Type B)	0130V/H (Type CR/CO)	0140V/H (Type CSR)
Frame:	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
Blades:	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
Enclosure:	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
Fusible Link: (UL Listed)	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
Blade Closure:	Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps	Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps	Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps	Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps
Mounting:	Vertical or Horiz.	Vertical or Horiz.	Vertical or Horiz.	Vertical or Horiz.
Integral Sleeve: 22 ga. (0.85) x 12" (305) long. 22 ga. (0.85) x 14" (356) long. 22 ga. (0.85) x 16" (406) long	See Model 0114-12 0114-14 0114-16	See Model 0124-12 0124-14 0124-16	See Model 0134-12 0134-14 0134-16	Specify SL Option

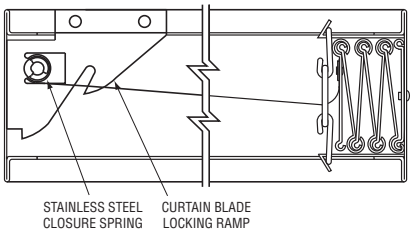
For MIN./MAX. UL SIZES see chart on page D11.



MODEL 0110: TYPE A

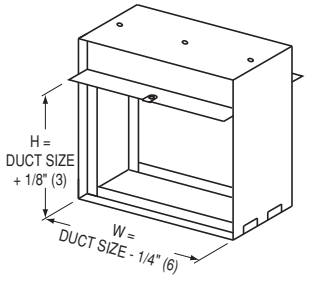


MODEL 0110V – VERTICAL MOUNT

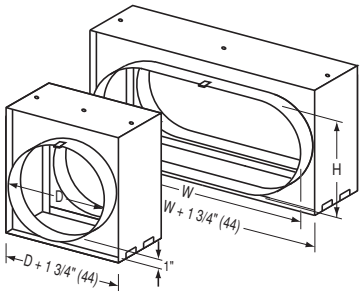


MODEL 0110H – HORIZONTAL MOUNT

DIMENSIONAL DATA:

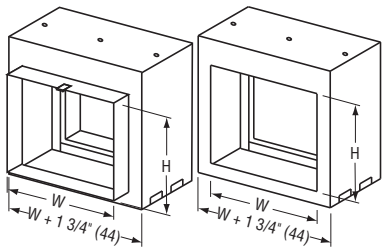


MODEL 0120: TYPE B



MODEL 0130: TYPE CR

MODEL 0130: TYPE CO



MODEL 0140: TYPE CSR WITH COLLAR (STANDARD)

MODEL 0140: TYPE CSR WITHOUT COLLAR

For overall damper dimensions see sizing chart on page D53.

PERFORMANCE DATA:

MODEL SERIES: 0100V/H - 1 1/2 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 Height in inches (mm)	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)
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 Height in inches (mm)	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)
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^2 x .00545 = Free Area (sq ft.)

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

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

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

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

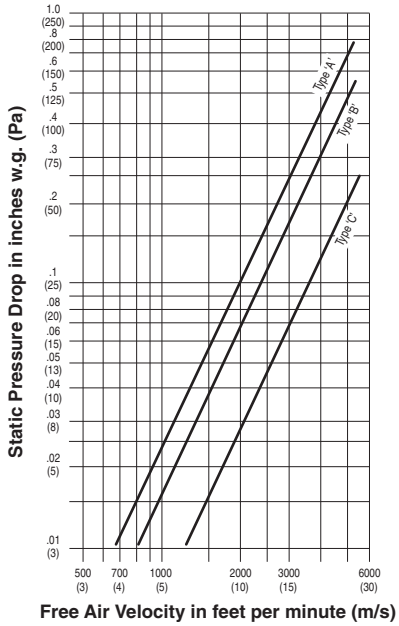
1700 fpm located on the 'A' curve shows a pressure drop of .07 in. wg.

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



- INTEGRAL SLEEVE
- STANDARD FRAME
- 1 1/2 HOUR RATING
- FOR USE IN STATIC SYSTEMS
- UL 555 CLASSIFIED

MODEL SERIES 01X4V/H-1X - 1 1/2 HOUR LABEL:

Series 01X4V/H-1X Integral Sleeve Static Curtain Fire Dampers ensure proper damper mounting in sleeve and can be shipped direct to job site for immediate installation, eliminating costly and inconvenient shop handling. 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. All units are constructed with 22 ga. (0.85) roll-formed G60 galvanized steel integral sleeve available in 12" (305), 14" (356) or 16" (406) length. Optional 'Quick-Set' retaining angles are available to complete the installation package.

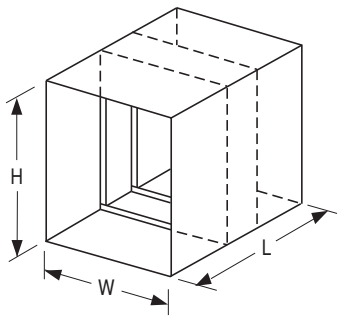
QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED FIRE DAMPER. 1 1/2 hr. label (File # R9492).**
- **Meets all the requirements of UL and NFPA 80, 90A and 101 for fire dampers in static 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. 3225-0935:0100.**

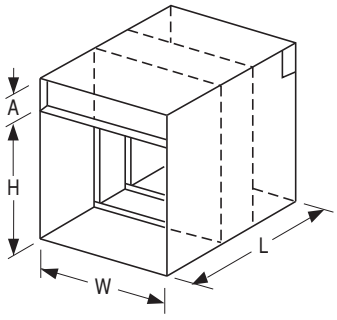
STANDARD CONSTRUCTION:

INTEGRAL SLEEVE/FRAME:	22 ga. (0.85) roll-formed G60 galvanized steel. 01X4X - 12 Length 12" (305) 01X4X - 14 Length 14" (356) 01X4X - 16 Length 16" (406)
BLADES:	Curtain type interlocking blades, 22 ga. (0.85) roll-formed G60 galvanized steel.
FUSIBLE LINK:	165°F (74°C) standard. UL Listed. 212°F (100°C) available.
BLADE CLOSURE:	Vertical mount model; gravity. Horizontal mount models are equipped with stainless steel closure springs and galvanized steel locking ramps.

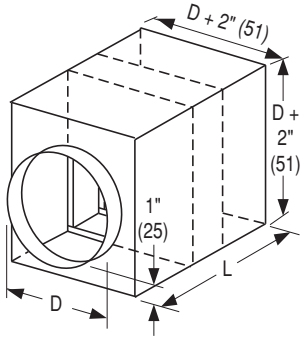
DIMENSIONAL DATA:



Models: 0114V-1X Vert. & 0114H-1X Horiz.
Type A – Blades and frame in the airstream.
Min. size - 4" x 4" (102 x 102)
Max. size - 48" x 48" (1219 x 1219)



Models: 0124V-1X Vert. & 0124H-1X Horiz.
Type B – Blades out of airstream.
Min. size - Vertical 4" x 3" (102 x 76)
Min. size - Horizontal 4" x 4" (102 x 102)
Max. size - V or H 48" x 43" (1219 x 1092)



Models: 0134V-1X Vert. & 0134H-1X Horiz.
Type CR – Round transition collars.
Blades partially in airstream
Min. size - Vertical 3" dia. (76)
Min. size - Horizontal 4" dia. (102)
Max. size - V or H 42" dia. (1067)

Duct Height (H)	Dim. 'A'
5" – 17" (127 – 432)	2" (51)
18" – 21" (457 – 533)	3" (76)
28" – 36" (711 – 914)	4" (102)
37" – 43" (940 – 1092)	5" (127)

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 MSE	24V Microswitch 120/24V Microswitch with Enclosure

HOW TO SPECIFY

MODEL SERIES: 0100V/H - 1 1/2 HOUR LABEL
STATIC CURTAIN FIRE DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Static 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, and shall have 1 1/2 hour fire resistance rating. Each damper shall bear a UL 1 1/2 hour fire resistance rating label and in addition, a label verifying intended mounting position. 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. Each fire damper shall be complete with 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. Information submitted for approval shall include confirmation of UL qualifications, pressure drop data and manufacturer's installation instructions. Each shipment of fire dampers shall include same installation instructions. Standard of acceptance shall be Nailor Model Series 0100 Static Curtain Fire Dampers.

MODEL SERIES: 01X4V/H-1X - 1 1/2 HOUR LABEL
INTEGRAL SLEEVE STATIC CURTAIN FIRE DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Integral Sleeve Static 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. Each damper shall bear a UL 1 1/2 hour fire resistance rating label and in addition, a label verifying intended mounting position. Damper shall be tested and approved for either vertical or horizontal mounting as required for each specific location.
Damper shall be provided from the factory in an integral 22 ga. (0.85) galvanized steel sleeve of (**specifier select length**) 12" (305) **or** 14" (356) **or** 16" (406) in length with Nailor 'Quick-Set' retaining angles 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 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. Each shipment of fire dampers shall include same installation instructions. Standard of acceptance shall be Nailor Model Series 01X4-1X Integral Sleeve Static Curtain Fire Dampers.

- THINLINE FRAME
- 1 1/2 HOUR RATING
- FOR USE IN STATIC SYSTEMS
- UL 555 CLASSIFIED

Models:

0210V/H Type A
0220V/H Type B
0230V/H Type CR/CO, Round/Oval
0240V/H Type CSR, Square/Rectangular

Model 0210V

Series 0200V/H Thinline Curtain Fire Dampers are UL approved for use where building codes require the protection of HVAC ductwork penetrations in walls, partitions or floors that have a fire resistance rating of 2 hours or less. They are classified for use only in static "fans off" systems where the HVAC system is automatically shut down in the event of a fire alarm. Series 0200V/H Thinline Dampers are only 2" (51) deep making them ideal for installation in narrow fire rated partitions, transfer duct openings, behind grilles or in any other application where space is limited. Design features include resilient 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.

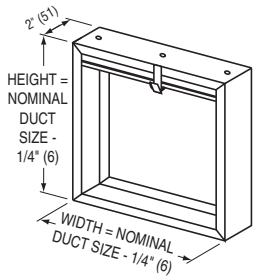
QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED FIRE DAMPER. 1 1/2 hr. label (File # R9492).**
- **Meets all the requirements of UL and NFPA 80, 90A and 101 for fire dampers in static 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. 3225-0935:0100.**

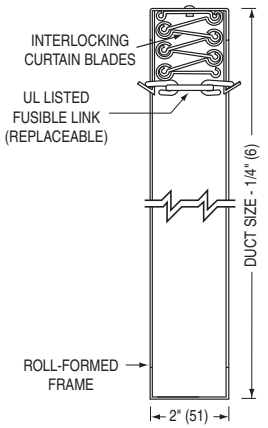
STANDARD CONSTRUCTION:

	0210V/H (Type A)	0220V/H (Type B)	0230V/H (Type CR/CO)	0240V/H (Type CSR)
Frame:	2" (51) wide, 22 ga. (0.85) roll-formed galv. steel	2" (51) wide, 22 ga. (0.85) roll-formed galv. steel	2" (51) wide, 22 ga. (0.85) roll-formed galv. steel; out of airstream	2" (51) wide, 22 ga. (0.85) roll-formed galv. steel; out of airstream
Blades:	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
Enclosure:	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
Fusible Link: (UL Listed)	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
Blade Closure:	Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps	Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps	Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps	Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps
Mounting:	Vertical or Horiz.	Vertical or Horiz.	Vertical or Horiz.	Vertical or Horiz.
Available Sleeve:	Galvanized steel; Specify SL option	Galvanized steel; Specify SL option	Galvanized steel; Specify SL option	Galvanized steel; Specify SL option

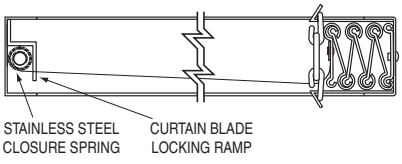
For MIN./MAX. UL SIZES see chart on page D11.



MODEL 0210: TYPE A

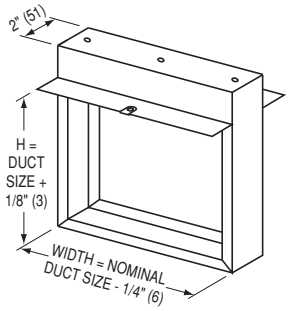


MODEL 0210V – VERTICAL MOUNT

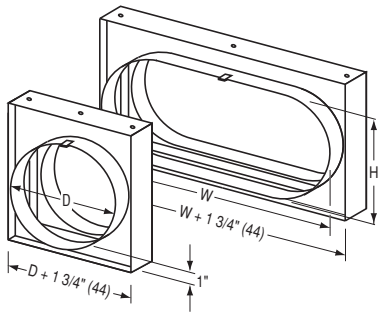


MODEL 0210H – HORIZONTAL MOUNT

DIMENSIONAL DATA:

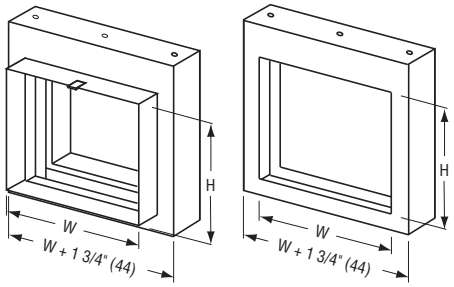


MODEL 0220: TYPE B



MODEL 0230: TYPE CR

MODEL 0230: TYPE CO



MODEL 0240: TYPE CSR WITH COLLAR (STANDARD)

MODEL 0240: TYPE CSR WITHOUT COLLAR

For overall damper dimensions see sizing chart on page D54.

PERFORMANCE DATA:

MODEL SERIES: 0210V/H - 1 1/2 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 Thinline Damper Free Area – sq. ft.

Duct Height in inches (mm)	Duct Width in inches (mm)						
	6" (152)	12" (305)	18" (457)	24" (610)	30" (762)	36" (914)	40" (1016)
6" (152)	.12	.27	.44	.59	.75	.94	1.02
12" (305)	.27	.61	.93	1.36	1.7	2.1	2.4
18" (457)	.42	.94	1.5	2.2	2.7	3.4	3.7
24" (610)	.55	1.29	2.1	3.0	3.7	4.5	4.9
30" (762)	.71	1.65	2.6	3.8	4.3	5.7	6.3
36" (914)	.86	2.1	3.2	4.6	5.7	7.0	7.7
42" (1067)	.93	2.3	3.5	5.1	6.3	7.6	8.8
48" (1219)	1.14	2.7	4.3	6.0	7.7	9.4	n/a
54" (1372)	1.32	3.1	4.9	6.2	8.8	10.7	n/a
60" (1524)	1.51	3.5	5.5	7.7	9.9	11.8	n/a

Type B Thinline Damper Free Area – sq. ft.

Duct Height in inches (mm)	Duct Width in inches (mm)						
	6" (152)	12" (305)	18" (457)	24" (610)	30" (762)	36" (914)	40" (1016)
6" (152)	.15	.32	.52	.69	.88	1.09	1.17
12" (305)	.31	.70	1.07	1.55	1.95	2.4	2.7
18" (457)	.47	1.05	1.7	2.5	3.05	3.8	4.2
24" (610)	.62	1.44	2.3	3.4	4.2	5.1	5.6
30" (762)	.80	1.84	2.9	4.3	4.9	6.5	7.2
36" (914)	.95	2.33	3.6	5.1	6.4	7.8	n/a
42" (1067)	1.0	2.5	3.8	5.6	7.0	8.5	n/a
48" (1219)	1.3	3.1	4.8	6.8	8.6	10.4	n/a

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

To calculate Free Area of round duct: Diameter^2 x .00545 = Free Area (sq ft.)

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

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

Example:
1 – 36" x 36" Damper required for 14,000 cfm. (Type A)

FAV = $\frac{14{,}000}{7 \text{ sq. ft.}}$ = 2000 fpm

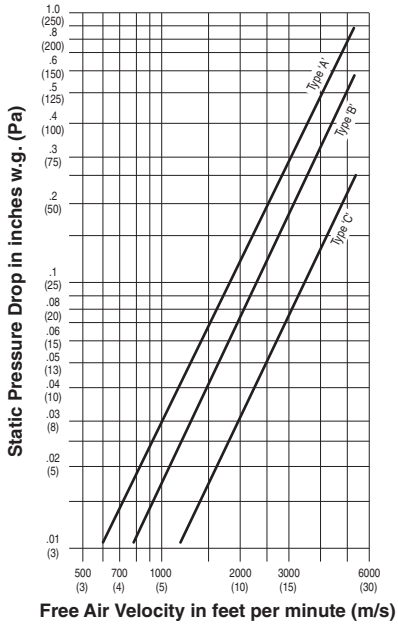
2000 fpm located on the 'A' curve shows a pressure drop of .12 in. wg.

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



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 MSE	24V Microswitch 120/24V Microswitch with Enclosure

HOW TO SPECIFY

MODEL SERIES: 0200V/H - 1 1/2 HOUR LABEL
THINLINE STATIC CURTAIN FIRE DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and as described in specifications, Thinline Static 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. Each damper shall bear a UL 1 1/2 hour fire resistance rating label and in addition, a label verifying intended mounting position. Damper shall be tested and approved for either vertical or horizontal mounting as required for each specific location.
Thinline style frame shall be a maximum of 2" (51) in width, 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 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. Each shipment of fire dampers shall include same installation instructions. Standard of acceptance shall be Nailor Model Series 0200 Thinline Static Curtain Fire Dampers.

- WIDE FRAME
- 1 1/2 HOUR RATING
- FOR USE IN STATIC SYSTEMS
- UL 555 CLASSIFIED

Model:

0310V/H Type A

Model 0310V

Model 0310V/H Wide Frame Curtain Fire Damper is UL approved for use where local building codes require the protection of HVAC ductwork penetrations in walls, partitions or floors that have a fire rating of 2 hours or less. The 0310V/H is classified for use only in static "fans off" systems where the HVAC system is automatically shut down in the event of a fire alarm.

The 6" (152) wide frame design with 4 3/4" (121) blades, reduces the number of blades required in the curtain stack, thus increasing the free area and reducing the pressure drop across the damper compared to standard Type A static curtain fire dampers. The construction features corrosion resistant interlocking steel blades and frame designed for lasting performance and available factory installed sleeves for fast, simple installation.

QUALIFICATIONS:

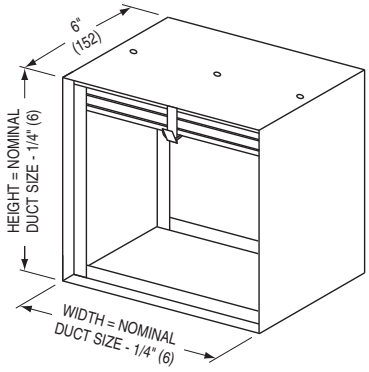
- **UL 555 & CAN/ULC-S112 CLASSIFIED FIRE DAMPER. 1 1/2 hr. label (File # R9492).**
- **Meets all the requirements of UL and NFPA 80, 90A and 101 for fire dampers in static HVAC systems, as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York Board of Standards and Appeals. Cal. No. 460-88-SA.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0100.**

STANDARD CONSTRUCTION:

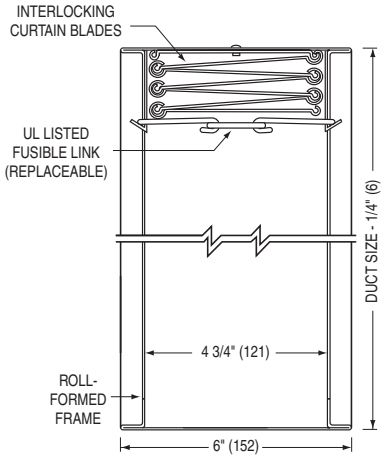
	0310V/H (Type A)
Frame:	6" (152) wide, 22 ga. (0.85) roll-formed galv. steel
Blades:	Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel
Fusible Link: (UL Listed)	165°F (74°C) std. 212°F (100°C) avail.
Blade Closure:	Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps
Mounting:	Vertical or Horizontal
Available Sleeve:	Galvanized steel; Specify SL option

For MIN./MAX. UL SIZES see chart on page D11.

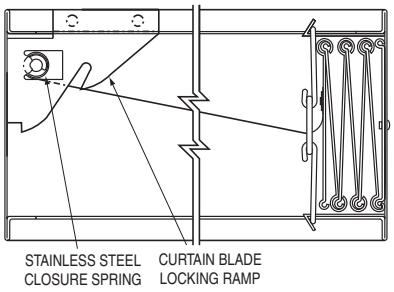
See Sizing Chart on page D55 for blade pack depth.



MODEL 0310: TYPE A



MODEL 0310V – VERTICAL MOUNT



MODEL 0310H – HORIZONTAL MOUNT

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 MSE	24V Microswitch 120/24V Microswitch with Enclosure

HOW TO SPECIFY

MODEL: 0310V/H - 1 1/2 HOUR LABEL
WIDE FRAME STATIC CURTAIN FIRE DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and as described in specifications, Wide Frame Static 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. Each damper shall bear a UL 1 1/2 hour fire resistance rating label and in addition, a label verifying intended mounting position. Damper shall be tested and approved for either vertical or horizontal mounting as required for each specific location.
Frame shall be 6" (152) in width, 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 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. Each shipment of fire dampers shall include same installation instructions. Standard of acceptance shall be Nailor Model 0310 Wide Frame Static Curtain Fire Damper.

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

Models:

0510V Type A
0520V Type B
0530V Type CR/CO, Round/Oval
0530V Type CSR, Square/Rectangular

Model 0510V

Series 0500 Standard Frame Curtain Fire Dampers, for use in static "fans off" systems where the HVAC system shuts down in the event of a fire, are UL approved to provide protection of HVAC ductwork penetrations in walls, partitions or floors that have a fire resistance rating of 4 hours or less. The 0500 Series features durable corrosion resistant roll formed steel frame and blades designed for lasting performance and a choice of transition styles and factory installed sleeves to suit duct size, making installation fast and simple.

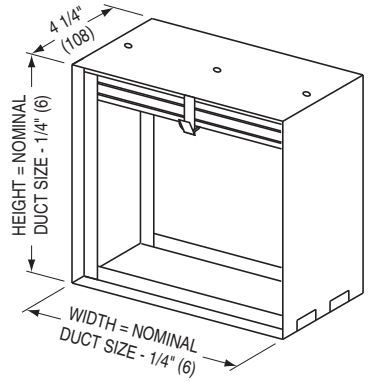
QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED FIRE DAMPER. 3 hr. label (File # R9492).**
- **Meets all the requirements of UL and NFPA 80, 90A and 101 for fire dampers in static 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. 3225-0935:0100.**

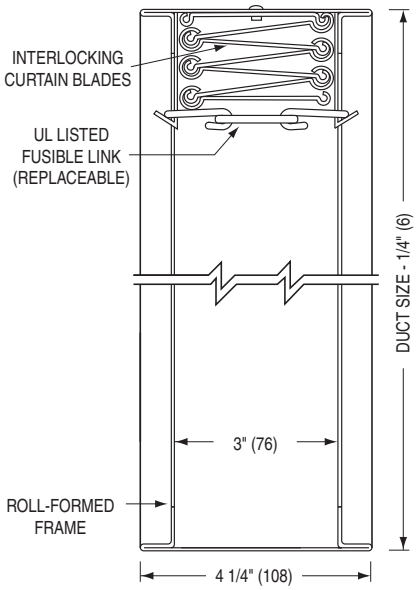
STANDARD CONSTRUCTION:

	0510V (Type A)	0520V (Type B)	0530V (Type CR/CO)	0530V (Type CSR)
Frame:	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
Blades:	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
Enclosure:	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
Fusible Link: (UL Listed)	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
Blade Closure:	Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps	Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps	Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps	Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps
Mounting:	Vertical or Horiz.	Vertical or Horiz.	Vertical or Horiz.	Vertical or Horiz.
Available Sleeve:	Galvanized steel; Specify SL option	Galvanized steel; Specify SL option	Galvanized steel; Specify SL option	Galvanized steel; Specify SL option

For MIN./MAX. UL SIZES see chart on page D11.

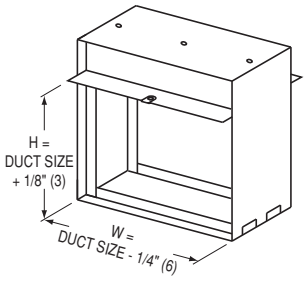


MODEL 0510: TYPE A

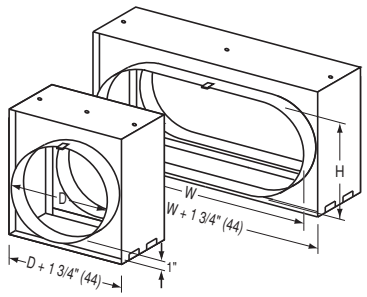


MODEL 0510V – VERTICAL MOUNT

DIMENSIONAL DATA:

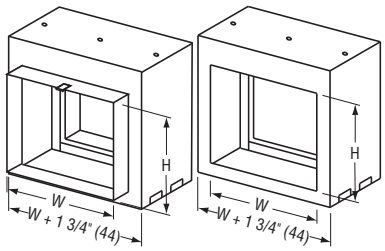


MODEL 0520: TYPE B



MODEL 0530: TYPE CR

MODEL 0530: TYPE CO



MODEL 0530: TYPE CSR WITH COLLAR (STANDARD)

MODEL 0530: TYPE CSR WITHOUT COLLAR

For overall damper dimensions see sizing chart on page D53.

PERFORMANCE DATA:

MODELS: 0510V, 0520V, 0530V - 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 Height in inches (mm)	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)
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 Height in inches (mm)	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)
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^2 x .00545 = Free Area (sq ft.)

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

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

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

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

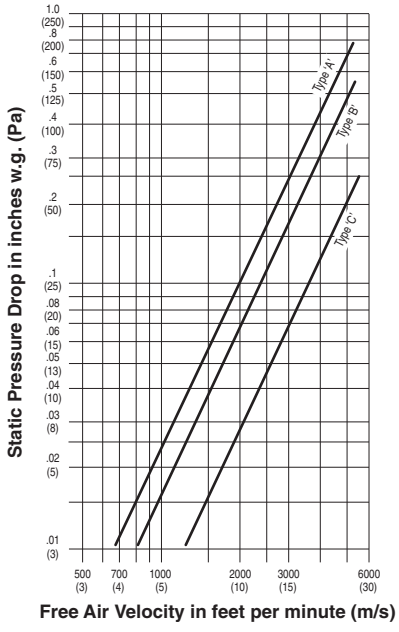
1700 fpm located on the 'A' curve shows a pressure drop of .07 in. wg.

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



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 MSE	24V Microswitch 120/24V Microswitch with Enclosure

HOW TO SPECIFY

MODELS: 0510V, 0520V, 0530V - 3 HOUR LABEL
STATIC CURTAIN FIRE DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Static 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. Each damper shall bear a UL 3 hour fire resistance rating label and in addition, a label verifying intended mounting position. 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 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 Models 0510V (Type A), 0520V (Type B) and 0530V (Type C) Static Curtain Fire Dampers.

- UL 555 CLASSIFIED
- 3 HOUR RATING
- FOR USE IN STATIC SYSTEMS
- THINLINE FRAME
- VERTICAL MOUNT

Models:

0570V Type A
0580V Type B
0590V Type CR/CO, Round/Oval
0590V Type CSR, Square/Rectangular

Model 0570V

Series 0570 Thinline Curtain Fire Dampers are UL approved for use where building codes require the protection of HVAC ductwork penetrations in vertical fire separations (walls or partitions) that have a fire resistance rating of 4 hours or less, classified for use in static "fans off" systems where the HVAC system is automatically shut down in the event of a fire. These thinline dampers are only 2" (51) deep making them ideal for installation in narrow fire rated partitions, transfer duct openings and behind grilles or any other application where room is limited. The design features durable corrosion resistant steel frame and blades for lasting performance and a choice of transition styles and factory installed sleeves to suit duct size, making installation fast and simple.

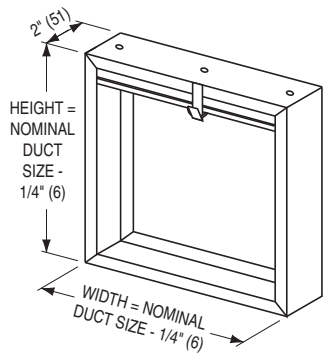
QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED FIRE DAMPER. 3 hr. label (File # R9492).**
- **Meets all the requirements of UL and NFPA 80, 90A and 101 for fire dampers in static 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. 3225-0935:0100.**

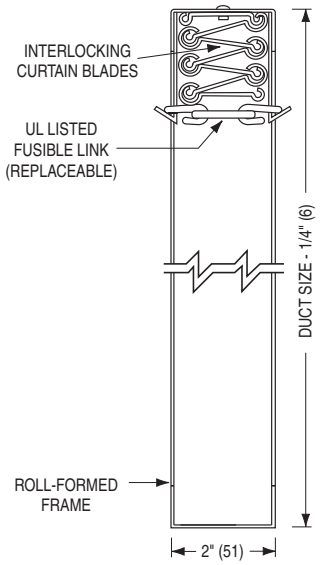
STANDARD CONSTRUCTION:

	0570V (Type A)	0580V (Type B)	0590V (Type CR/CO)	0590V (Type CSR)
Frame:	2" (51) wide, 22 ga. (0.85) roll-formed galv. steel	2" (51) wide, 22 ga. (0.85) roll-formed galv. steel	2" (51) wide, 22 ga. (0.85) roll-formed galv. steel; out of airstream	2" (51) wide, 22 ga. (0.85) roll-formed galv. steel; out of airstream
Blades:	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
Enclosure:	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
Fusible Link: (UL Listed)	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
Blade Closure:	Gravity	Gravity	Gravity	Gravity
Mounting:	Vertical only	Vertical only	Vertical only	Vertical only
Available Sleeve:	Galvanized steel; Specify SL option	Galvanized steel; Specify SL option	Galvanized steel; Specify SL option	Galvanized steel; Specify SL option

For MIN./MAX. UL SIZES see chart on page D11.

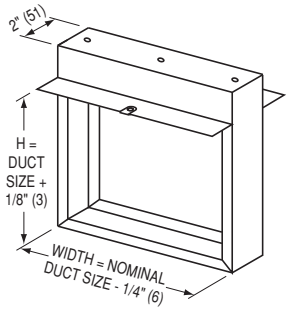


MODEL 0570: TYPE A

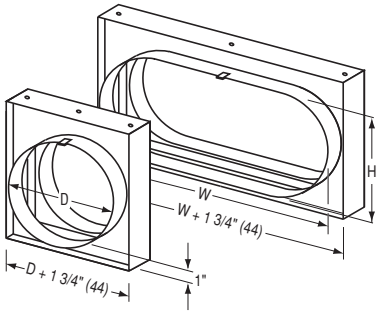


MODEL 0570V – VERTICAL MOUNT

DIMENSIONAL DATA:

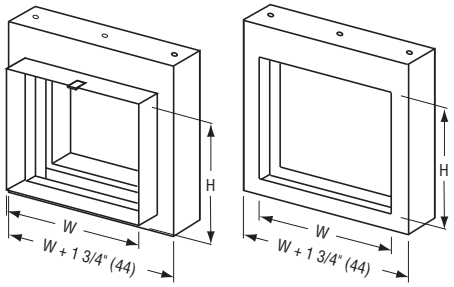


MODEL 0580: TYPE B



MODEL 0590: TYPE CR

MODEL 0590: TYPE CO



MODEL 0590: TYPE CSR WITH COLLAR (STANDARD)

MODEL 0590: TYPE CSR WITHOUT COLLAR

For overall damper dimensions see sizing chart on page D54.

D

CURTAIN FIRE DAMPERS

PERFORMANCE DATA:

MODELS: 0570V, 0580V, 0590V - 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 Thinline Damper Free Area – sq. ft.

Duct Height in inches (mm)	Duct Width in inches (mm)						
	6" (152)	12" (305)	18" (457)	24" (610)	30" (762)	36" (914)	40" (1016)
6" (152)	.12	.27	.44	.59	.75	.94	1.02
12" (305)	.27	.61	.93	1.36	1.7	2.1	2.4
18" (457)	.42	.94	1.5	2.2	2.7	3.4	3.7
24" (610)	.55	1.29	2.1	3.0	3.7	4.5	4.9
30" (762)	.71	1.65	2.6	3.8	4.3	5.7	6.3
36" (914)	.86	2.1	3.2	4.6	5.7	7.0	7.7
42" (1067)	.93	2.3	3.5	5.1	6.3	7.6	8.8
48" (1219)	1.14	2.7	4.3	6.0	7.7	9.4	n/a
54" (1372)	1.32	3.1	4.9	6.2	8.8	10.7	n/a
60" (1524)	1.51	3.5	5.5	7.7	9.9	11.8	n/a

Type B Thinline Damper Free Area – sq. ft.

Duct Height in inches (mm)	Duct Width in inches (mm)						
	6" (152)	12" (305)	18" (457)	24" (610)	30" (762)	36" (914)	40" (1016)
6" (152)	.15	.32	.52	.69	.88	1.09	1.17
12" (305)	.31	.70	1.07	1.55	1.95	2.4	2.7
18" (457)	.47	1.05	1.7	2.5	3.05	3.8	4.2
24" (610)	.62	1.44	2.3	3.4	4.2	5.1	5.6
30" (762)	.80	1.84	2.9	4.3	4.9	6.5	7.2
36" (914)	.95	2.33	3.6	5.1	6.4	7.8	n/a
42" (1067)	1.0	2.5	3.8	5.6	7.0	8.5	n/a
48" (1219)	1.3	3.1	4.8	6.8	8.6	10.4	n/a

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

To calculate Free Area of round duct: Diameter^2 x .00545 = Free Area (sq ft.)

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

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

Example:
1 – 36" x 36" Damper required for 14,000 cfm. (Type A)

FAV = $\frac{14{,}000}{7 \text{ sq. ft.}}$ = 2000 fpm

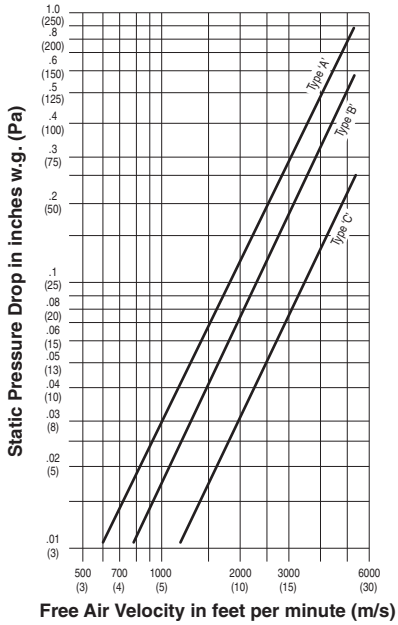
2000 fpm located on the 'A' curve shows a pressure drop of .12 in. wg.

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



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 MSE	24V Microswitch 120/24V Microswitch with Enclosure

HOW TO SPECIFY

MODELS: 0570V, 0580V, 0590V - 3 HOUR LABEL
THINLINE STATIC CURTAIN FIRE DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and as described in specifications, Thinline Static 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. Each damper shall bear a UL 3 hour fire resistance rating label and in addition, a label verifying intended mounting position. Damper shall be tested and approved for either vertical or horizontal mounting as required for each specific location.
Thinline style frame shall be a maximum of 2" (51) in width, 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 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. Each shipment of fire dampers shall include same installation instructions. Standard of acceptance shall be Nailor Models 0570V (Type A), 0580V (Type B) and 0590V (Type C). Thinline Static Curtain Fire Dampers.

- WIDE FRAME
- 3 HOUR RATING
- FOR USE IN STATIC SYSTEMS
- VERTICAL MOUNT
- UL 555 CLASSIFIED

Model:

0540V Type A

Model 0540V

Model 0540V Wide Frame Curtain Fire Damper is UL approved for use where building codes require the protection of HVAC ductwork penetrations in vertical fire separations (walls or partitions) that have a fire resistant rating of 4 hours or less, classified for use in static "fans off" systems where the HVAC system is automatically shut down in the event of a fire.

The wide frame design reduces the number of blades required in the curtain stack, which increases the free area and reduces the pressure drop across the damper when compared to standard Type A curtain fire damper designs. The 0540V is ideal for use when maximum free area is desired in situations where space or design does not yield room for a Type B damper style. Design features include corrosion resistant roll formed steel frame and blades for lasting performance, available with factory installed sleeve for fast and simple installation.

QUALIFICATIONS:

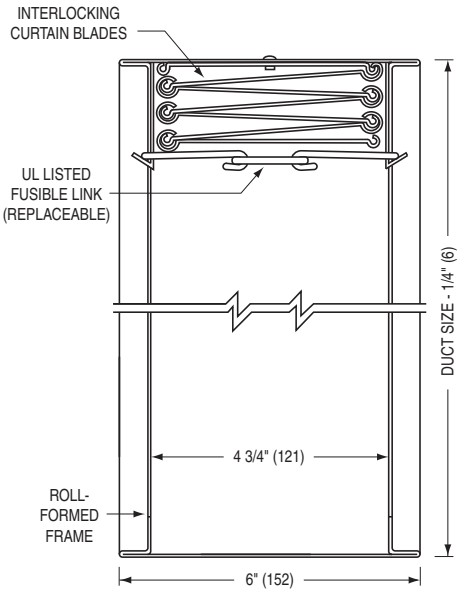
- **UL 555 & CAN/ULC-S112 CLASSIFIED FIRE DAMPER. 3 hr. label (File # R9492).**
- **Meets all the requirements of UL and NFPA 80, 90A and 101 for fire dampers in static HVAC systems, as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York Board of Standards and Appeals. Cal. No. 460-88-SA.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0100.**

STANDARD CONSTRUCTION:

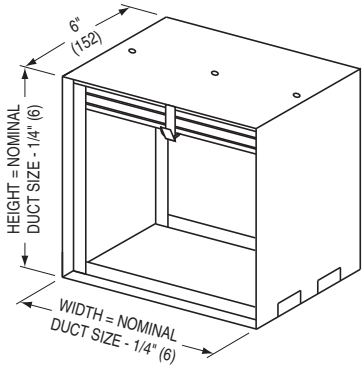
	0540V (Type A)
Frame:	6" (152) wide, 22 ga. (0.85) roll-formed galv. steel
Blades:	Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel
Fusible Link: (UL Listed)	165°F (74°C) std. 212°F (100°C) avail.
Blade Closure:	Gravity
Mounting:	Vertical only
Available Sleeve:	Galvanized steel; Specify SL option

For MIN./MAX. UL SIZES see chart on page D11.

See Sizing Chart on page D55 for blade pack depth.



MODEL 0540V – VERTICAL MOUNT



MODEL 0540: TYPE A

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 MSE	24V Microswitch 120/24V Microswitch with Enclosure

HOW TO SPECIFY

MODEL: 0540V - 3 HOUR LABEL
WIDE FRAME STATIC CURTAIN FIRE DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and as described in specifications, Wide Frame Static 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. Each damper shall bear a UL 3 hour fire resistance rating label and in addition, a label verifying intended mounting position. Damper shall be tested and approved for vertical mounting.
Frame shall be 6" (152) in width, 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 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. Each shipment of fire dampers shall include same installation instructions. Standard of acceptance shall be Nailor Model 0540V Wide Frame Static Curtain Fire Damper.

- STANDARD FRAME
- INTEGRAL SLEEVE FOR USE WITH GRILLE
- 1 1/2 HOUR RATING
- FOR USE IN STATIC SYSTEMS
- UL 555 CLASSIFIED

Model 0110G

Models:

0110G Type A

0120G Type B

0130G Type CR, Round

Series 0100G Integral Sleeve Curtain Fire Dampers are designed for use in conjunction with a steel grille when ductwork terminates at an opening in a fire rated wall/partition. The 0100G Series is 1 1/2 hour UL labeled for use in 2 hour fire separations or less and is classified for use in static "fans off" systems where the HVAC system shuts down in the event of a fire.

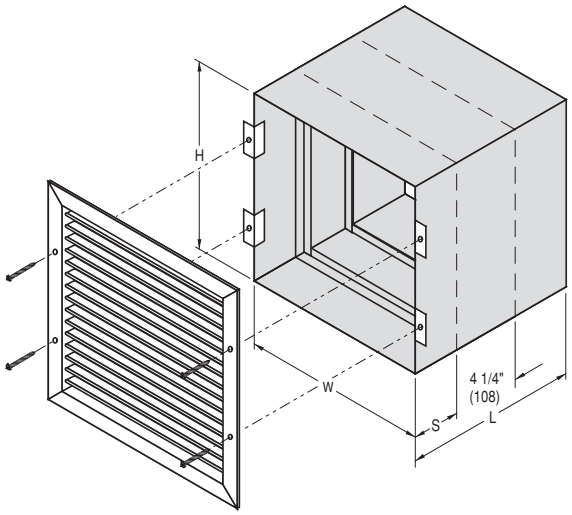
This unique product utilizes special grille mounting tabs on the sleeve that eliminate the requirement for unsightly retaining angles which commonly protrude from behind the grille. A steel grille installs over and completely conceals the mounting tabs for a clean, aesthetic finish. The fire damper is offset in the sleeve to accommodate a single or double defection supply air grille, single deflection supply air register or a return air grille or register. Countersunk screw holes in the grille frame will match to mounting tabs when a Nailor grille is ordered in conjunction with the damper assembly. Design features include corrosion resistant steel frame, blades and sleeve for performance that lasts, and a choice of transition styles and accessories making installation fast and simple.

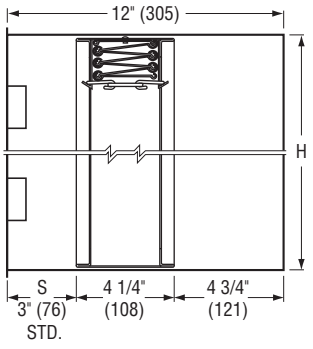
QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED FIRE DAMPER. 1 1/2 hr. label (File # R9492).**
- **Meets all the requirements of UL and NFPA 80, 90A and 101 for fire dampers in static 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. 3225-0935:0100.**

STANDARD CONSTRUCTION:

	0110G (Type A)	0120G (Type B)	0130G (Type CR)
Frame:	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
Blades:	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
Standard Sleeve:	12" (305) long x 22 ga. (0.85) galv. steel with 3/4" (19) wide grille mounting flanges	12" (305) long x 22 ga. (0.85) galv. steel with 3/4" (19) wide grille mounting flanges; Type B duct connection on one end	12" (305) long x 22 ga. (0.85) galv. steel with 3/4" (19) wide grille mounting flanges; Type C duct connection on one end
Fusible Link: (UL Listed)	165°F (74°C) std. 212°F (100°C) avail.	165°F (74°C) std. 212°F (100°C) available	165°F (74°C) std. 212°F (100°C) available
Blade Closure:	Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps	Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps	Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps
Mounting:	Vertical or Horiz.	Vertical or Horiz.	Vertical or Horiz.
Optional Grille:	Steel grille with correctly located countersunk screw holes; Select model from Nailor Air Distribution Catalog	Steel grille with correctly located countersunk screw holes; Select model from Nailor Air Distribution Catalog	Steel grille with correctly located countersunk screw holes; Select model from Nailor Air Distribution Catalog



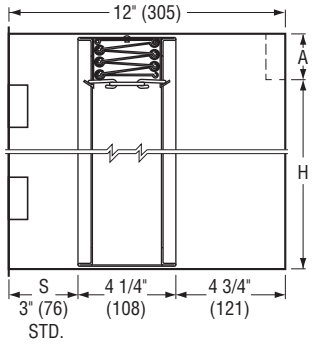


MODEL 0110G: TYPE A

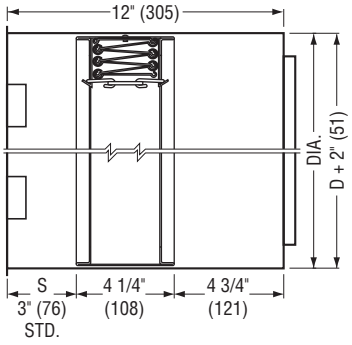
For MIN./MAX. UL SIZES see chart on page D11.

DIMENSIONAL DATA:

Duct Height (H)	Dim. 'A'
6" – 17" (152 – 432)	2" (51)
18" – 21" (457 – 533)	3" (76)



MODEL 0120G: TYPE B DUCT CONNECTION ON ONE END



MODEL 0130G: TYPE CR ROUND DUCT CONNECTION ON ONE END

HOW TO DETERMINE SLEEVE LENGTH / DAMPER POSITION:

To calculate sleeve length, determine wall thickness, add S dimension (3" [76] standard) and then add 3" (76) minimum for rear retaining angles and duct connection. Front of assembly fits flush with wall. Damper offset (dimension 'S') should accommodate grille selection depth, but fire damper blade centerline must remain within the plane of the wall or floor. The standard design shown above requires a minimum wall thickness of 5 1/8" (130).

FOR NON-STANDARD SLEEVE LENGTH, SPECIFY LENGTH.

FOR NON STANDARD DAMPER POSITION IN SLEEVE, SPECIFY DIMENSION 'S'.

OPTIONS & ACCESSORIES:

	CODE	DESCRIPTION
QUICK-SET ANGLE	QS1	Single set of "Quick-Set" Retaining Angles for Rear Side
HEMMED SLEEVE	HM1	Sleeve End Hemmed for Slip and Drive Connection for Rear Side
FLANGED SLEEVE	TDF1	One Sleeve End Flanged for Breakaway Connection for Rear Side
MICROSWITCH	MS	24V Microswitch
	MSE	120/24V Microswitch with Enclosure

HOW TO SPECIFY

MODEL SERIES: 0100G - 1 1/2 HOUR LABEL
INTEGRAL SLEEVE STATIC CURTAIN FIRE DAMPERS FOR GRILLE MOUNT

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Integral Sleeve Static Curtain Fire Dampers for use with a grille 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. Each damper shall bear a UL 1 1/2 hour fire resistance rating label. Damper shall be tested and approved for either vertical or horizontal mounting as required for each specific location.
Damper shall be provided from the factory in an integral 22 ga. (0.85) G60 galvanized steel sleeve of appropriate length with Nailor 'Quick-Set' retaining angles to ensure proper installation in accordance with damper manufacturer's instructions and 3/4" (19) wide grille mounting tabs specially designed for use with a 26 ga. (0.50) steel grille. Fire dampers shall be offset in the sleeve an appropriate amount to maintain positioning of fire damper within plane of wall. Frame shall be constructed of 22 ga. (0.85) roll formed G60 galvanized steel and blades shall be curtain type interlocking blades constructed of 22 ga. (0.85) roll formed G60 galvanized steel. Damper shall be complete with 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 0100G Integral Sleeve Static Curtain Fire Dampers for use with a grille.

- THINLINE FRAME
- INTEGRAL SLEEVE FOR USE WITH GRILLE
- 1 1/2 HOUR RATING
- FOR USE IN STATIC SYSTEMS
- UL 555 CLASSIFIED

Models:

0210G Type A
0220G Type B
0230G Type CR, Round

Model 0210G

Series 0200G Thinline Frame Integral Sleeve Curtain Fire Dampers are designed for use in conjunction with a steel grille when ductwork terminates at an opening in a fire rated wall/partition. The 0200G Thinline Series is 1 1/2 hour UL labeled for use in 2 hour fire separations or less and is classified for use in static "fans off" systems where the HVAC system shuts down in the event of a fire.

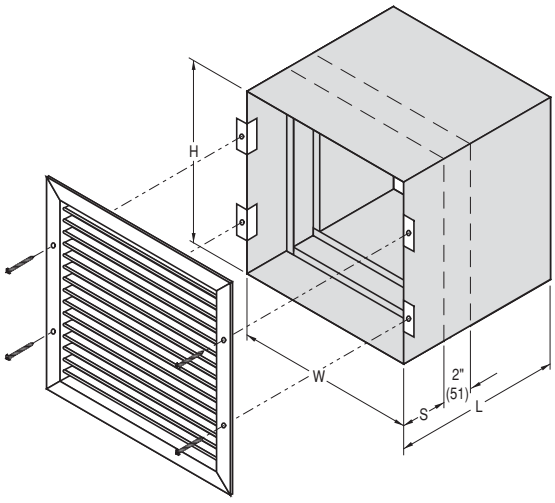
This unique product utilizes special grille mounting tabs on the sleeve that eliminate the requirement for unsightly retaining angles which commonly protrude from behind the grille. A steel grille installs over and completely conceals the mounting tabs for a clean, aesthetic finish. The 2" (51) deep thinline fire damper is offset in the sleeve to accommodate a single or double deflection grille or register. Countersunk screw holes in the grille frame will match to mounting tabs when a Nailor grille is ordered in conjunction with the damper assembly. Design features include durable corrosion resistant roll formed steel frame, blades and sleeve for lasting performance, and a choice of transition styles and accessories making installation simple and fast.

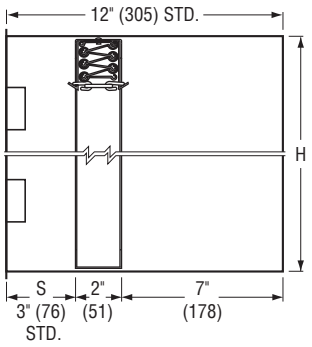
QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED FIRE DAMPER. 1 1/2 hr. label (File # R9492).**
- **Meets all the requirements of UL and NFPA 80, 90A and 101 for fire dampers in static 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. 3225-0935:0100.**

STANDARD CONSTRUCTION:

	0210G (Type A)	0220G (Type B)	0230G (Type CR)
Frame:	2" (51) wide, 22 ga. (0.85) roll-formed galv. steel	2" (51) wide, 22 ga. (0.85) roll-formed galv. steel	2" (51) wide, 22 ga. (0.85) roll-formed galv. steel; out of airstream
Blades:	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
Standard Sleeve:	12" (305) long x 22 ga. (0.85) galv. steel with 3/4" (19) wide grille mounting flanges	12" (305) long x 22 ga. (0.85) galv. steel with 3/4" (19) wide grille mounting flanges; Type B duct connection on one end	12" (305) long x 22 ga. (0.85) galv. steel with 3/4" (19) wide grille mounting flanges; Type C duct connection on one end
Fusible Link: (UL Listed)	165°F (74°C) std. 212°F (100°C) avail.	165°F (74°C) std. 212°F (100°C) available	165°F (74°C) std. 212°F (100°C) available
Blade Closure:	Gravity	Gravity	Gravity
Mounting:	For Vertical mounting	For Vertical mounting	For Vertical mounting
Optional Grille:	Steel grille with correctly located countersunk screw holes; Select model from Nailor Air Distribution Catalog	Steel grille with correctly located countersunk screw holes; Select model from Nailor Air Distribution Catalog	Steel grille with correctly located countersunk screw holes; Select model from Nailor Air Distribution Catalog



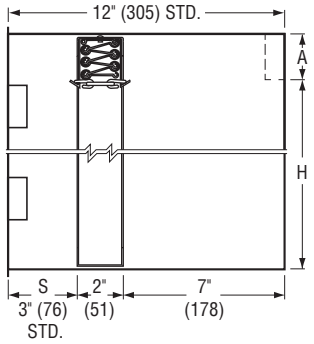


MODEL 0210G: TYPE A

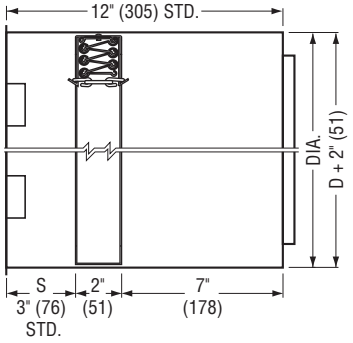
For MIN./MAX. UL SIZES see chart on page D11.

DIMENSIONAL DATA:

Duct Height (H)	Dim. 'A'
6" – 9" (152 – 229)	2" (51)
10" – 15" (254 – 381)	3" (76)
16" – 19" (406 – 483)	4" (102)



MODEL 0220G: TYPE B DUCT CONNECTION ON ONE END



MODEL 0230G: TYPE CR ROUND DUCT CONNECTION ON ONE END

HOW TO DETERMINE SLEEVE LENGTH / DAMPER POSITION:

To calculate sleeve length, determine wall thickness, add S dimension (3" [76] standard) and then add 3" (76) minimum for rear retaining angles and duct connection. Front of assembly fits flush with wall. Damper offset (dimension 'S') should accommodate grille selection depth, but fire damper blade centerline must remain within the plane of the wall or floor. The standard design shown above requires a minimum wall thickness of 4" (102).

FOR NON-STANDARD SLEEVE LENGTH, SPECIFY LENGTH.

FOR NON STANDARD DAMPER POSITION IN SLEEVE, SPECIFY DIMENSION 'S'.

OPTIONS & ACCESSORIES:

	CODE	DESCRIPTION
QUICK-SET ANGLE	QS1	Single set of "Quick-Set" Retaining Angles for Rear Side
HEMMED SLEEVE	HM1	Sleeve End Hemmed for Slip and Drive Connection for Rear Side
FLANGED SLEEVE	TDF1	One Sleeve End Flanged for Breakaway Connection for Rear Side
MICROSWITCH	MS	24V Microswitch
	MSE	120/24V Microswitch with Enclosure

HOW TO SPECIFY

MODEL SERIES: 0200G - 1 1/2 HOUR LABEL
INTEGRAL SLEEVE THINLINE STATIC CURTAIN FIRE DAMPERS FOR GRILLE MOUNT

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Integral Sleeve Thinline Static Curtain Fire Dampers for use with a grille 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. Each damper shall bear a UL 1 1/2 hour fire resistance rating label. Damper shall be tested and approved for either vertical or horizontal mounting as required for each specific location.
Damper shall be provided from the factory in an integral 22 ga. (0.85) G60 galvanized steel sleeve of appropriate length with Nailor 'Quick-Set' retaining angles to ensure proper installation in accordance with damper manufacturer's instructions and 3/4" (19) wide grille mounting tabs specially designed for use with a 26 ga. (0.50) steel grille. Fire damper shall be offset in the sleeve an appropriate amount to maintain positioning of fire damper within plane of wall. Frame shall be constructed of 22 ga. (0.85) roll formed G60 galvanized steel and blades shall be curtain type interlocking blades constructed of 22 ga. (0.85) roll formed G60 galvanized steel. Damper shall be complete with 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 0200G, Integral Sleeve Thinline Static Curtain Fire Dampers for use with a grille.

- INTEGRAL "OUT OF WALL" SLEEVE FOR USE WITH GRILLE
- 1 1/2 HOUR RATING
- FOR USE IN STATIC SYSTEMS
- UL 555 CLASSIFIED

Model:

0110GOW Out of Wall Curtain Fire Damper

Model 0110GOW

Model 0110GOW is an "out of wall or floor" integral sleeve curtain type fire damper specifically designed for supply or return ducts that terminate at a grille or register for use where local building codes require the protection of HVAC ductwork penetrations in walls, partitions or floors that have a fire resistance rating of up to 2 hours. The 0110GOW is classified for use only in static "fans off" systems where the HVAC system is automatically shut down in the event of a fire.

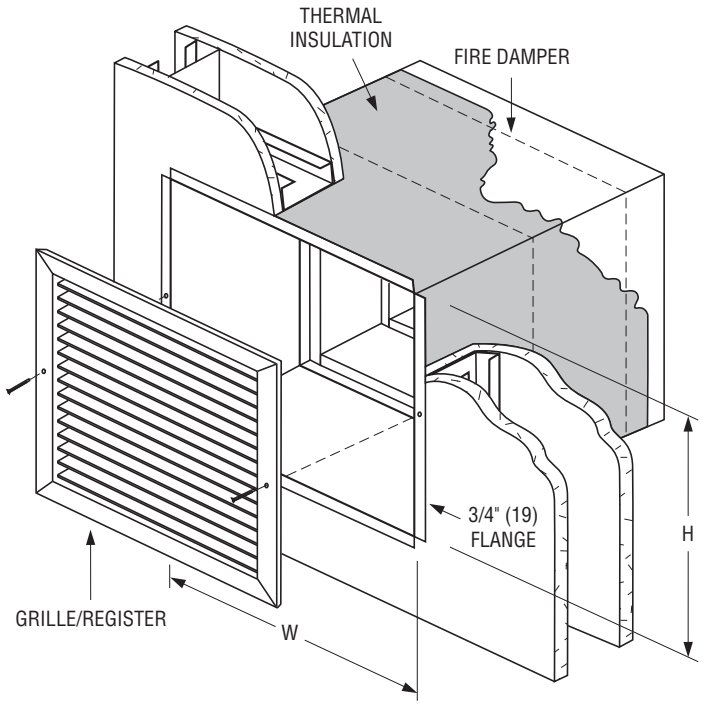
The design provides sufficient damper off-set to accommodate most commercial grille/register designs while ensuring an approved installation in any fire partition or wall no matter how narrow. This model is particularly suited for use in common steel stud drywall partition designs as narrow as 3 1/2" (89) where a traditional "within the plane of the wall" fire damper installation is not possible.

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED FIRE DAMPER. 1 1/2 hr. label (File # R9492).**
- **Meets all the requirements of UL and NFPA 80, 90A and 101 for fire dampers in static 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. 3225-0935:0100.**

STANDARD CONSTRUCTION:

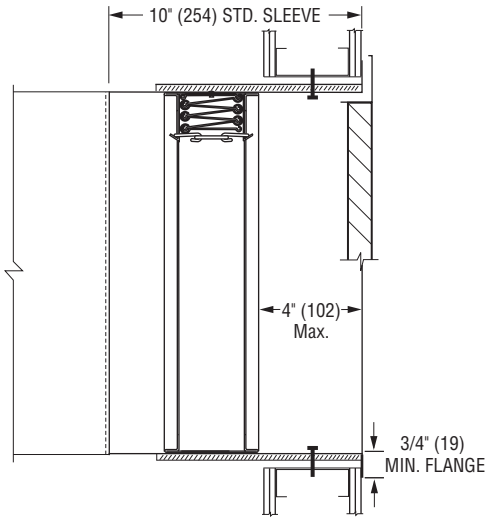
	0110GOW (Type A)
Frame:	4 1/4" (108) wide, 22 ga. (0.85) roll-formed galv. steel
Blades:	Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel
Standard Sleeve:	10" (254) long x 16 ga. (1.6) galvanized steel with 3/4" (19) wide grille mounting flanges; intumescent thermal insulation on all four sides
Fusible Link: (UL Listed)	165°F (74°C) std. 212°F (100°C) avail.
Blade Closure:	Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps
Mounting:	Vertical or Horizontal
Optional Grille:	Steel or aluminum grille or register; Select model from Nailor Air Distribution Catalog



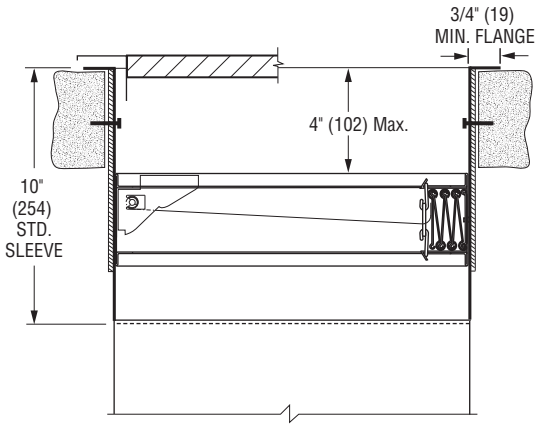
MODEL: 0110GOW

For MIN./MAX. UL SIZES see chart on page D11.

DIMENSIONAL DATA:
MODEL: 0110GOW



Vertical Mount



Horizontal Mount

OPTIONS & ACCESSORIES:

	CODE	DESCRIPTION
QUICK-SET ANGLE	QS1	Single set of "Quick-Set" Retaining Angles for Rear Side
HEMMED SLEEVE	HM1	Sleeve End Hemmed for Slip and Drive Connection for Rear Side
FLANGED SLEEVE	TDF1	Sleeve End Flanged for Breakaway Connection for Rear Side
MICROSWITCH	MS	24V Microswitch
	MSE	120/24V Microswitch with Enclosure

HOW TO SPECIFY

MODEL: 0110GOW - 1 1/2 HOUR LABEL
"OUT OF WALL" INTEGRAL SLEEVE STATIC CURTAIN FIRE DAMPERS FOR GRILLE MOUNT

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, "Out of Wall" Integral Sleeve Static Curtain Fire Dampers for use with a grille 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. Each damper shall bear a UL 1 1/2 hour fire resistance rating label. Damper shall be tested and approved for either vertical or horizontal mounting as required for each specific location.
Damper shall be provided from the factory in an integral 16 ga. (1.61) galvanized steel sleeve of appropriate length with intumescent thermal insulation on four sides and 3/4" (19) wide grille mounting flanges specially designed for use with a steel or aluminum grille with Nailor 'Quick-Set' retaining angles to ensure proper installation in accordance with damper manufacturer's instructions. Frame shall be constructed of 22 ga. (0.85) roll formed G60 galvanized steel and blades shall be curtain type interlocking blades constructed of 22 ga. (0.85) roll formed G60 galvanized steel. Damper shall be complete with 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 0110GOW "Out of Wall" Integral Sleeve Static Curtain Fire Dampers for use with a grille.

- 100% FREE AREA
- GARBAGE CHUTE FIRE DAMPER
- HORIZONTAL MOUNT

Model:

0130GC Garbage Chute Fire Dampers

Model 0130GC

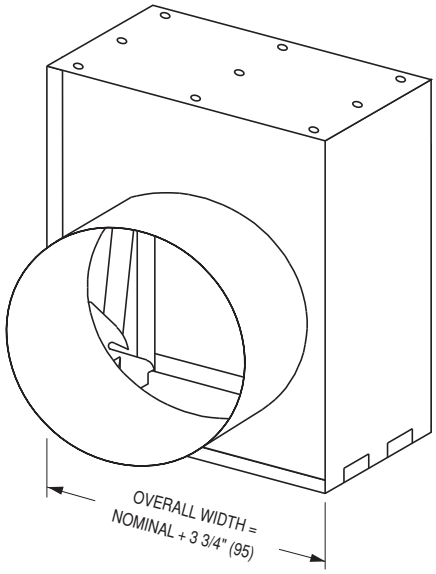
Model 0130GC Garbage Chute Fire Damper has been specifically designed for garbage chute applications. The damper casing is oversized to ensure that the blade stack, fusible link and closure springs are unobstructed from falling waste. The round collar is slightly oversized for direct attachment to the outside of the garbage chute. The design features durable corrosion resistant steel construction, 100% free area and is available in three standard sizes, 20" dia. (508), 22" dia. (559) and 24" dia. (610), as well as custom sizes.

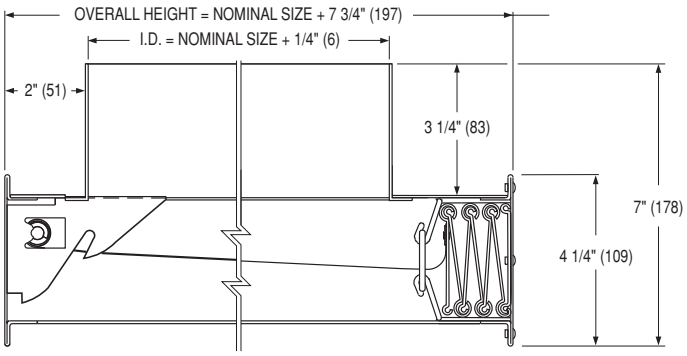
QUALIFICATIONS:

- **Contact the "Authority Having Jurisdiction" for approval.**

STANDARD CONSTRUCTION:

	0130GC
Frame:	4 1/4" (108) wide, 22 ga. (0.85) roll-formed galv. steel
Blades:	Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel
Mounting Collar:	22 ga. (0.85) galvanized steel; 3/4" (19) wide grille mounting flanges
Fusible Link: (UL Listed)	165°F (74°C) std. 212°F (100°C) avail.
Blade Closure:	Stainless steel closure springs with galvanized steel locking ramps
Mounting:	Horizontal mount
Standard Sizes:	20" (508) diameter 22" (559) diameter 24" (610) diameter Note: Other sizes available upon request





HOW TO SPECIFY

MODEL: 0130GC

GARBAGE CHUTE FIRE DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, garbage chute type fire dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Fire dampers shall be manufactured and tested in accordance with UL 555 Safety Standard for Fire Dampers. Use of this product may require approval from the local "Authority Having Jurisdiction", as UL does not recognize this application and there are no UL approved installation instructions.
Each fire damper shall be complete with a (**specifier select temperature**) 165°F (74°C) **or** 212°F (100°C) UL Listed fusible link. Garbage chute type fire dampers shall be equipped with closure springs and locking ramps suitable for horizontal mounting and shall be enclosed in a Type C housing, oversized to ensure all damper parts are not exposed to falling debris. Round collar of minimum 22 ga. (0.85) shall be provided on top side only, and shall be oversized for connection over chute. Each shipment of fire dampers shall include same installation instructions. Standard of acceptance shall be Nailor Model 0130GC garbage chute type fire dampers.

HOW TO ORDER

MODEL SERIES: 0100 – 0500
STATIC CURTAIN FIRE DAMPERS

EXAMPLE: 0110H - 24X24 - FL - 165

1a. **Models**

Static Applications Only

Non-Integral Sleeve

0110H	Horizontal, Type A, 1 1/2 Hr. Label
0110V	Vertical, Type A, 1 1/2 Hr. Label
0120H	Horizontal, Type B, 1 1/2 Hr. Label
0120V	Vertical, Type B, 1 1/2 Hr. Label
0130H	Horizontal, Type C, Round/Oval, 1 1/2 Hr. Label
0130V	Vertical, Type C, Round/Oval, 1 1/2 Hr. Label
0140H	Horizontal, Type C, Sq./Rect., 1 1/2 Hr. Label
0140V	Vertical, Type C, Sq./Rect., 1 1/2 Hr. Label
0210H	Thinline, Horizontal, Type A, 1 1/2 Hr. Label
0210V	Thinline, Vertical, Type A, 1 1/2 Hr. Label
0220H	Thinline, Horizontal, Type B, 1 1/2 Hr. Label
0220V	Thinline, Vertical, Type B, 1 1/2 Hr. Label
0230H	Thinline, Horizontal, Type C, Round/Oval, 1 1/2 Hr. Label
0230V	Thinline, Vertical, Type C, Round/Oval, 1 1/2 Hr. Label
0240H	Thinline, Horiz., Type C, Sq./Rect., 1 1/2 Hr. Label
0240V	Vertical, Type C, Sq./Rect., 1 1/2 Hr. Label
0310H	Wide Frame, Horizontal, Type A, 1 1/2 Hr. Label
0310V	Wide Frame, Vertical, Type A, 1 1/2 Hr. Label
0510H	Horizontal, Type A, 3 Hr. Label
0510V	Vertical, Type A, 3 Hr. Label
0520H	Horizontal, Type B, 3 Hr. Label
0520V	Vertical, Type B, 3 Hr. Label
0530H	Horizontal, Type C, 3 Hr. Label
0530V	Vertical, Type C, 3 Hr. Label
0540V	Wide Frame, Vertical, Type A, 3 Hr. Label
0570V	Thinline Frame, Vertical, Type A, 3 Hr. Label
0580V	Thinline Frame, Vertical, Type B, 3 Hr. Label
0590V	Thinline Frame, Vertical, Type C, 3 Hr. Label
0130GC	Garbage Chute Fire Damper

Integral Sleeve

0114	Type A, 1 1/2 Hr. Label
0124	Type B, 1 1/2 Hr. Label
0134	Type C, 1 1/2 Hr. Label
0110G	Grille Mount, Type A, 1 1/2 Hr. Label
0120G	Grille Mount, Type B, 1 1/2 Hr. Label
0130G	Grille Mount, Type C, 1 1/2 Hr. Label
0210G	Thinline, Grille Mount, Type A, 1 1/2 Hr. Label
0220G	Thinline, Grille Mount, Type B, 1 1/2 Hr. Label
0230G	Thinline, Grille Mount, Type C, 1 1/2 Hr. Label
0110GOW	Out of Wall, Grille Mount, Type A, 1 1/2 Hr. Label

1b. **Integral Sleeve Length (01X4 Series only)**

Add Suffix to Model Number

- 12H	12" (305) Horiz. Mount 12" x 22 GA.
- 12V	12" (305) Vert. Mount 12" x 22 GA.
- 14H	14" (356) Horiz. Mount 14" x 22 GA.
- 14V	14" (356) Vert. Mount 14" x 22 GA.
- 16H	16" (406) Horiz. Mount 16" x 22 GA.
- 16V	16" (406) Vert. Mount 16" x 22 GA.

1c. **Transition: (Non-Integral Sleeve Type C only)**

CO	Oval
CR	Round
CSR	Sq./Rect. (1 1/2 Hr. Label only)

2. **Duct Size**

Width x Height

inches (mm's)

2b. **Pressure (Type C only)**

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

2c. **Collar (Type CSR only)**

WC	With Collar (default)
NC	No Collar

3. **Closure Device**

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

4. **Closure Temperature**

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

5. **Sleeve Length**

– None (default)

SL = Specify

8" - 28" (203 - 700)

6a. **Sleeve Gauge**

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

6b. *Sleeve Style (0120 only)

STY2	Type 2 Standard (default)
STY1	Type 1 Optional

OPTIONS & ACCESSORIES:

7. **Pull Tab Release**

–	None (default)
PT	Pull Tab Release

8. **Micro Switch**

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

9. **Retaining Angles**

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

10. **Sleeve Accessory**

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

Notes:

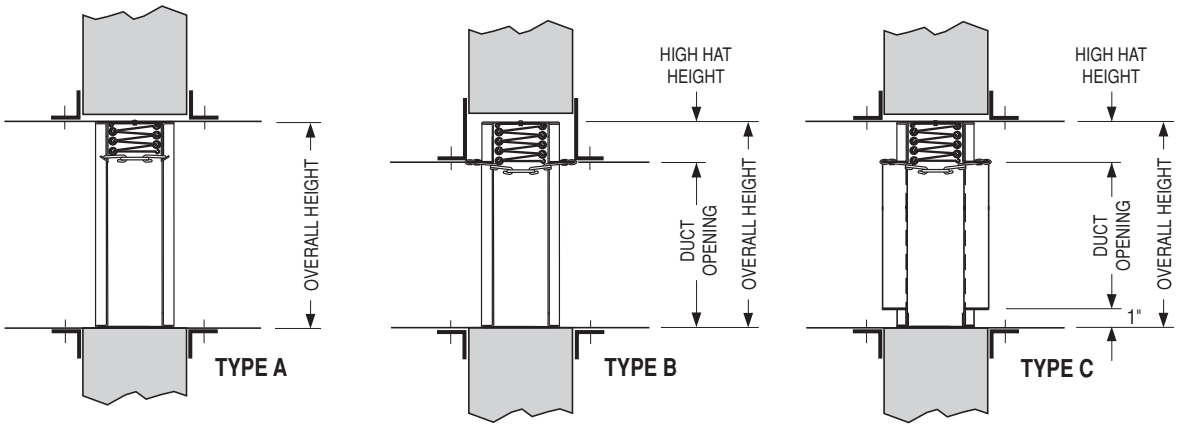
1. Not all variants and options are available on all models. Refer to individual model for selection availability.

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:



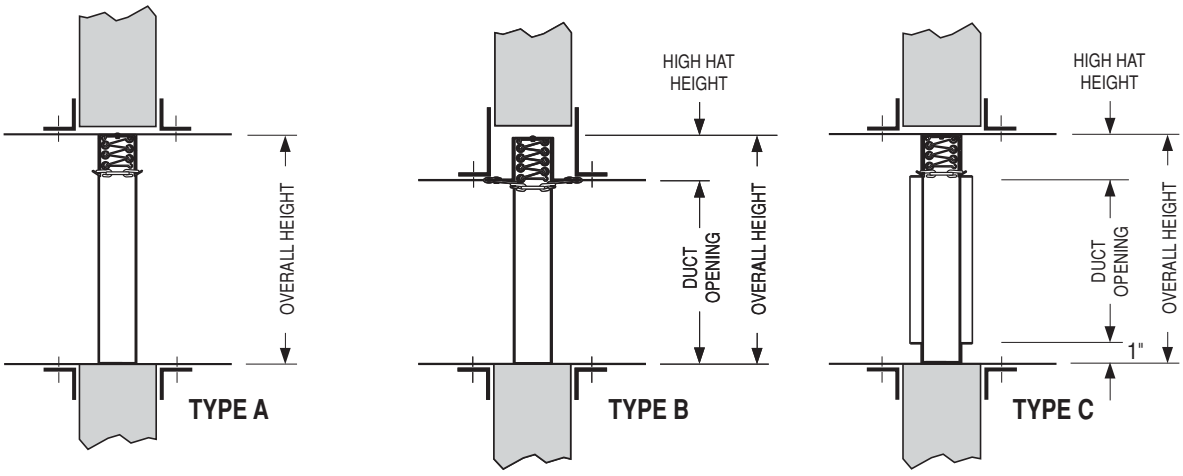
	Duct Opening Height		Overall Height	
	Imperial	**Metric**	**Imperial**	**Metric**
Type A	4" → 60"	102 mm → 1524 mm	Duct Height – 1/4"	Duct Height – 6 mm
	Note: Type A Damper Overall Width = Duct Opening – 1/4" (6 mm)			
Type B	3" → 17"	76 → 432 mm	Duct Height + 2 1/8"	Duct Height + 54 mm
	18" → 27"	457 → 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)			
Type C	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.

THINLINE 2" (51) FRAME FIRE DAMPERS:

SERIES / MODELS: 0200, 0570, 0580, 0590

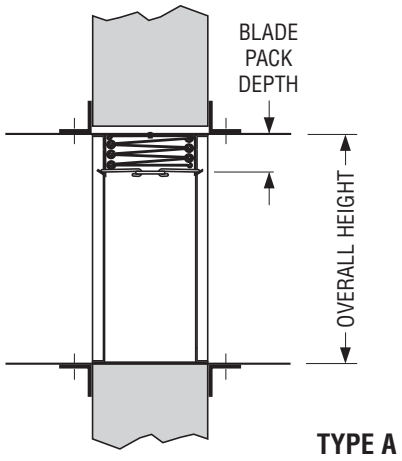
Use the following chart to determine overall dimensions for Type A, B, and C curtain type fire dampers:



	Duct Opening Height		Overall Height	
	Imperial	**Metric**	**Imperial**	**Metric**
Type A	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)			
Type B	3" → 9"	76 → 229 mm	Duct Height + 2 1/8"	Duct Height + 54 mm
	10" → 15"	254 → 381 mm	" + 3 1/8"	" + 79 mm
	16" → 19"	406 → 483 mm	" + 4 1/8"	" + 105 mm
	20" → 25"	508 → 635 mm	" + 5 1/8"	" + 130 mm
	26" → 31"	660 → 787 mm	" + 6 1/8"	" + 156 mm
	32" → 34"	813 → 864 mm	" + 7 1/8"	" + 181 mm
	35" → 40"	889 → 1016 mm	" + 8 1/8"	" + 206 mm
	41" → 46"	1041 → 1168 mm	" + 9 1/8"	" + 232 mm
	47" → 50"	1194 → 1245 mm	" + 10 1/8"	" + 257 mm
	Note: Type B Damper Overall Width = Duct Opening – 1/4" (6 mm)			
Type C	3" → 9"	76 → 229 mm	Duct Height + 2 3/4"	Duct Height + 70 mm
	10" → 15"	254 → 381 mm	" + 3 3/4"	" + 95 mm
	16" → 19"	406 → 483 mm	" + 4 3/4"	" + 121 mm
	20" → 25"	508 → 635 mm	" + 5 3/4"	" + 146 mm
	26" → 31"	660 → 787 mm	" + 6 3/4"	" + 172 mm
	32" → 34"	813 → 864 mm	" + 7 3/4"	" + 197 mm
	35" → 40"	889 → 1016 mm	" + 8 3/4"	" + 222 mm
	41" → 46"	1041 → 1168 mm	" + 9 3/4"	" + 248 mm
	47" → 49"	1194 → 1245 mm	" + 10 3/4"	" + 273 mm
	Note: Type C Damper Overall Width = Duct Opening + 1 3/4" (44 mm)			

BLADE PACK DEPTH FOR 6" (152) WIDE FRAME FIRE DAMPERS
MODELS: 0310 AND 0540 (TYPE A)

Duct Opening Height		Type "A" Overall Height		Blade Pack Depth	
(inches)	(mm)	(inches)	(mm)	(inches)	(mm)
4	102	3 3/4	95	3/4	19
5	127	4 3/4	121	7/8	22
6	152	5 3/4	146	7/8	22
7	178	6 3/4	171	7/8	22
8	203	7 3/4	197	1 1/4	32
9	229	8 3/4	222	1 1/4	32
10	254	9 3/4	248	1 1/4	32
11	279	10 3/4	273	1 3/8	35
12	305	11 3/4	298	1 3/8	35
13	330	12 3/4	324	1 3/8	35
14	356	13 3/4	349	1 5/8	41
15	381	14 3/4	375	1 5/8	41
16	406	15 3/4	400	1 5/8	41
17	432	16 3/4	425	1 3/4	44
18	457	17 3/4	451	1 3/4	44
19	483	18 3/4	476	1 3/4	44
20	508	19 3/4	502	2	51
21	534	20 3/4	527	2	51
22	559	21 3/4	552	2	51
23	584	22 3/4	578	2	51
24	610	23 3/4	603	2 1/4	57
25	635	24 3/4	629	2 1/4	57
26	661	25 3/4	654	2 1/2	64
27	656	26 3/4	679	2 1/2	64
28	711	27 3/4	705	2 1/2	64
29	737	28 3/4	730	2 1/2	64
30	762	29 3/4	756	2 5/8	67
31	787	30 3/4	781	2 5/8	67
32	813	31 3/4	806	2 5/8	67
33	838	32 3/4	832	2 5/8	67
34	864	33 3/4	857	2 7/8	73
35	889	34 3/4	883	2 7/8	73
36	914	35 3/4	908	2 7/8	73
37	940	36 3/4	933	3 1/8	79
38	965	37 3/4	959	3 1/8	79
39	991	38 3/4	984	3 1/8	79
40	1016	39 3/4	1010	3 3/8	86
41	1041	40 3/4	1035	3 3/8	86
42	1067	41 3/4	1060	3 3/8	86
43	1092	42 3/4	1086	3 3/8	86
44	1117	43 3/4	1111	3 1/2	89
45	1143	44 3/4	1137	3 1/2	89
46	1168	45 3/4	1162	3 1/2	89
47	1194	46 3/4	1187	3 3/4	95
48	1219	47 3/4	1213	3 3/4	95
49	1245	48 3/4	1238	3 3/4	95
50	1270	49 3/4	1264	3 3/4	95
51	1296	50 3/4	1289	3 7/8	98
52	1321	51 3/4	1314	3 7/8	98
53	1346	52 3/4	1340	3 7/8	98
54	1372	53 3/4	1365	4 1/8	105
55	1397	54 3/4	1391	4 1/8	105
56	1423	55 3/4	1416	4 1/8	105
57	1448	56 3/4	1441	4 1/8	105
58	1473	57 3/4	1467	4 1/4	108
59	1499	58 3/4	1492	4 1/4	108
60	1524	59 3/4	1518	4 1/4	108

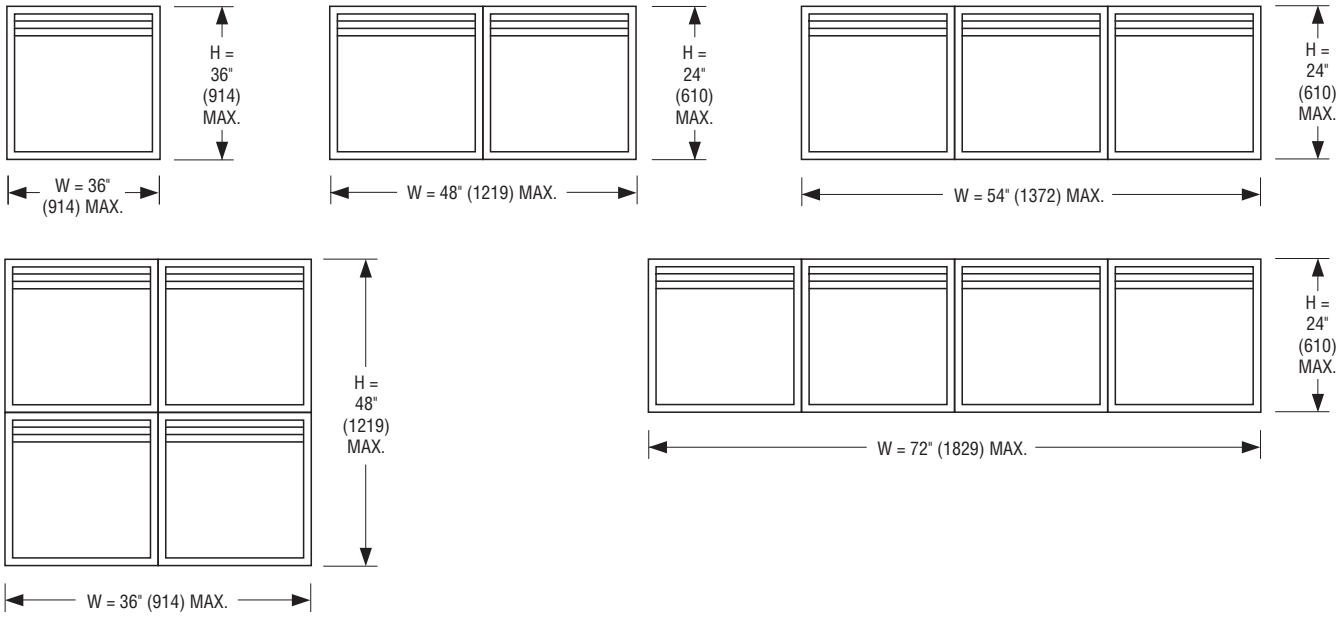


TYPE A

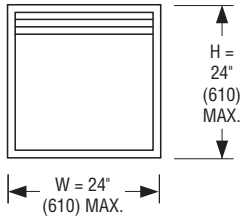
DAMPER OVERALL WIDTH
= Duct Opening - 1/4" (6).

MODEL: D0110 TYPE A (2000 fpm @ 4" w.g. [10 m/s @ 1 kPa])

VERTICAL INSTALLATION:

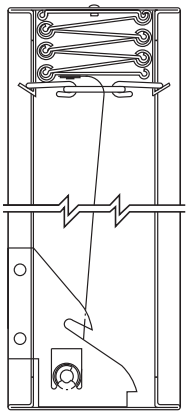


HORIZONTAL INSTALLATION:



Notes:

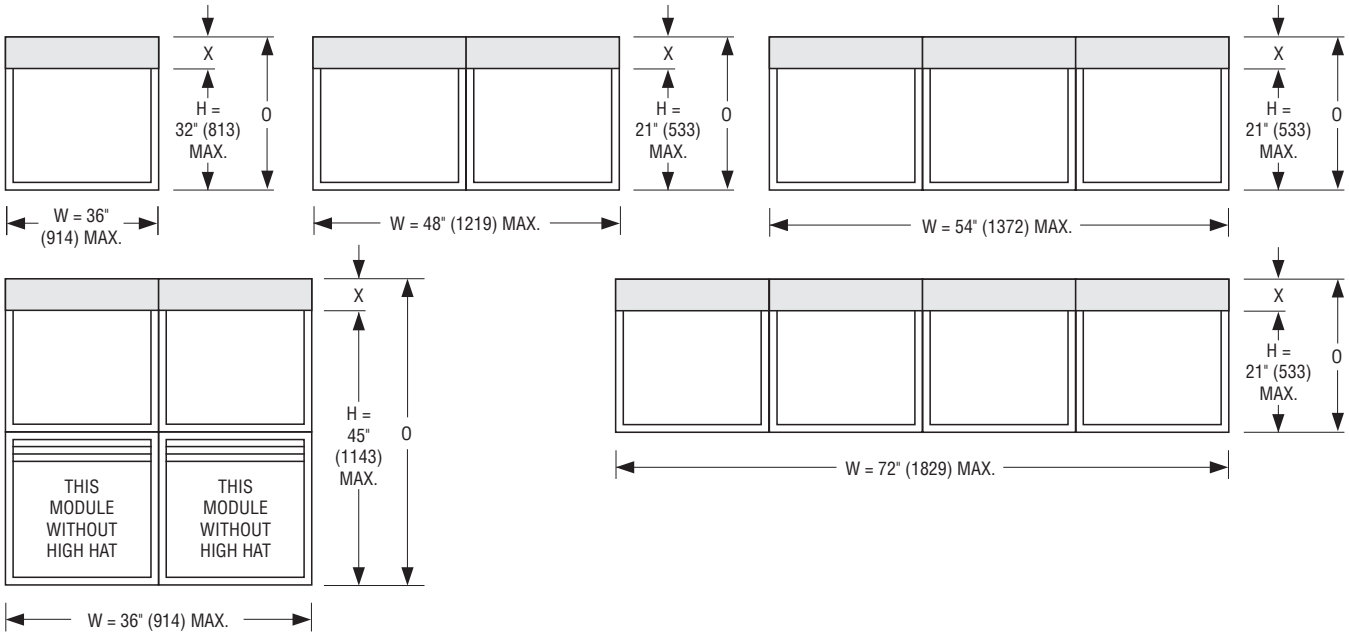
1. The above diagrams illustrate the maximum sizes available for single section and multiple section assemblies with a dynamic velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).
2. Modules are equal divisions of nominal size.
3. Dimension "W" Width and "H" Height are maximum duct size.
4. Modules are manufactured 1/4" (6) under nominal duct size.



MODEL D0110: TYPE A
WIDTH AND HEIGHT =
NOMINAL SIZE - 1/4" (6)

MODEL: D0120 TYPE B (2000 fpm @ 4" w.g. [10 m/s @ 1 kPa])

VERTICAL INSTALLATION:

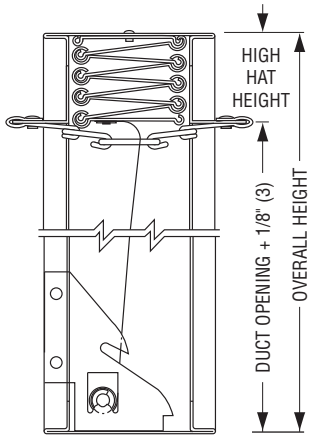


HORIZONTAL INSTALLATION:

Type B	H Dimension Nominal Duct Height	X Dimension High Hat	O Dimension Overall Height
Single High Assemblies	4" – 17" (102 – 432) 18" – 27" (457 – 656) 28" – 32" (711 – 813)	2" (51) 3" (76) 4" (102)	H + 2 1/8" (54) H + 3 1/8" (79) H + 4 1/8" (105)
Double High Assemblies	33" – 38" (838 – 965) 39" – 45" (991 – 1143)	2" (51) 3" (76)	H + 2 1/8" (54) H + 3 1/8" (79)

Notes:

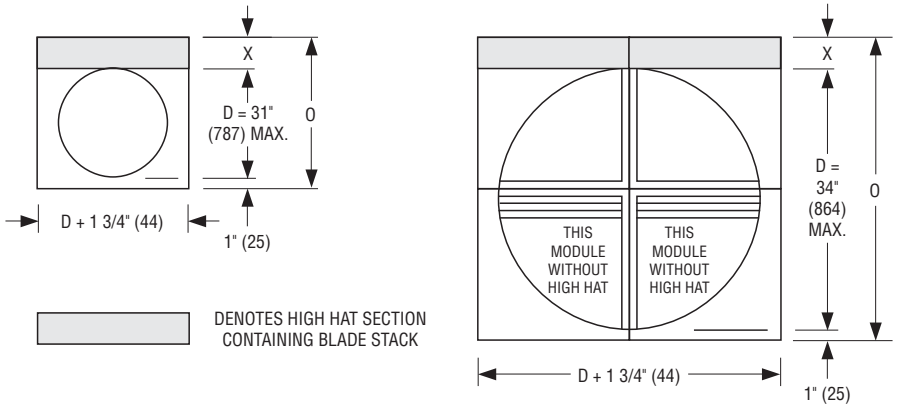
1. The above diagrams illustrate the maximum sizes available for single section and multiple section assemblies with a dynamic velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).
2. Modules are equal divisions of nominal size.
3. Dimension "W" Width and "H" Height are maximum duct size.
4. Modules without high hat section are manufactured 1/4" (6) under nominal duct size.
5. Modules with high hat section are manufactured to nominal width minus 1/4" (6) and to nominal height plus 1/8" (3).
6. "X" High Hat dimension and "O" Overall Damper Height are per the table above.



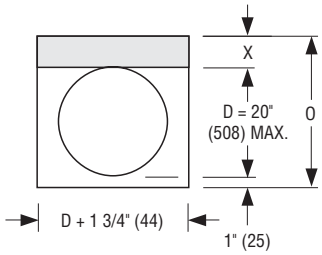
MODEL D0120: TYPE B
WIDTH = NOMINAL SIZE - 1/4" (6)

MODEL: D0130 TYPE CR (2000 fpm @ 4" w.g. [10 m/s @ 1 kPa])

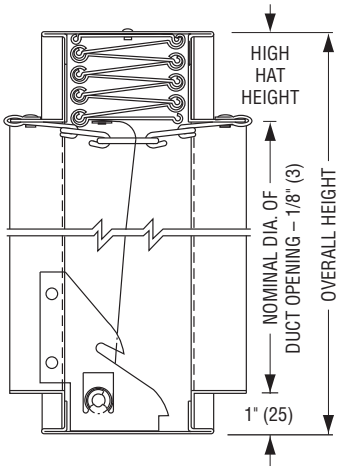
VERTICAL INSTALLATION:



HORIZONTAL INSTALLATION:



Type CR	D Dimension Nom. Duct Diameter	X Dimension High Hat	O Dimension Overall Height
Single High Assemblies	4" – 17" (102 – 432) 18" – 27" (457 – 686) 28" – 31" (711 – 787)	2" (51) 3" (76) 4" (102)	D + 2 3/4" (70) D + 3 3/4" (95) D + 4 3/4" (121)
Double High Assemblies	32" – 34" (813 – 864)	2" (51)	D + 2 3/4" (70)

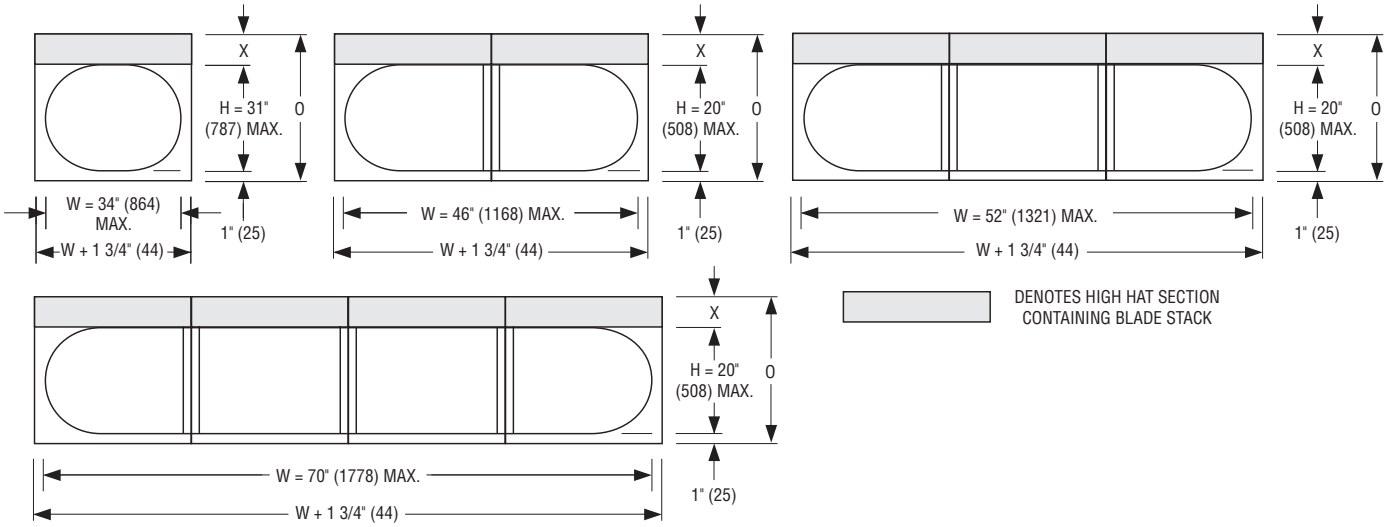


MODEL D0130: TYPE CR ROUND
OVERALL WIDTH = DUCT SIZE + 1 3/4" (44)

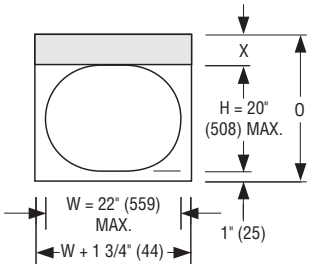
Notes:
1. The above diagrams illustrate the maximum sizes available for single section and multiple section assemblies with a dynamic velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).
2. Modules are equal divisions of nominal size.
3. Dimension "D" Diameter is maximum duct size.
4. Modules are manufactured 1/8" (3) under nominal duct size.
5. "X" High Hat dimension and "O" Overall Damper Height are per the table above.

MODELS: D0130 TYPE CO (2000 fpm @ 4" w.g. [10 m/s @ 1 kPa])
D0140 TYPE CSR

VERTICAL INSTALLATION:



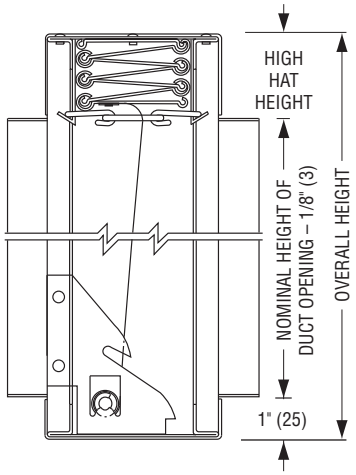
HORIZONTAL INSTALLATION:



Types CO/CSR	H Dimension Nominal Duct Height	X Dimension High Hat	O Dimension Overall Height
Single High Assemblies	4" – 17" (102 – 432) 18" – 27" (457 – 686) 28" – 31" (711 – 787)	2" (51) 3" (76) 4" (102)	H + 2 3/4" (70) H + 3 3/4" (95) H + 4 3/4" (121)

Notes:

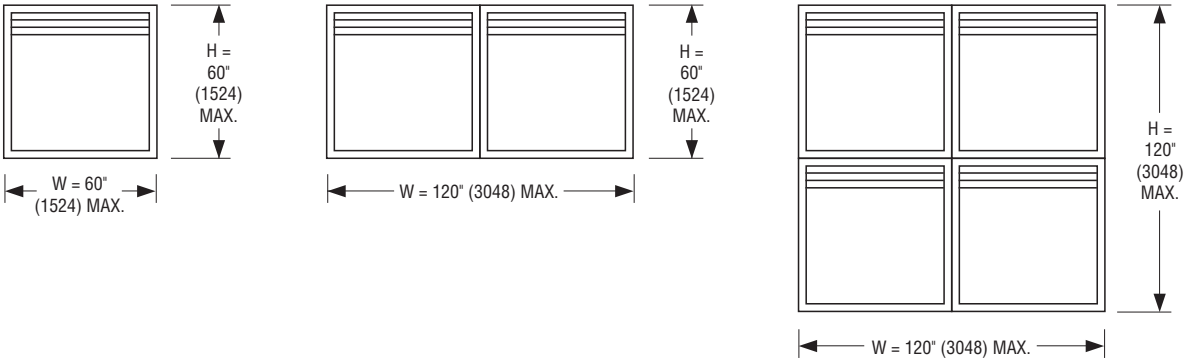
1. The above diagrams illustrate the maximum sizes available for single section and multiple section assemblies with a dynamic velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa). Type CO (flat oval duct) dampers are illustrated, but dimensions also apply to Type CSR (rectangular duct) dampers.
2. Modules are equal divisions of nominal size.
3. Dimension "W" Width and "H" Height are maximum duct size.
4. Modules are manufactured 1/8" (3) under nominal duct size.
5. "X" High Hat dimension and "O" Overall Damper Height are per the table above.



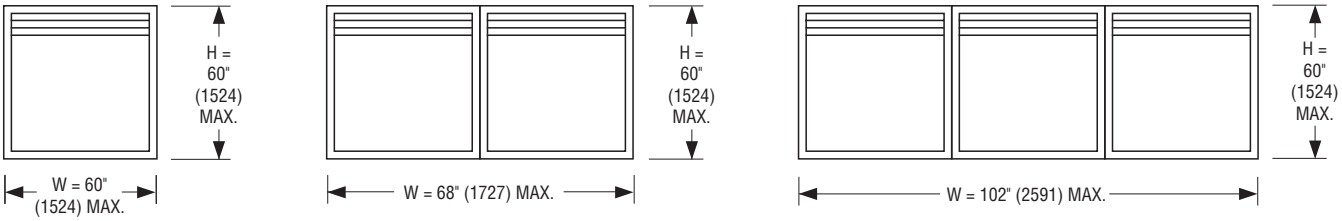
MODEL: D0130 TYPE CO OVAL
MODEL: D0140 TYPE CSR RECTANGULAR
OVERALL WIDTH = DUCT SIZE + 1 3/4" (44)

MODEL: 0110 TYPE A

VERTICAL INSTALLATION:

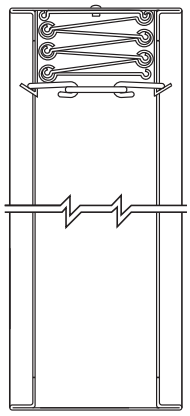


HORIZONTAL INSTALLATION:



Notes:

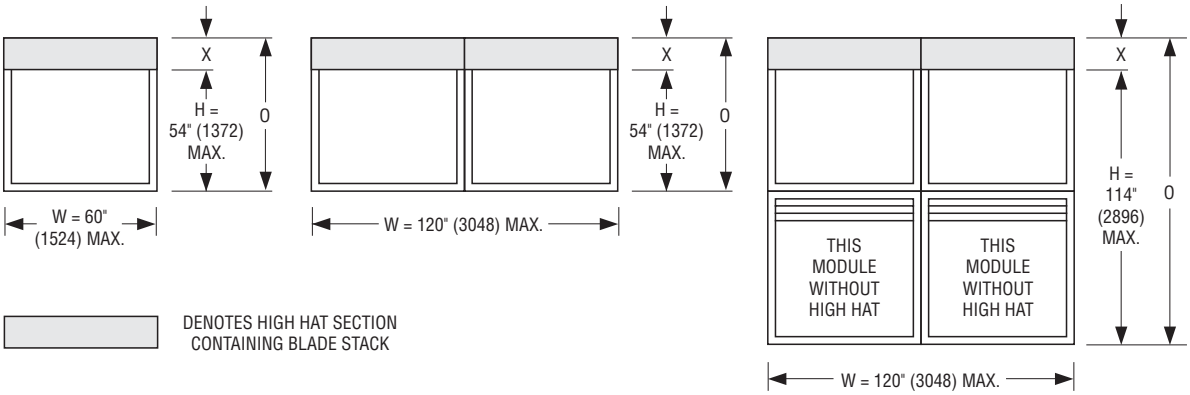
1. The above diagrams illustrate the maximum sizes available for single section and multiple section assemblies.
2. Modules are equal divisions of nominal size.
3. Dimension "W" Width and "H" Height are maximum duct size.
4. Modules are manufactured 1/4" (6) under nominal duct size.



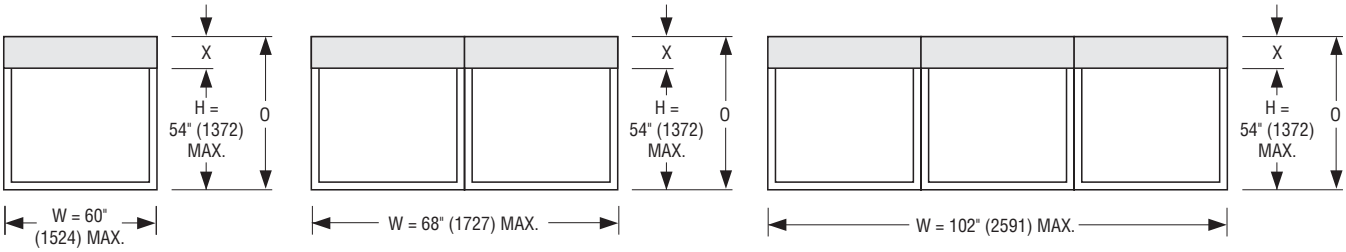
MODEL 0110: TYPE A
WIDTH AND HEIGHT =
NOMINAL SIZE - 1/4" (6)

MODEL: 0120 TYPE B

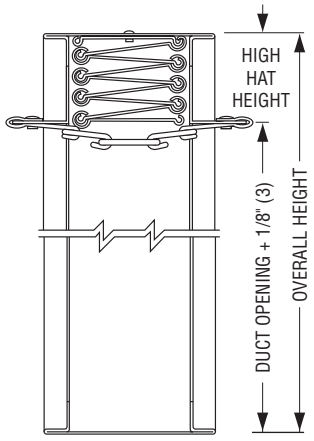
VERTICAL INSTALLATION:



HORIZONTAL INSTALLATION:



Type B	H Dimension Nominal Duct Height	X Dimension High Hat	O Dimension Overall Height
Single High Assemblies	3" – 17" (76 – 432) 18" – 27" (457 – 686) 28" – 36" (711 – 914) 37" – 45" (940 – 1143) 46" – 54" (1168 – 1372)	2" (51) 3" (76) 4" (102) 5" (127) 6" (152)	H + 2 1/8" (54) H + 3 1/8" (79) H + 4 1/8" (105) H + 5 1/8" (130) H + 6 1/8" (156)
Double High Assemblies	55" – 76" (1397 – 1930) 77" – 95" (1956 – 2413) 96" – 114" (2438 – 2896)	4" (102) 5" (127) 6" (152)	H + 4 1/8" (105) H + 5 1/8" (130) H + 6 1/8" (156)



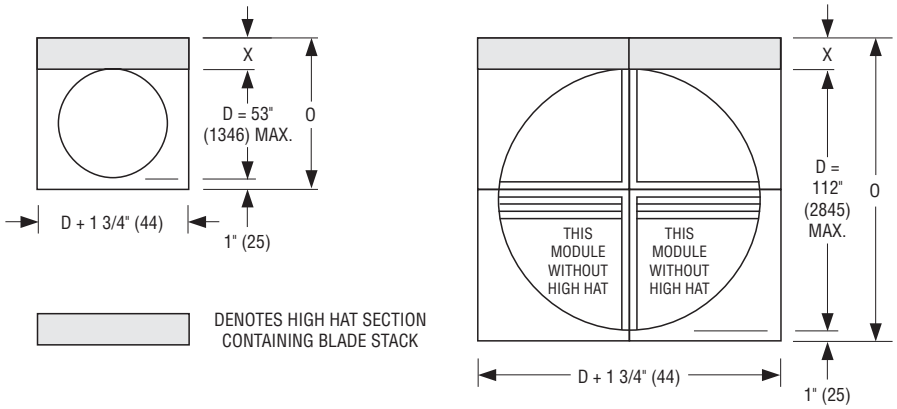
MODEL 0120: TYPE B
WIDTH = NOMINAL SIZE - 1/4" (6)

Notes:

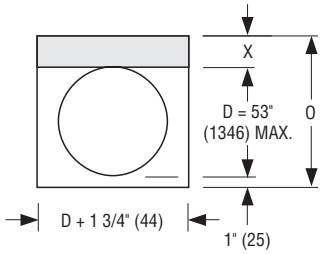
1. The above diagrams illustrate the maximum sizes available for single section and multiple section assemblies.
2. Modules are equal divisions of nominal size.
3. Dimension "W" Width and "H" Height are maximum duct size.
4. Modules without high hat section are manufactured 1/4" (6) under nominal duct size.
5. Modules with high hat section are manufactured to nominal width minus 1/4" (6) and to nominal height plus 1/8" (3).
6. "X" High Hat dimension and "O" Overall Damper Height are per the table above.

MODEL: 0130 TYPE CR

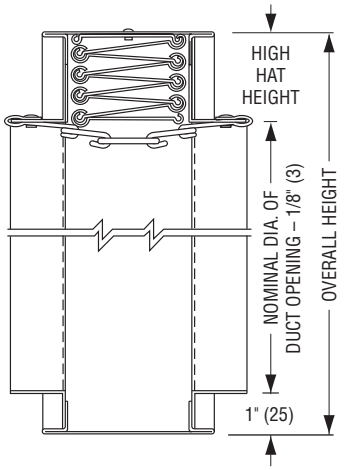
VERTICAL INSTALLATION:



HORIZONTAL INSTALLATION:



Type CR	D Dimension Nom. Duct Diameter	X Dimension High Hat	O Dimension Overall Height
Single High Assemblies	3" – 17" (76 – 432) 18" – 27" (457 – 686) 28" – 36" (711 – 914) 37" – 45" (940 – 1143) 46" – 53" (1168 – 1346)	2" (51) 3" (76) 4" (102) 5" (127) 6" (152)	D + 2 3/4" (70) D + 3 3/4" (95) D + 4 3/4" (121) D + 5 3/4" (146) D + 6 3/4" (171)
Double High Assemblies	54" – 75" (1372 – 1905) 76" – 94" (1930 – 2388) 95" – 112" (2413 – 2845)	4" (102) 5" (127) 6" (152)	D + 4 3/4" (121) D + 5 3/4" (146) D + 6 3/4" (171)

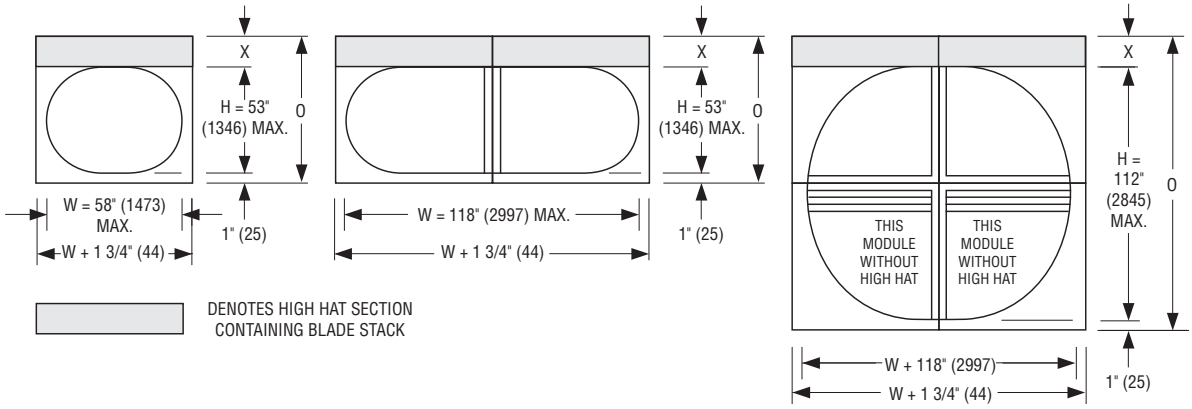


MODEL 0130: TYPE CR ROUND
OVERALL WIDTH = DUCT SIZE + 1 3/4" (44)

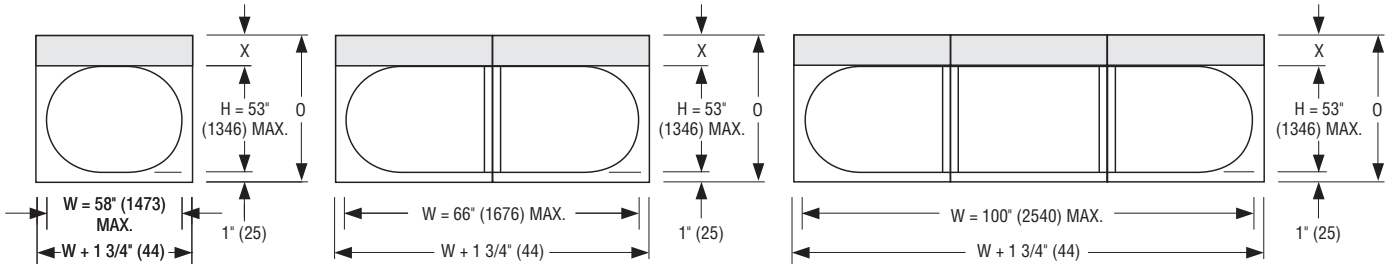
Notes:
1. The above diagrams illustrate the maximum sizes available for single section and multiple section assemblies.
2. Modules are equal divisions of nominal size.
3. Dimension "D" Diameter is maximum duct size.
4. Modules are manufactured 1/8" (3) under nominal duct size.
5. "X" High Hat dimension and "O" Overall Damper Height are per the table above.

MODELS: 0130 TYPE CO
0140 TYPE CSR

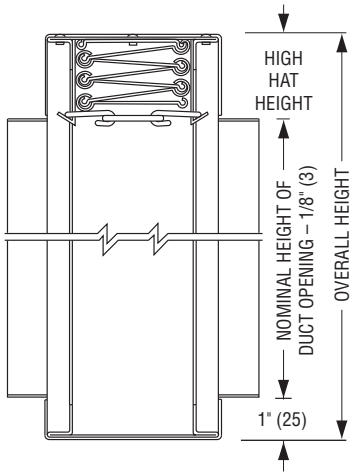
VERTICAL INSTALLATION:



HORIZONTAL INSTALLATION:



Types CO/CSR	H Dimension Nominal Duct Height	X Dimension High Hat	O Dimension Overall Height
Single High Assemblies	3" – 17" (76 – 432) 18" – 27" (457 – 686) 28" – 36" (711 – 914) 37" – 45" (940 – 1143) 46" – 53" (1168 – 1346)	2" (51) 3" (76) 4" (102) 5" (127) 6" (152)	H + 2 3/4" (70) H + 3 3/4" (95) H + 4 3/4" (121) H + 5 3/4" (146) H + 6 3/4" (171)
Double High Assemblies	54" – 75" (1372 – 1905) 76" – 94" (1930 – 2388) 95" – 112" (2413 – 2845)	4" (102) 5" (127) 6" (152)	H + 4 3/4" (121) H + 5 3/4" (146) H + 6 3/4" (171)



MODEL: 0130 TYPE CO OVAL
MODEL: 0140 TYPE CSR RECTANGULAR
OVERALL WIDTH = DUCT SIZE + 1 3/4" (44)

Notes:
1. The above diagrams illustrate the maximum sizes available for single section and multiple section assemblies. Type CO (flat oval duct) dampers are illustrated, but dimensions also apply to Type CSR (rectangular duct) dampers.
2. Modules are equal divisions of nominal size.
3. Dimension "W" Width and "H" Height are maximum duct size.
4. Modules are manufactured 1/8" (3) under nominal duct size.
5. "X" High Hat dimension and "O" Overall Damper Height are per the table above.

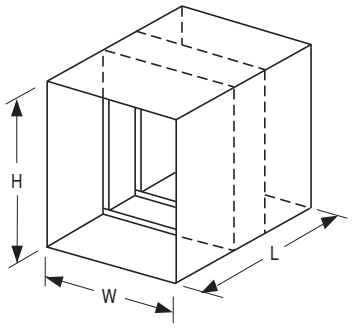
Options and Accessories

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

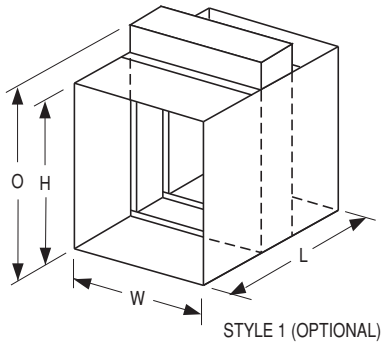
SLEEVE OPTIONS:

CUSTOM SLEEVES FOR NON-INTEGRAL SLEEVE MODELS

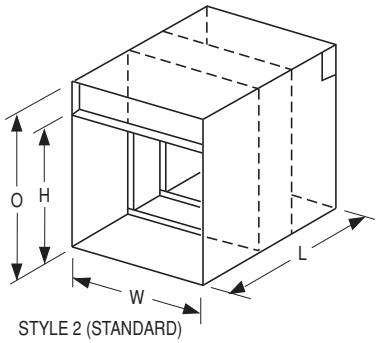
Fire dampers, in most cases, must be mounted in a steel sleeve and the damper/sleeve assembly is to be held in place in the wall, partition or floor by use of steel retaining angles. This allows for the ductwork to 'break-away' from the sleeve should the ductwork fall during a fire, thus leaving the 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

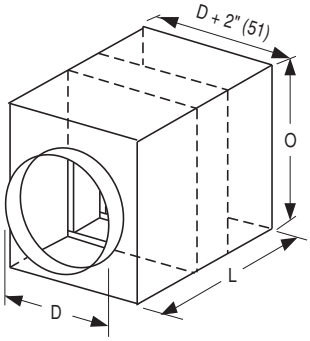


STYLE 1 (OPTIONAL)

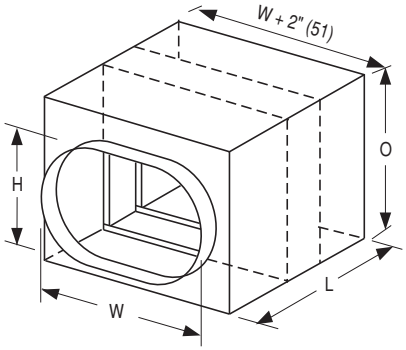


STYLE 2 (STANDARD)

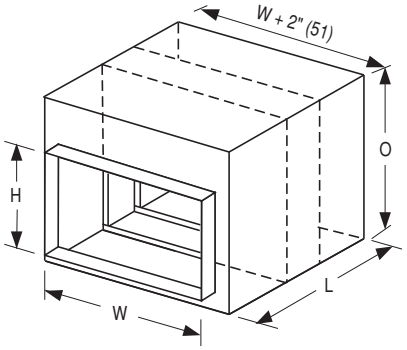
TYPE 'B' BLADES OUT OF AIRSTREAM



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

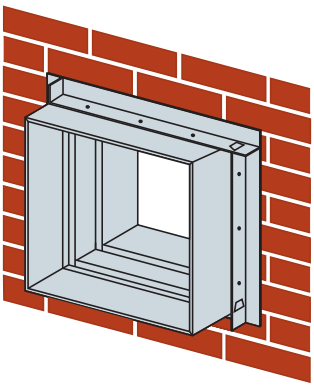
- Maximum size: 90" x 48" (2286 x 1219) or 48" x 90" (1219 x 2286).

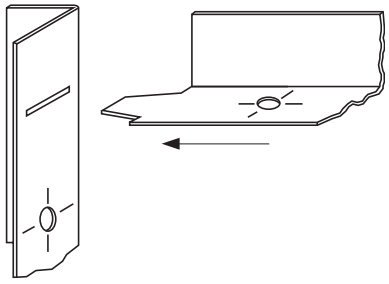
OPTION CODES
QS2 TWO SIDES (PAIR)
QS1 ONE SIDE
'QUICK-SET' RETAINING ANGLES

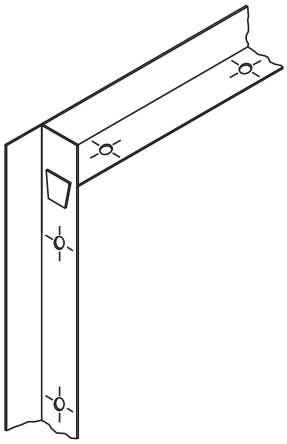
BENEFITS:

- 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).

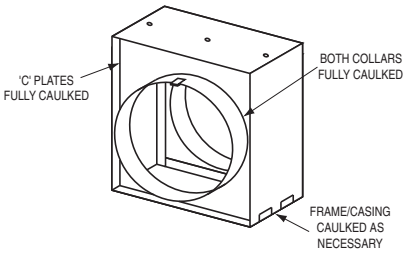
- 1 1/2 or 3 hour label fire dampers.
- Maximum Size: 90" x 48" (2286 x 1219) or 48" x 90" (1219 x 2286).
- Single side (1 1/2 hour only. Refer to Single Side Retaining Angles Supplementary Installation Instructions for size limitations) or two sided installation.

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).

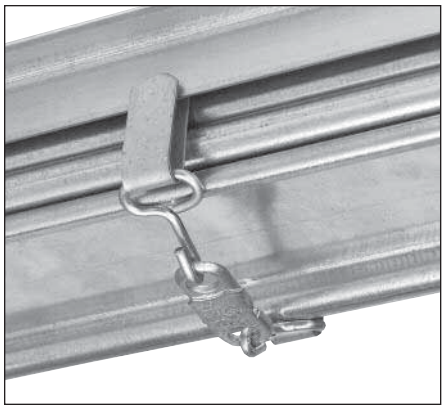
OPTION CODE **HP**
HIGH PRESSURE (SEALED)



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 it's 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):

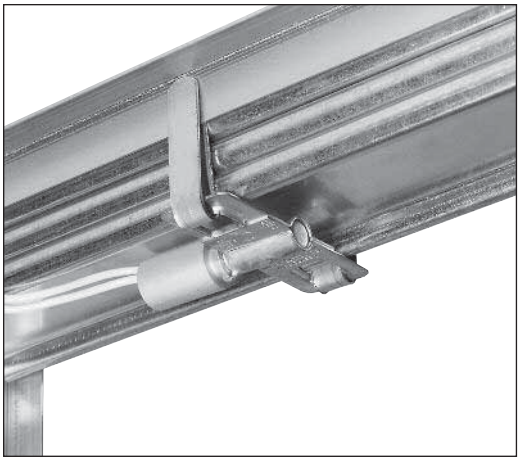
Curtain type fire dampers shall each be equipped with factory installed Easy Maintenance Link (EML), as manufactured by Nailor Industries. EML shall be accessible from either side of damper and shall allow for releasing, testing and relatching of blades with one hand.

CLOSURE DEVICES:

OPTION CODE **ETL**
ELECTRO-THERMAL LINK

Nailor's Electro-Thermal Link (ETL®) 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® 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®'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®'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® 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® 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®), 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:

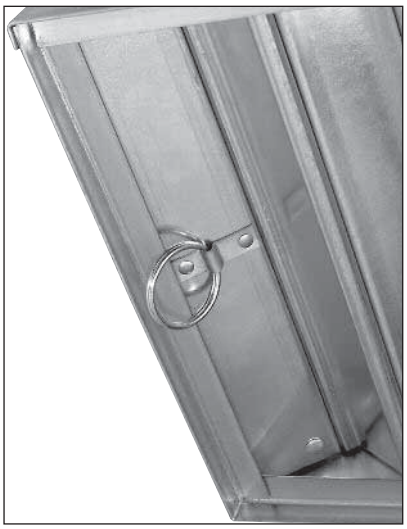
OPTION CODES **165 & 212**
165 or 212°F FUSIBLE LINKS

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.

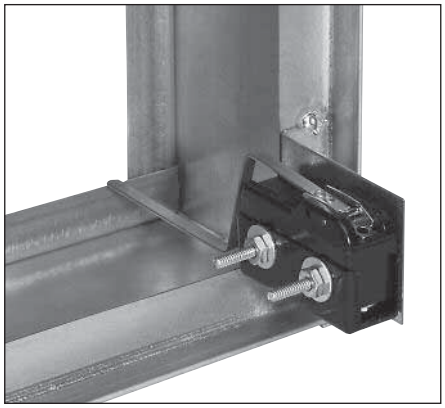
When access from above is not possible or convenient, the Pull-Tab release option permits simple resetting from beneath the damper.

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:

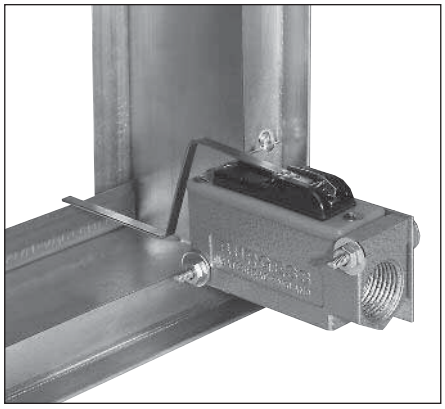
FOR DAMPER STATUS INDICATION OR HVAC FAN SHUT-DOWN

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

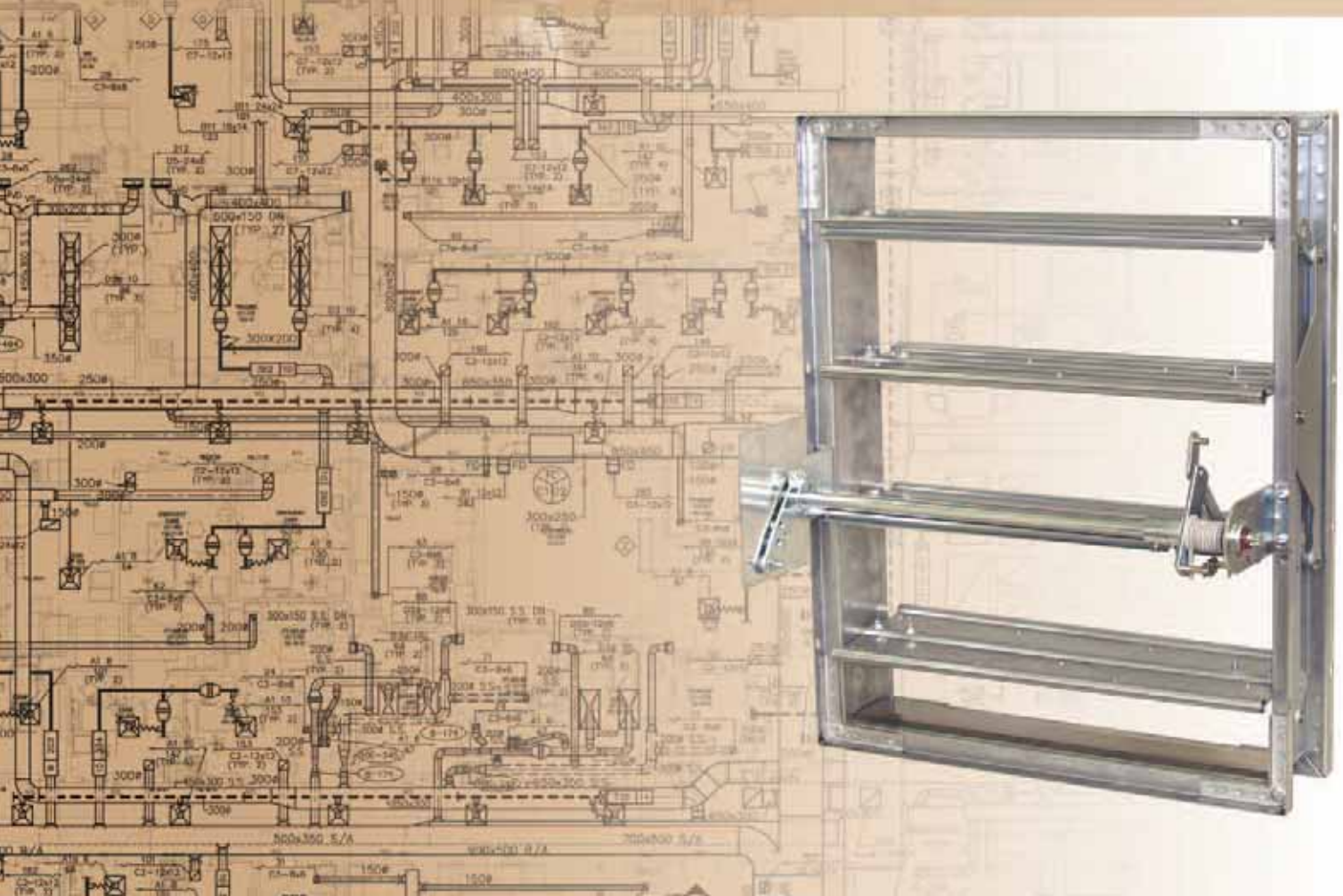
TDF (by Engle) and **TDC** (by Lockformer) proprietary flange systems are approved as breakaway connections for connecting a factory sleeved (22 or 20 gauge) Type A or B curtain type fire damper to ductwork. They may be used in place of the approved slip joints shown in standard installation instructions.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

Nailor® Industries Inc.

MULTI-BLADE FIRE DAMPERS



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GENERAL PRODUCT OVERVIEW

Over the past 100 years, the US and other industrial countries have experienced a dramatic decrease in deaths attributed to fires in commercial and industrial-use buildings. As the focus of modern commercial and industrial building construction continues to become increasingly life safety oriented, fire containment and smoke management systems are being utilized to a higher degree as more sophisticated technology is developed and implemented into building codes. Resulting property damage is minimized and occupant safety is maximized. Nailor Industries' commitment to the development of new and existing fire and smoke control technology has resulted in a comprehensive line of premium quality smoke, fire and combination fire/smoke dampers and accessories, available at a reasonable cost and in a timely fashion. Nailor's 'multi-blade' type fire dampers are available in several blade and frame styles with a multitude of options to suit most commercial and light industrial applications.

MODEL SERIES D1200 (1 1/2 HR.) & D1200-3 (3 HR.)
DYNAMIC FIRE DAMPER
AIRFOIL BLADE

Model Series D1200 and D1200-3 Airfoil Multi-blade Fire Dampers provide the ultimate in fire containment for both static and dynamic HVAC systems. The design utilizes an innovative inter-locking double skin airfoil blade that maintains a complete barrier throughout the fire test with absolutely no visible through-gaps. Amazingly, the damper gets tighter as it gets hotter! Ideal for use where building codes require a fire damper for the protection of ductwork penetrations in walls or floors with a low pressure drop design suitable for high velocity applications. Premium performance, versatility and assured closure under airflow make the D1200 and D1200-3 series dampers an excellent choice for the majority of today's commercial applications.

Model D1200

Model 1200

MODEL SERIES 1200 (1 1/2 HR.) & 1200-3 (3 HR.)
STATIC FIRE DAMPER
AIRFOIL BLADE

Model Series 1200 and 1200-3 Airfoil Multi-blade Fire Dampers are classified for use only in static "fans off" systems where the HVAC system is automatically shut down in the event of a fire alarm. Largest fire damper listing in the industry (exceeding curtain dampers) at 144" x 96" (3658 x 2438). Standard features include an innovative inter-locking double skin airfoil blade design that maintains a complete barrier throughout the fire test with absolutely no visible through-gaps. The airfoil blade design and elimination of blade sills, top and bottom, provide a low pressure drop design. The 1200 and 1200-3 series dampers have been especially designed and tested to provide premium performance.

MODEL SERIES D1250 (1 1/2 HR.)
DYNAMIC FIRE DAMPER
VEE-GROOVE BLADE

Model Series D1250 provides 1 1/2 hour UL labeled fire protection suitable for use where ductwork penetrates a wall or floor with a fire resistance rating of up to 2 hours. Nailor's most popular and economical design features sturdy vee groove style blades and a rugged mitered corner hat channel frame design that virtually eliminates racking. The over-center/knee lock with high torque spring/fusible link assures fail-safe closure during fire conditions under airflow. The D1250 series is approved for use in both static and dynamic HVAC system designs, and is an economical and versatile performer, available with a factory fitted sleeve and choice of transition styles, suitable for use in the majority of today's commercial applications.

Model D1250

MODEL D1201-DOW (1 1/2 HR.)
OUT OF WALL DYNAMIC FIRE DAMPER
AIRFOIL BLADE • DUCTED BOTH SIDES

Model D1201-DOW is an "out of wall" (vertical mount) or "out of floor" (horizontal mount) high performance dynamic fire damper for through penetration applications (ductwork is connected to both sides) where the damper cannot be installed within the plane of the wall or floor. Innovative design features include inter-locking double skin blades that eliminate combustible seals and provide flame protection under fire conditions at temperatures up to 2000°F (1366°C) and premium performance and a low pressure drop well suited to the majority of commercial applications. The D1201-DOW is ideal for applications where building codes require a fire damper for the protection of ductwork penetrations in walls or floors that have a fire resistance rating of up to 2 hours.

Model D1201-DOW

Model D1201-OW

MODEL D1201-OW (1 1/2 HR.)
OUT OF WALL DYNAMIC FIRE DAMPER
AIRFOIL BLADE • GRILLE MOUNT

Model D1201-OW is an "out of wall" high performance dynamic fire damper specifically designed for supply or return ducts that terminate at a grille and provides through the grille access to the damper. Standard sleeve length accommodates most commercial supply and return grilles/registers. It offers premium performance and a low pressure drop well suited to the majority of commercial applications. Unique, inter-locking double skin blade design eliminates combustible seals and provides flame protection under fire conditions at temperatures up to 2000°F (1366°C). The D1201-OW is supplied as standard with an internal locking quadrant which holds the damper in the fully open position, but may also be used for system balancing if required.

MODEL SERIES D1200SS (1 1/2 HR.) & D1200SS-3 (3 HR.)
DYNAMIC FIRE DAMPER
AIRFOIL BLADE • STAINLESS STEEL

Model Series D1200SS and D1200SS-3 Stainless Steel Airfoil Multi-blade Fire Dampers provide the ultimate in fire containment for both static and dynamic HVAC systems, ideal for use high humidity or corrosive environments where building codes require a fire damper for the protection of ductwork penetrations in walls or floors. Available in either Type 304 or 316 Stainless Steel, premium performance, rugged construction and assured closure under airflow make the D1200SS and D1200SS-3 series dampers an excellent choice for the majority of today's commercial and light industrial applications.

Model D1200SS

Model 1200SS

MODEL SERIES 1200SS (1 1/2 HR.) & 1200SS-3 (3 HR.)
STATIC FIRE DAMPER
AIRFOIL BLADE • STAINLESS STEEL

Model Series 1200SS and 1200SS-3 Stainless Steel Airfoil Multi-blade Fire Dampers are classified for use only in static "fans off" systems where the HVAC system is automatically shut down in the event of a fire alarm. The 1200SS and 1200SS-3 series dampers have been designed and tested to provide premium performance, available in either Type 304 or 316 Stainless Steel, ideal for use in high humidity and mildly corrosive environments where building codes require a fire damper for the protection of ductwork penetrations in walls or floors. The airfoil blade design and elimination of blade sills, top and bottom, provide a low pressure drop design.

MODELS 1201-MDG & 1201-MDS
MULTI-BLADE MARINE FIRE DAMPERS
AIRFOIL BLADE • LOW LEAKAGE

Model Series 1201-MDG and 1201-MDS are Multi-Blade Low Leakage Fire Dampers for use in marine applications which require USCG approval for installation on Class A-60 divisions. Unique airfoil blade design provides low pressure drop, particularly suited for high velocity applications. Standard features include a rugged hat channel frame, 12" (305) factory fitted sleeve, concealed in-frame linkage and stainless steel jamb seals for low leakage performance. Models 1201-MDG and 1201-MDS may be installed vertically, with blades running horizontal, or horizontally.

Model 1201-MDG

Model 1290F

MODEL 1290F (1 1/2 HR.)
DYNAMIC FIRE DAMPER
TRUE ROUND

Model 1290F is an economical true round fire damper designed and qualified for point-of-origin fire containment where round ductwork passes through metal stud drywall partitions or masonry walls that have a fire resistance rating of up to 2 hours and building codes require a fire damper. Features include the industry proven over-center/knee lock design with high torque spring/fusible link closure which provides fail-safe security during fire conditions under airflow. Each damper is supplied as standard with retaining plates for fast secure installation and a hand locking quadrant which holds the damper in the fully open position, but may also be used for system balancing if required.

MODEL 1290F-SS (1 1/2 HR.)
DYNAMIC FIRE DAMPER
TRUE ROUND • STAINLESS STEEL

Model 1290FSS is an economical true round fire damper designed and qualified for point-of-origin fire containment in high humidity or corrosive environments where round ductwork passes through metal stud drywall partitions or masonry walls that have a fire resistance rating of up to 2 hours and building codes require a fire damper. Features include the industry proven over-center/knee lock design with high torque spring/fusible link closure which provides fail-safe security during fire conditions under airflow. Each damper is supplied as standard with retaining plates for fast secure installation and a hand locking quadrant which holds the damper in the fully open position, but may also be used for system balancing if required. The 1290F-SS is available in either Type 304 or 316 Stainless Steel.

Model 1290F-SS

- PREMIUM PERFORMANCE
- AIRFOIL BLADE
- UL 555 CLASSIFIED DYNAMIC FIRE DAMPER

Model Series:

D1200 **1 1/2 Hour Label** **(for fire separations up to 2 hours)**
D1200-3 **3 Hour Label** **(for fire separations up to 4 hours)**

Model D1200

Model Series D1200 and D1200-3 Multi-Blade Fire Dampers provide the ultimate in fire containment for both static and dynamic HVAC systems. Unique airfoil blade design provides low pressure drop, particularly suited to high velocity applications. The design utilizes an innovative inter-locking double skin airfoil blade that maintains a complete barrier throughout the fire test. Ideal for use where building codes require a fire damper for the protection of ductwork penetrations in walls or floors, UL approved for installation with airflow in either direction and inverted mounting. Supplied as standard with an internal hand locking quadrant to hold blades in the open position or balancing the system, available with a factory fitted sleeve ready for installation and choice of transition styles to suit duct size and type.

Rugged 16 ga. (1.6) hat channel frames, 14 ga. (2.0) equivalent blades, long lasting self-lubricating bearings, double bolted blade axles and reinforced mitered corners with die formed corner gussets result in one the industry's most durable fire dampers. Premium performance, versatility and assured closure under airflow make the D1200 and D1200-3 series dampers an excellent choice for the majority of today's commercial applications.

QUALIFICATIONS:

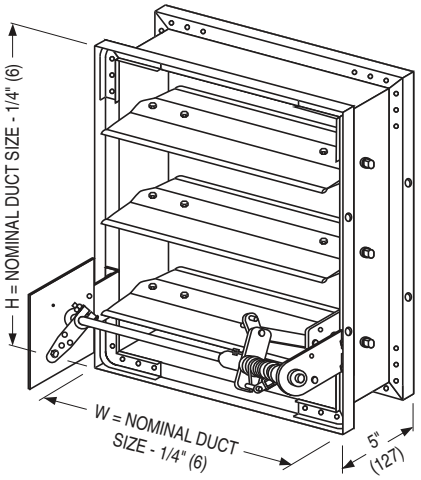
- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 hr. Label or 3 hr. Label (File # R9492).**
- **Meets NFPA 80, 90A and 101 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0101.**
- **Maximum velocity: 4000 fpm @ 4" w.g. (20 m/s @ 1 kPa).**

STANDARD CONSTRUCTION:

Frame:	5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.
Blades:	14 ga. (2.0) equivalent galvanized steel formed airfoil on 5 1/2" (140) centers. Opposed action.
Linkage:	Concealed in frame. 12 ga. (2.7) plated steel.
Bearings:	1/2" (13) dia. self-lubricating oilite bronze.
Axles:	1/2" (13) dia. plated steel double bolted to blades.
Jackshaft:	1/2" (13) dia. cadmium plated steel. Internal locking quadrant is factory installed.
Fusible Link:	165°F (74°C) standard. 212°F (100°C) available on single and double sections only.

COMMON OPTIONS:

- MLS-300 Position Indicator Switch Pack.
- QS1 & QS2 "Quick-Set" Retaining Angles.
- Factory fitted sleeves in custom lengths, gauges and transition styles.

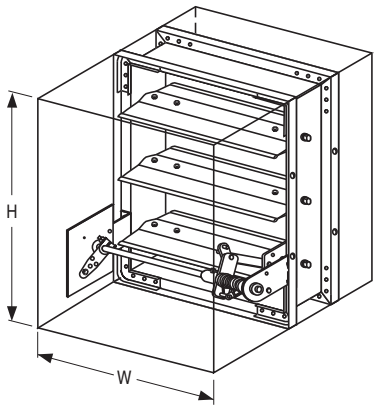


MODEL D1200 1 1/2 HOUR LABEL
MODEL D1200-3 3 HOUR LABEL
(Side Mounting Plate/Sleeve not shown)

DIMENSIONAL DATA:

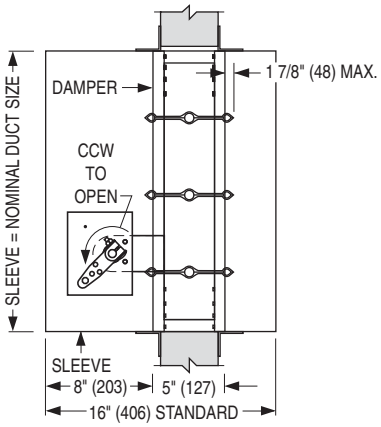
Model Series D1200 (1 1/2 hr. label) and D1200-3 (3 hr. label) dampers with duct heights less than 8" [203] in width only, or in both width and height, require a Type 'B' sleeve enclosure (Models D1202 [1 1/2 hr. label] and D1202-3 [3 hr. label]). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Models D1203 [1 1/2 hr. label] and D1203-3 [3 hr. label]).

MODELS D1200, D1200-3, D1201 AND D1201-3: TYPE A SLEEVE



Models D1200 (no sleeve), D1201, D1200-3 (no sleeve) and D1201-3 Sizes (Duct W x H):

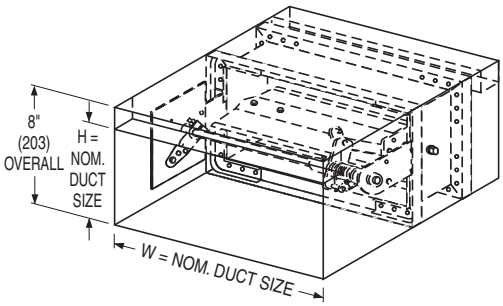
Model	Velocity/ Pressure Rating	Minimum	Maximum			
		Single Sect.	Single Section		Multiple Section	
		Vert./Horiz.	Vertical	Horizontal	Vertical	Horizontal
Model D1200	24	8" x 8" (203 x 203)	36" x 48" (914 x 1219)	32" x 48" (813 x 1219)	72" x 96" (1829 x 2438) or 144" x 48" (3658 x 1219).	64" x 96" (1626 x 2438) or 128" x 48" (3251 x 1219).
	34, 44				n/a	n/a
Model D1200-3	24	8" x 8" (203 x 203)	36" x 48" (914 x 1219)	32" x 48" (813 x 1219)	60" x 96" (1524 x 2438). (Individual sections not to exceed 30" x 48" [762 x 1219]).	n/a
	34, 44				n/a	



Standard factory sleeve 16" long x 20 ga. (406 x 1.0). (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

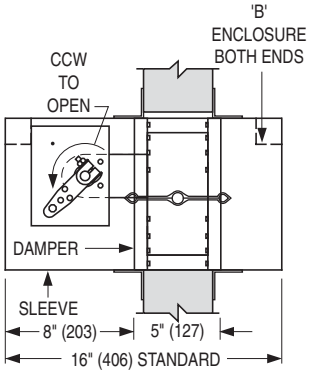
MODELS D1202 AND D1202-3: TYPE B SLEEVE ENCLOSURE



Models D1202 and D1202-3 Sizes (Duct W x H):

Model	Velocity/ Pressure Rating	Minimum	Maximum			
		Single Sect.	Single Section		Multiple Section	
		Vert./Horiz.	Vertical	Horizontal	Vertical	Horizontal
Model D1202	24	8" x 4" (203 x 102). Overall damper height is 8" (203).	36" x 48" (914 x 1219)	32" x 7 1/2" (813 x 191)	144" x 7 1/2" (3658 x 191)	128" x 7 1/2" (3251 x 191)
	34, 44				n/a	n/a
Model D1202-3	24	8" x 4" (203 x 102). Overall damper height is 8" (203).	36" x 7 1/2" (914 x 191)	32" x 7 1/2" (813 x 191)	60" x 7 1/2" (1524 x 191). (Individual sections width not to exceed 30" [762]).	n/a
	34, 44				n/a	

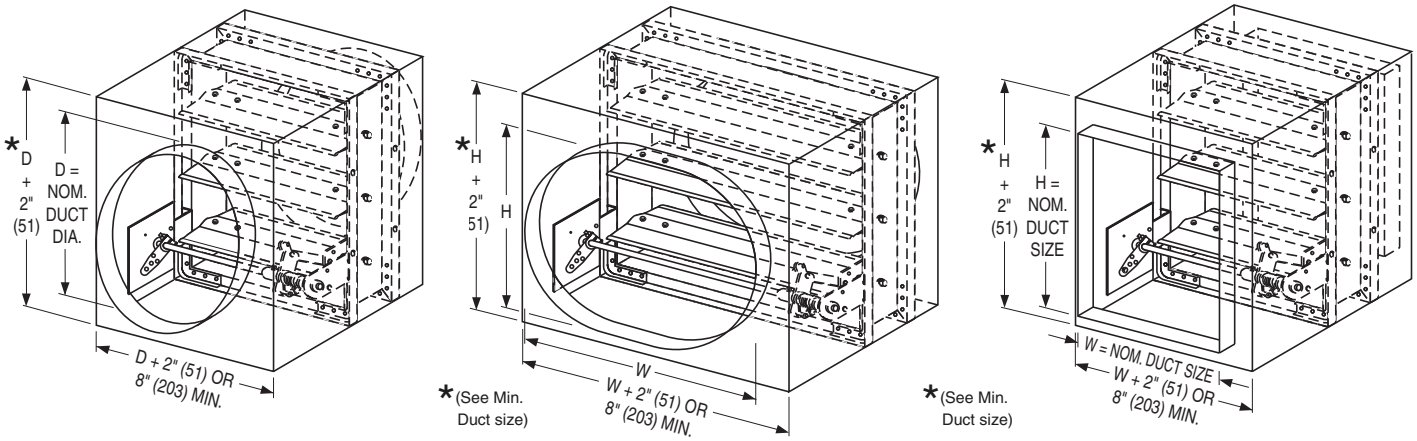
Note: Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Models D1203 and D1203-3).



Standard factory sleeve 16" long x 20 ga. (406 x 1.0). (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

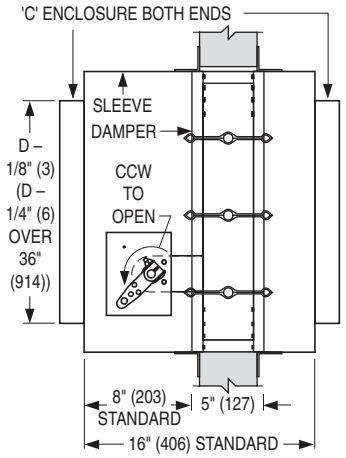
MODELS D1203 AND D1203-3: TYPE C SLEEVE ENCLOSURES



STYLE CR : FOR ROUND DUCT

STYLE CO : FOR OVAL DUCT

STYLE CSR : FOR SQUARE OR RECTANGULAR DUCT



Standard factory sleeve 16" long x 20 ga. (406 x 1.0). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Models D1203 and D1203-3 - Round Duct Connection Sizes (Duct Dia.):

Model	Velocity/ Pressure Rating	Minimum	Maximum			
		Single Sect.	Single Section		Multiple Section	
		Vertical/Horizontal	Vertical	Horizontal	Vertical	Horizontal
Model D1203	24*	4" (102) dia. Overall damper size is 8" x 8" (203 x 203) min.	34" (864) dia.	30" (762) dia.	70" (1778) dia.	62" (1575) dia.
	34, 44				n/a	n/a
Model D1203-3	24*	4" (102) dia. Overall damper size is 8" x 8" (203 x 203) min.	34" (864) dia.	30" (762) dia.	58" (1473) dia. duct size (Individual sections not to exceed 28" [711] dia. duct size).	n/a
	34, 44				n/a	

Note - Model D1203 only: *Larger sizes up to 94" (2388) dia., Vertical or Horizontal mount, are available but require actuators and ERL heat responsive device.

Models D1203 and D1203-3 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):

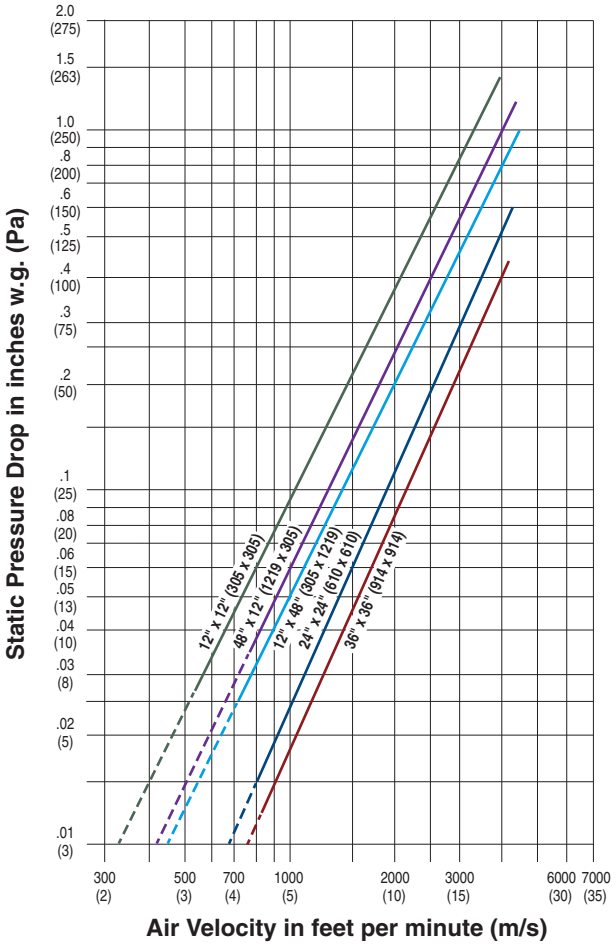
Model	Velocity/ Pressure Rating	Minimum	Maximum			
		Single Sect.	Single Section		Multiple Section	
		Vertical/Horizontal	Vertical	Horizontal	Vertical	Horizontal
Model D1203	24	4" x 4" (102 x 102). Overall damper size is 8" x 8" (203 x 203) min.	34" x 46" (864 x 1168)	30" x 46" (762 x 1168)	70" x 94" (1778 x 2388) or 142" x 46" (3607 x 1168)	62" x 94" (1575 x 2388) or 126" x 46" (3200 x 1168)
	34, 44				n/a	n/a
Model D1203-3	24	4" x 4" (102 x 102). Overall damper size is 8" x 8" (203 x 203) min.	34" x 46" (864 x 1168)	30" x 46" (762 x 1168)	58" x 94" (1473 x 2388) duct size (Individual sections not to exceed 28" x 46" [711 x 1168] duct size).	n/a
	34, 44				n/a	

Note - Model D1203 only: Larger sizes up to 142" x 94" (3607 x 2388) dia., Vertical or Horizontal mount, are available but require actuators and ERL heat responsive device.

PERFORMANCE DATA:

MODEL SERIES: D1200 - 1 1/2 HOUR LABEL AND D1200-3 - 3 HOUR LABEL

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

D1200 Series Maximum Performance Ratings	
UL 555 Fire Rating	1 1/2 Hour
Maximum Velocity	4000 fpm (20 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)

D1200-3 Series Maximum Performance Ratings	
UL 555 Fire Rating	3 Hour
Maximum Velocity	4000 fpm (20 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)

HOW TO SPECIFY

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Multi-Blade Dynamic 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. Each damper shall bear a UL fire resistance rating label of (**specifier select rating**) 1 1/2 hours **or** 3 hours, and in addition, a label verifying the airflow and closure pressure ratings of (**specifier select rating**) 2000 fpm (10 m/s) **or** 3000 fpm (15 m/s) **or** 4000 fpm (20 m/s), at 4" w.g. (1 kPa) static pressure differential, as established by the Dynamic Closure Test. Each fire damper shall also be marked with the words "For use in dynamic systems". Dampers marked "For use in static systems only" are not acceptable.

Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent galvanized steel formed double skin, airfoil design, on 5 1/2" (140) centers. Dampers shall be of opposed blade configuration with an inter-locking blade design. Blade seals are not acceptable. Blade axles shall be plated steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream.

Each fire damper shall be complete with a (**specifier select temperature**) 165°F (74°C) **or** 212°F (100°C) UL Listed fusible link that will cause the damper to close and lock in closed position by means of an over center/knee lock linkage for assured closure. Fire dampers shall each include a steel sleeve of appropriate length/gauge as field verified by contractor, with Nailor 'Quick-Set' retaining angles supplied by damper manufacturer to ensure proper installation in accordance with damper manufacturer's instructions. Each damper shall be supplied with an internal manual quadrant(s) for setting and locking of blades in desired position. 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 (**specifier to select**) D1200 (1 1/2 hour label) **or** D1200-3 (3 hour label).

- HIGH PERFORMANCE
- AIRFOIL BLADE
- UL 555 CLASSIFIED STATIC FIRE DAMPER

Model Series:

1200 **1 1/2 Hour Label** **(for fire separations up to 2 hours)**
1200-3 **3 Hour Label** **(for fire separations up to 4 hours)**

Model 1200

Model Series 1200 and 1200-3 Multi-Blade Fire Dampers are classified for use only in static "fans off" systems where the HVAC system is automatically shut down in the event of a fire alarm. Unique airfoil design provides low pressure drop, particularly suited for high velocity applications. Ideal for use where building codes require a fire damper for the protection of ductwork penetrations in walls or floors, UL approved for installation with airflow in either direction and inverted mounting. Supplied as standard with an internal locking quadrant which holds the damper in the fully open position, but may also be used for system balancing if required, available with a factory fitted sleeve ready for installation and choice of transition styles to suit duct size and type.

The design utilizes an innovative interlocking double skin airfoil blade that maintains a complete barrier throughout the fire test and also features the industry proven over-center knee-lock design with high torque spring/fusible link closure. Sturdy 16 ga. (1.6) hat channel frames, 14 ga. (2.0) equivalent blades with double bolted axles, long lasting self-lubricating bearings and reinforced mitered corners result in one the industry's most durable fire dampers. Premium performance and versatility make the 1200 and 1200-3 series dampers an excellent choice for the majority of today's commercial applications.

QUALIFICATIONS:

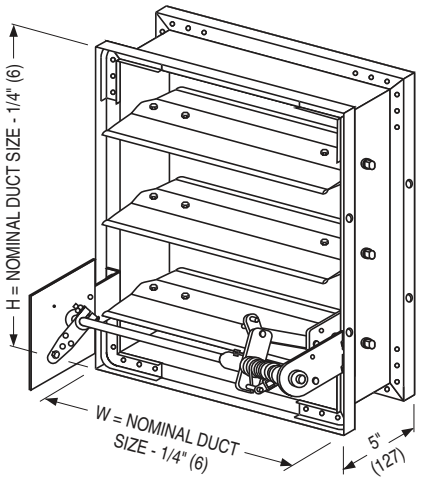
- **UL 555 & CAN/ULC-S112 CLASSIFIED FIRE DAMPER 1 1/2 hr. Label or 3 hr. Label (File # R9492).**
- **Meets NFPA 80, 90A and 101 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0101.**

STANDARD CONSTRUCTION:

Frame:	5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.
Blades:	14 ga. (2.0) equivalent galvanized steel formed airfoil on 5 1/2" (140) centers. Opposed action.
Linkage:	Concealed in frame. 12 ga. (2.7) plated steel.
Bearings:	1/2" (13) dia. self-lubricating oilite bronze.
Axles:	1/2" (13) dia. plated steel double bolted to blades.
Jackshaft:	1/2" (13) dia. cadmium plated steel. Internal locking quadrant is factory installed.
Fusible Link:	165°F (74°C) standard. 212°F (100°C) available on single and double sections only.

COMMON OPTIONS:

- MLS-300 Position Indicator Switch Pack.
- QS1 & QS2 "Quick-Set" Retaining Angles.
- Factory fitted sleeves in custom lengths, gauges and transition styles.

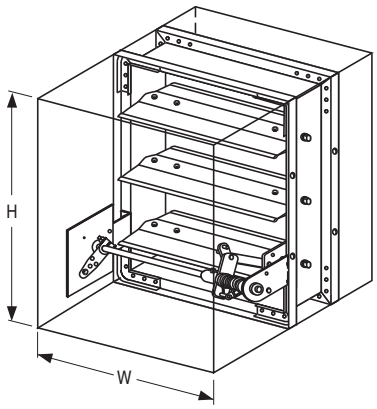


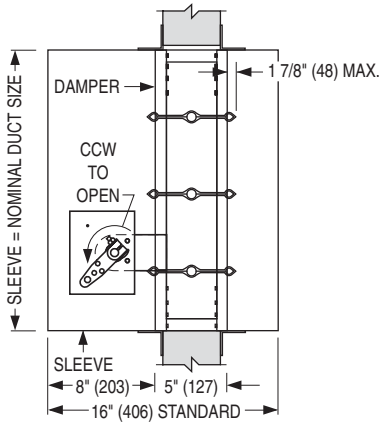
MODEL 1200 1 1/2 HOUR LABEL
MODEL 1200-3 3 HOUR LABEL
(Side Mounting Plate/Sleeve not shown)

DIMENSIONAL DATA:

Model Series 1200 (1 1/2 hr. label) and D1200-3 (3 hr. label) dampers with duct heights less than 8" [203] in width only, or in both width and height, require a Type 'B' sleeve enclosure (Models 1202 [1 1/2 hr. label] and 1202-3 [3 hr. label]). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Models 1203 [1 1/2 hr. label] and D1203-3 [3 hr. label]).

MODELS 1200, 1200-3, 1201 AND 1201-3: TYPE A SLEEVE





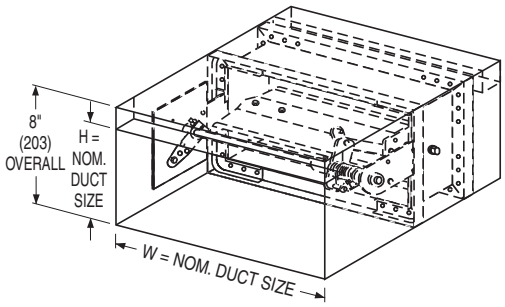
Models 1200 (no sleeve), 1201, 1200-3 (no sleeve) and 1201-3 Sizes (Duct W x H):

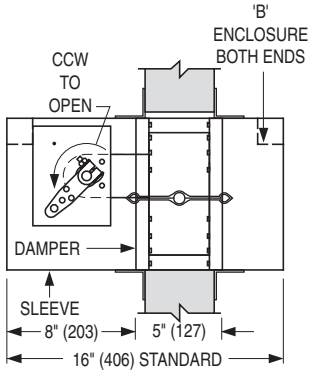
Model	Minimum	Maximum			
	Single Sect.	Single Section		Multiple Section	
	Vert./Horiz.	Vertical	Horizontal	Vertical	Horizontal
Model 1200	8" x 8" (203 x 203)	36" x 48" (914 x 1219)	32" x 48" (813 x 1219)	144" x 96" (3658 x 2438)	144" x 96" (3658 x 2438)
Model 1200-3	8" x 8" (203 x 203)	36" x 48" (914 x 1219)	32" x 48" (813 x 1219)	120" x 96" (3048 x 2438). (Individual sections not to exceed 30" x 48" [762 x 1219]).	n/a

Standard factory sleeve 16" long x 20 ga. (406 x 1.0). (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

MODELS 1202 AND 1202-3: TYPE B SLEEVE ENCLOSURE





Models 1202 and 1202-3 Sizes (Duct W x H):

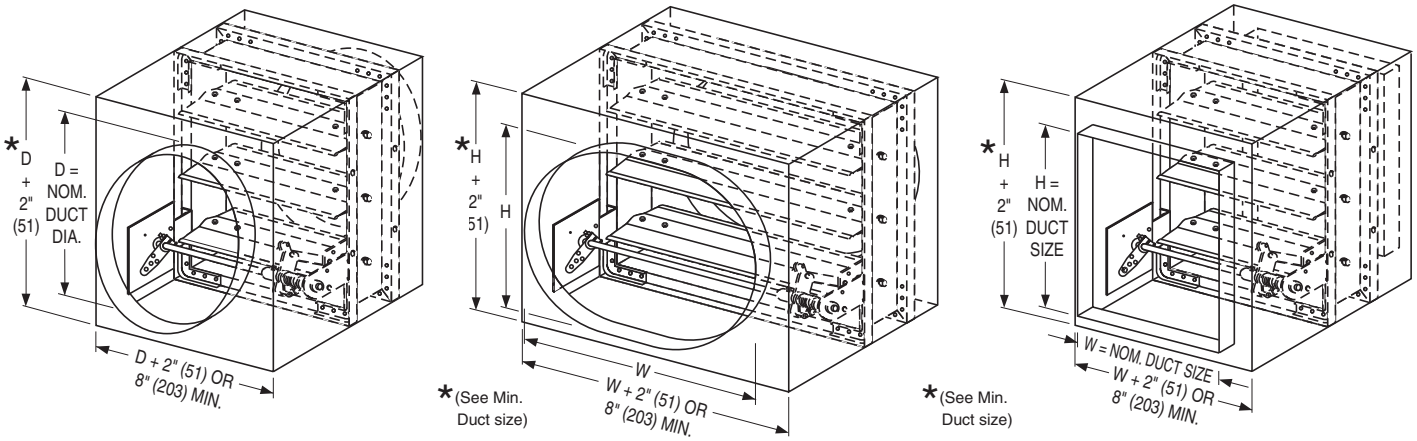
Model	Minimum	Maximum			
	Single Sect.	Single Section		Multiple Section	
	Vert./Horiz.	Vertical	Horizontal	Vertical	Horizontal
Model 1202	8" x 4" (203 x 102). Overall damper height is 8" (203).	36" x 7 1/2" (914 x 191)	32" x 7 1/2" (813 x 191)	144" x 7 1/2" (3658 x 191)	144" x 7 1/2" (3658 x 191)
Model 1202-3	8" x 4" (203 x 102). Overall damper height is 8" (203).	36" x 7 1/2" (914 x 191)	32" x 7 1/2" (813 x 191)	120" x 7 1/2" (3048 x 191). (Individual sections width not to exceed 30" [762]).	n/a

Note: Duct sizes less than 8" (203) in width only, or in both width and height, require a Type 'C' enclosure (Models 1203 and 1203-3).

Standard factory sleeve 16" long x 20 ga. (406 x 1.0). (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

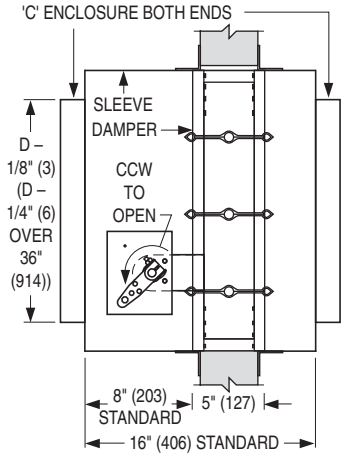
MODELS 1203 AND 1203-3: TYPE C SLEEVE ENCLOSURES



STYLE CR : FOR ROUND DUCT

STYLE CO : FOR OVAL DUCT

STYLE CSR : FOR SQUARE OR RECTANGULAR DUCT



Standard factory sleeve 16" long x 20 ga. (406 x 1.0). (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Models 1203 and 1203-3 - Round Duct Connection Sizes (Duct Dia.):

Model	Minimum	Maximum			
	Single Sect.	Single Section		Multiple Section	
	Vertical/Horizontal	Vertical	Horizontal	Vertical	Horizontal
Model 1203	4" (102) dia. Overall damper size is 8" x 8" (203 x 203) min.	34" (864) dia.	30" (762) dia.	94" (2388) dia.	94" (2388) dia.
Model 1203-3	4" (102) dia. Overall damper size is 8" x 8" (203 x 203) min.	34" (864) dia.	30" (762) dia.	94" (2388) dia. (Individual sections not to exceed 28" [711] dia. duct size).	n/a

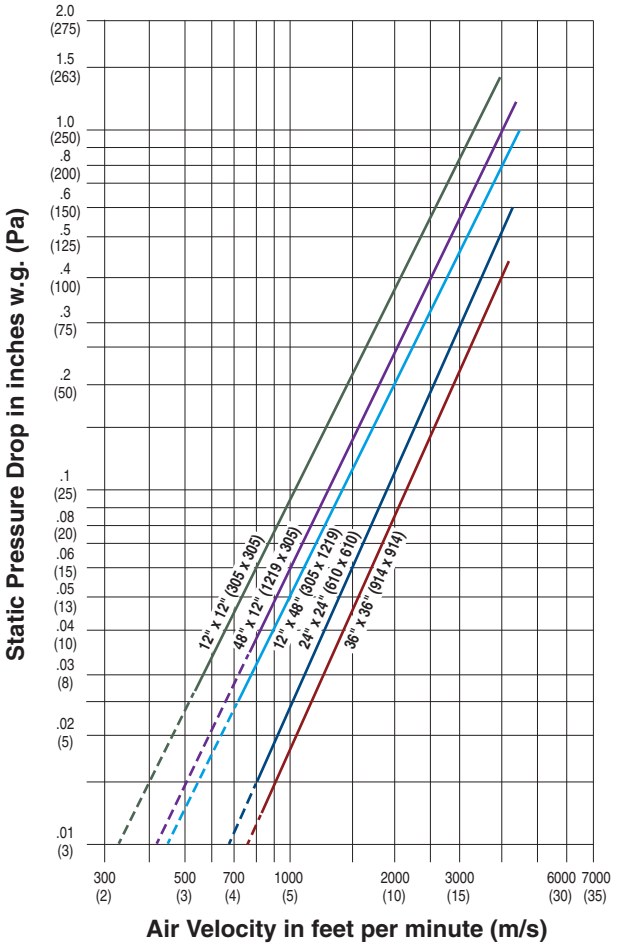
Models 1203 and 1203-3 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):

Model	Minimum	Maximum			
	Single Sect.	Single Section		Multiple Section	
	Vertical/Horizontal	Vertical	Horizontal	Vertical	Horizontal
Model 1203	4" x 4" (102 x 102). Overall damper size is 8" x 8" (203 x 203) min.	34" x 46" (864 x 1168)	30" x 46" (762 x 1168)	142" x 94" (3607 x 2388)	142" x 94" (3607 x 2388)
Model 1203-3	4" x 4" (102 x 102). Overall damper size is 8" x 8" (203 x 203) min.	34" x 46" (864 x 1168)	30" x 46" (762 x 1168)	118" x 94" (2997 x 2388) (Individual sections not to exceed 28" x 46" [711 x 1168] duct size).	n/a

PERFORMANCE DATA:

MODEL SERIES: 1200 - 1 1/2 HOUR LABEL AND 1200-3 - 3 HOUR LABEL

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

HOW TO SPECIFY

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Multi-Blade Static 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. Each damper shall bear a UL fire resistance rating label of (**specifier select rating**) 1 1/2 hours **or** 3 hours.

Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent galvanized steel formed double skin, airfoil design, on 5 1/2" (140) centers. Dampers shall be of opposed blade configuration with an interlocking blade design. Blade seals are not acceptable. Blade axles shall be plated steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream.

Each fire damper shall be complete with a (**specifier select temperature**) 165°F (74°C) **or** 212°F (100°C) UL Listed fusible link that will cause the damper to close and lock in closed position by means of an over center/knee lock linkage for assured closure. Fire dampers shall each include a steel sleeve of appropriate length/gauge as field verified by contractor, with Nailor 'Quick-Set' retaining angles supplied by damper manufacturer to ensure proper installation in accordance with damper manufacturer's instructions. Each damper shall be supplied with an internal manual quadrant(s) for setting and locking of blades in desired position. 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 (**specifier to select**) 1200 (1 1/2 hour label) **or** 1200-3 (3 hour label).

- STANDARD PERFORMANCE
- VEE BLADE
- UL 555 CLASSIFIED DYNAMIC FIRE DAMPER
- 1 1/2 HOUR RATING

Model D1250

Models:

D1250 Type A No Sleeve (for fire separations of up to 2 hours)
D1251 Type A Sleeve (for fire separations of up to 2 hours)
D1252 Type B Sleeve Enclosure (for fire separations of up to 2 hours)
D1253 Type C Sleeve Enclosure (for fire separations of up to 2 hours)

Model Series D1250 Multi-Blade Dynamic Fire Dampers have been especially designed and tested to offer a rugged cost effective damper well suited to the majority of commercial applications. Ideal for applications where building codes require a fire damper for the protection of ductwork penetrations in walls or floors that have a fire resistance rating of up to 2 hours. Engineered to perform, reliable parallel blade action assures closure in dynamic ("fans on") systems. UL approved for installation with airflow in either direction and inverted mounting. Supplied as standard with an internal crank arm and locking screw which holds the damper in the fully open position, but may also be used for system balancing if required.

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 hr. Label (File # R9492).**
- **Meets NFPA 80, 90A and 101 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. 3225-0935:0101.**
- **Maximum velocity: 4000 fpm @ 4" w.g. (20 m/s @ 1 kPa).**

STANDARD CONSTRUCTION:

Frame: 5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.
Blades: 6" (152) wide on 5 1/2" (140) centers. 16 ga. (1.6) galvanized steel vee groove design. Parallel action.
Linkage: Concealed in frame. 12 ga. (2.7) plated steel.
Bearings: 1/2" (13) dia. self-lubricating oilite bronze.
Axles: 1/2" (13) dia. plated steel double bolted to blades.
Jackshaft: 1/2" (13) dia. cadmium plated steel. Internal locking quadrant is factory installed.
Fusible Link: 165°F (74°C) standard. 212°F (100°C) available.

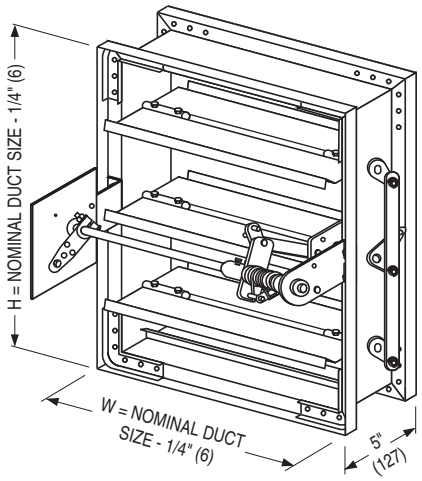
Models D1250 and D1251 Sizes (Duct W x H):

Velocity/ Pressure Rating	Minimum	Maximum			
	Single Section	Single Section		Multiple Section	
	Vertical/Horiz.	Vertical	Horizontal	Vertical	Horizontal
24	8" x 8" (203 x 203)	36" x 48" (914 x 1219)	30" x 40" (762 x 1016)	72" x 48" (1829 x 1219) or 36" x 96" (914 x 2438).	60" x 40" (1524 x 1016) or 30" x 80" (762 x 2032).
34, 44				n/a	n/a

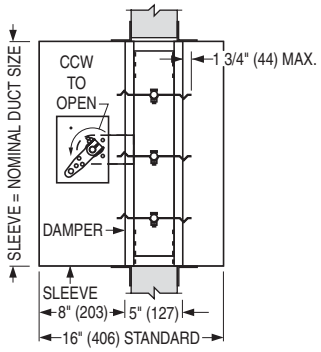
Notes: Dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model D1252). Units less than 8" (203) in width only, or in both width and height, require a Type 'C' enclosure (Model D1253).

COMMON OPTIONS:

- MLS-300 Position Indicator Switch Pack.
- QS1 & QS2 "Quick-Set" Retaining Angles.
- Factory fitted sleeves in custom lengths, gauges and transition styles.



MODEL D1250 1 1/2 HOUR LABEL
(Side Mounting Plate/Sleeve not shown)



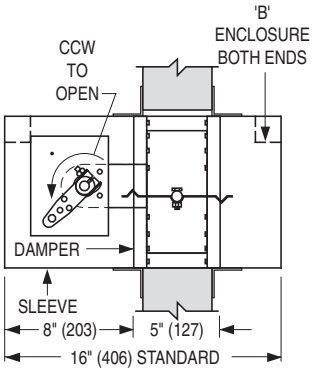
MODEL D1251: TYPE A SLEEVE

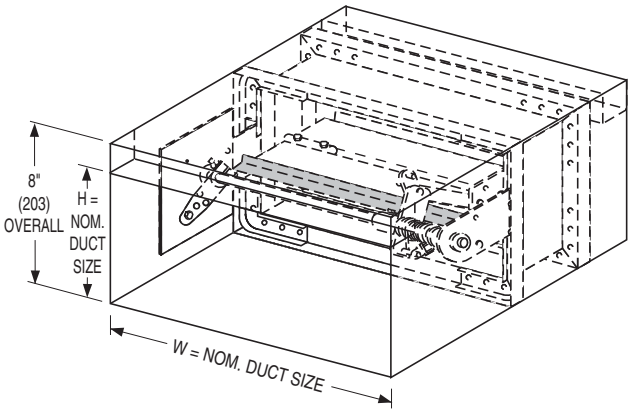
Standard factory sleeve 16" long x 20 ga. (406 x 1.0). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

DIMENSIONAL DATA:

Model Series D1250 dampers with duct heights less than 8" (203) in width only, or in both width and height, require a Type 'B' sleeve enclosure (Model D1252). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model D1253).

MODEL D1252: TYPE B SLEEVE ENCLOSURE





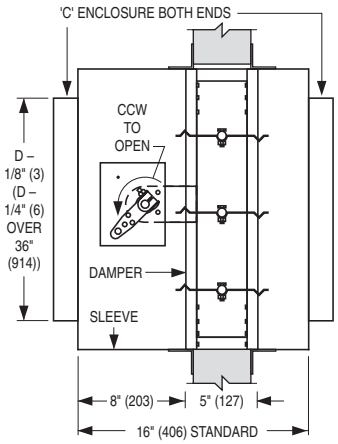
Standard factory sleeve 16" long x 20 ga. (406 x 1.0). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

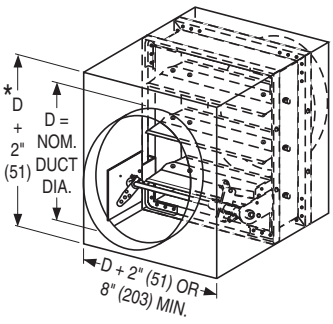
Wall Thickness	Minimum Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Model D1252 Sizes (Duct W x H):

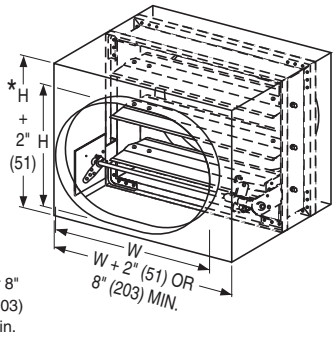
Velocity/ Pressure Rating	Minimum	Maximum			
	Single Section	Single Section		Multiple Section	
	Vertical/Horizontal	Vertical	Horizontal	Vertical	Horizontal
24	8" x 4" (203 x 102) Overall damper height is 8" (203).	36" x 7 1/2" (914 x 191)	30" x 7 1/2" (762 x 191)	72" x 7 1/2" (1829 x 191)	60" x 7 1/2" (1524 x 191)
34, 44				n/a	n/a

MODEL D1253: TYPE C SLEEVE ENCLOSURES

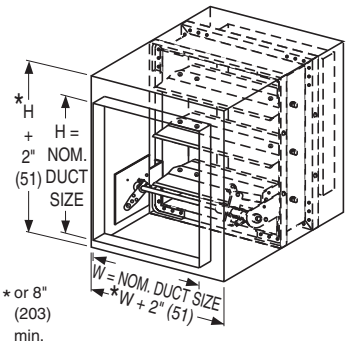




STYLE CR : FOR ROUND DUCT



STYLE CO : FOR OVAL DUCT



STYLE CSR : FOR SQUARE OR RECTANGULAR DUCT

Standard factory sleeve 16" long x 20 ga. (406 x 1.0). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Minimum Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Model D1253 - Round Duct Connection Sizes (Duct Dia.):

Velocity/ Pressure Rating	Minimum	Maximum			
	Single Section	Single Section		Multiple Section	
	Vertical/Horizontal	Vertical	Horizontal	Vertical	Horizontal
24	4" (102) dia. Overall damper size is 8" x 8" (203 x 203) min.	34" (864) dia.	28" (711) dia.	46" (1168) dia.	38" (965) dia.
34				n/a	n/a

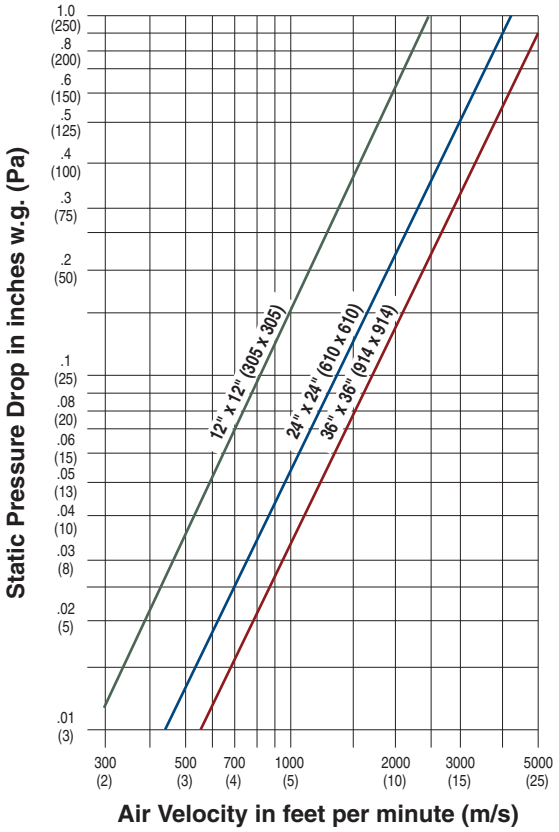
Model D1253 - Sq., Rect. or Oval Duct Connection Sizes (Duct W x H):

Velocity/ Pressure Rating	Minimum	Maximum			
	Single Section	Single Section		Multiple Section	
	Vertical/Horiz.	Vertical	Horizontal	Vertical	Horizontal
24	4" x 4" (102 x 102). Overall damper size is 8" x 8" (203 x 203) min.	34" x 46" (864 x 1168)	28" x 38" (711 x 965)	70" x 46" (1778 x 1168) or 34" x 94" (864 x 2388).	58" x 38" (1473 x 965) or 28" x 78" (711 x 1981).
34, 44				n/a	n/a

PERFORMANCE DATA:

MODEL SERIES: D1250 - 1 1/2 HOUR LABEL

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

D1250 Series Maximum Performance Ratings	
UL 555 Fire Rating	1 1/2 Hour
Maximum Velocity	4000 fpm (20 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)

HOW TO SPECIFY

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Multi-Blade Dynamic 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. Each damper shall bear a UL fire resistance rating label of 1 1/2 hours and in addition, a label verifying the airflow and closure pressure ratings of (**specifier select rating**) 2000 fpm (10 m/s) **or** 3000 fpm (15 m/s) **or** 4000 fpm (20 m/s), at 4" w.g. (1 kPa) static pressure differential, as established by the Dynamic Closure Test. Each fire damper shall also be marked with the words "For use in dynamic systems". Dampers marked "For use in static systems only" are not acceptable.

Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be of vee-groove design, 16 ga. (1.6) galvanized steel on 5 1/2" (140) centers, and shall be parallel configuration. Blade axles shall be 1/2" (13) dia. plated steel, double bolted at each end of blade to ensure positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream.

Each fire damper shall be complete with a (**specifier select temperature**) 165°F (74°C) **or** 212°F (100°C) UL Listed fusible link that will cause the damper to close and lock in closed position by means of an over center/knee lock linkage for assured closure. Fire dampers shall each include a steel sleeve of appropriate length/gauge as field verified by contractor, with Nailor 'Quick-Set' retaining angles supplied by damper manufacturer to ensure proper installation in accordance with damper manufacturer's instructions. Each damper shall be supplied with an internal manual quadrant(s) for setting and locking of blades in desired position. 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 D1250.

- "OUT OF WALL" (THROUGH DUCTED)
- HIGH PERFORMANCE
- AIRFOIL BLADE
- UL 555 CLASSIFIED DYNAMIC FIRE DAMPER

Model D1201-DOW

Model:

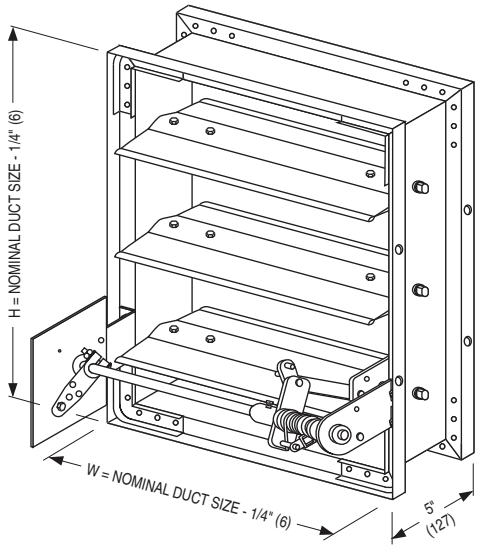
D1201-DOW 1 1/2 Hour Label (for fire separations up to 2 hours)

Model D1201-DOW is an “out of wall” (vertical mount) or “out of floor” (horizontal mount) Multi-Blade Dynamic Fire Damper intended for use in through applications (ductwork connected on both sides) where the damper cannot be installed within the plane of the wall or floor. Ideal for use where building codes require a fire damper for the protection of ductwork penetrations in walls or floors that have a fire resistance of up to 2 hours. Suitable to retrofit applications to bring older buildings up to current code where existing penetrations require a fire damper but there is no expansion clearance or high security applications where security bars are required in the plane of the wall or floor.

Rugged 16 ga. (1.6) hat channel frames, 14 ga. (2.0) equivalent blades, long lasting self-lubricating bearings, double bolted blade axles and reinforced mitered corners with die formed corner gussets result in one the industry’s most durable out of wall fire dampers. Premium performance, versatility and assured closure under airflow make the D1201-DOW damper an excellent choice for the majority of today’s commercial applications where ductwork is connected on both sides of the damper.

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 Hour Label (File # R9492).**
- **Meets NFPA 80, 90A and 101 as well as IBC and NBC (Canada) requirements.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0101.**
- **Maximum velocity 4000 fpm @ 4" w.g. (20 m/s @ 1 kPa).**
- **For use in vertical or horizontal concrete partitions and vertical steel stud partitions only.**



MODEL D1201-DOW
(Integral Sleeve not shown)

STANDARD CONSTRUCTION:

Frame: 5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.

Blades: 14 ga. (2.0) equivalent galvanized steel formed airfoil on 5 1/2" (140) centers. Opposed action.

Sleeve: 16" x 20 ga. (406 x 1.0) galvanized steel.

Insulation: Intumescent thermal insulation on four sides.

Linkage: Concealed in frame. 12 ga. (2.7) plated steel.

Bearings: 1/2" (13) dia. self-lubricating oilite bronze.

Axles: 1/2" (13) dia. plated steel double bolted to blades.

Jackshaft: 1/2" (13) dia. cadmium plated steel. Internal locking quadrant is factory installed.

Fusible Link: 165°F (74°C) standard. 212°F (100°C) available.

Model D1201-DOW Sizes (Duct W x H):

Velocity/ Pressure Rating	Minimum	Maximum	
	Single Section	Single Section	
	Vertical/Horizontal	Vertical	Horizontal
24, 34, 44	8" x 8" (203 x 203)	36" x 48" (914 x 1219)	32" x 48" (813 x 1219)

Note: Multiple section assemblies are not permitted.

COMMON OPTIONS:

- MLS-300 Position Indicator Switch Pack.
- QS2 "Quick-Set" Retaining Angles.
- Factory fitted sleeves in custom lengths, gauges and transition styles.

DIMENSIONAL DATA:

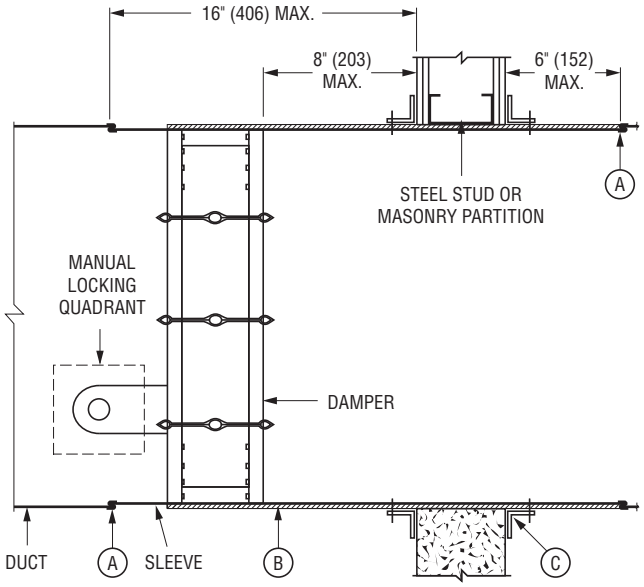
MODEL: D1201-DOW - 1 1/2 HOUR LABEL

APPLICATION:

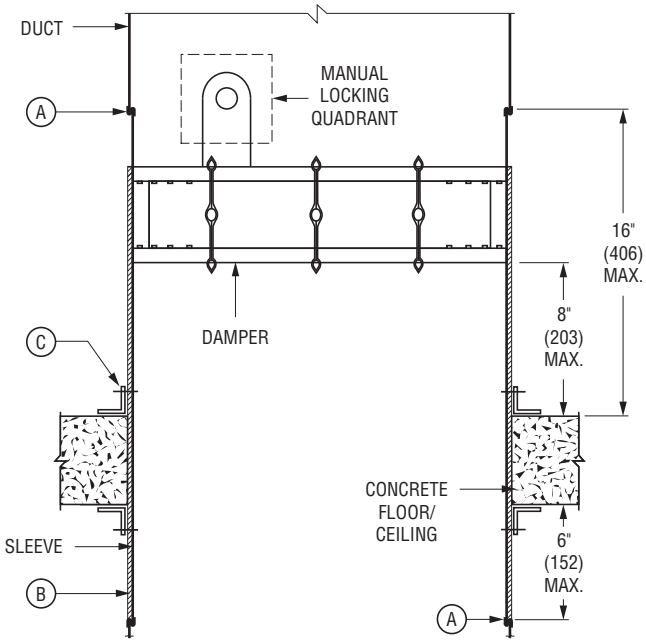
Model D1201-DOW fire damper is specially designed for "out of wall" (vertical mount) or "out of floor" (horizontal mount) through penetration applications (ductwork is connected to both sides) where the damper cannot be installed within the plane of the wall or floor.

ITEMS:

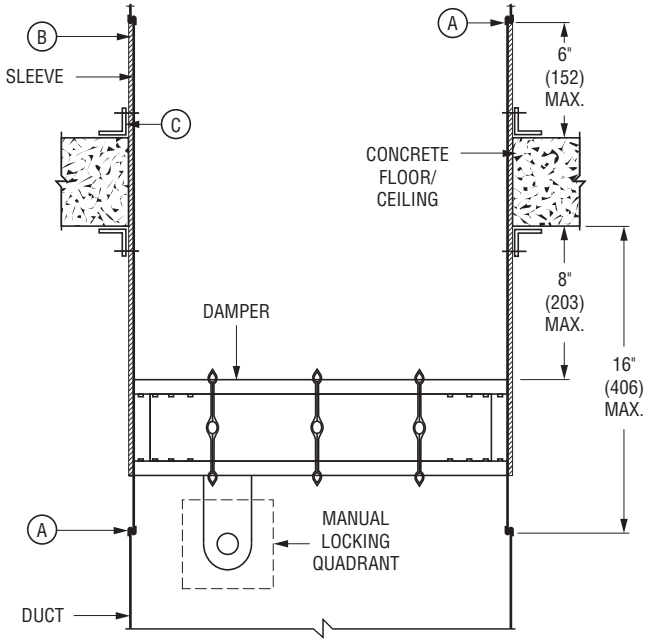
- (A) Duct/sleeve connection.
- (B) Intumescent material (insulation).
- (C) Retaining angles and fasteners.



VERTICAL INSTALLATION



ABOVE FLOOR INSTALLATION



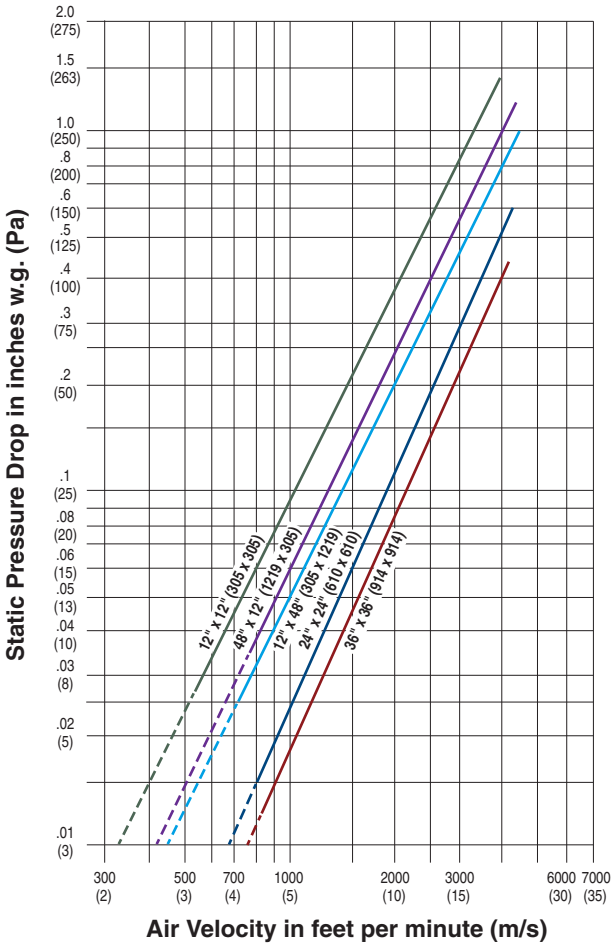
BELOW FLOOR INSTALLATION

Note:
Standard sleeve/damper (for 4" [102] wall) provides 1" (25) offset from wall face to edge of damper frame.
For thicker walls or to offset damper farther from wall face (max. 8" [203]) lengthen sleeve accordingly.

PERFORMANCE DATA:

MODEL: D1201-DOW - 1 1/2 HOUR LABEL

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

D1201-DOW Series Maximum Performance Ratings	
UL 555 Fire Rating	1 1/2 Hour
Maximum Velocity	4000 fpm (20 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)

HOW TO SPECIFY

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Out of Wall Multi-Blade Dynamic 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. Each damper shall bear a UL fire resistance rating label of 1 1/2 hours and in addition, a label verifying the airflow and closure pressure ratings of (**specifier select rating**) 2000 fpm (10 m/s) **or** 3000 fpm (15 m/s) **or** 4000 fpm (20 m/s), at 4" w.g. (1 kPa) static pressure differential, as established by the Dynamic Closure Test. Each fire damper shall also be marked with the words "For use in dynamic systems". Dampers marked "For use in static systems only" are not acceptable.

Damper shall be provided from the factory in an integral 16 ga. (1.6) galvanized steel sleeve of appropriate length with intumescent thermal insulation on four sides. Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent galvanized steel formed double skin, airfoil design, on 5 1/2" (140) centers. Dampers shall be of opposed blade configuration with an inter-locking blade design. Blade seals are not acceptable. Blade axles shall be plated steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream.

Each fire damper shall be complete with a (**specifier select temperature**) 165°F (74°C) **or** 212°F (100°C) UL Listed fusible link that will cause the damper to close and lock in closed position by means of an over center/knee lock linkage for assured closure. Each damper shall be supplied with an internal manual quadrant(s) for setting and locking of blades in desired position. 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 D1201-DOW.

- "OUT OF WALL" GRILLE MOUNT WITH DAMPER ACCESS
- HIGH PERFORMANCE
- AIRFOIL BLADE
- UL 555 CLASSIFIED DYNAMIC FIRE DAMPER

Model D1201-OW

Model:

D1201-OW 1 1/2 Hour Label (for fire separations of up to 2 hours)

Model D1201-OW is an “out of wall” (vertical mount) or “out of floor” (horizontal mount) Multi-Blade Dynamic Fire Damper intended for use in supply or return ducts that terminate at a grille where access through the grille to the damper actuator and other components is required. Standard integral sleeve length accommodates most commercial supply and return grilles and registers. Ideal for use where building codes require a fire damper for the protection of ductwork penetrations in walls or floors that have a fire resistance of up to 2 hours.

The design utilizes an innovative inter-locking double skin airfoil blade that maintains a complete barrier throughout the fire test with absolutely no visible through-gaps and also features the industry proven over-center knee-lock design with high torque spring/fusible link closure. Intumescent thermal insulation covers all four sides to reduce thermal transfer. Supplied as standard with an internal locking quadrant which holds the damper in the fully open position, but may also be used for system balancing if required.

Rugged 16 ga. (1.6) hat channel frames, 14 ga. (2.0) equivalent blades, long lasting self-lubricating bearings, double bolted blade axles and reinforced mitered corners with die formed corner gussets result in one the industry’s most durable out of wall fire dampers. Premium performance, versatility and assured closure under airflow make the D1201-OW damper an excellent choice for the majority of today’s commercial applications that terminate at a grille.

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 Hour Label (File # R9492).**
- **Meets NFPA 80, 90A and 101 as well as IBC and NBC (Canada) requirements.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0101.**
- **Maximum velocity 4000 fpm @ 4" w.g. (20 m/s @ 1 kPa).**
- **For use in vertical or horizontal concrete partitions and vertical steel stud partitions only.**

STANDARD CONSTRUCTION:

Frame: 5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.

Blades: 14 ga. (2.0) equivalent galvanized steel formed airfoil on 5 1/2" (140) centers. Opposed action.

Sleeve: 16" x 20 ga. (406 x 1.0) galvanized steel with 3/4" (19) flange on one end standard.

Insulation: Intumescent thermal insulation on four sides.

Linkage: Concealed in frame. 12 ga. (2.7) plated steel.

Bearings: 1/2" (13) dia. self-lubricating oilite bronze.

Axles: 1/2" (13) dia. plated steel double bolted to blades.

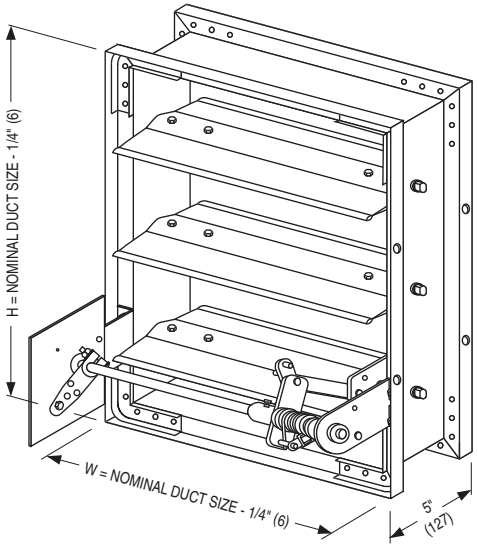
Jackshaft: 1/2" (13) dia. cadmium plated steel. Internal locking quadrant is factory installed.

Fusible Link: 165°F (74°C) standard. 212°F (100°C) available.

Model D1201-OW Sizes (Duct W x H):

Velocity/ Pressure Rating	Minimum	Maximum	
	Single Section	Single Section	
	Vertical/Horizontal	Vertical	Horizontal
24, 34, 44	8" x 8" (203 x 203)	36" x 48" (914 x 1219)	32" x 48" (813 x 1219)

Note: Multiple section assemblies are not permitted.



MODEL D1201-OW

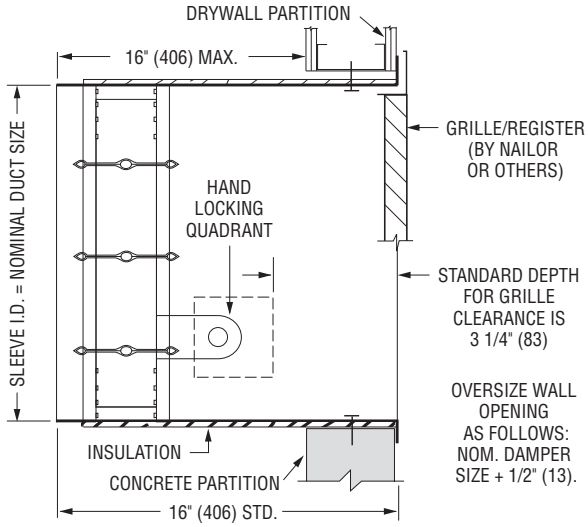
(Integral Sleeve not shown)

COMMON OPTIONS:

- MLS-300 Position Indicator Switch Pack.
- QS1 "Quick-Set" Retaining Angles.
- Factory fitted sleeves in custom lengths, gauges and transition styles.

DIMENSIONAL DATA:

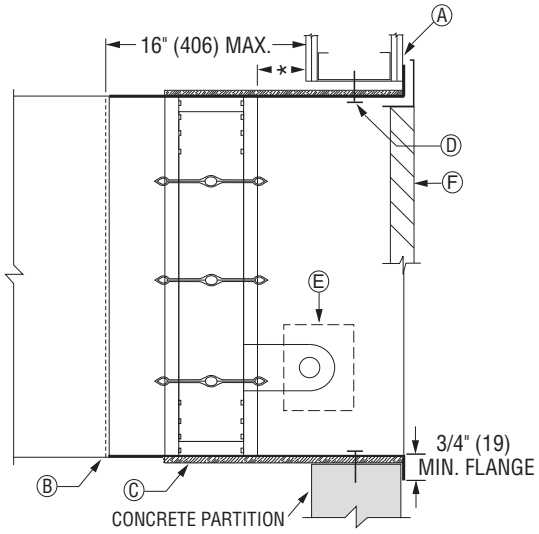
MODEL: D1201-OW - 1 1/2 HOUR LABEL



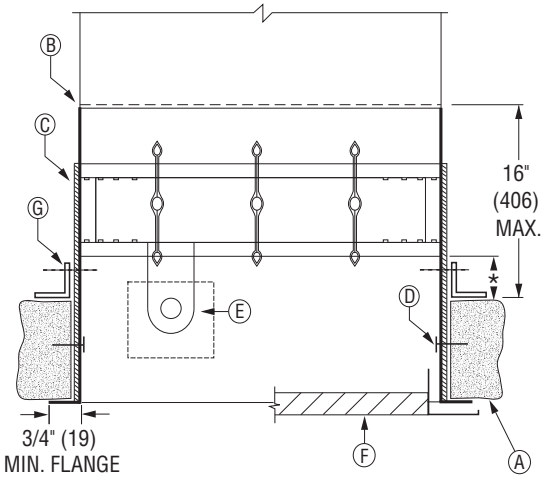
'OUT OF WALL' MOUNTING

NOTES:

1. Important: Dampers are furnished full ordered size to facilitate grille installation. Opening size in partition should be sized 1/2" (13) larger in all directions to allow for sleeve thickness.



VERTICAL MOUNT



HORIZONTAL MOUNT

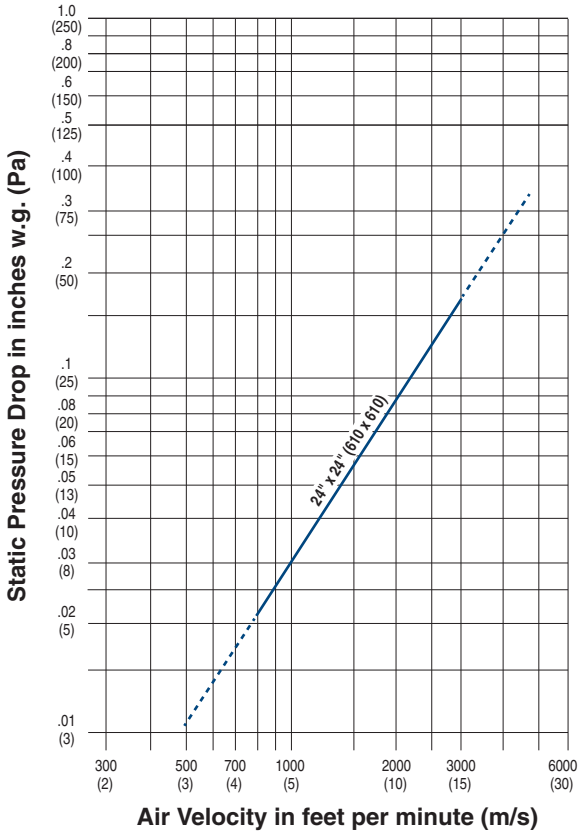
- **A** Typical 2 hour rated vertical concrete or steel stud construction and horizontal concrete fire partition.
- **B** Duct connection.
- **C** Intumescent material (insulation).
- **D** #10 sheet metal screws or concrete anchors.
- **E** Manual Locking Quadrant
- **F** Steel Grille/Diffuser
- **G** Rear retaining angle (required for horizontal mounting).

***Note:** Damper to be located maximum 8" (203) out of wall/floor.

PERFORMANCE DATA:

MODEL: D1201-OW - 1 1/2 HOUR LABEL

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.2.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

D1201-OW Series Maximum Performance Ratings	
UL 555 Fire Rating	1 1/2 Hour
Maximum Velocity	4000 fpm (20 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)

HOW TO SPECIFY

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Out of Wall Multi-Blade Dynamic 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. Each damper shall bear a UL fire resistance rating label of 1 1/2 hours and in addition, a label verifying the airflow and closure pressure ratings of (**specifier select rating**) 2000 fpm (10 m/s) **or** 3000 fpm (15 m/s) **or** 4000 fpm (20 m/s), at 4" w.g. (1 kPa) static pressure differential, as established by the Dynamic Closure Test. Each fire damper shall also be marked with the words "For use in dynamic systems". Dampers marked "For use in static systems only" are not acceptable.

Damper shall be provided from the factory in an integral 16 ga. (1.6) galvanized steel sleeve of appropriate length with intumescent thermal insulation on four sides. Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent galvanized steel formed double skin, airfoil design, on 5 1/2" (140) centers. Dampers shall be of opposed blade configuration with an inter-locking blade design. Blade seals are not acceptable. Blade axles shall be plated steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream.

Each fire damper shall be complete with a (**specifier select temperature**) 165°F (74°C) **or** 212°F (100°C) UL Listed fusible link that will cause the damper to close and lock in closed position by means of an over center/knee lock linkage for assured closure. Each damper shall be supplied with an internal manual quadrant(s) for setting and locking of blades in desired position. 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 D1201-OW.

- HARSH ENVIRONMENT
- TYPE 304 OR 316 STAINLESS STEEL
- HIGH PERFORMANCE AIRFOIL BLADE
- UL 555 CLASSIFIED DYNAMIC FIRE DAMPER

Model D1200SS

Model Series:

D1200SS **1 1/2 Hour Label** **(for fire separations up to 2 hours)**
D1200SS-3 **3 Hour Label** **(for fire separations up to 4 hours)**

Model Series D1200SS and D1200SS-3 Stainless Steel Multi-Blade Fire Dampers provide the ultimate in fire containment for dynamic HVAC systems. Ideal for use in high humidity or corrosive environments where building codes require a fire damper for the protection of ductwork penetrations in walls or floors, UL approved for installation with airflow in either direction and inverted mounting. The design utilizes an innovative inter-locking double skin airfoil blade that maintains a complete barrier throughout the fire test with absolutely no visible through-gaps and also features the industry proven over-center knee-lock design with high torque spring/fusible link closure.

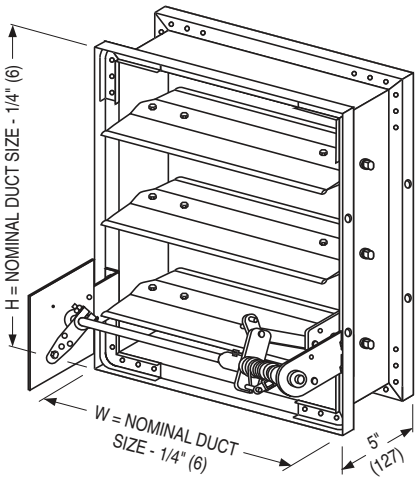
Rugged 16 ga. (1.6) hat channel frames, 14 ga. (2.0) equivalent blades, long lasting self-lubricating bearings, double bolted blade axles and reinforced mitered corners with die formed corner gussets result in one the industry's most durable fire dampers. Available in either Type 304 (standard) or Type 316 (optional) Stainless Steel. Premium performance, versatility and assured closure under airflow make the D1200SS and D1200SS-3 series dampers an excellent choice for the majority of today's commercial and light industrial applications.

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 hr. Label or 3 hr. Label (File # R9492).**
- **Meets NFPA 80, 90A and 101 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0101.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**

STANDARD CONSTRUCTION:

Frame:	5" x 7/8" x 16 ga. (127 x 22 x 1.6) stainless steel hat channel.
Blades:	14 ga. (2.0) equivalent stainless steel formed airfoil on 5 1/2" (140) centers. Opposed action.
Linkage:	Concealed in frame. 12 ga. (2.7) stainless steel.
Bearings:	1/2" (13) dia. sintered stainless steel.
Axles:	1/2" (13) dia. stainless steel double bolted to blades.
Jackshaft:	1/2" (13) dia. stainless steel. CCW rotation to open. Internal locking quadrant is factory installed.
Fusible Link:	165°F (74°C) standard.



MODEL D1200SS 1 1/2 HOUR LABEL
MODEL D1200SS-3 3 HOUR LABEL
(Side Mounting Plate/Sleeve not shown)

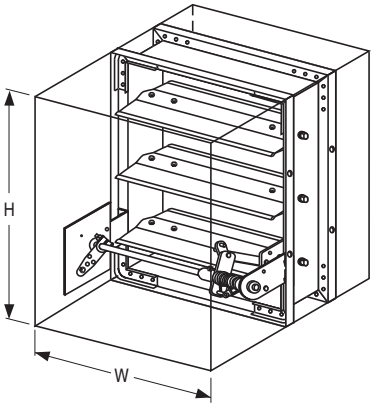
COMMON OPTIONS:

- Type 304 or 316 Stainless Steel construction.
- MLS-300 Position Indicator Switch Pack.
- QS1 & QS2 "Quick-Set" Retaining Angles.
- Factory fitted sleeves in custom lengths, gauges and transition styles.

DIMENSIONAL DATA:

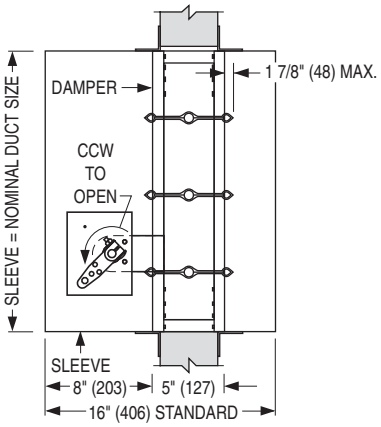
Model Series D1200SS (1 1/2 hr. label) and D1200SS-3 (3 hr. label) dampers with duct heights less than 8" [203] in width only, or in both width and height, require a Type 'B' sleeve enclosure (Models D1202SS [1 1/2 hr. label] and D1202SS-3 [3 hr. label]). Duct sizes less than 8" (203) in width only, or in both width and height, require a Type 'C' enclosure (Models D1203SS [1 1/2 hr. label] and D1203SS-3 [3 hr. label]).

MODELS D1200SS, D1200SS-3, D1201SS AND D1201SS-3: TYPE A SLEEVE



Models D1200SS (no sleeve), D1201SS, D1200SS-3 (no sleeve) and D1201SS-3 Sizes (Duct W x H):

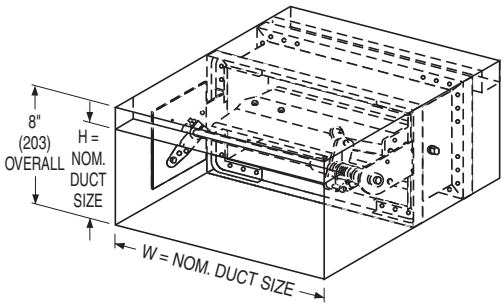
Model	Velocity/ Pressure Rating	Minimum	Maximum			
		Single Sect.	Single Section		Multiple Section	
		Vertical	Vertical	Horizontal	Vertical	Horizontal
Model D1200SS	24	8" x 8" (203 x 203)	36" x 48" (914 x 1219)	n/a	72" x 96" (1829 x 2438) or 144" x 48" (3658 x 1219).	n/a
Model D1200SS-3	24	8" x 8" (203 x 203)	36" x 48" (914 x 1219)	n/a	60" x 96" (1524 x 2438). (Individual sections not to exceed 30" x 48" [762 x 1219]).	n/a



Standard factory sleeve 16" long x 20 ga. (406 x 1.0). (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

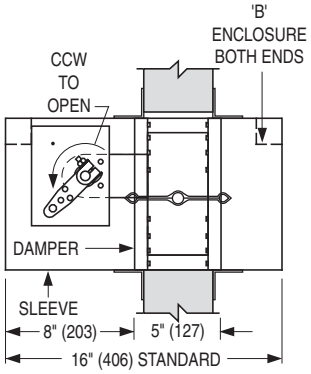
Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

MODELS D1202SS AND D1202SS-3: TYPE B SLEEVE ENCLOSURE



Models D1202SS and D1202SS-3 Sizes (Duct W x H):

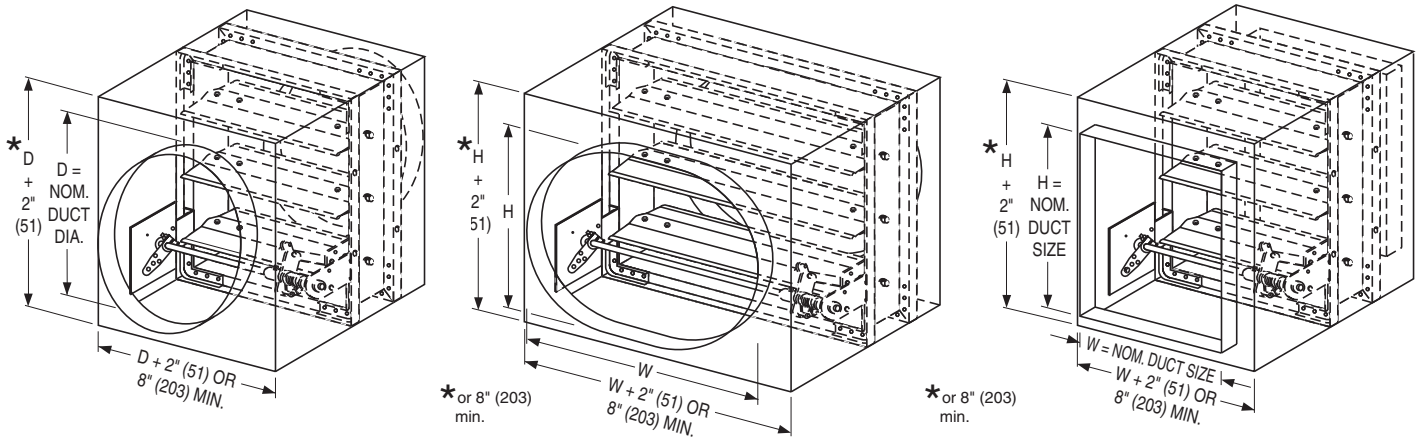
Model	Velocity/ Pressure Rating	Minimum	Maximum			
		Single Sect.	Single Section		Multiple Section	
		Vertical	Vertical	Horizontal	Vertical	Horizontal
Model D1202SS	24	8" x 4" (203 x 102). Overall damper height is 8" (203).	36" x 7 1/2" (914 x 191)	n/a	144" x 7 1/2" (3658 x 191).	n/a
Model D1202SS-3	24	8" x 4" (203 x 102). Overall damper height is 8" (203).	36" x 7 1/2" (914 x 191)	n/a	60" x 7 1/2" (1524 x 191). (Individual sections width not to exceed 30" [762]).	n/a



Standard factory sleeve 16" long x 20 ga. (406 x 1.0). (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

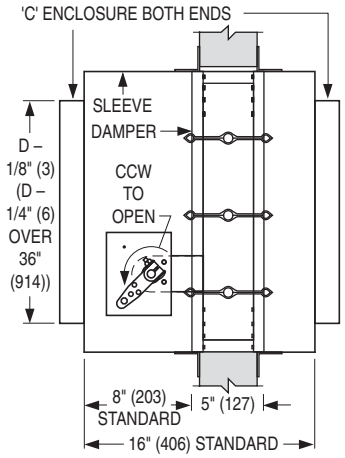
MODELS D1203SS AND D1203SS-3: TYPE C SLEEVE ENCLOSURES



STYLE CR : FOR ROUND DUCT

STYLE CO : FOR OVAL DUCT

STYLE CSR : FOR SQUARE OR RECTANGULAR DUCT



Standard factory sleeve 16" long x 20 ga. (406 x 1.0). (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Models D1203SS and D1203SS-3 - Round Duct Connection Sizes (Duct Dia.):

Model	Velocity/ Pressure Rating	Minimum	Maximum			
		Single Sect.	Single Section		Multiple Section	
		Vertical	Vertical	Horizontal	Vertical	Horizontal
Model D1203SS	24	4" (102) dia. Overall damper size is 8" x 8" (203 x 203) min.	34" (864) dia.	n/a	70" (1778) dia.	n/a
Model D1203SS-3	24	4" (102) dia. Overall damper size is 8" x 8" (203 x 203) min.	34" (864) dia.	n/a	58" (1473) dia. duct size (Individual sections not to exceed 28" [711] dia. duct size).	n/a

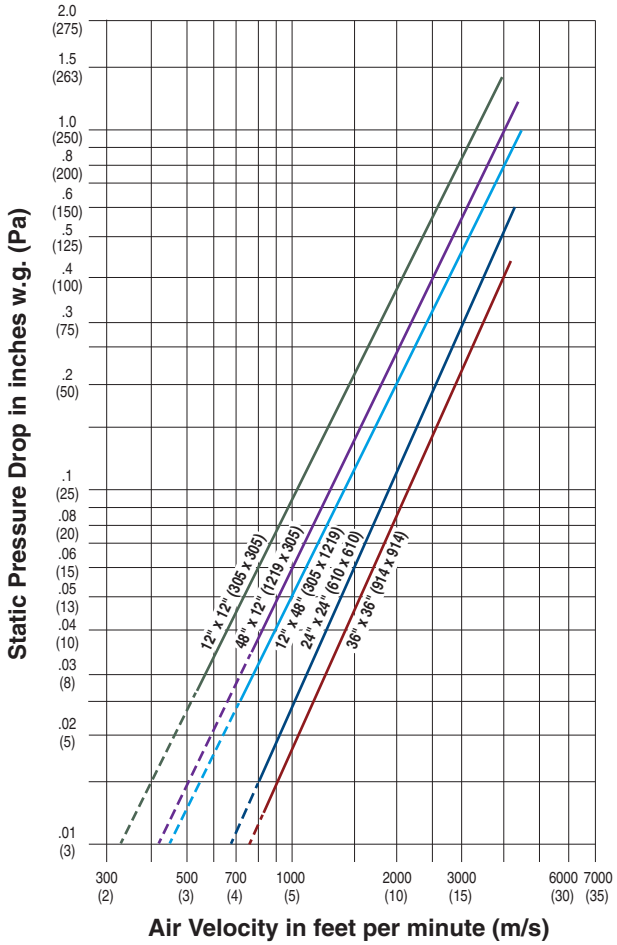
Models D1203SS and D1203SS-3 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):

Model	Velocity/ Pressure Rating	Minimum	Maximum			
		Single Sect.	Single Section		Multiple Section	
		Vertical	Vertical	Horizontal	Vertical	Horizontal
Model D1203SS	24	4" x 4" (102 x 102). Overall damper size is 8" x 8" (203 x 203) min.	34" x 46" (864 x 1168)	n/a	70" x 94" (1778 x 2388) or 142" x 46" (3607 x 1168)	n/a
Model D1203SS-3	24	4" x 4" (102 x 102). Overall damper size is 8" x 8" (203 x 203) min.	34" x 46" (864 x 1168)	n/a	58" x 94" (1473 x 2388) duct size (Individual sections not to exceed 28" x 46" [711 x 1168] duct size).	n/a

PERFORMANCE DATA:

MODEL SERIES: D1200SS - 1 1/2 HOUR LABEL AND D1200SS-3 - 3 HOUR LABEL

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

D1200SS Series Maximum Performance Ratings	
UL 555S Fire Rating	1 1/2 Hour
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)

D1200SS-3 Series Maximum Performance Ratings	
UL 555S Fire Rating	3 Hour
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)

HOW TO SPECIFY

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Stainless Steel Multi-Blade Dynamic 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. Each damper shall bear a UL fire resistance rating label of (**specifier select rating**) 1 1/2 hours **or** 3 hours, and in addition, a label verifying the airflow and closure pressure ratings of 2000 fpm (10 m/s) at 4" w.g. (1 kPa) static pressure differential, as established by the Dynamic Closure Test. Each fire damper shall also be marked with the words "For use in dynamic systems". Dampers marked "For use in static systems only" are not acceptable.

Frame shall be constructed of 16 ga. (1.6) (**specifier to select**) Type 304 **or** Type 316 Stainless Steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent stainless steel formed double skin, airfoil design, on 5 1/2" (140) centers. Dampers shall be of opposed blade configuration with an interlocking blade design. Blade seals are not acceptable. Blade axles shall be stainless steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be sintered stainless steel type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream.

Each fire damper shall be complete with a (**specifier select temperature**) 165°F (74°C) **or** 212°F (100°C) UL Listed fusible link that will cause the damper to close and lock in closed position by means of an over center/knee lock linkage for assured closure. Fire dampers shall each include a stainless steel sleeve of appropriate length/gauge as field verified by contractor, with Nailor 'Quick-Set' retaining angles supplied by damper manufacturer to ensure proper installation in accordance with damper manufacturer's instructions. Each damper shall be supplied with an internal manual quadrant(s) for setting and locking of blades in desired position. 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 (**specifier to select**) D1200SS (1 1/2 hour label) **or** D1200SS-3 (3 hour label).

- HARSH ENVIRONMENT
- TYPE 304 OR 316 STAINLESS STEEL
- HIGH PERFORMANCE AIRFOIL BLADE
- UL 555 CLASSIFIED STATIC FIRE DAMPER

Model 1200SS

Model Series:

1200SS	**1 1/2 Hour Label**	**(for fire separations up to 2 hours)**
1200SS-3	**3 Hour Label**	**(for fire separations up to 4 hours)**

Model Series 1200SS and 1200SS-3 Stainless Steel Multi-Blade Fire Dampers provide the ultimate in fire containment for static HVAC systems, classified for use only in static "fans off" systems where the HVAC system is automatically shut down in the event of a fire alarm. Ideal for use in high humidity or corrosive environments where building codes require a fire damper for the protection of ductwork penetrations in walls or floors. The design utilizes an innovative inter-locking double skin airfoil blade that maintains a complete barrier throughout the fire test with absolutely no visible through-gaps.

Sturdy 16 ga. (1.6) hat channel frames with reinforced mitered corners, 14 ga. (2.0) equivalent blades, long lasting self-lubricating bearings and double-bolted axles result in one the industry's most durable fire dampers. Available in either Type 304 (standard) or Type 316 (optional) Stainless Steel. Premium performance and versatility make the 1200SS and 1200SS-3 series dampers an excellent choice for the majority of today's commercial and light industrial applications.

QUALIFICATIONS:

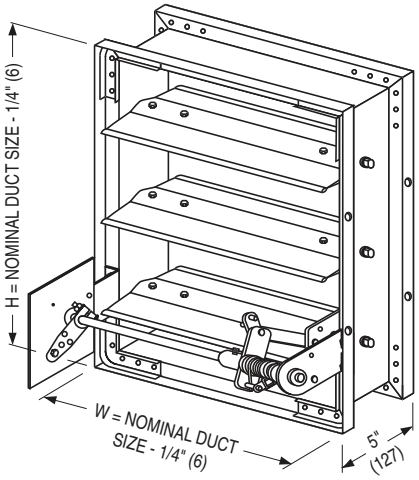
- **UL 555 & CAN/ULC-S112 CLASSIFIED FIRE DAMPER 1 1/2 hr. Label or 3 hr. Label (File # R9492).**
- **Meets NFPA 80, 90A and 101 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0101.**

STANDARD CONSTRUCTION:

Frame:	5" x 7/8" x 16 ga. (127 x 22 x 1.6) stainless steel hat channel.
Blades:	14 ga. (2.0) equivalent stainless steel formed airfoil on 5 1/2" (140) centers. Opposed blade action.
Linkage:	Concealed in frame. 12 ga. (2.7) stainless steel.
Bearings:	1/2" (13) dia. sintered stainless steel.
Axles:	1/2" (13) dia. stainless steel double bolted to blades.
Jackshaft:	1/2" (13) dia. stainless steel. CCW rotation to open. Internal locking quadrant is factory installed.
Fusible Link:	165°F (74°C) standard. 212°F (100°C) available.

COMMON OPTIONS:

- Type 304 or 316 Stainless Steel construction.
- MLS-300 Position Indicator Switch Pack.
- QS1 & QS2 "Quick-Set" Retaining Angles.
- Factory fitted sleeves in custom lengths, gauges and transition styles.

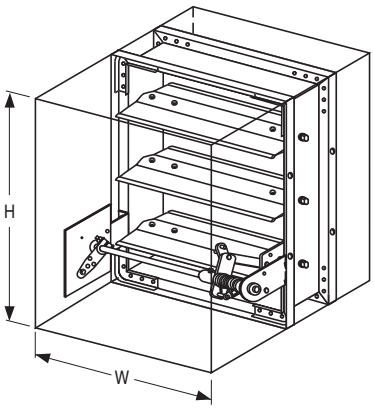


MODEL 1200SS 1 1/2 HOUR LABEL
MODEL 1200SS-3 3 HOUR LABEL
(Side Mounting Plate/Sleeve not shown)

DIMENSIONAL DATA:

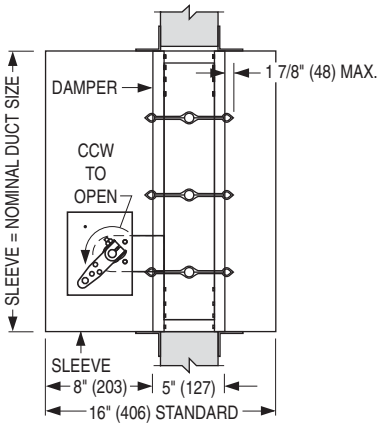
Model Series 1200SS (1 1/2 hr. label) and 1200SS-3 (3 hr. label) dampers with duct heights less than 8" [203] in width only, or in both width and height, require a Type 'B' sleeve enclosure (Models 1202SS [1 1/2 hr. label] and 1202SS-3 [3 hr. label]). Duct sizes less than 8" (203) in width only, or in both width and height, require a Type 'C' enclosure (Models 1203SS [1 1/2 hr. label] and 1203SS-3 [3 hr. label]).

MODELS 1200SS, 1200SS-3, 1201SS AND 1201SS-3: TYPE A SLEEVE



Models 1200SS (no sleeve), 1201SS, 1200SS-3 (no sleeve) and 1201SS-3 Sizes (Duct W x H):

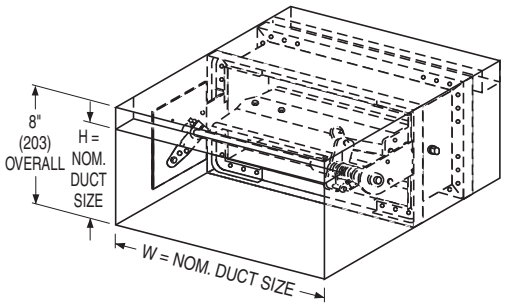
Model	Minimum	Maximum			
	Single Sect.	Single Section		Multiple Section	
	Vertical	Vertical	Horizontal	Vertical	Horizontal
Model 1200SS	8" x 8" (203 x 203)	36" x 48" (914 x 1219)	n/a	144" x 96" (3658 x 2438)	n/a
Model 1200SS-3	8" x 8" (203 x 203)	36" x 48" (914 x 1219)	n/a	120" x 96" (3048 x 2438). (Individual sections not to exceed 30" x 48" [762 x 1219]).	n/a



Standard factory sleeve 16" long x 20 ga. (406 x 1.0). (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

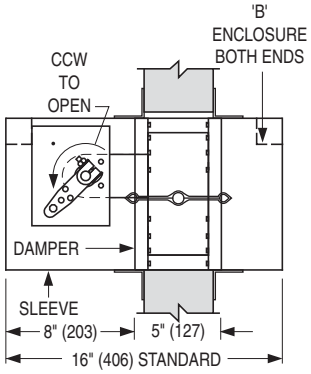
Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

MODELS 1202SS AND 1202SS-3: TYPE B SLEEVE ENCLOSURE



Models 1202SS and 1202SS-3 Sizes (Duct W x H):

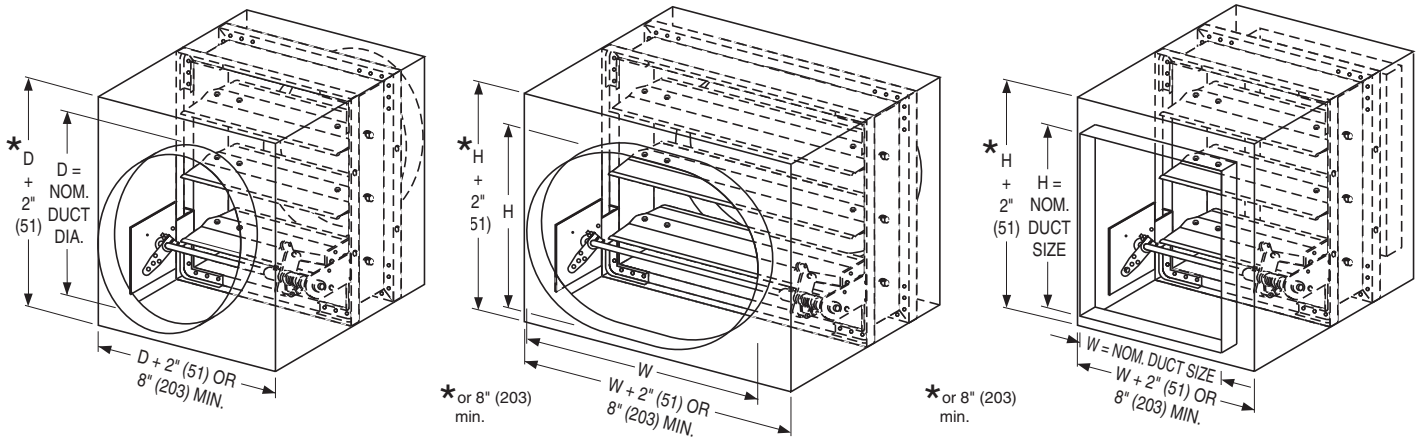
Model	Minimum	Maximum			
	Single Sect.	Single Section		Multiple Section	
	Vertical	Vertical	Horizontal	Vertical	Horizontal
Model 1202SS	8" x 4" (203 x 102). Overall damper height is 8" (203).	36" x 7 1/2" (914 x 191)	n/a	144" x 7 1/2" (3658 x 191).	n/a
Model 1202SS-3	8" x 4" (203 x 102). Overall damper height is 8" (203).	36" x 7 1/2" (914 x 191)	n/a	120" x 7 1/2" (3048 x 191). (Individual sections width not to exceed 30" [762]).	n/a



Standard factory sleeve 16" long x 20 ga. (406 x 1.0). (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

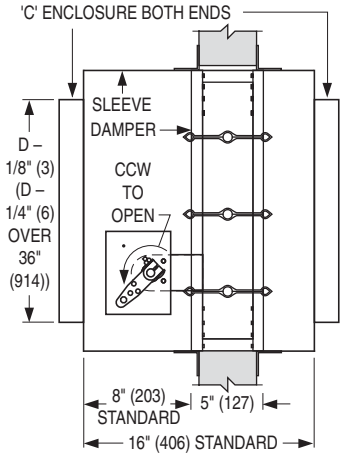
MODELS 1203SS AND 1203SS-3: TYPE C SLEEVE ENCLOSURES



STYLE CR : FOR ROUND DUCT

STYLE CO : FOR OVAL DUCT

STYLE CSR : FOR SQUARE OR RECTANGULAR DUCT



Standard factory sleeve 16" long x 20 ga. (406 x 1.0). (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Models 1203SS and 1203SS-3 - Round Duct Connection Sizes (Duct Dia.):

Model	Minimum	Maximum			
	Single Sect.	Single Section		Multiple Section	
	Vertical	Vertical	Horizontal	Vertical	Horizontal
Model 1203SS	4" (102) dia. Overall damper size is 8" x 8" (203 x 203) min.	34" (864) dia.	n/a	94" (2388) dia.	n/a
Model 1203SS-3	4" (102) dia. Overall damper size is 8" x 8" (203 x 203) min.	34" (864) dia.	n/a	94" (2388) dia. duct size (Individual sections not to exceed 28" [711] dia. duct size).	n/a

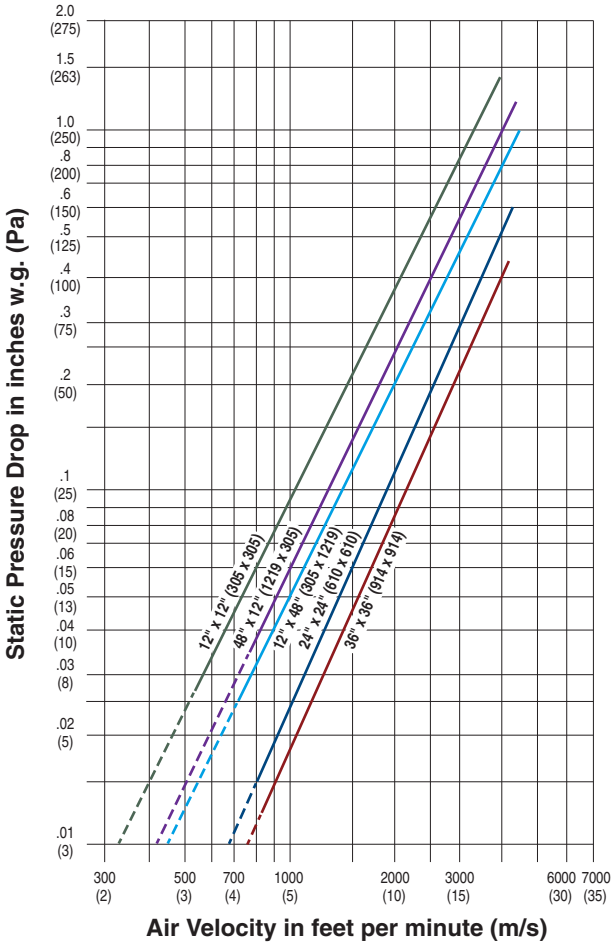
Models 1203SS and 1203SS-3 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):

Model	Minimum	Maximum			
	Single Sect.	Single Section		Multiple Section	
	Vertical	Vertical	Horizontal	Vertical	Horizontal
Model 1203SS	4" x 4" (102 x 102). Overall damper size is 8" x 8" (203 x 203) min.	34" x 46" (864 x 1168)	n/a	142" x 94" (3607 x 2388)	n/a
Model 1203SS-3	4" x 4" (102 x 102). Overall damper size is 8" x 8" (203 x 203) min.	34" x 46" (864 x 1168)	n/a	118" x 94" (2997 x 2388) duct size (Individual sections not to exceed 28" x 46" [711 x 1168] duct size).	n/a

PERFORMANCE DATA:

MODEL SERIES: 1200SS - 1 1/2 HOUR LABEL AND 1200SS-3 - 3 HOUR LABEL

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

HOW TO SPECIFY

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Stainless Steel Multi-Blade Static 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. Each damper shall bear a UL fire resistance rating label of (**specifier select rating**) 1 1/2 hours **or** 3 hours.

Frame shall be constructed of 16 ga. (1.6) (**specifier to select**) Type 304 **or** Type 316 Stainless Steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent stainless steel formed double skin, airfoil design, on 5 1/2" (140) centers. Dampers shall be of opposed blade configuration with an interlocking blade design. Blade seals are not acceptable. Blade axles shall be stainless steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be sintered stainless steel type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream.

Each fire damper shall be complete with a (**specifier select temperature**) 165°F (74°C) **or** 212°F (100°C) UL Listed fusible link that will cause the damper to close and lock in closed position by means of an over center/knee lock linkage for assured closure. Fire dampers shall each include a stainless steel sleeve of appropriate length/gauge as field verified by contractor, with Nailor 'Quick-Set' retaining angles supplied by damper manufacturer to ensure proper installation in accordance with damper manufacturer's instructions. Each damper shall be supplied with an internal manual quadrant(s) for setting and locking of blades in desired position. 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 (**specifier to select**) 1200SS (1 1/2 hour label) **or** 1200SS-3 (3 hour label).

- TRUE ROUND DESIGN
- EXCELLENT PERFORMANCE
- LOW PRESSURE DROP
- UL 555 CLASSIFIED DYNAMIC FIRE DAMPER

Model:

1290F 1 1/2 Hour Label (for fire separations up to 2 hours)

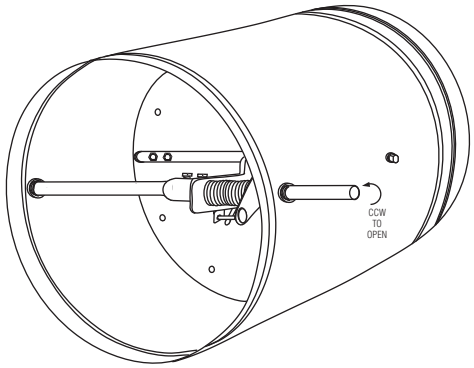
Model 1290F

Model 1290F True Round Fire Damper is designed and qualified specifically for applications where round ductwork passes through metal stud drywall partitions or masonry walls and building codes require a fire damper for the protection of ductwork penetrations in walls or floors that have a fire resistance rating of up to 2 hours. The 1290F is classified for use in dynamic "fans on" systems where the HVAC system remains operative in the event of a fire, and damper closure under airflow is assured.

The 1290F design features the industry proven over-center knee lock design with high torque spring/fusible link closure, economical galvanized steel construction, heavy duty 14 ga. (2.0) laminated blade and long life self-lubricating bearings. Available in large range of round sizes from 6" – 24" with a multitude of options, supplied as standard with a crank arm and locking screw which holds the damper in the fully open position, but may also be used for system balancing if required.

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 hr. Label (File # R9492).**
- **Meets NFPA 80, 90A and 101 as well as IBC and NBC (Canada) Building Code requirements.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0101.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**



MODEL 1290F
1 1/2 HOUR LABEL
(Retaining Plates not shown)

STANDARD CONSTRUCTION:

Frame: 20 ga. (1.0) galvanized steel integral sleeve and retaining plates.

Blade: 2 x 20 ga. (1.0) galvanized steel laminated together. 14 ga. (2.0) equivalent thickness.

Linkage: Jackshaft to blade.

Bearings: 1/2" (13) dia. self-lubricating oilite bronze.

Axles: 1/2" (13) dia. plated steel double bolted to blades.

Jackshaft: 1/2" (13) dia. cadmium plated steel. Supplied with factory mounted hand locking quadrant.

Fusible Link: 165°F (74°C) standard. 212°F (100°C) available.

Model 1290F Sizes (Duct Dia.):

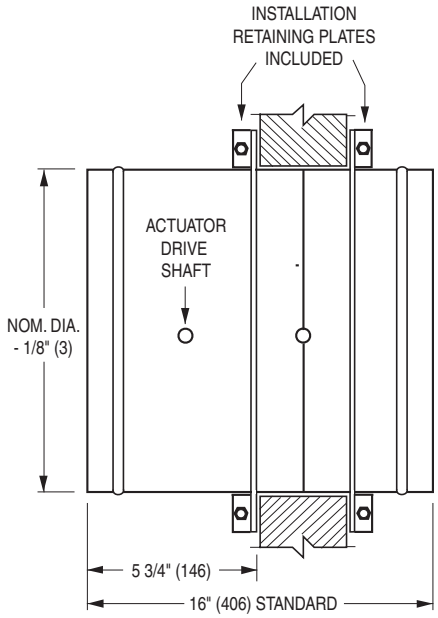
Minimum	Maximum
6" (152) dia.	24" (610) dia.

Note: Dampers available in 1" (25) increments. Vertical or horizontal installation.

Wall Thickness	Min. Sleeve Length
4 to 8 (102 to 203)	16 (406)
10 to 12 (254 to 305)	20 (508)
14 to 16 (356 to 406)	24 (610)

COMMON OPTIONS:

- MLS-300 Position Indicator Switch Pack.



- HARSH ENVIRONMENT
- TRUE ROUND DESIGN
- EXCELLENT PERFORMANCE
- TYPE 304 OR 316 STAINLESS STEEL
- LOW PRESSURE DROP
- UL 555 CLASSIFIED DYNAMIC FIRE DAMPER

Model 1290F-SS

Model:

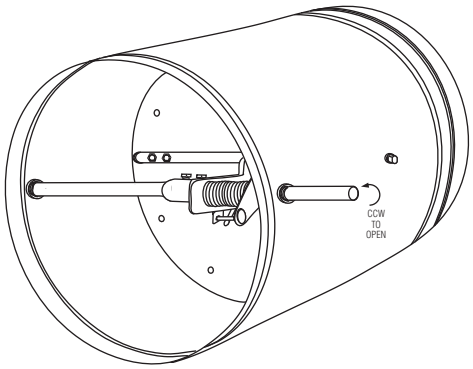
1290F-SS 1 1/2 Hour Label (for fire separations up to 2 hours)

Model 1290F-SS Stainless Steel True Round Fire Damper is designed and qualified specifically for applications where round stainless steel ductwork passes through metal stud drywall partitions or masonry walls and building codes require a fire damper for the protection of ductwork penetrations in walls or floors that have a fire resistance rating of up to 2 hours. Ideal for use in commercial and light industrial applications with high humidity or mildly corrosive environments. The 1290F is classified for use in dynamic "fans on" systems where the HVAC system remains operative in the event of a fire, and damper closure under airflow is assured.

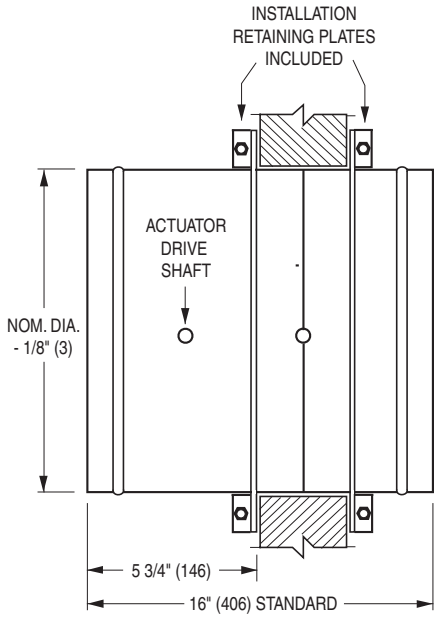
The 1290F design features the industry proven over-center knee lock design with high torque spring/fusible link closure, durable stainless steel construction, heavy duty 14 ga. (2.0) laminated blade and long life self-lubricating bearings. Available in large range of round sizes from 6" – 24" with a multitude of options, supplied as standard with a crank arm and locking screw which holds the damper in the fully open position, but may also be used for system balancing if required.

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 hr. Label (File # R9492).**
- **Meets NFPA 80, 90A and 101 as well as IBC and NBC (Canada) Building Code requirements.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0101.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**



MODEL 1290F-SS
1 1/2 HOUR LABEL
(Retaining Plates not shown)



STANDARD CONSTRUCTION:

Frame: 20 ga. (1.0) stainless steel integral sleeve and retaining plates.

Blade: 2 x 20 ga. (1.0) stainless steel laminated together. 14 ga. (2.0) equivalent thickness.

Linkage: Stainless steel; jackshaft to blade.

Bearings: 1/2" (13) dia. stainless steel.

Axles: 1/2" (13) dia. stainless steel double bolted to blades.

Jackshaft: 1/2" (13) dia. stainless steel. Supplied with factory mounted hand locking quadrant.

Fusible Link: 165°F (74°C) standard. 212°F (100°C) available.

Model 1290F-SS Sizes (Duct Dia.):

Minimum	Maximum
6" (152) dia.	24" (610) dia.

Note: Dampers available in 1" (25) increments. Vertical or horizontal installation.

Wall Thickness	Min. Sleeve Length
4 to 8 (102 to 203)	16 (406)
10 to 12 (254 to 305)	20 (508)
14 to 16 (356 to 406)	24 (610)

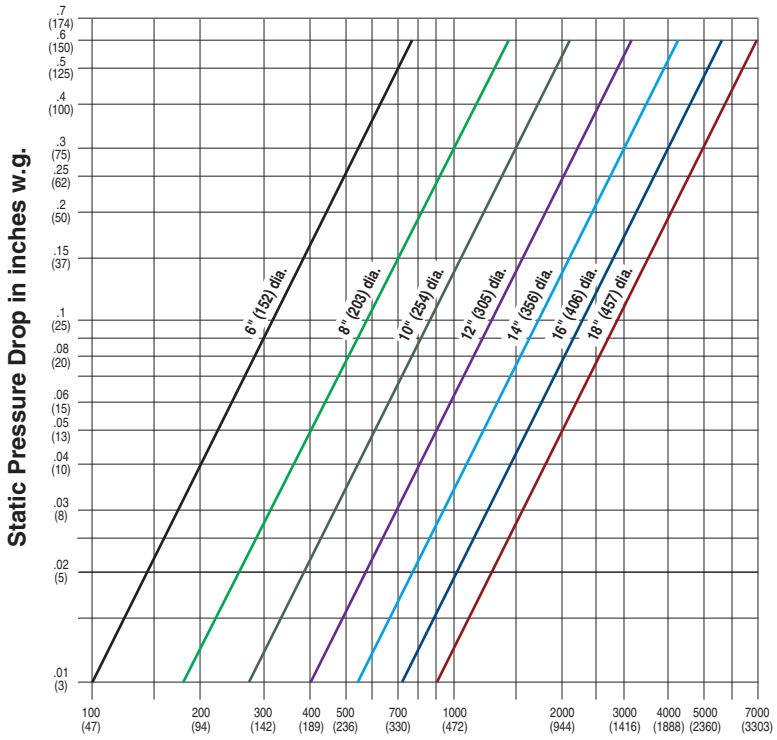
COMMON OPTIONS:

- Type 304 or 316 Stainless Steel construction.
- MLS-300 Position Indicator Switch Pack.

PERFORMANCE DATA:

MODEL SERIES: 1290F - 1 1/2 HOUR LABEL AND 1290F-SS - 1 1/2 HOUR LABEL

PRESSURE DROP



Pressure Drop tested per AMCA Standard 500-D, Fig. 5.5.

1290F Maximum Performance Ratings	
UL 555 Fire Rating	1 1/2 Hour
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)

1290F-SS Maximum Performance Ratings	
UL 555 Fire Rating	1 1/2 Hour
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)

HOW TO SPECIFY

TRUE ROUND FIRE DAMPERS
MODEL: 1290F - 1 1/2 HOUR LABEL

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules True Round Dynamic 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. Each damper shall bear a UL fire resistance rating label of 1 1/2 hours and in addition, a label verifying the airflow and closure pressure rating of 2000 fpm (10 m/s) at 4" w.g. (1 kPa) static pressure differential, as established by the Dynamic Closure Test. Each fire damper shall also be marked with the words "For use in dynamic systems". Dampers marked "For use in static systems only" are not acceptable.
Frame/integral sleeve shall be roll-formed from 20 ga. (1.0) galvanized steel, beaded for structural strength and grooved to accept 20 ga. (1.0) galvanized steel retaining plate. Required sleeve length shall be field verified by contractor. Each damper shall be complete with retaining plate and 20 ga. (1.0) galvanized steel damper plate, supplied by the damper manufacturer to ensure proper fit and installation. Blade shall be of two 20 ga. (1.0) galvanized steel pieces laminated together with an equivalent thickness of 14 ga. (2.0). Blades axles shall be 1/2" (13) dia. plated steel double bolted to blade. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type.
Each fire damper shall be complete with a (**specifier select temperature**) 165°F (74°C) **or** 212°F (100°C) UL Listed fusible link that will cause the damper to close and lock in closed position by means of an over center/knee lock linkage for assured closure. Each damper shall be supplied with an internal manual quadrant(s) for setting and locking of blades in desired position. 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 1290F.

STAINLESS STEEL TRUE ROUND FIRE DAMPERS
MODEL: 1290F-SS - 1 1/2 HOUR LABEL

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules Stainless Steel True Round Dynamic 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. Each damper shall bear a UL fire resistance rating label of 1 1/2 hours and in addition, a label verifying the airflow and closure pressure rating of 2000 fpm (10 m/s) at 4" w.g. (1 kPa) static pressure differential, as established by the Dynamic Closure Test. Each fire damper shall also be marked with the words "For use in dynamic systems". Dampers marked "For use in static systems only" are not acceptable.
Frame/integral sleeve shall be from 20 ga. (1.0) stainless steel, beaded for structural strength and grooved to accept 20 ga. (1.0) stainless steel retaining plate. Required sleeve length shall be field verified by contractor. Each damper shall be complete with retaining plate and 20 ga. (1.0) stainless steel damper plate, supplied by the damper manufacturer to ensure proper fit and installation. Blade shall be of two 20 ga. (1.0) stainless steel pieces laminated together with an equivalent thickness of 14 ga. (2.0). Blades axles shall be 1/2" (13) dia. plated stainless steel double bolted to blade. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type.
Each fire damper shall be complete with a (**specifier select temperature**) 165°F (74°C) **or** 212°F (100°C) UL Listed fusible link that will cause the damper to close and lock in closed position by means of an over center/knee lock linkage for assured closure. Each damper shall be supplied with an internal manual quadrant(s) for setting and locking of blades in desired position. 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 1290F-SS.

HOW TO ORDER

MULTI-BLADE & TRUE ROUND FIRE DAMPERS

MODEL SERIES: D1200, D1200-3, D1200SS, D1200SS-3, D1201-OW, D1201-DOW, D1250, 1290F, 1290F-SS, 1200, 1200-3, 1200SS, 1200SS-3

EXAMPLE: D1251 - 24 x 24 - V - 24 - FL - 165 - BO - SL = 16 - 20G - L8

1a. **Models**

Dynamic or Static Applications

D1200	Airfoil Blade, 1 1/2 Hour Label
D1200-3	Airfoil Blade, 3 Hour Label
D1200SS	Stainless Steel, Airfoil Blade, 1 1/2 Hour Label
D1200SS-3	Stainless Steel, Airfoil Blade, 3 Hour Label
D1201-OW	Out-Of-Wall Airfoil Blade, 1 1/2 Hour Label, Grille Mount
D1201-DOW	Out-Of-Wall Airfoil Blade, 1 1/2 Hour Label, Through Penetrations
D1250	Vee Blade, 1 1/2 Hour Label
1290F	True Round, 1 1/2 Hour Label
1290F-SS	Stainless Steel, True Round, 1 1/2 Hour Label

Static Only Applications

1200	Airfoil Blade, 1 1/2 Hour Label
1200-3	Airfoil Blade, 3 Hour Label
1200SS	Stainless Steel, Airfoil Blade, 1 1/2 Hour Label
1200SS-3	Stainless Steel, Airfoil Blade, 3 Hour Label

1b. **Sleeve/Enclosure Style**

(4th digit not applicable to all models)

0 = No Sleeve
1 = Type A Sleeve
2 = Type B Sleeve Enclosure
3 = Type C Sleeve Enclosure

2. **Duct Size**

Width x Height or Diameter (inches [mm's])

3. **Construction**

(Stainless Steel models only)

304 Type 304 Stainless Steel (default)
316 Type 316 Stainless Steel

4. **Mounting**

V Vertical (wall)
H Horizontal (floor)

5. **Max. Velocity/Pressure Rating**

(Dynamic models only)

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

6. **Closure Device**

FL Fusible Link (default)

7. **Closure Temperature**

165 165°F (default)
212 212°F

8. **Bearings**

BO Oilite Bronze (default)
BS Stainless Steel (default on Stainless Steel models)

9. **Jamb Seals**

(Not applicable to all models)

— None
JSM Flexible metal
JSS Stainless steel

10. **Blade Seals**

(Not applicable to all models)

— None
BSS Silicone (D1250 Series only)

11a. **Side Mounting Plate**

(No sleeve models only)

SMP Side Mounting Plate

11b. **Sleeve Length**

SL = Specify
16" (406) standard (default)
16" – 36" (406 – 914)

12. **Sleeve Gauge**

20G 20 ga. standard (default)
18G 18 ga.
16G 16 ga.
14G 14 ga.
10G 10 ga.

13. **Transition**

(Sleeve Type C models only)

CR Round
CO Oval
CSR Square/Rectangular

14. **Damper Location**

L8 8" (203) from sleeve end
LX Other (specify) 8" – 16" (203 – 406)

ACCESSORIES:

15. **Retaining Angles**

— None (default)
QS1 Single set (Not available on Model D1201-DOW)
QS2 Pair (Not available on Model D1201-OW)

16. **Position Indicator**

— None (default)
300 MLS-300 (4-wire)

17. **TDF Flange**

(Type A sleeved models only)

— None (default)
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. One MLS-300 required per damper assembly.

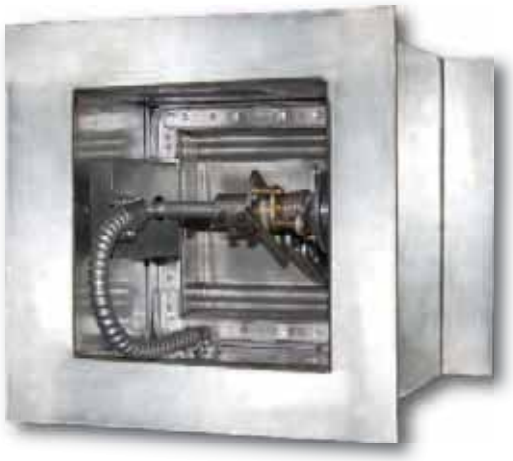
3. All multi-blade fire dampers are supplied with a locking quadrant.

- MARINE APPLICATIONS
- AIRFOIL BLADE
- HIGH PERFORMANCE
- LOW LEAKAGE
- USCG TYPE APPROVED FOR CLASS A-60 DIVISIONS

Models:

1201-MDG Galvanized Construction

1201-MDS Type 304 Stainless Steel Construction

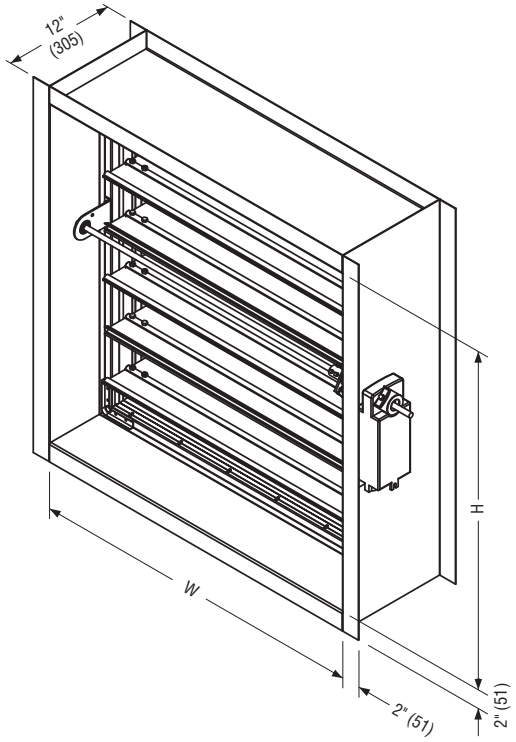


Model 1201-MDG

Models 1201-MDG and 1201-MDS are Multi-Blade Low Leakage Fire Dampers for use in marine applications which require USCG approval for installation on Class A-60 divisions. Unique airfoil blade design provides low pressure drop, particularly suited for high velocity applications. Standard features include a rugged hat channel frame, 12" (305) factory fitted sleeve, concealed in-frame linkage and stainless steel jamb seals for low leakage performance. Models 1201-MDG and 1201-MDS may be installed vertically, with blades running horizontal, or horizontally.

QUALIFICATIONS:

- **International Maritime Organization Fire Test Procedures Code USCG Type Approval A-60. Approval Number 164.139/8/0.**
- **European Wheel Mark 1408/05.**
- **Southwest Research Institute Test report No. 01.10933.01.701.**
- **Leakage: Less than 4 cfm/sq. ft. @ 1" w.g. (6.8 L/s/cm² @ 1250 Pa).**



MODEL 1201-MDG/1201-MDS

STANDARD CONSTRUCTION:

Frame: 5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized or stainless steel hat channel.

Blades: 14 ga. (2.0) equivalent galvanized or stainless steel formed airfoil on 5 1/2" (140) centers. Opposed action.

Sleeve: 12" x 16 ga. (305 x 1.6 ga.) with 2" (51) flange on both ends. 10" through 24" (254 through 610) long and 16 ga. through 10 ga. (1.6 through 3.51) available. 12" (305) min. with MLS-300. Flange widths from 1" to 3" (25 to 76) available.

Linkage: Concealed in frame. 12 ga. (2.7) plated or stainless steel.

Bearings: 1/2" (13) dia. self-lubricating oilite bronze or sintered stainless steel.

Axles: 1/2" (13) dia. plated steel or stainless steel double bolted to blades.

Jackshaft: 1/2" (13) dia. plated or stainless steel. CCW rotation to open.

Jamb Seals: Stainless steel.

Fusible Link: 165°F (74°C) standard. 212°F (100°C) available.

Models 1201-MDG and 1201-MDS Sizes (Duct W x H):

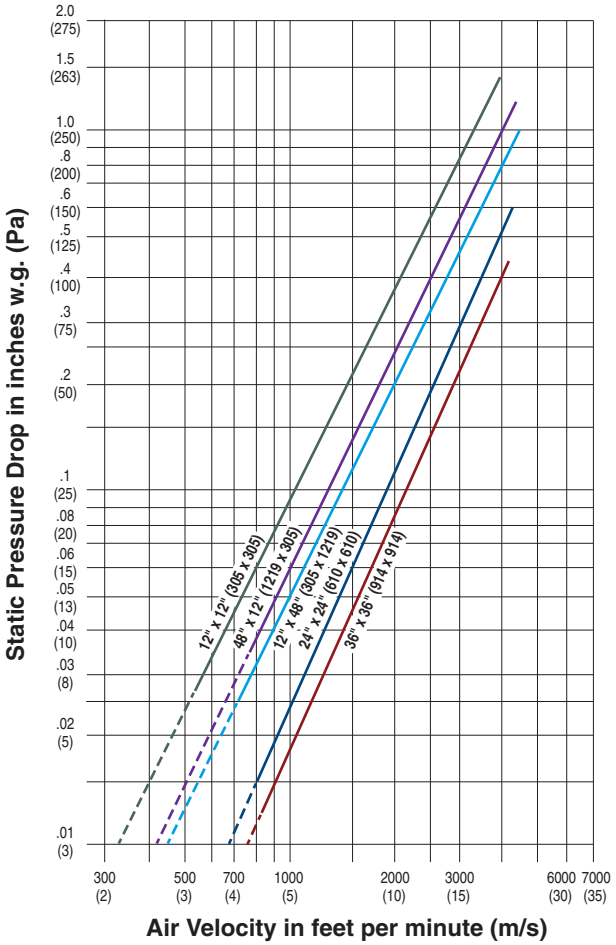
Minimum	Maximum		Maximum	
Single Section	Single Section		Multiple Section	
Vertical/Horizontal	Vertical	Horizontal	Vertical	Horizontal
8" x 8" (203 x 203)	36" x 36" (914 x 914)	32" x 48" (813 x 1219)	72" x 36" (1830 x 914)	72" x 36" (1830 x 914)

COMMON OPTIONS:

- Type 316 Stainless Steel Construction (Model 1201-MDS only)
- Explosion-Proof Motor.
- MLS-300 Position Indicator Switch Pack.
- Factory fitted sleeves.
- 1" (25), 1 1/2" (38), 2" (51), 2 1/2" (64), 3" (76) Sleeve Flange.

PERFORMANCE DATA:
MODELS: 1201-MDG AND 1201-MDS

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

HOW TO SPECIFY

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Multi-Blade Marine Fire Dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Dampers shall be tested and rated in accordance with the latest edition of International Maritime Organization Fire Test Procedures Code Coast Guard Approval Type A-60 and also bear the European Wheel Mark in accordance with Marine Equipment Directive 96/98/EC.

Frame shall be constructed of 16 ga. (1.6) (**specifier to select**) galvanized steel (**Model 1201-MDG**) **or** Type 304 Stainless Steel (**Model 1201-MDS**) **or** Type 316 Stainless Steel (**Model 1201-MDS**) hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent (**specifier to select**) galvanized steel (**Model 1201-MDG**) **or** Type 304 Stainless Steel (**Model 1201-MDS**) **or** Type 316 Stainless Steel (**Model 1201-MDS**) formed double skin, airfoil design, on 5 1/2" (140) centers. Dampers shall be of opposed blade configuration with an interlocking blade design. Blade seals are not acceptable. Damper shall be equipped with stainless steel jamb seals for low leakage performance. Bearings shall be (**specifier to select**) self-lubricating oilite bronze type (**Model 1201-MDG**) **or** Stainless Steel (**Model 1201-MDS**). Blade linkage shall be zero-maintenance, concealed in frame, out of airstream.

The heat responsive device shall have a temperature rating of (**specifier select temperature**) 165°F (74°C) **or** 212°F (100°C). Appropriate externally mounted electric actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism, external after-market spring mechanisms are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.

Standard of acceptance shall be Nailor Model (**specifier to select**) 1201-MDG (Galvanized Steel) **or** 1201-MDS (Stainless Steel).

HOW TO ORDER

MULTI-BLADE MARINE FIRE DAMPERS

MODELS: 1201-MDG, 1201MDS

EXAMPLE: 1201-MDG - 24 x 24 - V - FL - 165 - BO - SL = 12 - 16G - FD20 - AUTO - 120 - EXT - RH - CL - 412

1. **Models**
   - 1201-MDG Galvanized Steel, Airfoil Blade
   - 1201-MDS Stainless Steel, Airfoil Blade
2. **Duct Size**
   Width x Height or Diameter (inches [mm's])
3. **Mounting**
   - V Vertical (default)
   - H Horizontal
4. **Stainless Steel Construction**
   (Model 1201-MDS only)
   - 304 Type 304 Stainless Steel (default)
   - 316 Type 316 Stainless Steel
5. **Closure Device**
   - FL Fusible Link (default)
6. **Elevated Temperature**
   - 165 165°F (74°C) (default)
   - 212 212°F (100°C)
7. **Bearings**
   - BO Oilite Bronze (default on Model 1201-MDG)
   - BS Stainless Steel (default on Model 1201-MDS)
8. **Sleeve Length**
   SL = Specify
   - 12 12" (305) standard (default)
   - 10 10" (254)
   - 14 14" (356)
   - 16 16" (406)
   - 18 18" (457)
   - 20 20" (508)
   - 24 24" (610)
9. **Sleeve Gauge**
   - 16G 16 ga. standard (default)
   - 14G 14 ga.
   - 10G 10 ga.
10. **Sleeve Flange**
    - FD20 2" (51) standard (default)
    - FD10 1" (25)
    - FD15 1 1/2" (38)
    - FD25 2 1/2" (64)
    - FD30 3" (76)
11. **Bolt Holes**
    - — None (default)
    - BH1 In One Flange
    - BH2 In Both Flanges
12. **Actuator Selected by**
    - AUTO Least Cost (Auto-Select) (default)
    - MAN Manually Select
13. **Power Requirement**
    - 120 120 VAC (default)
    - 230 230 VAC
    - 24 24 VAC
    - 25 25 psi Pneumatic
    - MAN Manual
14. **Actuator Mounting**
    - EXT External (default)
15. **Actuator Location**
    - RH Right-Hand (default)
    - LH Left-Hand
16. **Fail Position**
    - CL Close (default)
    - OP Open
17. **Actuator Models**
    Electric:
    - MS4 MS4X09F 120 VAC
    - MS8 MS8X09F 24 VAC
    - 4Y0 MS4Y09F 230 VAC
    - 412 MS4120F 120 VAC
    - 812 MS8120F 24 VAC
    - 462 MS4620F 230 VAC

    Pneumatic:
    - 296 331-2961 #4
    - 306 331-3060 #3

OPTIONS & ACCESSORIES:

18. **Position Indicator**
    - — None (default)
    - 300 MLS-300 - 4 wire
19. **E. P. Switch**
    - EP1 2651008 120 V
    - EP2 2651007 24 V
20. **Explosion-Proof Motor**
    - — None (default)
    - EPH Explosion-Proof Motor
21. **Outdoor Motor Housing**
    - — None (default)
    - OMH4 Type 304 Stainless Steel (NEMA 4X)
    - OMH6 Type 316 Stainless Steel (NEMA 4X)
22. **Continuous Weld Sleeve**
    - — None (default)
    - CWS Continuous Weld Sleeve

Notes:

1. Standard sleeve is 12" (305 long x 16 ga. (1.6) with a 2" (51) flange at both ends.

2. Refer to actuator price sheet for selection availability. Contact factory for availability of other actuators.

3. One MLS-300 required per damper assembly.

4. EP (electric-pneumatic) switch optional accessory is applicable only to pneumatic actuators and is shipped loose.

Options and Accessories

Nailor multi-blade fire dampers are tested by and listed with Underwriters Laboratories Inc. and are manufactured within UL procedural requirements. Approved variables including a variety of options and accessories are available to suit specific applications.

MATERIAL OPTIONS:

OPTION CODE **304**
STAINLESS STEEL CONSTRUCTION

All parts of damper (except blade seals) will be constructed of 304 stainless steel. Provides higher corrosion resistance against harsh atmospheric and process elements. Consult your Nailor representative for specific application suitability.

OPTION CODE **316**
STAINLESS STEEL CONSTRUCTION

All parts of damper (except blade seals) will be constructed of 316 stainless steel. Provides higher corrosion resistance against harsh atmospheric and process elements. Consult your Nailor representative for specific application suitability.

BEARING OPTIONS:

OPTION CODE **BO**
OILITE® BRONZE BEARINGS

Bronze sintered (oil impregnated) self-lubricating oilite bearings provide long time lubrication making them ideal for use in applications where proper maintenance is uncertain or difficult.

OPTION CODE **BS**
STAINLESS STEEL BEARINGS

304 grade stainless steel bearings provide corrosion resistance in a wide variety of corrosive media. In higher heat applications, provides good oxidation resistance. Standard for stainless steel models.

CLOSURE TEMPERATURES:

OPTION CODES
165 212
FUSIBLE LINK TEMPERATURE

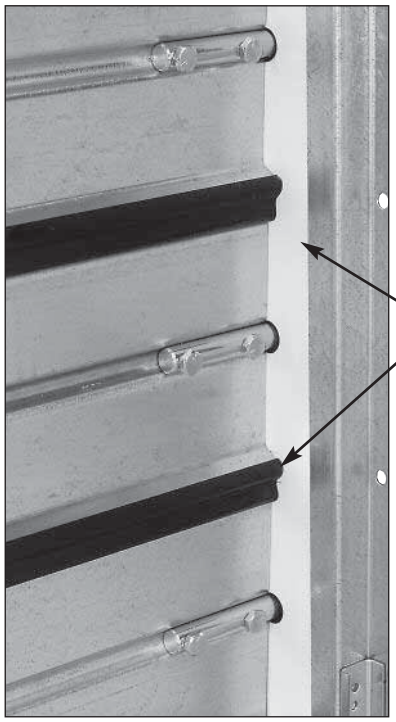
Fusible links for Model Series (D)1200, D1250 and 1290F fire dampers are available with a choice of several melting temperature ratings. Nailor fire dampers are provided as standard with 165°F (74°C) fusible link. Optional 212°F (100°C) link can be installed on damper at time of manufacturing, or can 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. Note that local building codes may also stipulate a maximum closure temperature rating.

OPTIONAL SEALS:

OPTION CODE **JSM**
FLEXIBLE METAL JAMB SEALS

OPTION CODE **JSS**
STAINLESS STEEL JAMB SEALS

OPTION CODE **BSS**
SILICONE SEALS



Option Code JSM (Option Code JSS on stainless steel models) provides damper with flexible metal jamb seals to minimize air leakage between blade ends and frame. Suitable for use in applications that may require damper to be used as a shut-off damper for example, as well as a fire damper.

Option Code BSS provides damper with Silicone blade edge seals. Blade seals minimize air leakage between blades, and are a suitable option for use in applications that may require damper to be used as a shut-off damper for example, as well as a fire damper.

RETAINING ANGLES:

FOR USE WITH ALL MULTI-BLADE FIRE DAMPERS EXCEPT MODELS 1290FS AND 1290FS-SS

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

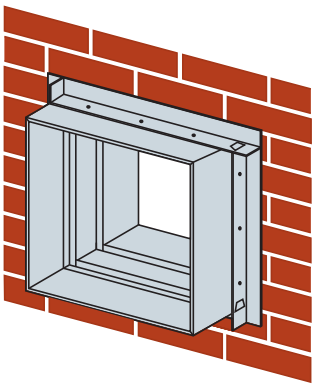
Note: Reference IOM-FDQSRA for more details.

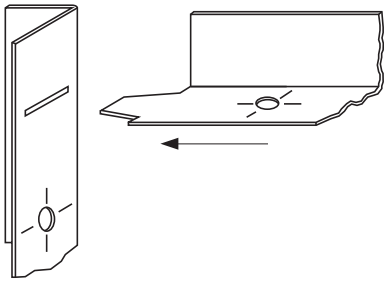
OPTION CODES
QS2 TWO SIDES (PAIR)
QS1 ONE SIDE
'QUICK-SET' RETAINING ANGLES

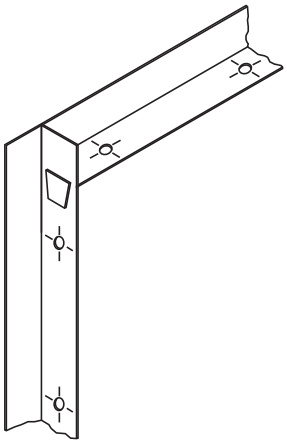
BENEFITS:

- 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.

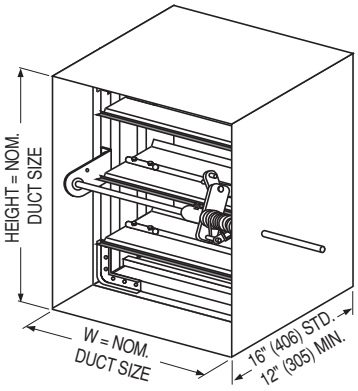
SLEEVES OR SIDE MOUNTING PLATE:

TYPE A SLEEVES
MODELS (D)1201 and D1251

All fire dampers require a steel sleeve of correct length and gauge in order to be installed in accordance with the product's UL approved installation instructions. Nailor recommends that all multi-blade fire dampers, including Type A models, are specified and ordered complete with a factory installed full sleeve (Type B and C models are manufactured as standard with a transition casing that acts as a sleeve). Nailor can provide a factory furnished sleeve that allows the units to ship directly to job site ready for installation, saving time, money and costly shop or field fabrication, as well as helping to ensure proper installation to UL requirements. A factory furnished sleeve also permits factory mounting of Nailor's MLS-300 Position Indicator Switch Pack. Standard sleeve is 16" (406) long. For further damper/sleeve details, see Models (D)1201 and D1251.

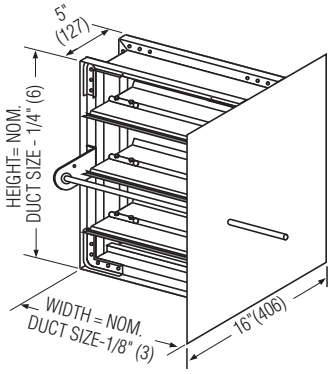
The following indicates model numbers to order for multi-blade fire dampers with factory fitted Type A sleeves:

Standard Model #	With Type A Sleeve
(D)1200 →	Model (D)1201
D1250 →	Model D1251



OPTION CODE **SMP**
SIDE MOUNTING PLATE

Nailor's **SMP**, Side Mounting Plate is required for factory mounting of the MLS-300 Position Indicator Switch Pack when a full factory sleeve is not requested. As with all fire dampers, an appropriate steel sleeve is required for installation of damper in wall or floor.



SIDE MOUNTING PLATE FOR MULTI-BLADE FIRE DAMPERS

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 combination fire/smoke damper Type A sleeve (22 or 20 gauge) 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. Specify which end to be flanged in relation to the jackshaft.

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).

Note: Reference IOM-FDTDCFINST for more details.

NOTES:

Nailor® Industries Inc.

SMOKE DAMPERS

TABLE OF CONTENTS

GENERAL PRODUCT OVERVIEW

It is widely accepted that fire destroys property and smoke is responsible for the vast majority of fire related occupant deaths. Smoke dampers have two general applications: 1) They may be applied in a "Passive Smoke Control System" where they simply close and prevent the circulation of air and smoke through a duct or a ventilation opening in a smoke barrier, or 2) They may be applied as part of an "Engineered Smoke Control System" designed to control the spread of smoke using floors and walls as barriers. The latter method utilizes the building's HVAC system and/or dedicated fans to create pressure differences that surround a fire area to prevent the spread of smoke from the fire zone into other areas of the building. Smoke dampers are motorized with electric or pneumatic actuators and may be controlled by a smoke or heat detector signal, a fire alarm signal or in a variety of ways by the building control system to accomplish the intent of the design. Nailor Industries' commitment to the development of new and existing fire and smoke control technology has resulted in a comprehensive line of premium quality smoke dampers and accessories, available at a reasonable cost and in a timely fashion.

MODEL SERIES 1280
EXTRUDED ALUMINUM AIRFOIL BLADE
PREMIUM PERFORMANCE

Model Series 1280 is the premium choice for applications where a leakage rated smoke damper is required as part of a static smoke control or dynamic smoke management system. The design features a smoothly contoured extruded aluminum airfoil blade and compression type seals that have been designed to offer the lowest leakage class available with airflow in either directions. Together with a concealed linkage, out of airstream, the design provides an ultra-low pressure drop and minimizes unwanted turbulence and noise generation. A rugged 16 ga. (2.0) frame with reinforced mitered corners and die-formed corner gussets combine performance with durability.

Model 1280

Model 1210

MODEL SERIES 1210
STEEL AIRFOIL BLADE
STANDARD PERFORMANCE

Model Series 1210 Smoke Dampers feature an innovative inter-locking double skin steel airfoil blade design that eliminates the need for combustible blade seals that typically burn off during fire conditions. The unique blade design combines high performance and low pressure drop while providing complete flame and smoke seal. Available at standard dynamic velocity/pressure ratings of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa), UL tested for extended ratings up to 4000 fpm @ 8" w.g. (20 m/s @ 2 kPa), Model Series 1210 has been designed and tested to provide premium performance. Features include an economical steel airfoil blade, low pressure drop frame design and maintenance free concealed blade linkage for superb air performance, turbulence and noise.

MODEL SERIES 1260
VEE GROOVE BLADE

Nailor 1260 Series Smoke Dampers are a ruggedly built economical choice for use where a smoke barrier has been penetrated by ductwork or where a leakage rated smoke damper is required in a static or dynamic smoke control system. The 1260 Series dampers are classified to UL Standard 555S Class I or II at 250°F (121°C) or 350°F (177°C) Elevated Temperatures, and are available with type B and C enclosures for small sizes and round ductwork. Design features include an economical steel vee groove style blade design that provides unmatched strength and durability, low pressure drop frame design and maintenance free concealed blade linkage for superb air performance, minimal turbulence and noise.

Model 1260

MODEL SERIES 1210M
AIRFOIL BLADE • MODULATING ACTUATOR

Model Series 1210M Modulating Smoke Dampers are classified for use as a volume control damper in applications where building codes require a leakage rated smoke damper as part of a static smoke control or dynamic smoke management system. The 1210M Series has been designed and tested to offer premium performance, tested and certified to offer the lowest leakage class available and is qualified for vertical or horizontal installation with airflow in either direction. Airfoil blade design and elimination of blade sills, top and bottom, provide lowest pressure drop. Unique inter-locking double skin blade design eliminates combustible blade seals and provides flame and smoke seal under fire conditions.

Model 1210M

Model 1210VB

MODEL SERIES 1210VB
VERTICAL AIRFOIL BLADE

Model Series 1210VB Vertical Blade Smoke Damper is a high performance smoke damper that provides superior protection and versatility. The vertical blade configuration allows for the actuator to be mounted below the damper and is ideal for applications where bottom access is desired or where there isn't space for a side mounted actuator. Model Series 1210VB dampers are ideal for applications where building codes require a leakage rated smoke damper as part of a static smoke control or dynamic smoke management system. The 1210VB Series has been designed and tested to provide premium performance, offers the lowest leakage class available and is qualified for installation with airflow in either direction. Airfoil blade design, elimination of blade sills and a maintenance free concealed blade linkage provide superb air performance and low pressure drop.

MODEL SERIES 1210SS
AIRFOIL BLADE • STAINLESS STEEL

Model Series 1210SS Stainless Steel Airfoil Blade Smoke Dampers are ideal for high humidity, mildly corrosive or, with optional Type 316 construction, more severe environment applications where building codes require a leakage rated damper for operational smoke control in static or dynamic smoke management systems.

Model Series 1210SS dampers have been designed and tested to provide premium performance and offers the lowest leakage class available, qualified for installation with airflow in either direction and inverted mounting. Features include a stainless steel airfoil blade, low pressure drop frame design and maintenance free concealed blade linkage for superb air performance, minimal turbulence and noise.

Model 1210SS

MODEL 1290S
TRUE ROUND

Model 1290S is a True Round Smoke Damper ideal for round ductwork applications where building codes require a leakage rated smoke damper for operational smoke control in static or dynamic smoke management systems. Features include a sturdy beaded casing for superior rigidity and a heavy duty 14 ga. (2.0) equivalent laminated blade that is double bolted to axles for positive connection. The 1290S smoke damper is designed and tested to provide premium performance and offers the lowest leakage class available, qualified for installation with airflow in either direction and inverted mounting.

Model 1290S

Model 1290S-SS

MODEL 1290S-SS
TRUE ROUND • STAINLESS STEEL

Model 1290S-SS Stainless Steel True Round Smoke Damper is ideal for high humidity or mildly corrosive applications where building codes require a leakage rated smoke damper for operational smoke control in static or dynamic smoke management systems. The 1290S-SS damper is designed and qualified for round ductwork and offers the lowest leakage class available, qualified for installation with airflow in either direction. Model 1290S-SS is available in either Type 304 Stainless Steel as standard or Type 316 Stainless Steel for more severe environment applications.

- PREMIUM PERFORMANCE
- EXTRUDED ALUMINUM AIRFOIL BLADE
- CLASS I OR II LEAKAGE @ 250°F OR 350°F
- UL 555S CLASSIFIED SMOKE DAMPER

Models:

1280 No Sleeve
1281 Type A Sleeve
1282 Type B Sleeve Enclosure
1283 Type C Sleeve Enclosure

Model 1280

Model Series 1280 Smoke Dampers are the premium choice for applications where building codes require a leakage rated smoke damper as part of a static smoke control or dynamic smoke management system. The design features a smoothly contoured, aerodynamic extruded aluminum airfoil blade with compression type seals, engineered to provide the lowest leakage class available and the lowest pressure drop in the industry! Together with a concealed linkage out of the airstream, the design exhibits ultra-low pressure drop characteristics with minimal turbulence and noise generation. A rugged 16 ga. (1.6) frame with reinforced mitered corners and die-formed corner gussets combine performance with durability. The 1280 Series is qualified for vertical or horizontal installation with airflow in either direction.

QUALIFICATIONS:

- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I or II at 250°F or 350°F elevated temperature.**
- **Meets NFPA 90A, 92, 101 and 105 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 03230-0935:0107.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**

STANDARD CONSTRUCTION:

Frame: 5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.
Blades: Airfoil type 6063-T5 extruded aluminum on 5 1/2" (140) centers. Parallel action.
Linkage: Concealed in frame. 12 ga. (2.7) plated steel.
Bearings: 1/2" (13) dia. self-lubricating oilite bronze.
Axles: 1/2" (13) dia. plated steel double bolted to blades.
Jackshaft: 1/2" (13) dia. plated steel.
Jamb Seals: Cambered stainless steel.
Blade Seals: Silicone.

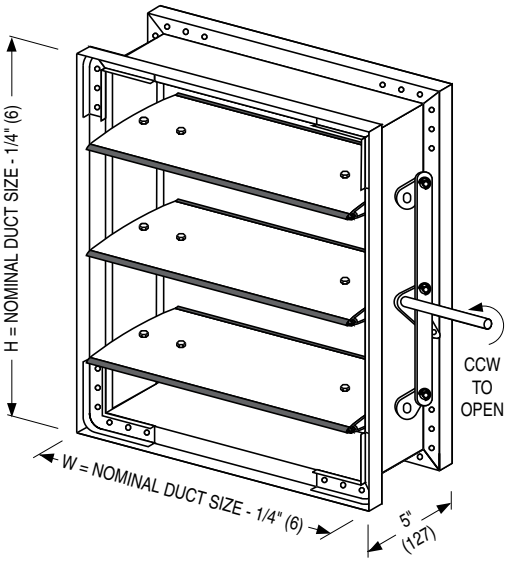
Models 1280 and 1281 Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
24	250/350	8" x 8" (203 x 203)	36" x 48" (914 x 1219)	144" x 96" (3658 x 2438), 288" x 48" (7315 x 1219) or 72" x 144" (1829 x 3658).

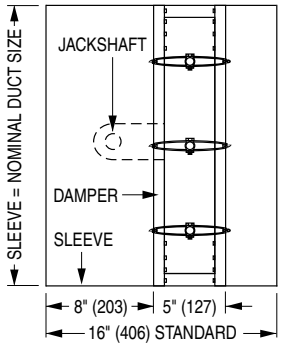
Note: Dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1282). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1283).

COMMON OPTIONS:

- DTS Damper Test Switch for cycle testing.
- DSDL/DSDN Duct Smoke Detectors.
- MLS-300 Position Indicator Switch Pack.
- Factory fitted sleeves in custom lengths, gauges and transition styles.



MODEL 1280
(Side Mounting Plate/Sleeve not shown)



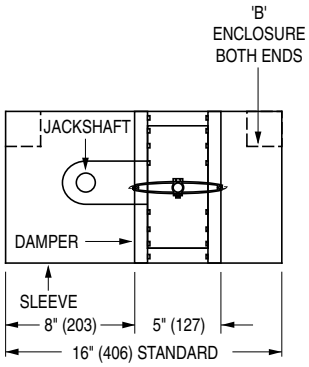
MODEL 1281 WITH TYPE A SLEEVE:

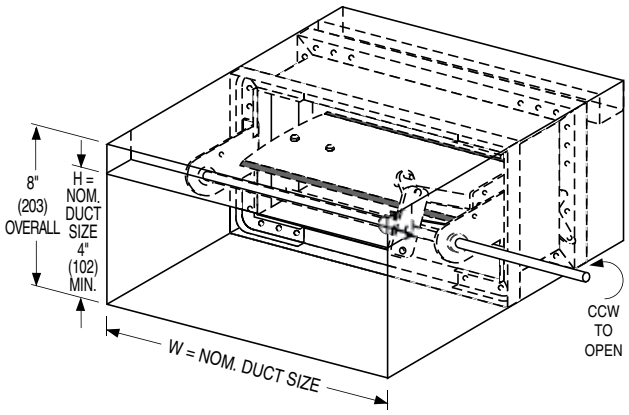
Model 1281 - Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

DIMENSIONAL DATA:

Model Series 1280 dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1282). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1283).

MODEL 1282: TYPE B SLEEVE ENCLOSURE





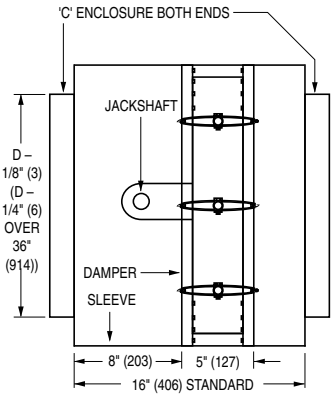
Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

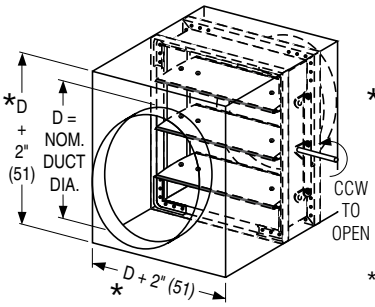
Wall Thickness	Minimum Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Model 1282 Sizes (Duct W x H):

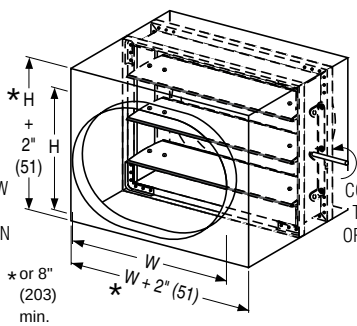
Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
24	250/350	8" x 4" (203 x 102) Overall damper height is 8" (203).	36" x 7 1/2" (914 x 191)	288" x 7 1/2" (7315 x 191)

MODEL 1283: TYPE C SLEEVE ENCLOSURES

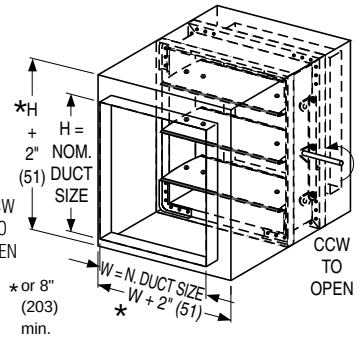




STYLE CR : FOR ROUND DUCT



STYLE CO : FOR OVAL DUCT



STYLE CSR : FOR SQUARE OR RECTANGULAR DUCT

Model 1283 - Round Duct Connection Sizes (Duct Dia.):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
24	250/350	4" (102) dia. Overall damper size is 8" x 8" (203 x 203) min.	34" (864) dia.	94" (2388) dia.

Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Minimum Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Model 1283 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horiz.	Vertical/Horizontal
24	250/350	4" x 4" (102 x 102). Overall damper size is 8" x 8" (203 x 203) min.	34" x 46" (864 x 1168)	142" x 94" (3607 x 2388), 286" x 46" (7264 x 1168) or 70" x 142" (1778 x 3607).

PERFORMANCE DATA:

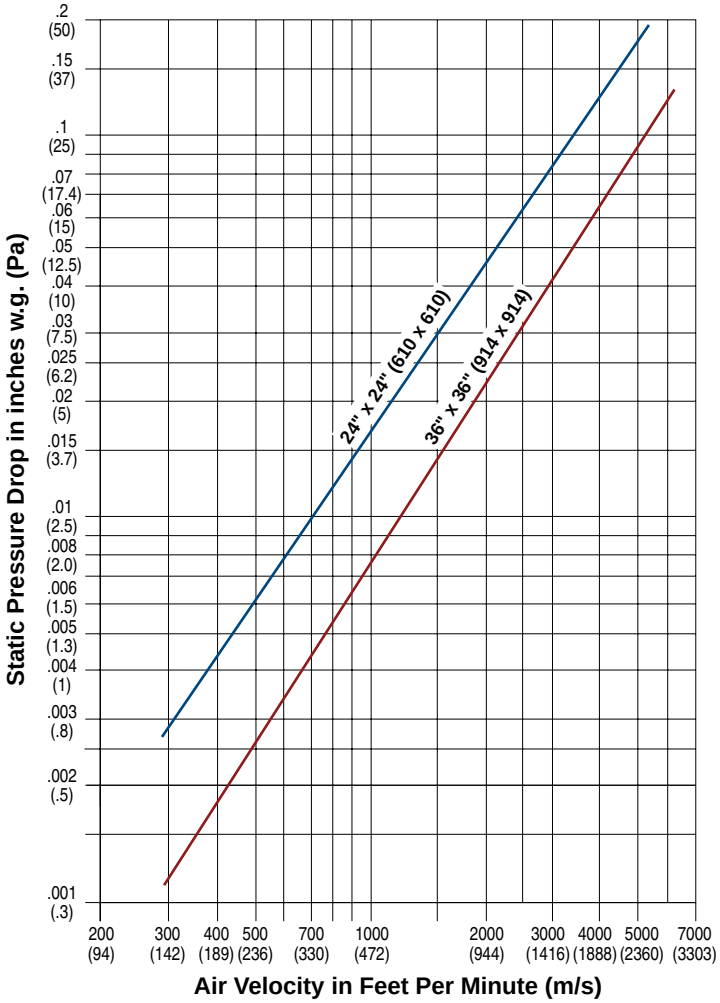
MODEL SERIES: 1280

LEAKAGE CLASS:

The 1280 Series Smoke Damper has been designed and qualified under UL 555S in order to provide maximum system design flexibility. It is available with a Class I (currently the lowest available) or Class II leakage rating with all damper/actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C) or 350°F (177°C), depending on actuator, under airflow of 2000 fpm (10 m/s) at 4" w.g. (1 kPa).

Maximum Performance Ratings	
UL 555S Leakage Rating	Class I
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)
Maximum Temperature	350°F (177°C)

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

HOW TO ORDER

EXTRUDED ALUMINUM AIRFOIL BLADE SMOKE DAMPERS

MODEL SERIES: 1280

EXAMPLE: 1281 - 24X24 - H/V - AUTO - 120 - I - 24 - 250 - BO - SL = 16 - 20G - EXT - RH - CL - HH1 - L8

1a. **Models**
- 1280 Aluminum, Airfoil Blade

1b. **Sleeve/Enclosure Style (4th Digit)**
- 0 = No Sleeve
- 1 = Type A Sleeve
- 2 = Type B Sleeve Enclosure
- 3 = Type C Sleeve Enclosure

2. **Duct Size**
Width x Height inches (mm's)

3. **Mounting**
- H/V Horizontal/Vertical (default)

4. **Actuator Selected By**
- AUTO Least Cost (Auto-Select) (default)
- HON Honeywell
- SIE Siemens

5. **Power Requirement**
- 120 120 VAC (default)
- 230 230 VAC
- 24 24 VAC
- 25 25 psi Pneumatic

6. **Leakage Rating**
- I Class I (default)
- II Class II

7. **Max. Velocity / Pressure Rating**
- 24 2000 fpm @ 4" w.g. (default)

8. **Elevated Temperature**
- 250 250°F (default)
- 350 350°F

9. **Bearings**
- BO Oilite Bronze (default)
- BS Stainless Steel

10. **Duct Smoke Detector**
- — None (default)
- DSDL Low-Flow, factory mounted
- DSDN No-Flow, factory mounted

11a. **Side Mounting Plate**
(No Sleeve models only)
- SMP Side Mounting Plate

11b. **Sleeve Length**
SL = Specify
16" (406) standard (default)
12" – 28" (305 – 711)

12. **Sleeve Gauge**
- 20G 20 Ga. standard (default)
- 18G 18 Ga.
- 16G 16 Ga.
- 14G 14 Ga.
- 10G 10 Ga.

13. **Transition**
(Sleeve Type C models only)
- CR Round
- CO Oval
- CSR Square/Rectangular

14. **Actuator Mounting**
- EXT External (default)
- INT Internal

15. **Actuator Location**
- RH Right hand (default)
- LH Left hand
- MH Multi-hand

16. **Actuator Fail Position**
- CL Close (default)

17. **Actuator Models**
Electric:
- HM1 MS4109F 120VAC
- HM2 MS8109F 24VAC
- HM3 MS4609F 230VAC
- HH1 MS4120F 120VAC
- HH2 MS8120F 24VAC
- HH3 MS4620F 230VAC

Pneumatic:
- 296 331-2961

18. **Damper Location**
- L8 8" (203) from sleeve end (default)
- LX Other (specify)
8" – 16" (203 – 406)

19. **Extruded Aluminum Frame**
- — None (default)
- EAF Extruded Aluminum Frame

OPTIONS & ACCESSORIES:

20. **Position Indicator**
- — None (default)
- 300 MLS-300 (4-wire)

21. **EP Switch**
- — None (default)
- EP1 120 VAC
- EP2 24 VAC

22. **TDF Flange**
- — None (default)
- TDF1 One End
- TDF2 Both Ends

23. **Damper Test Switch**
- — None (default)
- DTS Damper Test Switch

Notes:

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

2. One MLS-300 required per damper assembly.

3. EP (electric-pneumatic) switch optional accessory is applicable only to pneumatic actuators and is shipped loose.

HOW TO SPECIFY

EXTRUDED ALUMINUM AIRFOIL BLADE SMOKE DAMPERS

MODEL SERIES: 1280

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Smoke Dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Smoke dampers shall meet the requirements of NFPA 90A, 92, 101 and 105 and shall be classified as a (**specifier select class**) Class I **or** Class II Leakage Rated Smoke Damper under UL 555S at an elevated temperature of (**specifier select temperature**) 250°F (121°C) **or** 350°F (177°C) and each damper shall bear a UL label verifying same. Dampers shall be suitable for use in dynamic or static smoke control systems. Dampers shall have been operation tested by UL to a minimum velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).

Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be of Type 6063-T5 extruded aluminum airfoil design on maximum 6" (152) centers with integral structural reinforcing tube running full length of each blade. Blade axles shall be 1/2" (13) dia. plated steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream. Jamb seals shall be compression type cambered stainless steel. Blade seals shall be silicone, mechanically locked in extruded blade slots. Adhesive or clip-on type blade seals are not acceptable. Appropriate (**specifier select**) externally **or** internally mounted (**specifier select type**) electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism, external after-market spring mechanisms are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.

Damper manufacturer shall submit pressure drop data to be based on tests in accordance with AMCA Standard 500-D). Standard of acceptance shall be Nailor Industries, Inc. Model Series 1280.

- HIGH PERFORMANCE
- STEEL AIRFOIL BLADE
- CLASS I OR II LEAKAGE @ 250°F OR 350°F
- AMCA LICENSED
- UL 555S CLASSIFIED SMOKE DAMPER

Models:

1210 No Sleeve
1211 Type A Sleeve
1212 Type B Sleeve Enclosure
1213 Type C Sleeve Enclosure

Model 1210

Model Series 1210 Steel Airfoil Blade Smoke Dampers are ideal for applications where building codes require a leakage rated smoke damper as part of a static smoke control or dynamic smoke management system. Unique inter-locking double skin airfoil blade design eliminates the need for combustible blade seals that typically burn off during fire conditions. The design combines high performance and low pressure drop while providing complete flame and smoke seal.

Available at standard dynamic velocity/pressure ratings of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa), UL tested for extended ratings up to 4000 fpm @ 8" w.g. (20 m/s @ 2 kPa) and AMCA licensed for Air Performance, Model Series 1210 has been designed and tested to provide premium performance. Features include an economical steel airfoil blade, heavy duty frame design, elimination of blade sills, top and bottom, and maintenance free concealed blade linkage for minimal turbulence and noise. Qualified for vertical or horizontal installation with airflow in either direction.

QUALIFICATIONS:

- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I or II at 250°F or 350°F elevated temperature.**
- **Meets NFPA 90A, 92, 101 and 105 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 03230-0935:0107.**
- **Maximum velocity: Up to 4000 fpm @ 8" w.g. (20 m/s @ 2 kPa).**

STANDARD CONSTRUCTION:

Frame: 5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.

Blades: 14 ga. (2.0) equivalent galvanized steel formed airfoil on 5 1/2" (140) centers. Opposed action.

Linkage: Concealed in frame. 12 ga. (2.7) plated steel.

Bearings: 1/2" (13) dia. self-lubricating oilite bronze.

Axles: 1/2" (13) dia. plated steel double bolted to blades.

Jackshaft: 1/2" (13) dia. cadmium plated steel.

Jamb Seals: Cambered stainless steel.

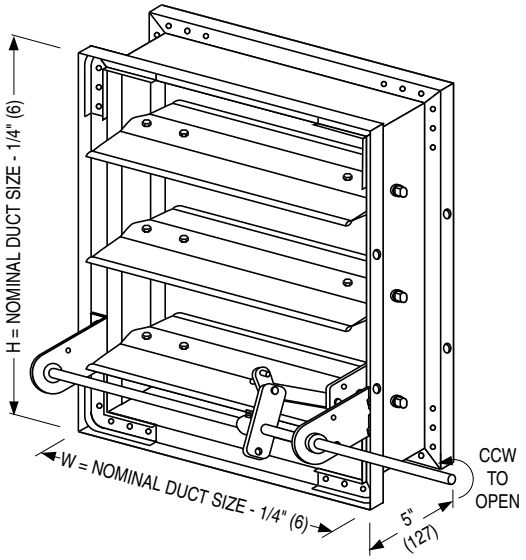
Models 1210 and 1211 Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
24, 34, 36, 46	250/350	8" x 8" (203 x 203). 6" x 6" (152 x 152) with low profile frame (maximum size is 18" x 6" [457 x 152]).	36" x 48" (914 x 1219)	144" x 96" (3658 x 2438) or 288" x 48" (7315 x 1219)
48	250		36" x 48" (914 x 1219)	144" x 96" (3658 x 2438) or 288" x 48" (7315 x 1219)
48	350		36" x 24" (914 x 610)	144" x 48" (3658 x 1219) or 288" x 24" (7315 x 610)

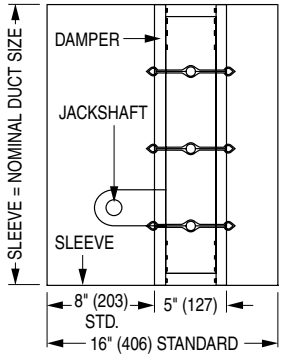
Note: Dampers with duct heights less than 6" (152) (8" [203] if width is over 18" [457]) require a Type 'B' sleeve enclosure (Model 1212). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1213).

COMMON OPTIONS:

- DTS Damper Test Switch for cycle testing.
- DSDL/DSDN Duct Smoke Detectors.
- MLS-300 Position Indicator Switch Pack.
- Factory fitted sleeves in custom lengths, gauges and transition styles.



MODEL 1210
(Side Mounting Plate/Sleeve not shown)



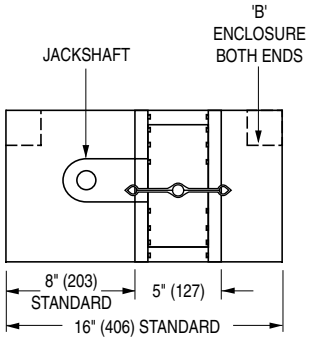
MODEL 1211: TYPE A SLEEVE

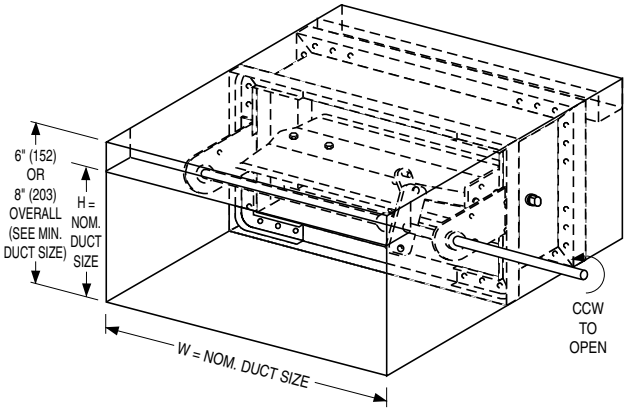
Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

DIMENSIONAL DATA:

Model Series 1210 dampers with duct heights less than 6" (152) (8" [203] if width is over 18" [457]) require a Type 'B' sleeve enclosure (Model 1212). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1213).

MODEL 1212 TYPE B SLEEVE ENCLOSURE:





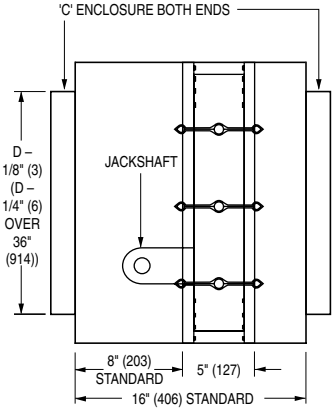
Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

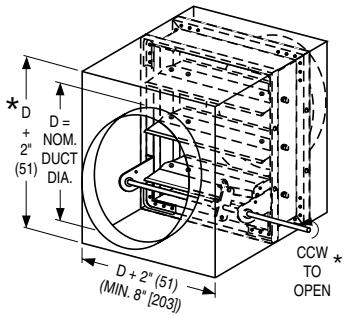
Wall Thickness	Minimum Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Models 1212 Sizes (Duct W x H):

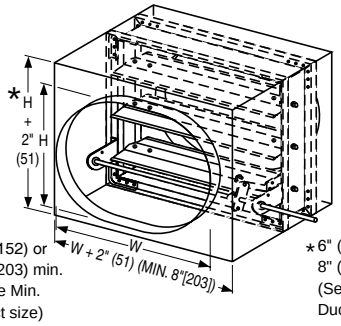
Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horiz.
24, 34, 36, 46, 48	250/350	Minimum size is 8" x 4" (203 x 102). Overall damper height is 8" (203), 6" (152) on duct sizes 18" x 5 1/2" (457 x 140) and under.	36" x 7 1/2" (914 x 191)	144" x 7 1/2" (3658 x 191)

MODEL 1213 TYPE C SLEEVE ENCLOSURES:

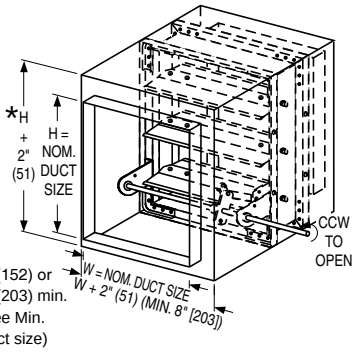




STYLE CR : FOR ROUND DUCT



STYLE CO : FOR OVAL DUCT



STYLE CSR : FOR SQUARE OR RECTANGULAR DUCT

Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Minimum Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Model 1213 - Round Duct Connection Sizes (Duct Dia.):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
24, 34, 36, 46	250/350	4" (102) dia. Overall damper size is 8" x 6" (203 x 152); 8" x 8" (203 x 203) min. for duct sizes over 4" (102) dia.	34" (864) dia.	94" (2388) dia.
48	250		34" (864) dia.	94" (2388) dia.
48	350		22" (559) dia.	44" (1118) dia.

Model 1213 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
24, 34, 36, 46	250/350	4" x 4" (102 x 102) (overall damper width is 8" [203] min.; min. overall height is 6" [152]; 8" [203] for duct sizes over 16" x 4" [406 x 102]).	34" x 46" (864 x 1168)	142" x 94" (3607 x 2388) or 286" x 46" (7264 x 1168)
48	250		34" x 46" (864 x 1168)	142" x 94" (3607 x 2388) or 286" x 46" (7264 x 1168)
48	350		34" x 22" (864 x 559)	142" x 46" (3607 x 1168) or 286" x 22" (7264 x 559)

PERFORMANCE DATA:

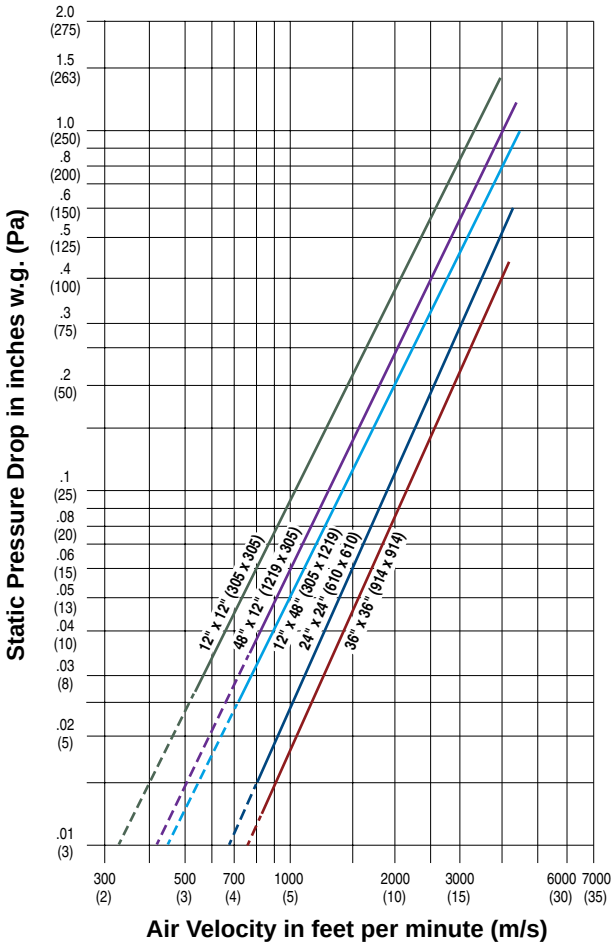
MODEL SERIES: 1210

LEAKAGE CLASS:

The 1210 Series Smoke Damper has been designed and qualified under UL 555S in order to provide maximum system design flexibility. It is available with a Class I or Class II leakage rating with all damper/ actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C) or 350°F (177°C) under airflow of 4000 fpm (20 m/s) at 8" w.g. (2 kPa).

Maximum Performance Ratings	
UL 555S Leakage Rating	Class I
Maximum Velocity	4000 fpm (20 m/s)
Maximum Pressure	8 in. w.g. (2 kPa)
Maximum Temperature	350°F (177°C)

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

Nailor Industries Inc. certifies that the Model 1210 Damper shown herein is licensed to bear the AMCA seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air performance ratings only.

HOW TO ORDER

STEEL AIRFOIL BLADE SMOKE DAMPERS

MODEL SERIES: 1210

EXAMPLE: 1211 - 24X24 - H/V - AUTO - 120 - I - 24 - 250 - BO - SL = 16 - 20G - EXT - RH - CL - FL12 - L8

1a. **Models**
- 1210 Steel, Airfoil Blade

1b. **Sleeve/Enclosure Style**
(4th Digit)
- 0 = No Sleeve
- 1 = Type A Sleeve
- 2 = Type B Sleeve Enclosure
- 3 = Type C Sleeve Enclosure

2. **Duct Size**
Width x Height
inches (mm's)

3. **Mounting**
- H/V Horizontal/Vertical (default)

4. **Actuator Selected By**
- AUTO Least Cost (Auto-Select) (default)
- BEL Belimo
- HON Honeywell
- SIE Siemens

5. **Power Requirement**
- 120 120 VAC (default)
- 230 230 VAC
- 24 24 VAC
- 25 25 psi Pneumatic

6. **Leakage Rating**
- I Class I (default)
- II Class II

7. **Max. Velocity / Pressure Rating**
- 24 2000 fpm @ 4" w.g. (default)
- 34 3000 fpm @ 4" w.g.
- 36 3000 fpm @ 6" w.g.
- 46 4000 fpm @ 6" w.g.
- 48 4000 fpm @ 8" w.g.

8. **Elevated Temperature**
- 250 250°F (default)
- 350 350°F

9. **Bearings**
- BO Oilite Bronze (default)
- BS Stainless Steel

10. **Duct Smoke Detector**
- — None (default)
- DSDL Low-Flow, factory mounted
- DSDN No-Flow, factory mounted

11a. **Side Mounting Plate**
(No Sleeve models only)
- SMP Side Mounting Plate

11b. **Sleeve Length**
SL = Specify
16" (406) standard (default)
12" – 28" (305 – 711)

12. **Sleeve Gauge**
- 20G 20 Ga. standard (default)
- 18G 18 Ga.
- 16G 16 Ga.
- 14G 14 Ga.
- 10G 10 Ga.

13. **Transition**
(Sleeve Type C models only)
- CR Round
- CO Oval
- CSR Square/Rectangular

14. **Actuator Mounting**
- EXT External (default)
- INT Internal

15. **Actuator Location**
- RH Right hand (default)
- LH Left hand
- MH Multi-hand

16. **Actuator Fail Position**
- CL Close (default)
- OP Open

17. **Actuator Models**
Electric:

HL1	MS4104F	120VAC
HL2	MS8104F	24VAC
HL3	MS4604F	230VAC
HM1	MS4109F	120VAC
HM2	MS8109F	24VAC
HM3	MS4609F	230VAC
HH1	MS4120F	120VAC
HH2	MS8120F	24VAC
HH3	MS4620F	230VAC
GD2	GGD221	120VAC
GD1	GGD121	24VAC
GD3	GGD321	230VAC
FT12	FSTF120	120VAC
FT23	FSTF230	230VAC
FT24	FSTF24	24VAC
FL12	FSLF120	120VAC
FL23	FSLF230	230VAC
FL24	FSLF24	24VAC
F12	FSNF120	120VAC
F23	FSNF230	230VAC
F24	FSNF24	24VAC
FA12	FSAF120A	120VAC
FA23	FSAF230A	230VAC
FA24	FSAF24A	24VAC

Pneumatic:
- 296 331-2961
- 306 331-3060

18. **Damper Location**
- L8 8" (203) From sleeve end (default)
- LX Other (specify)
8" – 16" (203 – 406)

OPTIONS & ACCESSORIES:

19. **Position Indicator**
- — None (default)
- 300 MLS-300 (4-wire)

20. **EP Switch**
- — None (default)
- EP1 120 VAC
- EP2 24 VAC

21. **Retaining Angles**
- — None (default)
- QS1 One side
- QS2 Both sides (pair)

22. **TDF Flange**
- — None (default)
- TDF1 One end
- TDF2 Both ends

23. **Damper Test Switch**
- — None (default)
- DTS Damper Test Switch

Notes:

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

2. One MLS-300 required per damper assembly.

3. EP (electric-pneumatic) switch optional accessory is applicable only to pneumatic actuators and is shipped loose.

HOW TO SPECIFY

STEEL AIRFOIL BLADE SMOKE DAMPERS

MODEL SERIES: 1210

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Smoke Dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Smoke dampers shall meet the requirements of NFPA 90A, 92, 101 and 105 and shall be classified as a (**specifier select class**) Class I **or** Class II Leakage Rated Smoke Damper under UL 555S at an elevated temperature of (**specifier select temperature**) 250°F (121°C) **or** 350°F (177°C) and each damper shall bear a UL label verifying same. Dampers shall be suitable for use in dynamic **or** static smoke control systems. Dampers shall have been operation tested by UL to a velocity/pressure rating of (**specifier to selec**t) 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa) **or** 3000 fpm @ 4" w.g. (15 m/s @ 1 kPa) **or** 3000 fpm @ 6" w.g. (15 m/s @ 1.5 kPa) **or** 4000 fpm @ 6" w.g. (20 m/s @ 1.5 kPa) **or** 4000 fpm @ 8" w.g. (20 m/s @ 2 kPa).

Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent galvanized steel formed double skin airfoil design on 5 1/2" (140) centers. Dampers shall be opposed blade configuration with an interlocking blade design that provides complete smoke seal under elevated temperature conditions when in closed position. Dampers requiring blade seals to maintain leakage class when under elevated temperature conditions are not acceptable. Blade axles shall be 1/2" (13) dia. plated steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream. Jamb seals shall be compression type stainless steel. Appropriate (**specifier select**) externally **or** internally mounted (**specifier select type**) electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism, external after-market spring mechanisms are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.

Submitted pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Dampers must comply with the requirements of AMCA 511 Certified Ratings Program and be qualified to bear the AMCA Seal for Air Performance. Standard of acceptance shall be Nailor Industries, Inc. Model Series 1210.

- ECONOMICAL CONSTRUCTION
- STANDARD PERFORMANCE
- CLASS I OR II LEAKAGE @ 250°F OR 350°F
- UL 555S CLASSIFIED SMOKE DAMPER

Models:

1260 No Sleeve
1261 Type A Sleeve
1262 Type B Sleeve Enclosure
1263 Type C Sleeve Enclosure

Model 1260

Model Series 1260 Vee Groove Blade Smoke Dampers are a ruggedly built, yet economical choice for use where a smoke barrier has been penetrated by ductwork or where a leakage rated smoke damper is required in a static or dynamic smoke control system. The 1260 Series dampers are classified to UL Standard 555S Class I or II at 250°F (121°C) or 350°F (176°C) Elevated Temperatures, and are available with Type B and Type C enclosures for small sizes and round ductwork.

Design features include a steel vee groove style blade design that provides strength and durability, low pressure drop frame design and maintenance free concealed blade linkage out of the airstream and a rugged hat channel frame. Qualified for vertical or horizontal installation. A wide variety of pneumatic and electric actuators are available.

QUALIFICATIONS:

- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I or II at 250°F or 350°F elevated temperature.**
- **Meets NFPA 90A, 92, 101 and 105 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. 3225-0935:0107.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**

STANDARD CONSTRUCTION:

Frame:	5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.
Blades:	6" (152) wide on 5 1/2" (140) centers. 16 ga. (1.6) galvanized steel vee groove or double-skin design.
Linkage:	Concealed in frame. 12 ga. (2.7) plated steel.
Bearings:	1/2" (13) dia. self-lubricating oilite bronze.
Axles:	1/2" (13) dia. plated steel double bolted to blades.
Jackshaft:	1/2" (13) dia. plated steel.
Jamb Seals:	Stainless steel.
Blade Seals:	Silicone on vee groove blade.

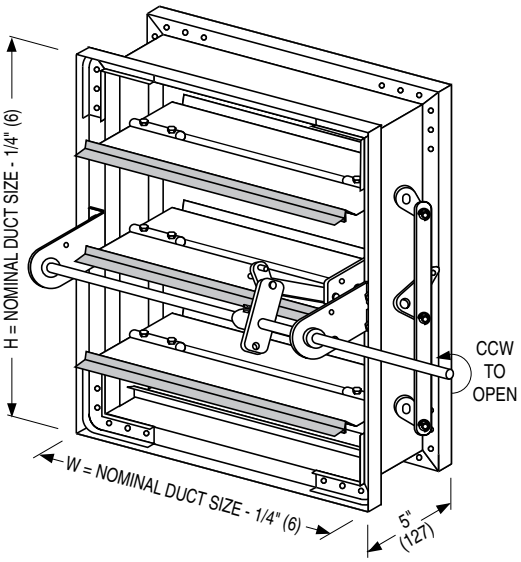
Models 1260 and 1261 Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
24	250/350	8" x 8" (203 x 203)	36" x 48" (914 x 1219)	144" x 48" (3658 x 1219) or 36" x 96" (914 x 2438)

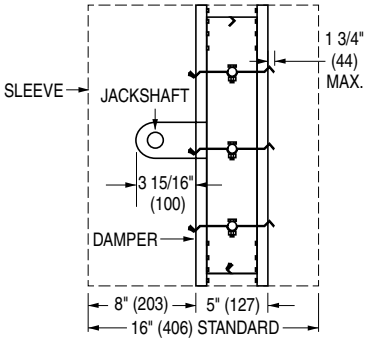
Note: Dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1262). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1263).

COMMON OPTIONS:

- DTS Damper Test Switch for cycle testing.
- DSDL/DSDN Duct Smoke Detectors.
- MLS-300 Position Indicator Switch Pack.
- Factory fitted sleeves in custom lengths, gauges and transition styles.



MODEL 1260
(Side Mounting Plate/Sleeve not shown)



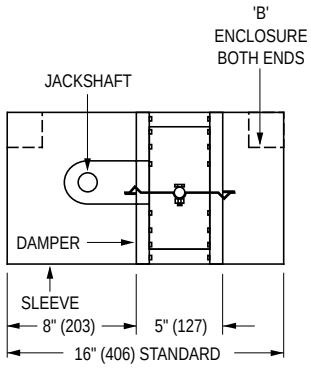
MODEL 1261: TYPE A SLEEVE

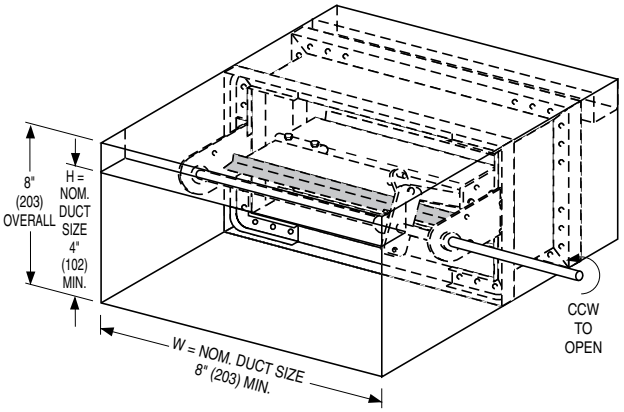
Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

DIMENSIONAL DATA:

Model Series 1260 smoke dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1262). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1263).

MODEL 1262 TYPE B SLEEVE ENCLOSURE:





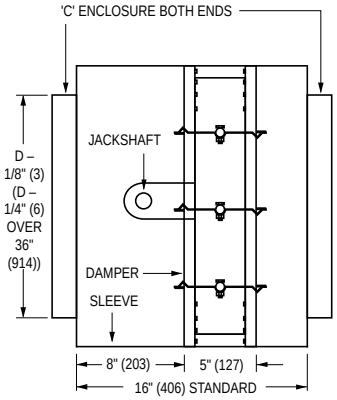
Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

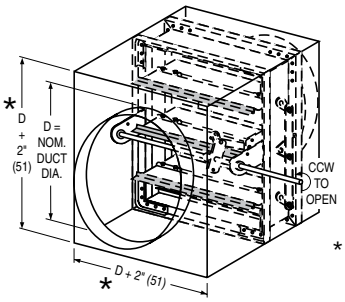
Wall Thickness	Minimum Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Model 1262 Sizes (Duct W x H):

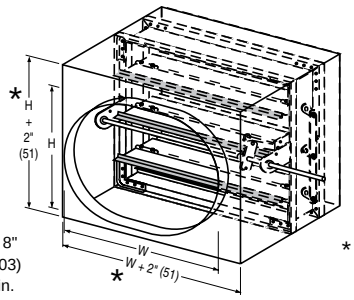
Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
24	250/350	8" x 4" (203 x 102) Overall damper height is 8" (203).	36" x 7 1/2" (914 x 191)	144" x 7 1/2" (3658 x 191)

MODEL 1263 TYPE C SLEEVE ENCLOSURES:

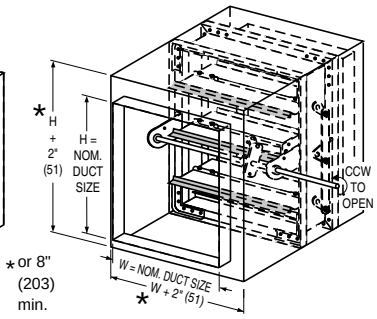




STYLE CR : FOR ROUND DUCT



STYLE CO : FOR OVAL DUCT



STYLE CSR : FOR SQUARE OR RECTANGULAR DUCT

Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Minimum Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Model 1263 - Round Duct Connection Sizes (Duct Dia.):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
24	250/350	4" (102) dia. Overall damper size is 8" x 8" (203 x 203) min.	34" (864) dia.	46" (1168) dia.

Model 1263 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
24	250/350	4" x 4" (102 x 102) Overall damper size is 8" x 8" (203 x 203).	34" x 46" (864 x 1168)	142" x 46" (3607 x 1168) or 34" x 94" (864 x 2388)

PERFORMANCE DATA:

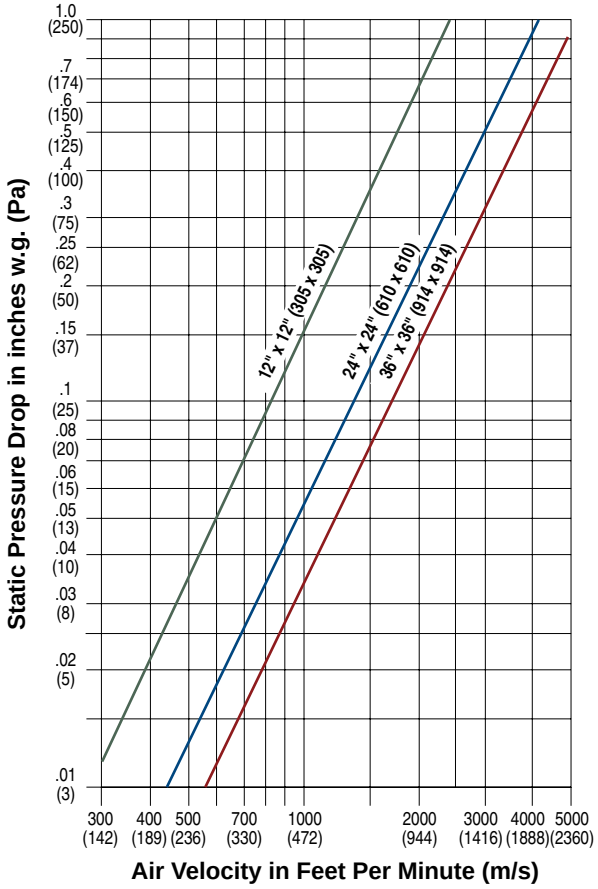
MODEL SERIES: 1260

LEAKAGE CLASS:

The 1260 Series Smoke Damper has been designed and qualified under UL 555S in order to provide maximum system design flexibility. It is available with a Class I or Class II leakage rating with all damper/actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C) or 350°F (177°C) under airflow of 2000 fpm (10 m/s) at 4" w.g. (1 kPa).

Maximum Performance Ratings	
UL 555S Leakage Rating	Class I
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)
Maximum Temperature	350°F (177°C)

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

F

SMOKE DAMPERS

HOW TO ORDER OR TO SPECIFY

VEE GROOVE BLADE SMOKE DAMPERS

MODEL SERIES: 1260

EXAMPLE: 1261 - 24X24 - H/V - AUTO - 120 - I - 24 - 250 - BO - SL = 16 - 20G - EXT - RH - CL - FL12 - L8

1a. **Models**
- 1260 Steel, Vee Groove Blade

1b. **Sleeve/Enclosure Style (4th Digit)**
- 0 = No Sleeve
- 1 = Type A Sleeve
- 2 = Type B Sleeve Enclosure
- 3 = Type C Sleeve Enclosure

2. **Duct Size**
Width x Height
inches (mm's)

3. **Mounting**
- H/V Horizontal/Vertical (default)

4. **Actuator Selected By**
- AUTO Least Cost (Auto-Select) (default)
- BEL Belimo
- HON Honeywell
- SIE Siemens

5. **Power Requirement**
- 120 120 VAC (default)
- 230 230 VAC
- 24 24 VAC
- 25 25 psi Pneumatic

6. **Leakage Rating**
- I Class I (default)
- II Class II

7. **Max. Velocity / Pressure Rating**
- 24 2000 fpm @ 4" w.g. (default)

8. **Elevated Temperature**
- 250 250°F (default)
- 350 350°F

9. **Bearings**
- BO Oilite Bronze (default)
- BS Stainless Steel

10. **Duct Smoke Detector**
- — None (default)
- DSDL Low-Flow, factory mounted
- DSDN No-Flow, factory mounted

11a. **Side Mounting Plate**
(No Sleeve models only)
- SMP Side Mounting Plate

11b. **Sleeve Length**
SL = Specify
16" (406) standard (default)
12" – 28" (305 – 711)

12. **Sleeve Gauge**
- 20G 20 Ga. standard (default)
- 18G 18 Ga.
- 16G 16 Ga.
- 14G 14 Ga.
- 10G 10 Ga.

13. **Transition**
(Sleeve Type C models only)
- CR Round
- CO Oval
- CSR Square/Rectangular

14. **Actuator Mounting**
- EXT External (default)
- INT Internal

15. **Actuator Location**
- RH Right hand (default)
- LH Left hand
- MH Multi-hand

16. **Actuator Fail Position**
- CL Close (default)
- OP Open

17. **Actuator Models**
Electric:

HL1	MS4104F	120VAC
HL2	MS8104F	24VAC
HL3	MS4604F	230VAC
HM1	MS4109F	120VAC
HM2	MS8109F	24VAC
HM3	MS4609F	230VAC
HH1	MS4120F	120VAC
HH2	MS8120F	24VAC
HH3	MS4620F	230VAC
GD1	GGD121	24VAC
GD2	GGD221	120VAC
GD3	GGD321	230VAC
FT12	FSTF120	120VAC
FT23	FSTF230	230VAC
FT24	FSTF24	24VAC
FL12	FSLF120	120VAC
FL23	FSLF230	230VAC
FL24	FSLF24	24VAC
F12	FSNF120	120VAC
F23	FSNF230	230VAC
F24	FSNF24	24VAC.
FA12	FSAF120A	120VAC
FA23	FSAF230A	230VAC
FA24	FSAF24A	24VAC

Pneumatic:
- 296 331-2961
- 306 331-3060

18. **Damper Location**
- L8 8" (203) From sleeve end (default)
- LX Other (specify)
8" – 16" (203 – 406)

OPTIONS & ACCESSORIES:

19. **Position Indicator**
- — None (default)
- 300 MLS-300 (4-wire)

20. **EP Switch**
- — None (default)
- EP1 120 VAC
- EP2 24 VAC

21. **TDF Flange**
- — None (default)
- TDF1 One end
- TDF2 Both ends

22. **Damper Test Switch**
- — None (default)
- DTS Damper Test Switch

Notes:

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

2. One MLS-300 required per damper assembly.

3. EP (electric-pneumatic) switch optional accessory is applicable only to pneumatic actuators and is shipped loose.

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Smoke Dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Smoke dampers shall meet the requirements of NFPA 90A, 92, 101 and 105 and shall be classified as a (**specifier select class**) Class I **or** Class II Leakage Rated Smoke Damper under UL 555S at an elevated temperature of (**specifier select temperature**) 250°F (121°C) or 350°F (177°C) and each damper shall bear a UL label verifying same. Dampers shall be suitable for use in dynamic **or** static smoke control systems. Dampers shall have been operation tested by UL to a minimum velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).
Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be of vee-groove design, 16 ga. (1.6) galvanized steel on 5 1/2" (140) centers and shall be parallel configuration. Blade axles shall be 1/2" (13) dia. plated steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream. Jamb seals shall be compression type cambered stainless steel. Blade seals shall be silicone type. Appropriate (**specifier select**) externally **or** internally mounted (**specifier select type**) electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism, external after-market spring mechanisms are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.
Submitted pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries, Inc. Model Series 1260.

- MODULATING ACTUATOR
- HIGH PERFORMANCE
- CLASS I LEAKAGE @ 250°F
- UL 555S CLASSIFIED SMOKE DAMPER

Models:

1210M No Sleeve
1211M Type A Sleeve
1212M Type B Sleeve Enclosure
1213M Type C Sleeve Enclosure

Model 1210M

Model Series 1210M Modulating Airfoil Blade Smoke Dampers are ideal for applications where building codes require a leakage rated smoke damper as part of a static smoke control or dynamic smoke management system and are equipped with either a modulating pneumatic or electric actuator so it may also be used as a volume control damper during normal HVAC operation. Unique inter-locking double skin airfoil blade design eliminates the need for combustible blade seals that typically burn off during fire conditions. The design combines high performance and low pressure drop while providing complete flame and smoke seal.

Available with a minimum dynamic velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa), Model Series 1210M dampers have been designed and tested to provide premium performance. Features include an economical steel airfoil blade, heavy duty frame design, elimination of blade sills, top and bottom, and maintenance free concealed blade linkage for minimal turbulence and noise. Qualified for vertical or horizontal installation with airflow in either direction.

QUALIFICATIONS:

- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I at 250°F elevated temperature.**
- **Meets NFPA 90A, 92, 101 and 105 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 03230-0935:0107.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**

STANDARD CONSTRUCTION:

Frame: 5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.
Blades: 14 ga. (2.0) equivalent galvanized steel formed airfoil on 5 1/2" (140) centers. Opposed action.
Linkage: Concealed in frame. 12 ga. (2.7) plated steel.
Bearings: 1/2" (13) dia. self-lubricating oilite bronze.
Axles: 1/2" (13) dia. plated steel double bolted to blades.
Jackshaft: 1/2" (13) dia. cadmium plated steel.
Jamb Seals: Cambered stainless steel.

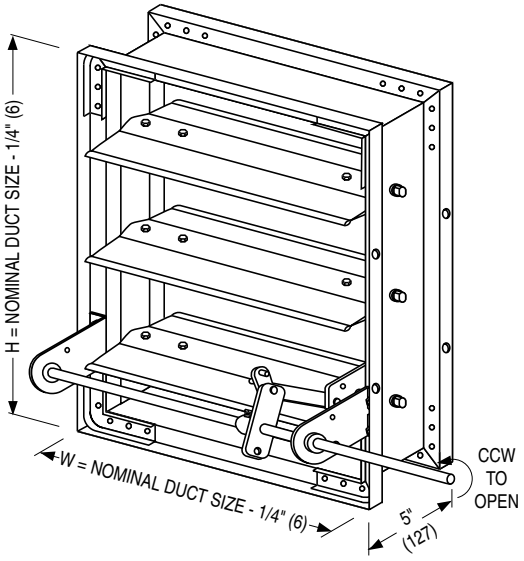
Models 1210M and 1211M Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
24	250	8" x 8" (203 x 203). 6" x 6" (152 x 152) with low profile frame (maximum size is 18" x 6" [457 x 152]).	36" x 48" (914 x 1219)	144" x 96" (3658 x 2438) or 288" x 48" (7315 x 1219)

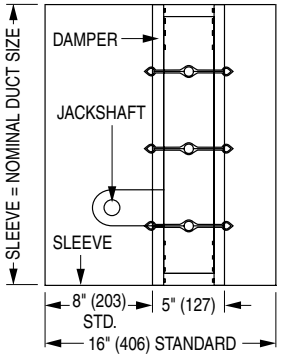
Note: Dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1212M). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1213M).

COMMON OPTIONS:

- DTS Damper Test Switch for cycle testing.
- DSDL/DSDN Duct Smoke Detectors.
- MLS-300 Position Indicator Switch Pack.
- Factory fitted sleeves in custom lengths, gauges and transition styles.



MODEL 1210M
(Side Mounting Plate/Sleeve not shown)



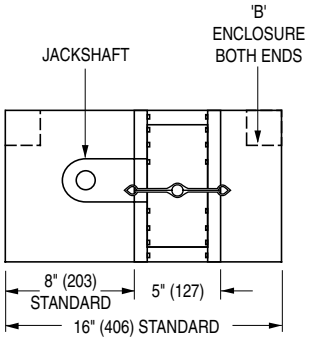
MODEL 1211M: TYPE A SLEEVE

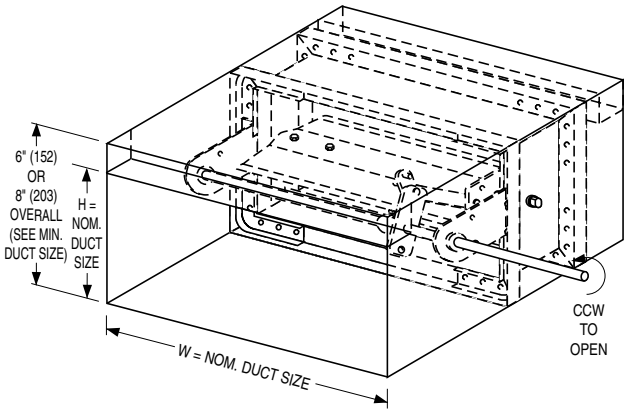
Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

DIMENSIONAL DATA:

Model Series 1210M dampers with duct heights less than 6" (152) (8" [203] if width is over 18" [457]) require a Type 'B' sleeve enclosure (Model 1212M). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1213M).

MODEL 1212M TYPE B SLEEVE ENCLOSURE:





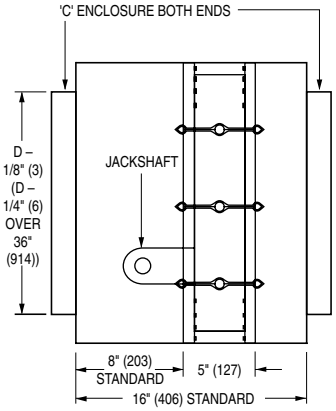
Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

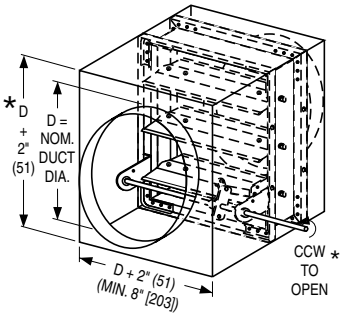
Wall Thickness	Minimum Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Model 1212M Sizes (Duct W x H):

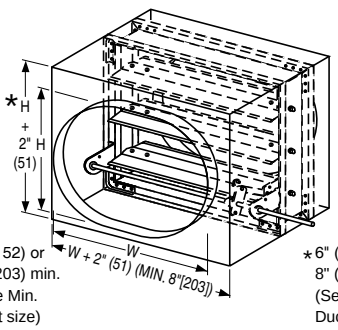
Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
24	250	8" x 4" (203 x 102). (Overall damper height is 8" [203]; [6" (152) on duct sizes 18" x 5 1/2 (457 x 140) and under]).	36" x 7 1/2" (914 x 191)	144" x 7 1/2" (3658 x 191)

MODEL 1213M TYPE C SLEEVE ENCLOSURES:

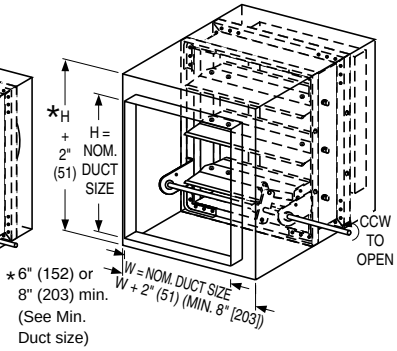




STYLE CR : FOR ROUND DUCT



STYLE CO : FOR OVAL DUCT



STYLE CSR : FOR SQUARE OR RECTANGULAR DUCT

Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Minimum Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Model 1213M - Round Duct Connection Sizes (Duct Dia.):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
24	250	4" (102) diameter. (Overall damper size is 8" x 6" [203 x 152]; 8" x 8" [203 x 203] min. for duct sizes over 4" [102] dia.).	34" (864) dia.	94" (2388) dia.

Model 1213M - Sq., Rect. or Oval Duct Connection Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
24	250	4" x 4" (203 x 102) diameter. Overall damper width is 8" (203) min.; min. overall height is 6" (152), 8" for duct sizes over 16 x 4 (406 x 102).	34" x 46" (864 x 1168)	142" x 94" (3607 x 2388) or 286" x 46" (7264 x 1168)

PERFORMANCE DATA:

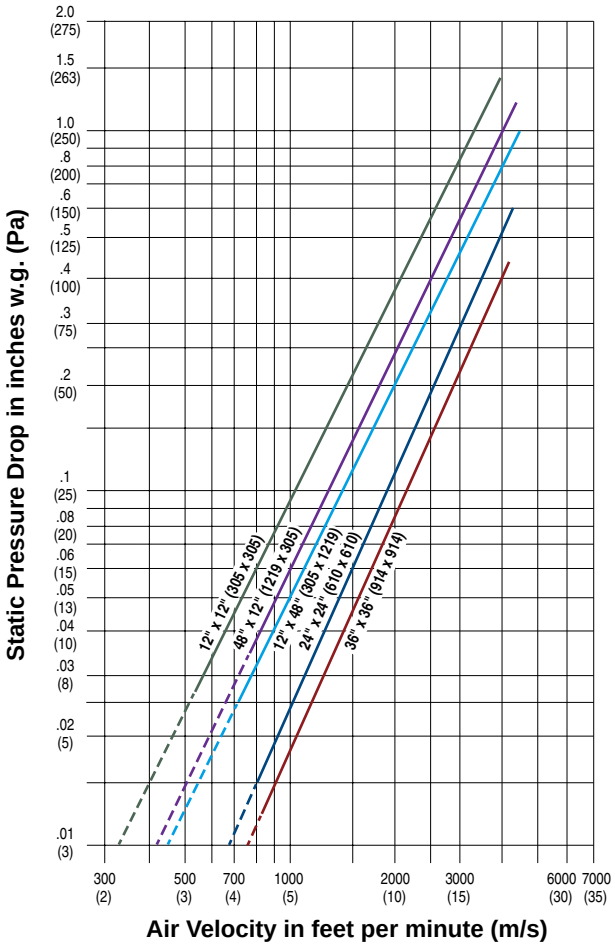
MODEL SERIES: 1210M

LEAKAGE CLASS:

The 1210M Series Modulating Smoke Damper has been designed and qualified under UL 555S in order to provide maximum system design flexibility. It is available with a Class I leakage rating with all damper/ actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C) under airflow of 2000 fpm (10 m/s) at 4" w.g. (1 kPa).

Maximum Performance Ratings	
UL 555S Leakage Rating	Class I
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)
Maximum Temperature	250°F (121°C)

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

F

SMOKE DAMPERS

HOW TO ORDER

MODULATING AIRFOIL BLADE SMOKE DAMPERS

MODEL SERIES: 1210M

EXAMPLE: 1211M - 24X24 - H/V - AUTO - 24 - I - 24 - 250 - BO - SL = 16 - 20G - EXT - RH - CL - FAM - L8

1a. **Models**
- 1210M Modulating, Steel, Airfoil Blade

1b. **Sleeve/Enclosure Style (4th Digit)**
- 0 = No Sleeve
- 1 = Type A Sleeve
- 2 = Type B Sleeve Enclosure
- 3 = Type C Sleeve Enclosure

2. **Duct Size**
Width x Height inches (mm's)

3. **Mounting**
- H/V Horizontal/Vertical (default)

4. **Actuator Selected By**
- AUTO Least Cost (Auto-Select) (default)
- BEL Belimo
- HON Honeywell
- SIE Siemens

5. **Power Requirement**
- 24 24 VAC
- 25 25 psi Pneumatic

6. **Leakage Rating**
- I Class I (default)

7. **Max. Velocity / Pressure Rating**
- 24 2000 fpm @ 4" w.g. (default)

8. **Elevated Temperature**
- 250 250°F (default)

9. **Bearings**
- BO Oilite Bronze (default)
- BS Stainless Steel

10. **Duct Smoke Detector**
- — None (default)
- DSDL Low-Flow, factory mounted
- DSDN No-Flow, factory mounted

11a. **Side Mounting Plate**
(No Sleeve models only)
- SMP Side Mounting Plate

11b. **Sleeve Length**
SL = Specify
16" (406) standard (default)
12" – 28" (305 – 711)

12. **Sleeve Gauge**
- 20G 20 Ga. standard (default)
- 18G 18 Ga.
- 16G 16 Ga.
- 14G 14 Ga.
- 10G 10 Ga.

13. **Transition**
(Sleeve Type C models only)
- CR Round
- CO Oval
- CSR Square/Rectangular

14. **Actuator Mounting**
- EXT External (default)
- INT Internal

15. **Actuator Location**
- RH Right hand (default)
- LH Left hand
- MH Multi-hand

16. **Actuator Fail Position**
- CL Close (default)
- OP Open

17. **Actuator Models**
Electric:
- FAM FSAFB24-SR 24VAC/DC

Pneumatic:
- 296P 331-2961PR

18. **Damper Location**
- L8 8" (203) From sleeve end (default)
- LX Other (specify)

8" – 16" (203 – 406)

OPTIONS & ACCESSORIES:

19. **Position Indicator**
- — None (default)
- 300 MLS-300 (4-wire)

20. **EP Switch**
- — None (default)
- EP1 120 VAC
- EP2 24 VAC

21. **TDF Flange**
- — None (default)
- TDF1 One end
- TDF2 Both ends

22. **Damper Test Switch**
- — None (default)
- DTS Damper Test Switch

Notes:

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

2. One MLS-300 required per damper assembly.

3. EP (electric-pneumatic) switch optional accessory is applicable only to pneumatic actuators and is shipped loose.

HOW TO SPECIFY

MODULATING AIRFOIL BLADE SMOKE DAMPERS
MODEL SERIES: 1210M

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Smoke Dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Smoke dampers shall meet the requirements of NFPA 90A, 92, 101 and 105 and shall be classified as a Class I Leakage Rated Smoke Damper under UL 555S at an elevated temperature of (**specifier select temperature**) 250°F (121°C) **or** 350°F (177°C) and each damper shall bear a UL label verifying same. Dampers shall be suitable for use in dynamic or static smoke control systems. Dampers shall have been operation tested by UL to a minimum velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).
Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent galvanized steel formed double skin airfoil design on 5 1/2" (140) centers. Dampers shall be opposed blade configuration with an interlocking blade design that provides complete smoke seal under elevated temperature conditions when in closed position. Dampers requiring blade seals to maintain leakage class when under elevated temperature conditions are not acceptable. Blade axles shall be 1/2" (13) dia. plated steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream. Jamb seals shall be compression type stainless steel. Appropriate (**specifier select**) externally **or** internally mounted (**specifier select type**) electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism, external after-market spring mechanisms are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.
Submitted pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries, Inc. Model Series 1210M.

- BOTTOM ACTUATOR ACCESS
- HIGH PERFORMANCE
- CLASS I OR II LEAKAGE @ 250°F
- UL 555S CLASSIFIED SMOKE DAMPER

Models:

1210VB No Sleeve
1211VB Type A Sleeve
1212VB Type B Sleeve Enclosure
1213VB Type C Sleeve Enclosure

Model 1210VB

Model Series 1210VB Vertical Steel Airfoil Blade Smoke Dampers are a high performance smoke damper that provides superior protection and versatility. The vertical blade configuration allows for the actuator to be mounted below the damper and is ideal for applications where bottom access is desired or where there isn't space for a side mounted actuator. The 1210VB Series dampers are ideal for applications where building codes require a leakage rated smoke damper as part of a static smoke control or dynamic smoke management system.

The 1210VB Series has been designed and tested to provide premium performance and offers the lowest leakage class available and is qualified for installation with airflow in either direction. Airfoil blade design, elimination of blade sills and a maintenance free concealed blade linkage provide superb air performance and low pressure drop.

QUALIFICATIONS:

- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I or II at 250°F elevated temperature.**
- **Meets NFPA 90A, 92, 101 and 105 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 03230-0935:0107.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**

STANDARD CONSTRUCTION:

Frame:	5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.
Blades:	14 ga. (2.0) equivalent galvanized steel formed airfoil on 5 1/2" (140) centers. Opposed action.
Linkage:	Concealed in frame. 12 ga. (2.7) plated steel.
Bearings:	1/2" (13) dia. self-lubricating oilite bronze.
Axles:	1/2" (13) dia. plated steel double bolted to blades.
Jackshaft:	1/2" (13) dia. cadmium plated steel.
Jamb Seals:	Stainless steel.

Models 1210VB and 1211VB Sizes (Duct W x H):

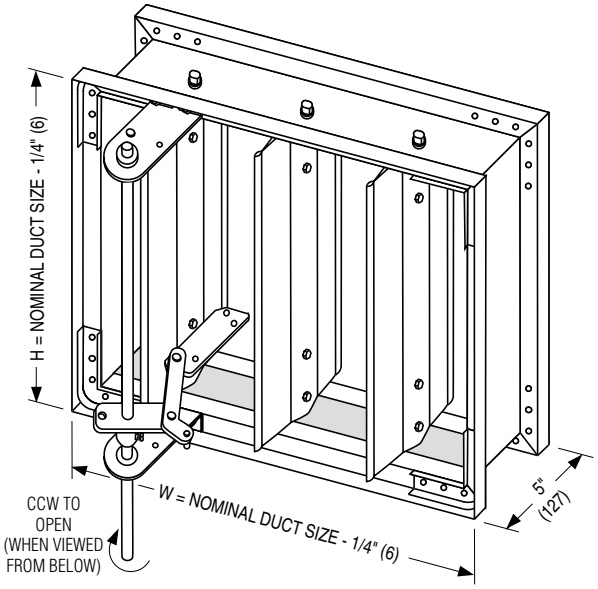
Velocity/ Pressure Rating	Elevated Temp. °F	Minimum Single Section Vertical	Maximum Single Section Vertical
24	250	8" x 8" (203 x 203)	48" x 36" (1219 x 914)

Note: Dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1212VB). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1213VB).

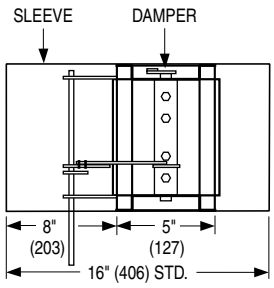
Multiple section assemblies are not permitted.

COMMON OPTIONS:

- DTS Damper Test Switch for cycle testing.
- DSDL/DSDN Duct Smoke Detectors.
- MLS-300 Position Indicator Switch Pack.
- Factory fitted sleeves in custom lengths, gauges and transition styles.



MODEL 1210VB
(Side Mounting Plate/Sleeve not shown)



MODEL 1211VB: TYPE A SLEEVE

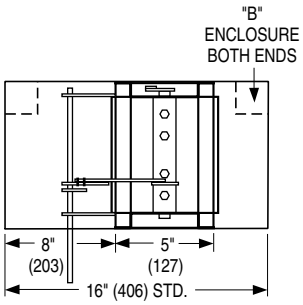
Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

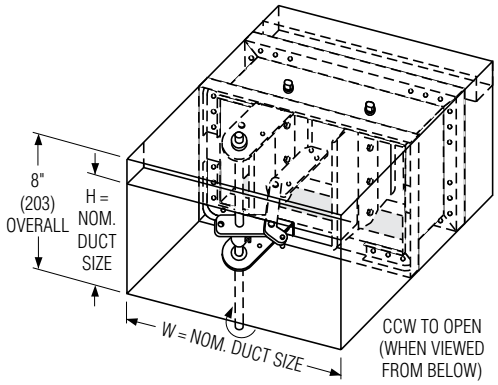
F
SMOKE DAMPERS

DIMENSIONAL DATA:

Model Series 1210VB dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1212VB). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1213VB).

MODEL 1212VB TYPE B SLEEVE ENCLOSURE:





Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

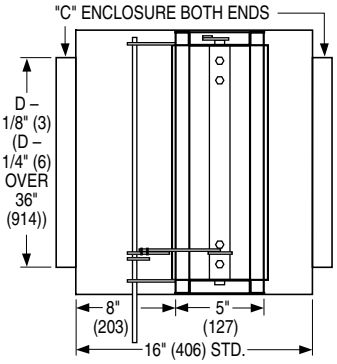
Wall Thickness	Minimum Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

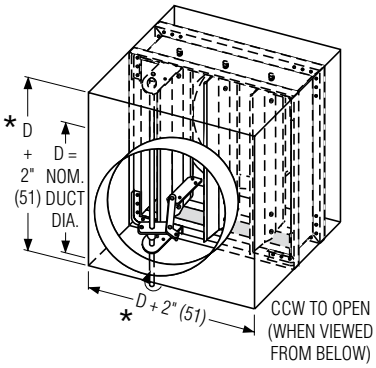
Model 1212VB Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum Single Section Vertical	Maximum Single Section Vertical
24	250	8" x 4" (203 x 102) (overall damper height is 8" [203]).	48" x 7 1/2" (1219 x 191)

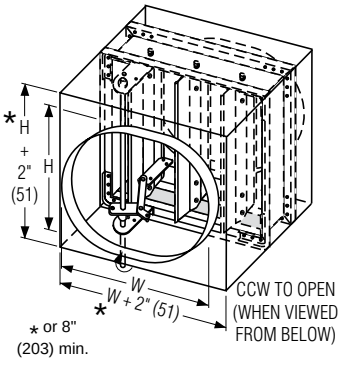
Note: Multiple section assemblies are not permitted.

MODEL 1213VB TYPE C SLEEVE ENCLOSURES:

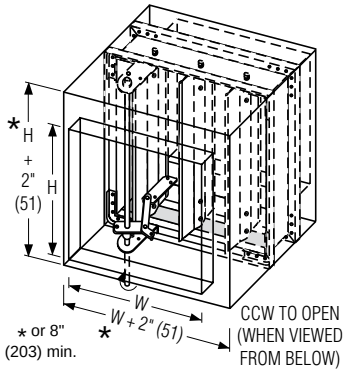




STYLE CR : FOR ROUND DUCT



STYLE CO : FOR OVAL DUCT



STYLE CSR : FOR SQUARE OR RECTANGULAR DUCT

Model 1213VB - Round Duct Connection Sizes (Duct Dia.):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum Single Section Vertical	Maximum Single Section Vertical
24	250	4" (102) dia. (overall damper size is 8" x 8" [203 x 203]).	34" (864) dia.

Note: Multiple section assemblies are not permitted.

Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Minimum Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Model 1213VB - Sq., Rect. or Oval Duct Conn. Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum Single Section Vertical	Maximum Single Section Vertical
24	250	4" x 4" (102 x 102) (overall damper size is 8" x 8" [203 x 203] min.).	46" x 34" (1168 x 864)

Note: Multiple section assemblies are not permitted.

HOW TO ORDER OR TO SPECIFY

VERTICAL AIRFOIL BLADE SMOKE DAMPERS

MODEL SERIES: 1210VB

EXAMPLE: 1211VB - 24X24 - V - AUTO - 24 - I - 24 - 250 - BO - SL = 16 - 20G - EXT - RH - CL - HH1 - L8

1a. **Models**
- 1210VB Vertical, Steel, Airfoil Blade

1b. **Sleeve/Enclosure Style (4th Digit)**
- 0 = No Sleeve
- 1 = Type A Sleeve
- 2 = Type B Sleeve Enclosure
- 3 = Type C Sleeve Enclosure

2. **Duct Size**
Width x Height inches (mm's)

3. **Mounting**
- V Vertical (default)

4. **Leakage Rating**
- I Class I (default)
- II Class II

5. **Actuator Selected By**
- AUTO Least Cost (Auto-Select)
- BEL Belimo
- HON Honeywell

6. **Power Requirement**
- 120 120 VAC (default)
- 230 230 VAC
- 24 24 VAC

7. **Max. Velocity / Pressure Rating**
- 24 2000 fpm @ 4" w.g. (default)

8. **Elevated Temperature**
- 250 250°F (default)

9. **Bearings**
- BO Oilite Bronze (default)
- BS Stainless Steel

10. **Duct Smoke Detector**
- — None (default)
- DSDL Low-Flow, factory mounted
- DSDN No-Flow, factory mounted

11a. **Side Mounting Plate**
(No Sleeve models only)
- SMP Side Mounting Plate

11b. **Sleeve Length**
SL = Specify
16" (406) standard (default)
12" – 28" (305 – 711)

12. **Sleeve Gauge**
- 20G 20 Ga. standard (default)
- 18G 18 Ga.
- 16G 16 Ga.
- 14G 14 Ga.
- 10G 10 Ga.

13. **Transition**
(Sleeve Type C models only)
- CR Round
- CO Oval
- CSR Square/Rectangular

14. **Actuator Mounting**
- EXT External (default)
- INT Internal

15. **Actuator Location**
- RH Right hand (default)
- LH Left hand

16. **Actuator Fail Position**
- CL Close (default)
- OP Open

17. **Actuator Models**
Electric:

HM1	MS4109F	120 VAC
HM2	MS8109F	24 VAC
HM3	MS4609F	230 VAC
HH1	MS4120F	120 VAC
HH2	MS8120F	24 VAC
HH3	MS4620F	230 VAC

18. **Damper Location**
- L8 8" (203) From sleeve end (default)
- LX Other (specify)
8" – 16" (203 – 406)

OPTIONS & ACCESSORIES:

19. **Position Indicator**
- — None (default)
- 300 MLS-300 (4-wire)

20. **TDF Flange**
- — None (default)
- TDF1 One end
- TDF2 Both ends

21. **Damper Test Switch**
- — None (default)
- DTS Damper Test Switch

Notes:

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

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Smoke Dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Smoke dampers shall meet the requirements of NFPA 90A, 92, 101 and 105 and shall be classified as a (**specifier select class**) Class I **or** Class II Leakage Rated Smoke Damper under UL 555S at an elevated temperature of 250°F (121°C) and each damper shall bear a UL label verifying same. Dampers shall be suitable for use in dynamic or static smoke control systems. Dampers shall have been operation tested by UL to a minimum velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).
Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent galvanized steel formed double skin, airfoil design, on 5 1/2" (140) centers and shall be oriented vertically to allow for bottom mount actuator. Dampers shall be opposed blade configuration with an interlocking blade design that provides complete smoke seal under elevated temperature conditions when in closed position. Dampers requiring blade seals to maintain leakage class when under elevated temperature conditions are not acceptable. Blade axles shall be 1/2" (13) dia. plated steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream. Jamb seals shall be compression type stainless steel. Appropriate (**specifier select**) externally **or** internally mounted electrical actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism, external after-market spring mechanisms are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.
Submitted pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries, Inc. Model Series 1210VB.

- HARSH ENVIRONMENT
- TYPE 304 OR 316 AVAILABLE
- HIGH PERFORMANCE
- CLASS I OR II LEAKAGE @ 250°F
- UL 555S CLASSIFIED SMOKE DAMPER

Models:

1210SS No Sleeve
1211SS Type A Sleeve
1212SS Type B Sleeve Enclosure
1213SS Type C Sleeve Enclosure

Model 1210SS

Model Series 1210SS Stainless Steel Airfoil Blade Smoke Dampers are ideal for high humidity, mildly corrosive or, with optional Type 316 construction, more severe environment applications where building codes require a leakage rated damper for operational smoke control in static or dynamic smoke management systems.

The 1210SS Series has been designed and tested to provide premium performance and offers the lowest leakage class available, qualified for installation with airflow in either direction and inverted mounting. Features include a stainless steel airfoil blade, low pressure drop frame design and maintenance free concealed blade linkage out of the airstream for superb air performance and minimal turbulence and noise.

QUALIFICATIONS:

- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I or II at 250°F elevated temperature.**
- **Meets NFPA 90A, 92, 101 and 105 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 03230-0935:0107.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**

STANDARD CONSTRUCTION:

Frame: 5" x 7/8" x 16 ga. (127 x 22 x 1.6) stainless steel hat channel.

Blades: 14 ga. (2.0) equivalent stainless steel formed airfoil on 5 1/2" (140) centers. Opposed action.

Linkage: Concealed in frame. 12 ga. (2.7) stainless steel.

Bearings: 1/2" (13) dia. sintered stainless steel.

Axles: 1/2" (13) dia. stainless steel double bolted to blades.

Jackshaft: 1/2" (13) dia. stainless steel.

Jamb Seals: Cambered stainless steel.

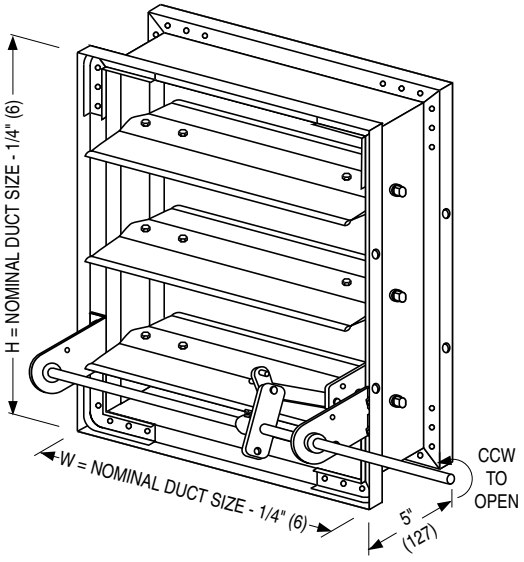
Models 1210SS and 1211SS Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
24	250	8" x 8" (203 x 203)	36" x 48" (914 x 1219)	144" x 96" (3658 x 2438)

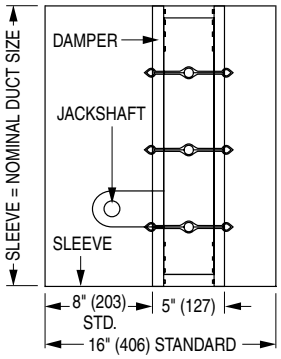
Note: Dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1212SS). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1213SS).

COMMON OPTIONS:

- Type 316 Stainless Steel Construction.
- DTS Damper Test Switch for cycle testing.
- DSDL/DSDN Duct Smoke Detectors.
- MLS-300 Position Indicator Switch Pack.
- Factory fitted sleeves in custom lengths, gauges and transition styles.



MODEL 1210SS
(Side Mounting Plate/Sleeve not shown)



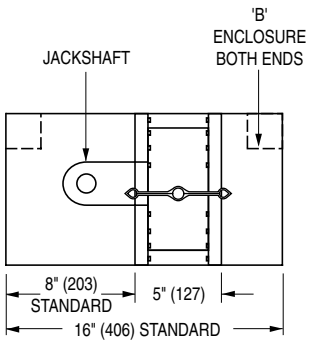
MODEL 1211SS: TYPE A SLEEVE

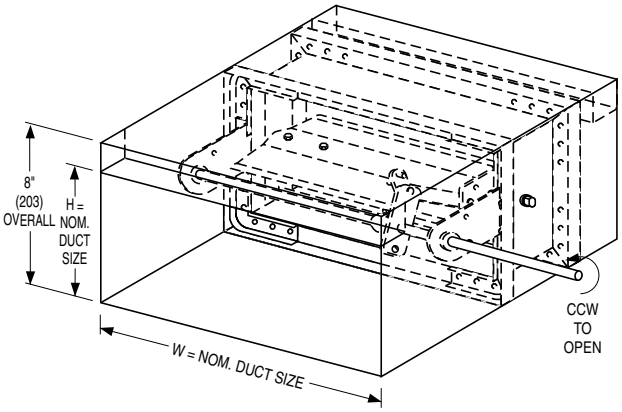
Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

DIMENSIONAL DATA:

Model Series 1210SS (1 1/2 Hr. Label) dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1212SS). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1213SS).

MODEL 1212SS TYPE B SLEEVE ENCLOSURE:





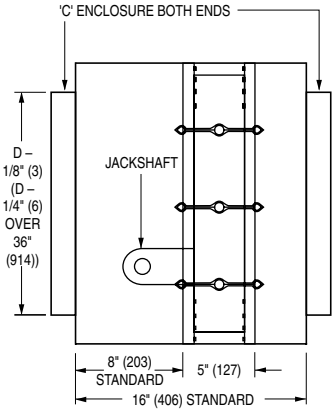
Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

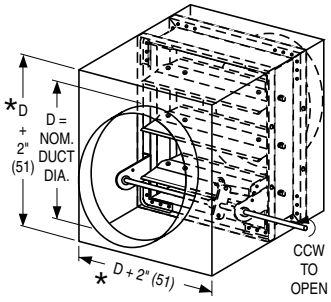
Wall Thickness	Minimum Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Model 1212SS Sizes (Duct W x H):

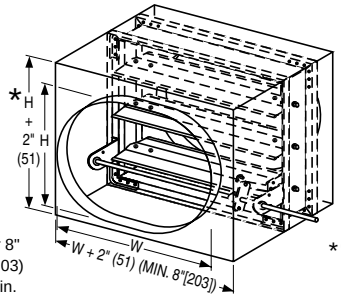
Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
24	250	8" x 4" (203 x 102) (Overall damper height is 8" [203])	36" x 7 1/2" (914 x 191)	144" x 7 1/2" (3658 x 191)

MODEL 1213SS TYPE C SLEEVE ENCLOSURES:

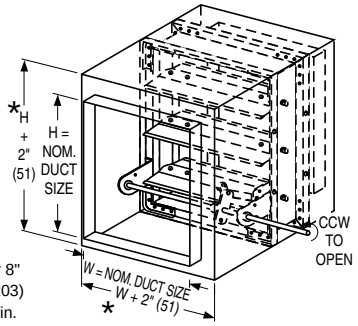




STYLE CR : FOR ROUND DUCT



STYLE CO : FOR OVAL DUCT



STYLE CSR : FOR SQUARE OR RECTANGULAR DUCT

Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Minimum Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Model 1213SS - Round Duct Connection Sizes (Duct Dia.):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
24	250	4" (102) dia. (Overall damper size is 8" x 8" [203 x 203] minimum).	34" (864) dia.	94" (2388) dia.

Model 1213SS - Sq., Rect. or Oval Duct Connection Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum	
		Single Section	Single Section	Multiple Section
		Vertical/Horizontal	Vertical/Horizontal	Vertical/Horizontal
24	250	4" x 4" (102 x 102) (Overall damper size is 8" x 8" [203 x 203] minimum).	34" x 46" (864 x 1168)	142" x 94" (3607 x 2388)

PERFORMANCE DATA:

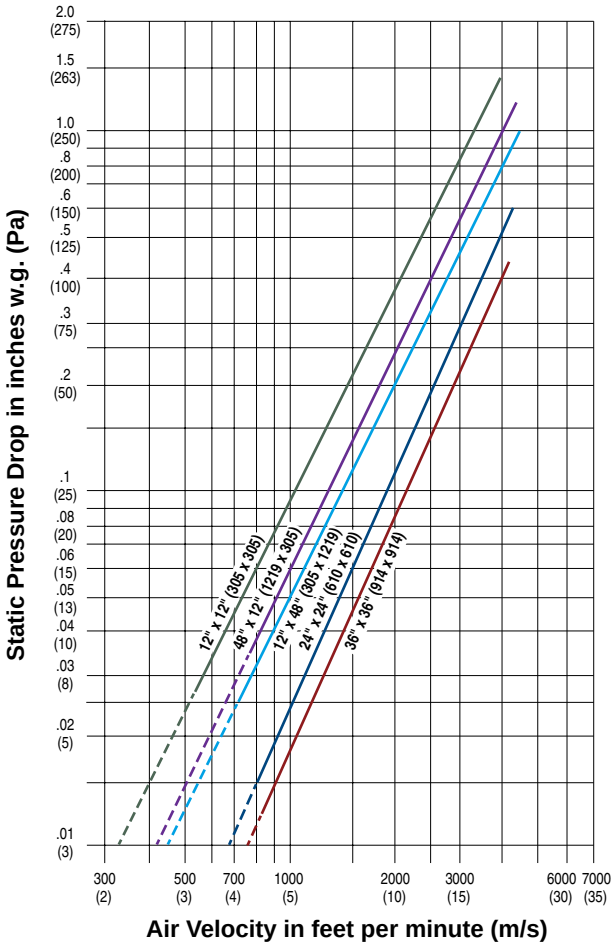
MODEL SERIES: 1210SS

LEAKAGE CLASS:

The 1210SS Series Stainless Steel Smoke Damper has been designed and qualified under UL 555S in order to provide maximum system design flexibility. It is available with a Class I or Class II leakage rating with all damper/actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C) under airflow of 2000 fpm (10 m/s) at 4" w.g. (1 kPa).

Maximum Performance Ratings	
UL 555S Leakage Rating	Class I
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)
Maximum Temperature	250°F (121°C)

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

F

SMOKE DAMPERS

HOW TO ORDER

AIRFOIL BLADE SMOKE DAMPERS

MODEL SERIES: 1210SS

EXAMPLE: 1211SS - 24X24 - H/V - AUTO - 120 - I - 24 - 250 - BO - SL = 16 - 20G - EXT - RH - CL - FL12 - L8

1a. **Models**
- 1210SS Stainless Steel, Airfoil Blade

1b. **Sleeve/Enclosure Style (4th Digit)**
- 0 = No Sleeve
- 1 = Type A Sleeve
- 2 = Type B Sleeve Enclosure
- 3 = Type C Sleeve Enclosure

2. **Duct Size**
Width x Height inches (mm's)

3. **Construction**
- 304 Type 304 Stainless Steel (default)
- 316 Type 316 Stainless Steel

4. **Mounting**
- H/V Horizontal/Vertical (default)

5. **Actuator Selected By**
- AUTO Least Cost (Auto-Select) (default)
- BEL Belimo
- HON Honeywell
- SIE Siemens

6. **Power Requirement**
- 120 120 VAC (default)
- 230 230 VAC
- 24 24 VAC
- 25 25 psi Pneumatic

7. **Leakage Rating**
- I Class I (default)
- II Class II

8. **Max. Velocity / Pressure Rating**
- 24 2000 fpm @ 4" w.g. (default)

9. **Elevated Temperature**
- 250 250°F (default)

10. **Bearings**
- BS Stainless Steel (default)

11. **Duct Smoke Detector**
- — None (default)
- DSDL Low-Flow, factory mounted
- DSDN No-Flow, factory mounted

12a. **Side Mounting Plate**
(No Sleeve models only)
- SMP Side Mounting Plate

12b. **Sleeve Length**
SL = Specify
16" (406) standard (default)
12" – 28" (305 – 711)

13. **Sleeve Gauge**
- 20G 20 Ga. standard (default)
- 18G 18 Ga.
- 16G 16 Ga.
- 14G 14 Ga.
- 10G 10 Ga.

14. **Transition**
(Sleeve Type C models only)
- CR Round
- CO Oval
- CSR Square/Rectangular

15. **Actuator Mounting**
- EXT External (default)
- INT Internal

16. **Actuator Location**
- RH Right hand (default)
- LH Left hand
- MH Multi-hand

17. **Actuator Fail Position**
- CL Close (default)
- OP Open

18. **Actuator Models**

Electric:

HL1	MS4104F	120VAC
HL2	MS8104F	24VAC
HL3	MS4604F	230VAC
HM1	MS4109F	120VAC
HM2	MS8109F	24VAC
HM3	MS4609F	230VAC
HH1	MS4120F	120VAC
HH2	MS8120F	24VAC
HH3	MS4620F	230VAC
GD2	GGD221	120VAC
GD1	GGD121	24VAC
GD3	GGD321	230VAC
FL12	FSLF120	120VAC
FL23	FSLF230	230VAC
FL24	FSLF24	24VAC
F12	FSNF120	120VAC
F23	FSNF230	230VAC
F24	FSNF24	24VAC

Pneumatic:
- 296 331-2961
- 306 331-3060

19. **Damper Location**
- L8 8" (203) From sleeve end
- LX Other (specify)
8" – 16" (203 – 406)

OPTIONS & ACCESSORIES:

20. **Position Indicator**
- — None (default)
- 300 MLS-300 (4-wire)

21. **EP Switch**
- — None (default)
- EP1 120 VAC
- EP2 24 VAC

22. **Damper Test Switch**
- — None (default)
- DTS Damper Test Switch

Notes:

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

2. One MLS-300 required per damper assembly.

3. EP (electric-pneumatic) switch optional accessory is applicable only to pneumatic actuators and is shipped loose.

HOW TO SPECIFY

STAINLESS STEEL AIRFOIL BLADE SMOKE DAMPERS

MODEL SERIES: 1210SS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Smoke Dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Smoke dampers shall meet the requirements of NFPA 90A, 92, 101 and 105 and shall be classified as a (**specifier select class**) Class I **or** Class II Leakage Rated Smoke Damper under UL 555S at an elevated temperature of 250°F (121°C) and each damper shall bear a UL label verifying same. Dampers shall be suitable for use in dynamic or static smoke control systems. Dampers shall have been operation tested by UL to a minimum velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).

Frame shall be constructed of 16 ga. (1.6) stainless steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent stainless steel formed double skin airfoil design on 5 1/2" (140) centers. Dampers shall be opposed blade configuration with an interlocking blade design that provides complete smoke seal under elevated temperature conditions when in closed position. Dampers requiring blade seals to maintain leakage class when under elevated temperature conditions are not acceptable. Blade axles shall be 1/2" (13) dia. stainless steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be sintered stainless steel type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream. Jamb seals shall be cambered stainless steel. Appropriate (**specifier select**) externally **or** internally mounted (**specifier select type**) electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism, external after-market spring mechanisms are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.

Submitted pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries, Inc. Model Series 1210SS.

- TRUE ROUND DESIGN
- CLASS I LEAKAGE @ 350°F
- UL 555S CLASSIFIED SMOKE DAMPER

Model:
1290S

Model 1290S

Nailor Model 1290S True Round Smoke Damper is ideal for round ductwork applications where building codes require a leakage rated smoke damper for operational smoke control in static or dynamic smoke management systems. Features include a sturdy beaded casing for superior rigidity and a heavy duty 14 ga. (2.0) equivalent laminated blade that is double bolted to axles for a positive no-slip connection. The 1290S smoke damper is designed and tested to provide premium performance and offers the lowest leakage class available, qualified for installation with airflow in either direction and inverted mounting.

QUALIFICATIONS:

- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I at 350°F elevated temperature.**
- **Meets NFPA 90A, 92, 101 and 105 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 03230-0935:0107.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**

STANDARD CONSTRUCTION:

Frame:	20 ga. (1.0) galvanized steel integral sleeve and retaining plates.
Blade:	2 x 20 ga. (1.0) galvanized steel laminated together. 14 ga. (2.0) equivalent thickness.
Bearings:	1/2" (13) dia. self-lubricating oilite bronze.
Drive Shaft/	1/2" (13) dia. plated steel double bolted to blade.
Axles:	Drive shaft extends approx. 6" (152) beyond frame.
Jackshaft:	1/2" (13) dia. cadmium plated steel.
Blade Seal:	Silicone rubber. Peripheral gasket sandwiched between two piece blade.

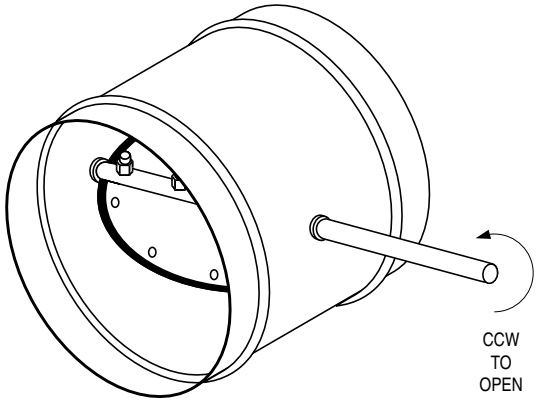
Model 1290S Sizes (Duct Dia.):

Minimum	Maximum
6" (152) dia.	24" (610) dia.

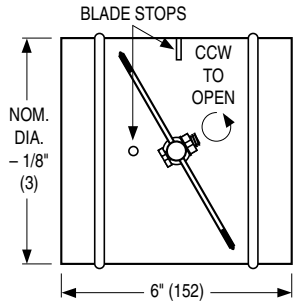
Note: Dampers available in 2" (51) increments.

COMMON OPTIONS:

- DTS Damper Test Switch for cycle testing.
- MLS-300 Position Indicator Switch Pack.



MODEL 1290S



F

SMOKE DAMPERS

- HARSH ENVIRONMENTS
- TYPE 304 OR 316 AVAILABLE
- CLASS I LEAKAGE @ 350°F
- TRUE ROUND DESIGN
- UL 555S CLASSIFIED SMOKE DAMPER

Model:
1290S-SS

Model 1290S-SS

The 1290S-SS Stainless Steel True Round Smoke Damper is ideal for high humidity or mildly corrosive round ductwork applications where building codes require a leakage rated smoke damper for operational smoke control in static or dynamic smoke management systems. Features include a sturdy beaded casing for superior rigidity and a heavy duty 14 ga. (2.0) equivalent laminated blade that is double bolted to axles for a positive no-slip connection. The 1290S-SS damper is designed and tested to provide premium performance and offers the lowest leakage class available, qualified for installation with airflow in either direction. Available in either Type 304 Stainless Steel as standard or Type 316 Stainless Steel for more severe environment applications.

QUALIFICATIONS:

- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I at 350°F elevated temperature.**
- **Meets NFPA 90A, 92, 101 and 105 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 03230-0935:0107.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**

STANDARD CONSTRUCTION:

Frame:	20 ga. (1.0) stainless steel integral sleeve and retaining plates.
Blade:	2 x 20 ga. (1.0) stainless steel laminated together. 14 ga. (2.0) equivalent thickness.
Bearings:	1/2" (13) dia. stainless steel.
Drive Shaft/	1/2" (13) dia. stainless steel double bolted to blade.
Axles:	Drive shaft extends approx. 6" (152) beyond frame.
Jackshaft:	1/2" (13) dia. stainless steel.
Blade Seal:	Silicone rubber. Peripheral gasket sandwiched between two piece blade.

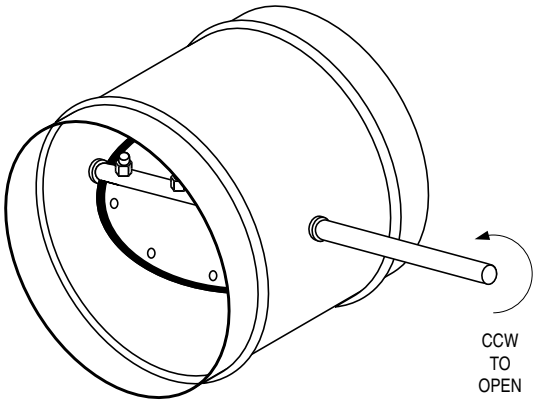
Model 1290S-SS Sizes (Duct Dia.):

Minimum	Maximum
6" (152) dia.	24" (610) dia.

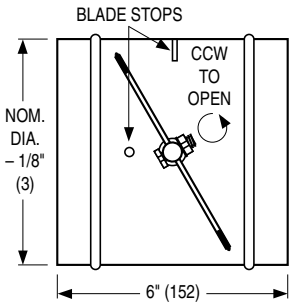
Note: Dampers available in 2" (51) increments.

COMMON OPTIONS:

- Type 316 Stainless Steel Construction.
- DTS Damper Test Switch for cycle testing.
- MLS-300 Position Indicator Switch Pack.



MODEL 1290S-SS



PERFORMANCE DATA:

MODEL SERIES: 1290S AND 1290S-SS

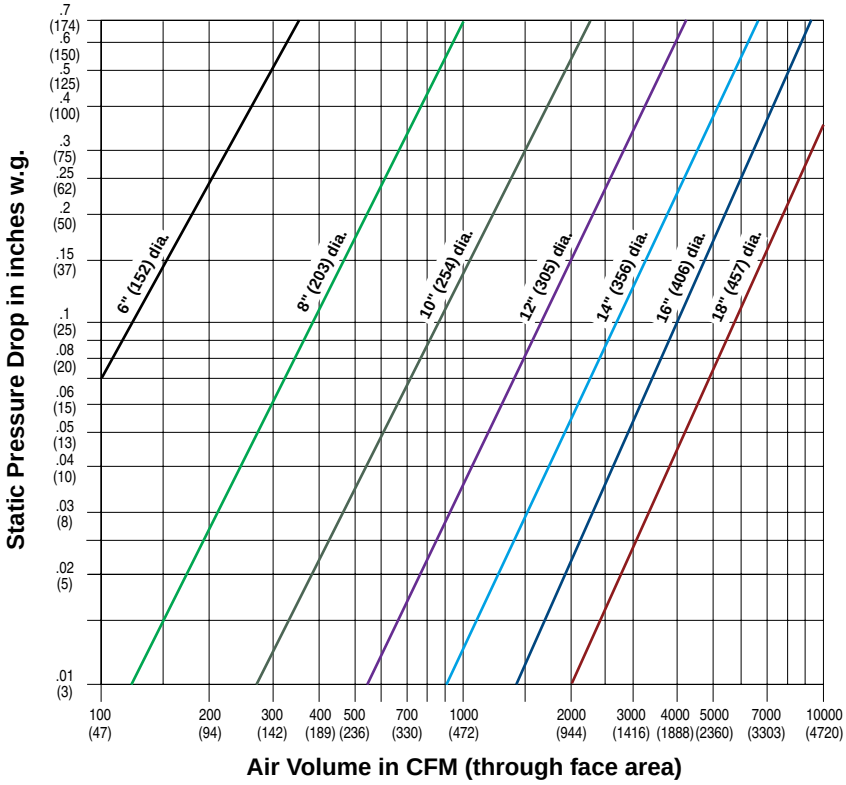
LEAKAGE CLASS:

The 1290S Series True Round Smoke Damper has been designed and qualified under UL 555S in order to provide maximum system design flexibility. It is available with a Class I leakage rating with all damper/actuator assemblies having been tested successfully at an elevated temperature of 350°F (177°C) under airflow of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).

The 1290S-SS Series Stainless Steel True Round Smoke Damper has been designed and qualified under UL 555S in order to provide maximum system design flexibility. It is especially ideal for high humidity or mildly corrosive applications. It is available with a Class I leakage rating with all damper/actuator assemblies having been tested successfully at an elevated temperature of 350°F (177°C) under airflow of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).

Maximum Performance Ratings	
UL 555S Leakage Rating	Class I
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)
Maximum Temperature	350°F (177°C)

PRESSURE DROP



Tested per AMCA standard 500, Fig. 5.5.

HOW TO ORDER

TRUE ROUND SMOKE DAMPERS

MODEL SERIES: 1290S AND 1290S-SS

EXAMPLE: 1290S - 24 - H/V - AUTO - 120 - I - 24 - 350 - BO - EXT - CL - HM1

1. **Models**
   - 1290S True Round
   - 1290S-SS Stainless Steel, True Round
2. **Duct Size**
   - Diameter inches (mm's)
3. **Construction**
   - (Stainless Steel Model 1290S-SS only)
   - 304 Type 304 Stainless Steel
   - 316 Type 316 Stainless Steel
4. **Actuator Selected By**
   - AUTO Least Cost (Auto-Select) (default)
   - HON Honeywell
   - SIE Siemens
5. **Power Requirement**
   - 120 120 VAC (default)
   - 230 230 VAC
   - 24 24 VAC
   - 25 25 psi Pneumatic
6. **Max. Velocity / Pressure Rating**
   - 24 2000 fpm @ 4" w.g. (default)
7. **Elevated Temperature**
   - 350 350°F (default)
8. **Bearings**
   - BO Oilite Bronze (default)
   - BS Stainless Steel (Default on Model 1290S-SS)
9. **Actuator Mounting**
   - EXT External (default)
10. **Actuator Fail Position**
    - CL Close (default)
11. **Actuator Models**

Electric:

HL1	MS4104F	120VAC
HL2	MS8104F	24VAC
HL3	MS4604F	230VAC
HM1	MS4109F	120VAC
HM2	MS8109F	24VAC
HM3	MS4609F	230VAC
FL12	FSLF120	120VAC
FL23	FSLF230	230VAC
FL24	FSLF24	24VAC
F12	FSNF120	120VAC
F23	FSNF230	230VAC
F24	FSNF24	24VAC

Pneumatic:

482	331-4826
296	331-2961

OPTIONS & ACCESSORIES:

12. **Position Indicator**
    - — None (default)
    - 300 MLS-300 (4-wire)
13. **EP Switch**
    - — None (default)
    - EP1 120 VAC
    - EP2 24 VAC
14. **Damper Test Switch**
    - — None (default)
    - DTS Damper Test Switch

Notes:

1. Not all variants and options are available on all models. Refer to individual model for selection availability.
2. EP (electric-pneumatic) switch optional accessory is applicable only to pneumatic actuators and is shipped loose.

HOW TO SPECIFY

TRUE ROUND SMOKE DAMPERS

MODEL: 1290S

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Round Smoke Dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Smoke dampers shall meet the requirements of NFPA 90A, 92, 101 and 105 and shall be classified as a Class I Leakage Rated Smoke Damper under UL 555S at an elevated temperature of 350°F (177°C) and each damper shall bear a UL label verifying same. Dampers shall be suitable for use in dynamic or static smoke control systems. Dampers shall have been operation tested by UL to a minimum velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).
Frame/integral sleeve shall be roll-formed from 20 ga. (1.0) galvanized steel, beaded for structural strength. Blade shall be of two 20 ga. (1.0) galvanized steel pieces laminated together with an equivalent thickness of 14 ga. (2.0). Blade seal shall be silicone rubber sandwiched between blade pieces and shall completely encircle blade periphery. Blade axles shall be 1/2" (13) dia. plated steel double bolted to blade. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type.
Appropriate externally mounted (**specifier select type**) electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism, external after-market spring mechanisms are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.
Submitted pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries, Inc. Model 1290S.

STAINLESS STEEL TRUE ROUND SMOKE DAMPERS

MODEL: 1290S-SS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Round Smoke Dampers as manufactured by Nailor Industries, Inc. which meet or exceed the following criteria: Smoke dampers shall meet the requirements of NFPA 90A, 92, 101 and 105 and shall be classified as a Class I Leakage Rated Smoke Damper under UL 555S at an elevated temperature of 350°F (177°C) and each damper shall bear a UL label verifying same. Dampers shall be suitable for use in dynamic or static smoke control systems. Dampers shall have been operation tested by UL to a minimum velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).
Frame/integral sleeve shall be roll-formed from 20 ga. (1.0) stainless steel, beaded for structural strength. Blade shall be of two 20 ga. (1.0) stainless steel pieces laminated together with an equivalent thickness of 14 ga. (2.0). Blade seal shall be silicone rubber sandwiched between blade pieces and shall completely encircle blade periphery. Blade axles shall be 1/2" (13) dia. stainless steel double bolted to blade. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be stainless type.
Appropriate externally mounted (**specifier select type**) electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism, external after-market spring mechanisms are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.
Submitted pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries, Inc. Model 1290S-SS.

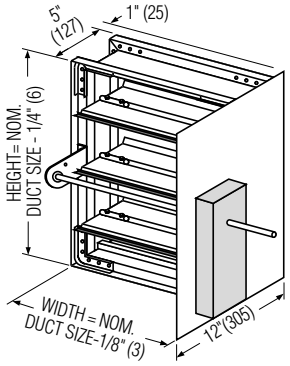
Options and Accessories

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

SIDE PLATES/SLEEVES FOR ACTUATOR MOUNTING:

OPTION CODE **SMP**
SIDE ACTUATOR MOUNTING PLATE

Nailor's **SMP**, Side Mounting Plate, provides a practical and cost effective method of factory installing an actuator onto Model Series 1210, 1260, and 1280 smoke dampers. UL 555S, Standard for Smoke Dampers requires actuators to be factory mounted securely in position. This is to help ensure that the damper/actuator assembly functions properly and eliminates possible job site installation errors. Nailor's SMP option allows the damper/actuator assembly to be conveniently mounted in duct opening for fast, worry-free installation.



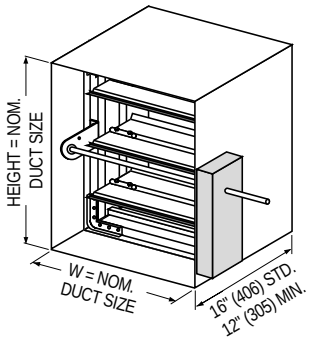
SIDE ACTUATOR MOUNTING PLATE FOR JACKSHAFT DRIVE

TYPE A SLEEVES
MODELS 1211, 1261, 1281

As an alternative to using a side mounting plate to mount an actuator onto a Series 1210, 1260 or 1280 smoke damper, Nailor smoke dampers can be provided in a full factory-fitted sleeve, factory caulked to UL specifications between the damper frame and sleeve. This eliminates on site worries about proper damper mounting in the duct and provides for quick and convenient job site installations. Standard Type A sleeve is 16" (406) long x 20 ga. (1.0) (18 ga. for dampers over 84" (2134) in width). Non-standard lengths and gauges are available to suit specific applications. See chart for specific sleeved model numbers.

The following indicates model numbers to order for smoke dampers with factory fitted Type A sleeves:

Standard Model #	With Type A Sleeve
1210 →	Model 1211
1260 →	Model 1261
1280 →	Model 1281

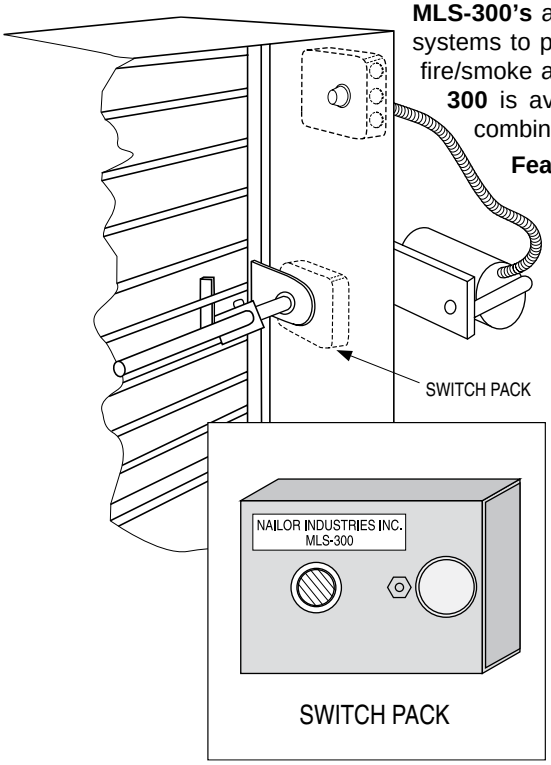


TYPE A SLEEVE FOR JACKSHAFT DRIVE

POSITION INDICATORS:

OPTION CODE **300**
MLS-300 POSITION INDICATOR SWITCH PACK

The **MLS-300 Series Position Indicator Switch Pack** is generally utilized to indicate open and closed position of the damper blades. It incorporates two SPDT switches that may be used to operate signal lamps or to provide a start/stop circuit for remote fans or to signal alarms.



MLS-300's are used in active smoke control management systems to positively indicate the status of all combination fire/smoke and smoke dampers in the building. The **MLS-300** is available only as a factory installed option on combination fire/smoke and smoke dampers.

Features:

- Operates as a function of the damper blade position.
- Provides remote indication of damper blade position.
- Provides the ability to remotely control ON/OFF fan stations.
- Provides the ability to remotely signal alarms.

Built-in Actuator Switch Packs

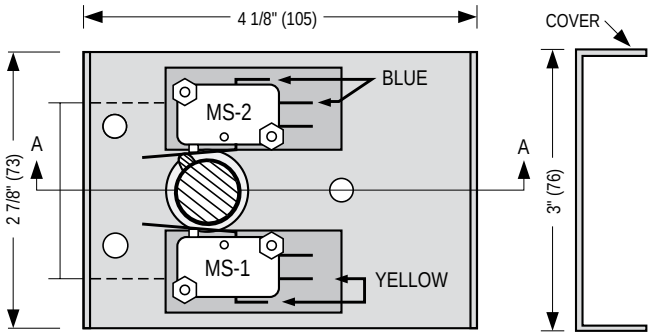
Many of the newer application specific actuators designed for use on fire/smoke dampers feature "add-on" component position indicator switches manufactured and UL tested by the actuator manufacturer. Honeywell MS4109F/MS8109F actuators are examples.

Some actuator models have variants with position indicator switches built right in to the actuator. Honeywell MS4120F/MS8120F and Belimo FSNF24S/FSNF120S actuators are examples.

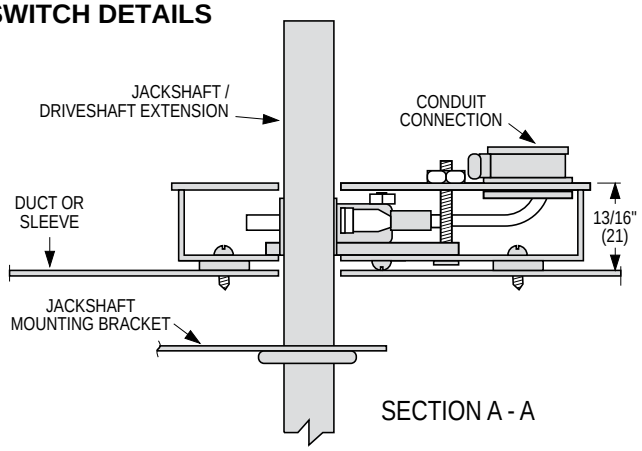
When ordered with the MLS-300 Position Indicator Switch Pack, Nailor combination fire/smoke and smoke dampers that utilize these actuators will usually be supplied with the actuator mounted switch pack, factory installed as required by UL.

POSITION INDICATORS:

MLS-300N (NAILOR) SWITCH DETAILS

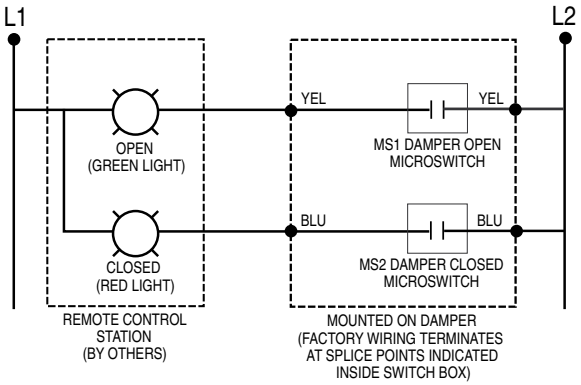


EXTERNAL RIGHT HAND MOUNTING: FRONT VIEW (LESS COVER)



TYPICAL JACKSHAFT MOUNTING

Position Indicator Microswitch Data:
Switch Type: Single Pole double throw (2)
15 Amps, 1/3 HP, 125, 250 Vac or 24 Vdc.
1/2 Amp, 125 Vdc. 1/4 Amp, 250 Vdc.
Standard Mounting:
MS1 is damper open signal.
MS2 is damper closed signal.
Non-Standard Mounting:
Important: Installer must double check continuity of MS1 and MS2 before wiring to determine which switch signals the damper's open or closed position.



FLANGED SLEEVE

OPTION CODES

TDF FLANGE

TDF2 BOTH ENDS

TDF1 ONE END

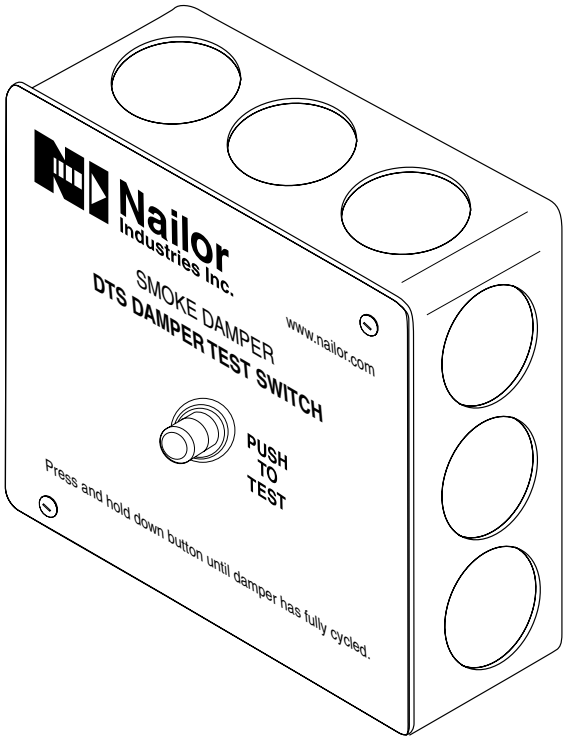
TDF (by Engle) and **TDC** (by Lockformer) proprietary flange systems are available as an option on all model smoke dampers fitted with a factory Type A sleeve of 22 or 20 gauge thickness. The flange system allows for fast, simple duct connections in the field.
For Option **TDF1** the sleeve is factory 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. Specify which end of sleeve to be flanged in relation to the jackshaft.

DAMPER TEST SWITCH

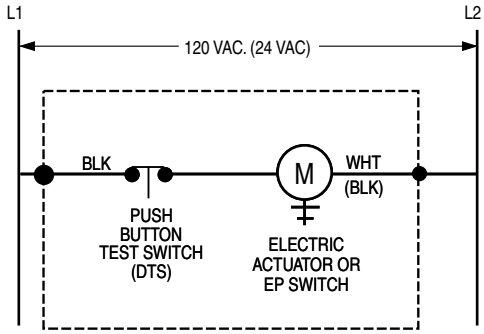
OPTION CODE **DTS**
PUSH BUTTON TEST SWITCH

The DTS (Damper Test Switch) is an optional "momentary" push button test switch available on all Nailor smoke and combination fire/smoke dampers. The DTS provides the ability to "cycle test" the damper by pushing and holding down the button until the damper has cycled and closure has been visually verified, either by inspecting the damper through the access door or by confirmation at a remote control panel when equipped with the optional MLS-300 position indicator.

The DTS is mounted right on the damper and enables a single maintenance person to test and cycle the damper, eliminating the need for help from another person in the control room.



DTS Damper Test Switch



MOUNTED ON DAMPER (FACTORY WIRING TERMINATES AT SPLICE POINTS INDICATED INSIDE 4" x 4" ELECTRICAL BOX)

Figure 1. DTS Damper Test Switch

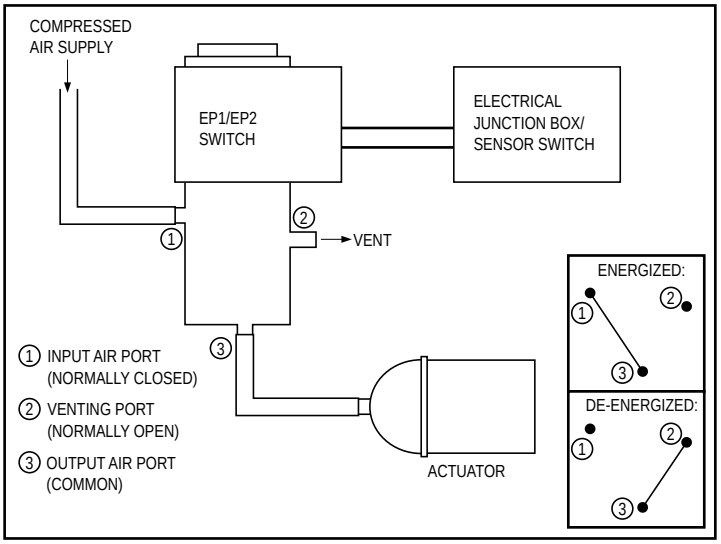
ELECTRO-PNEUMATIC SWITCHES:

OPTION CODES **EP1** AND **EP2**
EP1 120 VAC E/P SWITCH
EP2 24 VAC E/P SWITCH

EP1 Siemens 265-1008 120 V/60 Hz

EP2 Siemens 265-1007 24 VAC

Nailor Options **EP1** and **EP2** electro-pneumatic switches are electrically operated, two-position 3-way air valves. They are used to interlock an electrical smoke or fire alarm system with a pneumatic damper actuator. The **EP1 (120 VAC)** and **EP2 (24 VAC)** valves are utilized to alternately apply pressure to, and exhaust pressure from a pneumatic damper actuator by an electrical input that energizes or de-energizes the solenoid of the switch. Barb type pneumatic piping connections are sized for 1/4" (6) O.D. Polyethylene tubing. Units are UL and CSA approved and may be mounted in any position.



OPERATION:

Input air is connected to port 1 (normally closed) and the output to the actuator is connected to port 3 (common). When the solenoid is energized port 1 connects to port 3 allowing the actuator to be controlled by input air, usually holding the damper in open position. When the solenoid is de-energized, port 2 (normally open) is connected to port 3, exhausting the air from the actuator allowing it to return to its normal fail position (fail open or fail closed).

Note:

E.P. Switches ship loose when ordered with Smoke Dampers and require field installation.

DUCT SMOKE DETECTORS:

OPTION CODE **DSDN**
DSD-NF NO-FLOW
DUCT SMOKE DETECTOR

APPLICATION:

Nailor Model DSD-NF duct smoke detector (no-flow) can be utilized with Nailor UL555S Classified smoke dampers to detect the presence of smoke within HVAC ductwork, whether or not there is airflow, and close the damper to prevent the smoke from spreading. As most fatalities resulting from fires can be attributed to the effects of toxic smoke, detecting and controlling the smoke from spreading within the HVAC system is vital to preventing injury as well as limiting property damage, including damage to the HVAC system itself. Refer to NFPA Standards 72, 90A and 92 to determine when and where duct smoke detectors are required.

The DSD-NF detector features a low-profile design for optimum pressure drop and will operate with airflow in either direction. It can be factory installed to top of sleeve (side mounting optional) on Nailor Model Series 1210, 1260 and 1280 smoke dampers.

OPERATION:

Upon detection of smoke, the smoke detector causes the damper to close by cutting off power to the actuator. The actuator return spring forces the damper closed. The detector can be reset only by a momentary power interruption. The standard model DSD-NF detector and smoke damper combination is designed simply to close the damper upon detection of smoke. For applications requiring the detector to be wired into a fire fighters' smoke-control station (FSCS), contact Nailor.

DSD-NF STANDARD SPECIFICATION:

Model: System Sensor 2151 Low-Profile.

Sensor Type: Photoelectronic.

Dimensions: 6.1" (155) dia. flanged base.

Weight: 3.6 oz. (104 g).

Airflow Velocity Range: 0 to 3000 fpm (0 to 15.24 m/s).

Operating Temperature Range: 32°F to 120°F (0°C to 49°C).

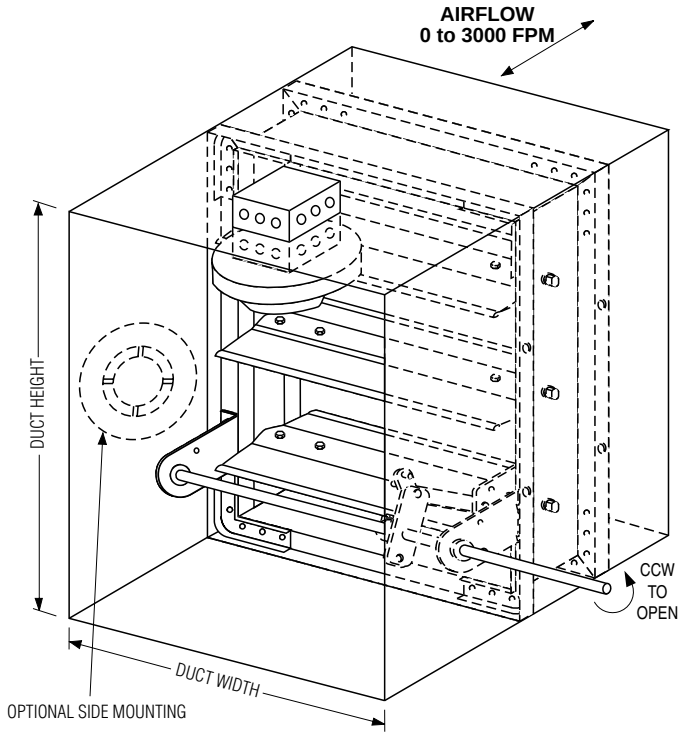
Operating Humidity Range: 10% to 93% Relative Humidity Non-Condensing.

Sensitivity: 3% ± .7%/ft

Voltage: 120 VAC or 24 VAC/DC.

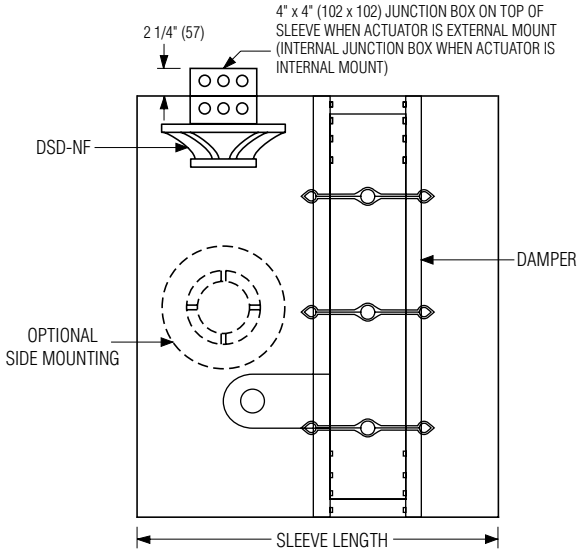
Latching Alarm: Reset by momentary power interruption.

Contact Nailor for minimum damper size and sleeve length for your specific application. See page C13 for general damper size, sleeve length and damper position guidelines.



NOTES:

1. Factory mounted smoke detectors will be factory wired to actuator(s) (or E.P. switch) and heat sensor(s), as applicable, into a 4" x 4" (102 x 102) common junction box in order to provide a single point wiring connection in the field.



F
SMOKE DAMPERS

DUCT SMOKE DETECTORS:

OPTION CODE **DSDL**
DSD-LF LOW-FLOW
DUCT SMOKE DETECTOR

APPLICATION:

Nailor Model DSD-LF duct smoke detector (low-flow) can be utilized with Nailor UL555S Classified smoke dampers to detect the presence of smoke within HVAC ductwork and close the damper to prevent the smoke from spreading. As most fatalities resulting from fires can be attributed to the effects of toxic smoke, detecting and controlling the smoke from spreading within the HVAC system is vital to preventing injury as well as limiting property damage, including damage to the HVAC system itself. Refer to NFPA Standards 72, 90A and 92A to determine when and where duct smoke detectors are required.

The DSD-NF detector can be factory installed to side of sleeve on Nailor Model Series 1210, 1260 and 1280 smoke dampers.

A minimum airflow velocity of 100 fpm (0.5 m/s) is required for Model DSD-LF.

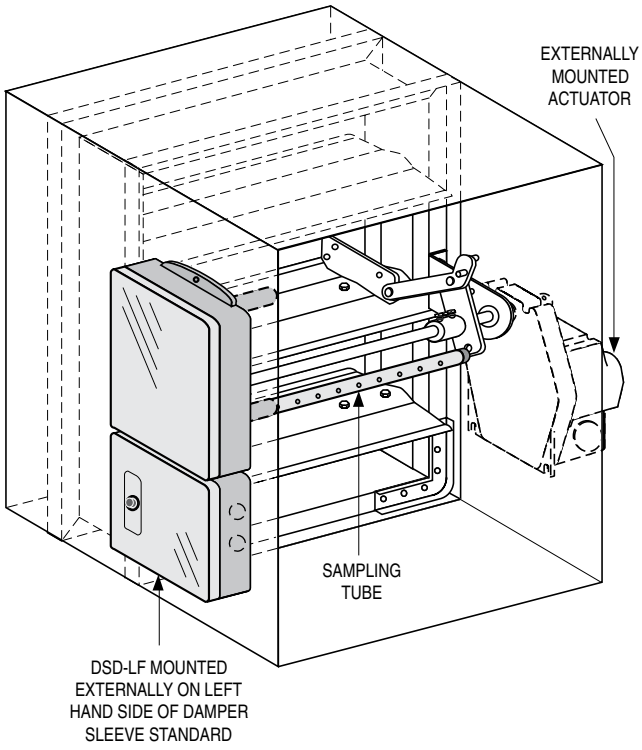
OPERATION:

Upon detection of smoke, the smoke detector causes the damper to close by cutting off power to the actuator. The actuator return spring forces the damper closed. The detector can be reset only by a momentary power interruption. The standard model DSD-LF detector and smoke damper combination is designed simply to close the damper upon detection of smoke. For applications requiring the detector to be wired into a fire fighters' smoke-control station (FSCS), contact Nailor.

DSD-LF STANDARD SPECIFICATION:

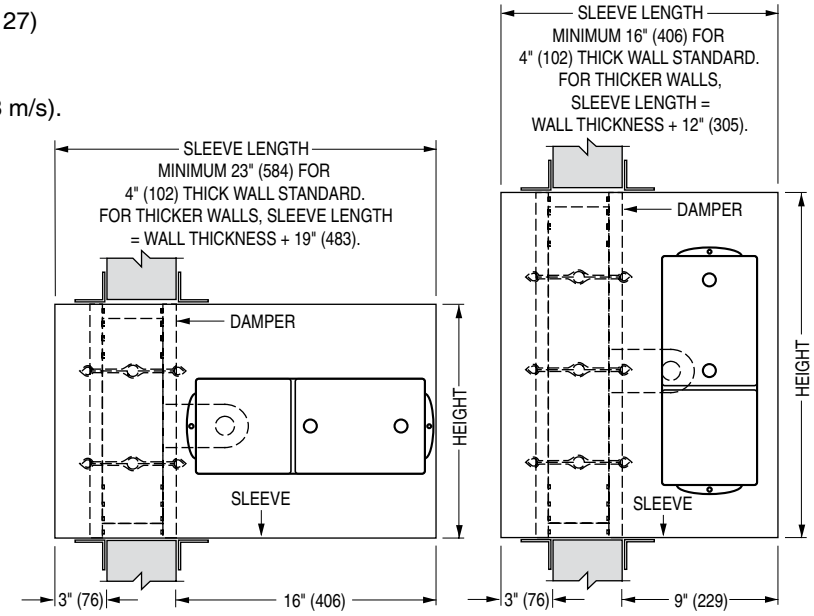
Model: System Sensor D4120.
Sensor Type: Photoelectric.
Dimensions: (Rectangular) 14.38" (365) Length, 5" (127) Width, 2.5" (64) Depth.
Weight: 2.5 lbs. (1.14 kg.).
Airflow Velocity Range: 100 to 4000 fpm (0.5 to 20.3 m/s).
Operating Temperature Range: –4°F to 158°F (–20°C to 70°C).
Operating Humidity Range: 0% to 95% Relative Humidity Non-Condensing.
Voltage: 24 VAC/DC or 120 VAC.

Contact Nailor for minimum damper size and sleeve length for your specific application.
See page C13 for general damper size, sleeve length and damper position guidelines.



NOTES:

1. Smoke detector is factory mounted externally on left side of sleeve (opposite side of sleeve to the actuator) and will be mounted horizontally on dampers under 20" (508) in height and mounted vertically on dampers 20" (508) in height and over. See orientation details below.
2. Factory mounted smoke detectors will be factory wired to actuator(s) (or E.P. switch) and heat sensor(s), as applicable, into a 4" x 4" (102 x 102) common junction box in order to provide a single point wiring connection in the field.

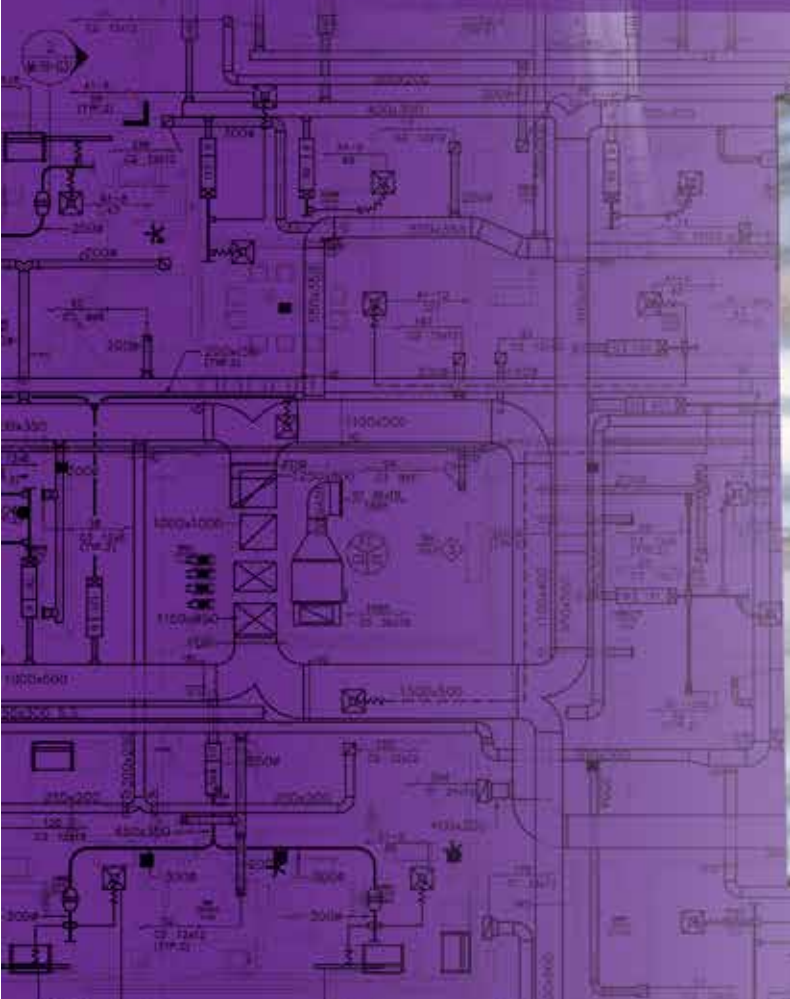


Height < 20" (508) **Height ≥ 20" (508)**

F
SMOKE DAMPERS

Nailor® Industries Inc.

COMBINATION FIRE/SMOKE DAMPERS



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GENERAL PRODUCT OVERVIEW

As today's modern commercial and industrial building construction becomes increasingly life safety oriented, fire containment and active smoke management systems are being utilized to a higher degree as more sophisticated technology is developed and implemented into building codes. The development process begins with the understanding of fire and smoke behavior through the research and study of real life emergency situations, and culminates in the design, testing of, and ultimate use of new products to better control and manage the ravages of fire and smoke. Thus, resulting property damage is minimized and occupant safety is maximized. Nailor Industries' commitment to the development of new and existing fire and smoke control technology has resulted in a comprehensive line of premium quality smoke, fire and combination fire/smoke dampers and accessories, available at a reasonable cost and in a timely fashion.

MODEL SERIES 1220 (1 1/2 HR.) AND 1220-3 (3 HR.)
AIRFOIL BLADE • PREMIUM PERFORMANCE

Model Series 1220 and 1220-3 Combination Fire/Smoke Dampers provide the ultimate in fire containment and smoke control for both static and dynamic smoke management systems. They utilize an innovative inter-locking double-skin airfoil blade design that provides a flame and smoke seal, eliminating the need for synthetic blade seals which burn out during fire conditions, and maintains its leakage class up to 2000°F (1093°C) - a feature no other fire/smoke damper in the industry can offer!

Ideal for use where building codes require both a fire damper to protect ductwork penetrations in fire separations and a leakage rated damper for use in smoke management systems, it is available with Leakage Class I or II at 250°F (121°C) or 350°F (177°C). Available at standard dynamic velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa), UL tested with extended ratings up to 4000 fpm (20 m/s) and 8" w.g. (2 kPa). Model Series 1220 and 1220-3 have been especially designed and tested to provide premium performance and are AMCA licensed. Qualified for installation with airflow in either direction and inverted mounting.

Model 1221

Model 1221G

MODEL 1221G (1 1/2 HR.)
AIRFOIL BLADE • GRILLE MOUNT

Model 1221G is a high performance combination fire/smoke damper specifically designed for supply or return ducts that terminate at a grille. The factory sleeve with unique 3/4" (19) grille mounting tabs simplifies installation, saves on field labor and eliminates the requirements for unsightly front retaining angles which commonly protrude from behind the grille. A steel grille installs over and completely hides the mounting tabs. The damper is offset in the sleeve to accommodate a single or double deflection supply air grille, single deflection supply air register or a return air grille or register.

MODEL SERIES 1220VB (1 1/2 HR.)
AIRFOIL BLADE • VERTICAL

Model 1221VB is a high performance combination fire/smoke damper that provides superior protection and versatility. The vertical blade configuration allows for the actuator to be mounted below the damper and is ideal for applications where bottom access is desired or where there is not enough space for a side mounted actuator.

Model 1221VB

MODEL SERIES 1270 (1 1/2 HR.)
VEE GROOVE BLADE

Model Series 1270 combination fire/smoke dampers, with sturdy vee-groove style blades and a rugged mitered corner hat channel frame design that virtually eliminates racking, provides 1 1/2 hour UL labeled fire protection suitable for use where ductwork penetrates a wall or floor with a fire resistance rating of 2 hours or less. The 1270 Series is UL tested and labeled for use as a Class I or II Leakage Rated Damper for smoke control applications in both static or dynamic HVAC system designs. Available with factory fitted sleeve (Model 1271), and a variety of actuators and options to suit each application, the 1270 series is a versatile and economical performer suitable for most commercial applications.

Model 1270

Model 1271G

MODEL 1271G (1 1/2 HR.)
VEE GROOVE BLADE • GRILLE MOUNT

Model 1271G is a combination fire/smoke damper specifically designed for supply or return ducts that terminate at a grille. The sleeve with unique 3/4" (19) grille mounting tabs simplifies installation, saves on field labor and eliminates the requirements for unsightly front retaining angles which commonly protrude from behind the grille. A steel grille installs over and completely hides the mounting tabs. The damper is offset in the sleeve to accommodate a single or double deflection supply air grille, single deflection supply air register or a return air grille or register.

MODEL SERIES 1220M (1 1/2 HR.) AND 1220M-3 (3 HR.)
AIRFOIL BLADE • MODULATING

Model Series 1220M and 1220M-3 "3-in-1" Modulating Fire/Smoke Dampers have been engineered to provide premium containment in fire and smoke conditions with the addition of volume control via a modulating electric or pneumatic actuator that eliminates the need and cost of a separate control damper. Classified for use as a volume control damper in applications where building codes require both a fire damper for the protection of ductwork penetrations in walls or floors and a leakage rated damper for operational smoke control in static or dynamic smoke management systems.

Model 1221M

MODEL 1221-DOW (1 1/2 HR.)
AIRFOIL BLADE • OUT OF WALL DUCTED BOTH SIDES

The Model 1221-DOW combination fire/smoke damper is specially designed for "out of wall" (vertical mount) or "out of floor" (horizontal mount) through penetration applications (ductwork is connected to both sides) where the damper cannot be installed within the plane of the wall or floor. It is ideal for applications where building codes require both a fire damper for the protection of ductwork penetrations in walls or floors that have a fire resistance rating of up to 2 hours and also require a leakage rated damper for operational smoke control in static or dynamic smoke management systems.

Model 1221-DOW

Model 1221-OW

MODEL 1221-OW (1 1/2 HR.)
AIRFOIL BLADE • OUT OF WALL GRILLE MOUNT

Model 1221-OW is an "out of wall" high performance combination fire/smoke damper specifically designed for supply or return ducts that terminate at a grille. The design allows for through the grille access to the damper, actuator and other components. It features Nailor's unique inter-locking double skin airfoil blade design that eliminates combustible seals and provides flame and smoke seal under fire conditions at temperatures up to 2000°F (1093°C)!

MODEL SERIES 1221C (1 HR. AND 1 1/2 HR.)
TUNNEL CORRIDOR DAMPER
AIRFOIL BLADE

Models 1221C-1 and 1221C-2 Airfoil Blade Tunnel Corridor Combination Fire/Smoke Dampers are for use where ductwork penetrates the ceiling of an interior corridor of a building, creating a horizontal opening that requires protection. Model 1221C-1 is suitable for use with a steel grille or diffuser when the duct terminates at the ceiling. Model 1221C-2 is suitable for use when the duct is required to continue down past the ceiling level. Each unit is supplied factory mounted in a suitable sleeve complete with upper retaining angles. Model 1221C-3 is both a 1 hr. rated Corridor Damper for use in corridor ceilings and a standard 1 1/2 hr. rated Combination Fire/Smoke Damper for use in walls and floors. The dual rating makes it ideal for stocking as the unit can be supplied when either type of damper is required by the local customer.

Model 1221C-1

Model 1271C-1

MODEL SERIES 1271C (1 HR. AND 1 1/2 HR.)
TUNNEL CORRIDOR DAMPER
VEE GROOVE BLADE

Models 1271C-1 and 1271C-2 Tunnel Corridor Combination Fire/Smoke Dampers are for use where ductwork penetrates the ceiling of an interior corridor of a building, creating a horizontal opening that requires protection. Model 1271C-1 is suitable for use with a steel grille or diffuser when the duct terminates at the ceiling. Model 1271C-2 is suitable for use when the duct is required to continue down past the ceiling level. Each unit is supplied factory mounted in a suitable sleeve complete with upper retaining angles. Model 1271C-3 is both a 1 hr. rated corridor damper for use in corridor ceilings and a standard 1 1/2 hr. rated combination fire/smoke damper for use in walls and floors. The dual rating makes it ideal for stocking as the unit can be supplied when either type of damper is required by the local customer.

MODEL SERIES 1220SS (1 1/2 HR.) AND 1220SS-3 (3 HR.)
AIRFOIL BLADE • STAINLESS STEEL

Model Series 1220SS and 1220SS-3 Combination Fire/Smoke Dampers are ideal for high humidity, mildly corrosive environment applications where building codes require both a fire damper for the protection of ductwork penetrations in walls and a leakage rated damper for operational smoke control on static or dynamic smoke management systems. Features include an airfoil blade, low pressure drop frame design, and maintenance free concealed blade linkage for superb air performance and minimal turbulence and noise. Optional Type 316 Stainless Steel construction is available for more severe environment applications.

Model 1221SS

Model 1290FS

MODEL 1290FS (1 1/2 HR.)
TRUE ROUND

Nailor's True Round Combination Fire/Smoke Damper, Model 1290FS, is ideal for round duct applications where building codes require both a fire damper for the protection of ductwork penetrations in walls or floor that have a fire resistance rating of up to 2 hours and a leakage rated damper for operational smoke control on static or dynamic smoke management systems.

Model 1290FS is an economical round combination fire/smoke damper designed and qualified for round ductwork passing through metal drywall partitions or masonry walls. Features of the damper include a sturdy beaded casing for superior rigidity and factory supplied retaining plates for fast, secure installation. The 1290FS offers the lowest leakage class available, Leakage Class I or II at 250°F (121°C) or 350°F (177°C), and is approved for vertical or horizontal installation.

MODEL 1290FS-SS (1 1/2 HR.)
TRUE ROUND • STAINLESS STEEL

Nailor's True Round Combination Fire/Smoke Damper, Model 1290FS-SS, is ideal for mildly corrosive environment round duct applications where building codes require both a fire damper for the protection of ductwork penetrations in walls or floor that have a fire resistance rating of up to 2 hours and a leakage rated damper for operational smoke control on static or dynamic smoke management systems.

Features of the damper include an industry proven over-center knee lock design with high torque spring/fusible link closure, a sturdy beaded casing for superior rigidity and factory supplied retaining plates for fast, secure installation. The 1290FS-SS offers the lowest leakage class available, Leakage Class I or II at 250°F (121°C) or 350°F (177°C), and is approved for vertical or horizontal installation. Optional Type 316 stainless steel construction available for more severe environment applications.

Model 1290FS-SS

WHEN IT COMES TO FIRE / SMOKE DAMPERS, NAILOR'S 1220 SERIES 'THE WALL' PROVIDES THE ULTIMATE CLOSURE!

'THE WALL' PRINCIPLE:

Most fire/smoke damper manufacturers commonly incorporate a synthetic blade-to-blade seal in order to maintain their leakage class under elevated temperature conditions – the smoke control mode.

The weakness in using a synthetic blade seal is that when the damper is subjected to fire conditions, these combustible seals burn out, allowing significant leakage! In fact, UL 555 Standard permits gaps between the damper blades of up to 3/4" (19) during the fire test, thus allowing significant quantities of smoke to pass through a closed damper under fire conditions.

Nailor's Model Series 1220 and 1220-3, known as **"The Wall"**, provides an innovative inter-locking double-skin airfoil blade which eliminates the need for blade seals and maintains a complete barrier throughout the fire test with absolutely no visible gaps.

When this design was tested to ISO Standard 10294-1, it maintained its cold leakage rating throughout a 4 hour fire test at temperatures up to 2000°F (1093°C)! **Amazingly, "The Wall" gets tighter as it gets hotter!**

THE LARGEST UL LISTING IN THE INDUSTRY!

Photograph of actual UL 555 fire test conducted successfully at Underwriters Laboratories Inc., Northbrook Illinois. The largest multi-blade fire damper listing established to date.

The 1220 and 1220-3 Series Dampers are ideal for applications where building codes require both a fire damper for the protection of ductwork penetrations in walls or floors that have a fire resistance rating of up to 4 hours and also require a leakage rated damper for operational smoke control in static or dynamic smoke management systems.

The 1220 and 1220-3 Series have been designed and tested to offer premium performance with the lowest leakage class available and a low pressure drop well suited to the majority of commercial applications.

FEATURES:

- Airfoil blade, double-skin design, provides extremely low pressure drop for optimal system performance.
- Unique interlocking blade design eliminates the need for combustible synthetic blade seals, maintaining leakage class under fire conditions.
- Largest UL listing in the industry at 96 sq. ft. (8.9 sq. m) eliminates the need for costly mullions in most applications.
- Heat responsive device provides controlled closure by the actuator, eliminating instantaneous damper closure that can damage ductwork.
- Out of airstream linkage is maintenance free and prevents unwanted turbulence and noise.
- Each blade includes "no-slip" double bolting onto the axle to provide positive locking connection.
- Rugged hat channel frame design is reinforced with die-formed corner gussets for superior strength.

OPTIONS:

- Factory supplied sleeve: Available from 10 to 20 ga. (3.5 to 1.0) and in various lengths to suit wall/floor thickness.

  Sleeve and damper are caulked at the factory to help ensure field compliance with UL installation requirements and to meet UL leakage performance.

  Standard sleeve is 16" x 20 ga. (406 x 1.0) for dampers up to 84" (2134) in width and 18 ga. (1.2) for wider assemblies in accordance with SMACNA requirements for duct construction.
- A comprehensive range of UL qualified electric or pneumatic actuators.
- MLS-300 Position Indicator Switchpack: Provides the ability to remotely indicate damper blade position.
- DTO Dual Temperature Override Sensor (MLS-400): A reopenable control system which provides the ability to override fire induced closure from a remote fire control station and permit controlled operation in a dynamic smoke management system.
- 'Quick-set' Retaining Angles: Completes the installation package. Sized to fit and shipped with each damper.

- PREMIUM PERFORMANCE
- AMCA LICENSED
- CLASS I OR II LEAKAGE @ 250°F OR 350°F
- UL 555 CLASSIFIED DYNAMIC FIRE DAMPER
- UL 555S CLASSIFIED SMOKE DAMPER

Model Series:

1220 **1 1/2 Hour Label**

1220-3 **3 Hour Label**

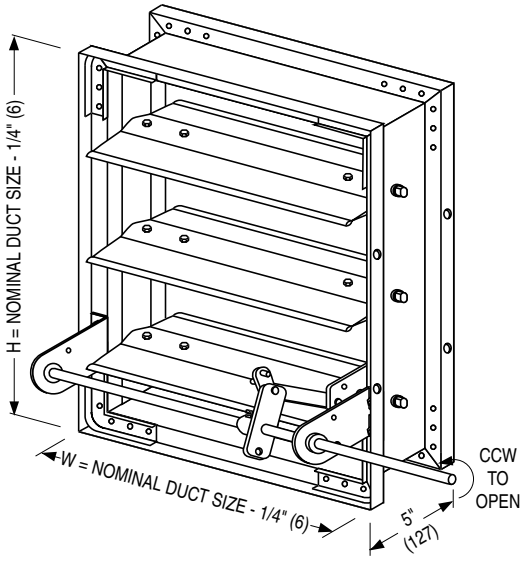
Model 1221

Model Series 1220 and 1220-3 Combination Fire/Smoke Dampers provide the ultimate in fire containment and smoke control for both static and dynamic smoke management systems. These dampers utilize an innovative inter-locking double-skin airfoil blade design that provides a flame and smoke seal, eliminating the need for synthetic blade seals which burn out during fire conditions, and maintains its leakage class up to 2000°F (1093°C) - a feature no other fire/smoke damper in the industry can offer!

Ideal for use where building codes require both a fire damper to protect ductwork penetrations in fire separations and a leakage rated damper for use in smoke management systems, available with Leakage Class I or II at 250°F (121°C) or 350°F (177°C). Qualified for installation with airflow in either direction and inverted mounting. Standard dynamic velocity/pressure rating of 2000 fpm @ 4" w.g., these models are also tested with extended ratings up to 4000 fpm @ 8" w.g. for stringent applications. Model Series 1220 and 1220-3 have been designed and tested to provide premium performance and are AMCA licensed. Features include an airfoil blade, low pressure drop frame design, and maintenance free concealed blade linkage for superb air performance and minimal turbulence and noise. Rugged hat channel frame with mitered corners is reinforced with die-formed corner gussets for superior strength.

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 hr. or 3 hr. Label (File # R9492).**
- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I or II at 250°F or 350°F elevated temperature.**
- **Meets NFPA 80, 90A, 92, 101 and 105 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0106.**
- **British/European Standards 10294 and 1366. ISO Standard 10294. Fire Dampers. 4 hr. fire test. Classification ES 240.**
- **Maximum velocity: Up to 4000 fpm @ 8" w.g. (20 m/s @ 2 kPa).**



MODEL 1220 1 1/2 HOUR LABEL
MODEL 1220-3 3 HOUR LABEL
(Side Mounting Plate/Sleeve not shown)

STANDARD CONSTRUCTION:

Frame:	5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.
Blades:	14 ga. (2.0) equivalent galvanized steel formed airfoil on 5 1/2" (140) centers. Opposed action.
Linkage:	Concealed in frame. 12 ga. (2.7) plated steel.
Bearings:	1/2" (13) dia. self-lubricating oilite bronze.
Axles:	1/2" (13) dia. plated steel double bolted to blades.
Jackshaft:	1/2" (13) dia. cadmium plated steel.
Jamb Seals:	Stainless steel.

Heat Responsive Device (Controlled Closure):
ERL (Electric Resettable Link) is standard on dampers with electric actuators: 250°F (121°C) standard. 165°F (74°C), 212°F (100°C) and 350°F (177°C) available.
PRL (Pneumatic Replaceable Link) is standard on dampers with pneumatic actuators: 212°F (100°C) standard. 165°F (74°C) and 280°F (138°C) available.

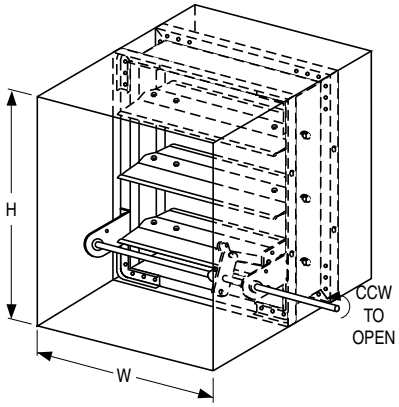
COMMON OPTIONS:

- DTS Damper Test Switch for cycle testing.
- DSDL/DSDN Duct Smoke Detectors.
- DTO Dual Temperature Override Sensor (MLS-400).
- MLS-300 Position Indicator Switch Pack.
- QS1 & QS2 "Quick-Set" Retaining Angles.
- Factory fitted sleeves in custom lengths, gauges and transition styles.

DIMENSIONAL DATA:

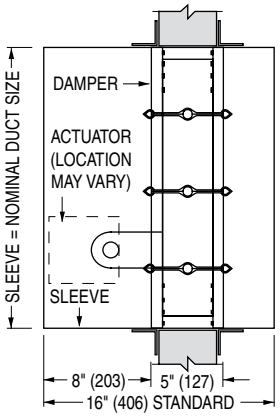
Model Series 1220 (1 1/2 Hr. Label) dampers with duct heights less than 6" (152) (8" [203] if width is over 18" [457]) require a Type 'B' sleeve enclosure (Model 1222). Model Series 1220-3 (3 Hr. Label) dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1222-3). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Models 1223 and 1223-3).

MODELS 1220, 1220-3, 1221 AND 1221-3: TYPE A SLEEVE



Models 1220 (no sleeve), 1221, 1220-3 (no sleeve) and 1221-3 Sizes (Duct W x H):

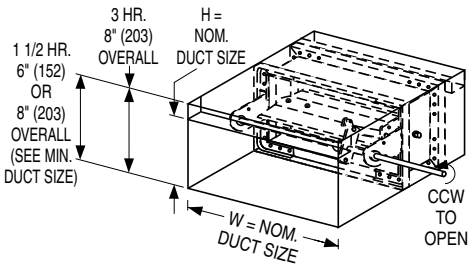
Model	Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum			
			Single Section	Single Section		Multiple Section	
			Vertical/Horizontal	Vertical	Horizontal	Vertical	Horizontal
Model 1220	24, 34, 36, 46	250/350	8" x 8" (203 x 203). 6" x 6" (152 x 152) with low profile frame (maximum size is 18" x 6" [457 x 152]).	36" x 48" (914 x 1219)	32" x 48" (813 x 1219)	144" x 96" (3658 x 2438)	128" x 96" (3251 x 2438)
Model 1221	48	250		36" x 48" (914 x 1219)	32" x 48" (813 x 1219)	144" x 96" (3658 x 2438)	128" x 96" (3251 x 2438)
	48	350		36" x 24" (914 x 610)	32" x 24" (813 x 610)	144" x 48" (3658 x 1219)	128" x 48" (3251 x 1219)
Model 1220-3	24, 34, 36, 46	250/350	8" x 8" (203 x 203).	36" x 48" (914 x 1219)	32" x 48" (813 x 1219)	120" x 96" (3048 x 2438) (maximum each section is 30" x 48" [762 x 1219]).	n/a
Model 1221-3	48	250		36" x 48" (914 x 1219)	32" x 48" (813 x 1219)	120" x 96" (3048 x 2438) (maximum each section is 30" x 48" [762 x 1219]).	n/a
	48	350		36" x 24" (914 x 610)	32" x 24" (813 x 610)	120" x 48" (3048 x 1219) (maximum each section is 30" x 24" [762 x 610]).	n/a



Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width on Models 1220 and 1221 only). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

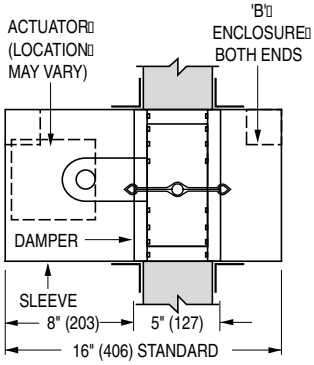
Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

MODELS 1222 AND 1222-3: TYPE B SLEEVE ENCLOSURE



Models 1222 and 1222-3 Sizes (Duct W x H):

Model	Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum			
			Single Section	Single Section		Multiple Section	
			Vertical/Horizontal	Vertical	Horizontal	Vertical	Horizontal
Model 1222	24, 34, 36, 46, 48	250/350	8" x 4" (203 x 102) Overall damper height is 8" (203); 6" (152) on duct sizes 18 x 5 1/2" (457 x 140) and under.	36" x 7 1/2" (914 x 191)	32" x 7 1/2" (813 x 191)	144" x 7 1/2" (3658 x 191)	128" x 7 1/2" (3251 x 191)
Model 1222-3	24, 34, 36, 46, 48	250/350	8" x 4" (203 x 102) (overall damper height is 8" [203]).	36" x 7 1/2" (914 x 191)	32" x 7 1/2" (813 x 191)	120" x 7 1/2" (3048 x 191) (max. each section is 30" x 7 1/2" [762 x 191]).	n/a



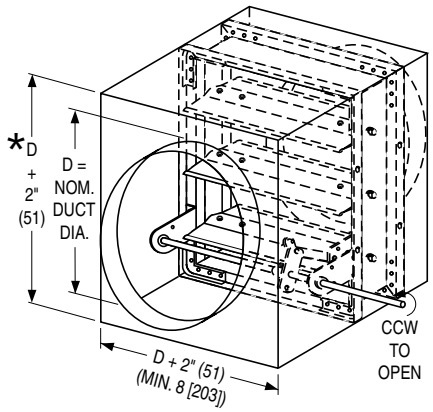
Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

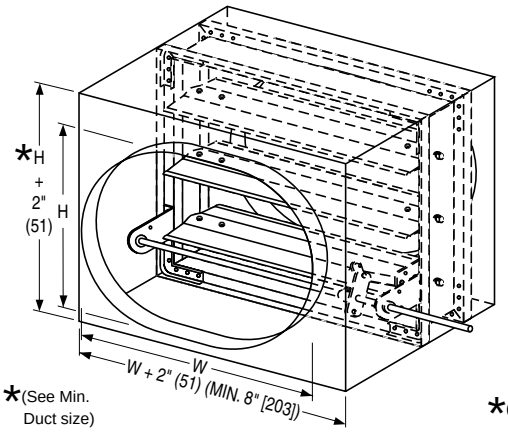
DIMENSIONAL DATA:

Model Series 1220 (1 1/2 Hr. Label) dampers with duct heights less than 6" (152) (8" [203] if width is over 18" [457]) require a Type 'B' sleeve enclosure (Model 1222). Model Series 1220-3 (3 Hr. Label) dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1222-3). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Models 1223 and 1223-3).

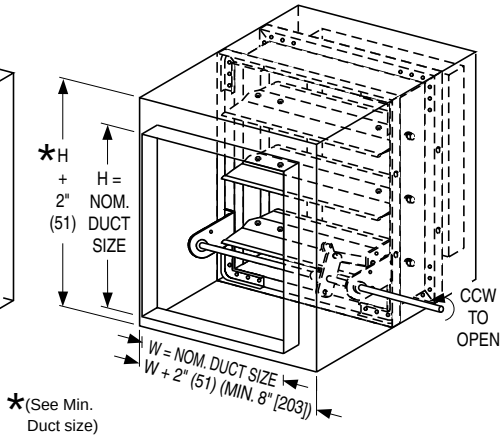
MODELS 1223 AND 1223-3: TYPE C SLEEVE ENCLOSURES



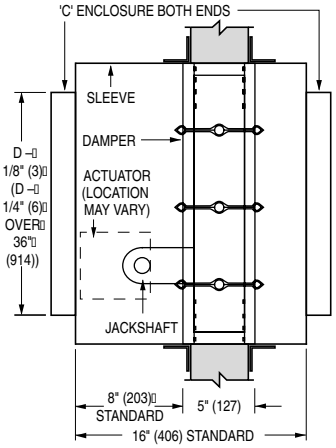
STYLE CR : FOR ROUND DUCT



STYLE CO : FOR OVAL DUCT



STYLE CSR : FOR SQUARE OR RECTANGULAR DUCT



Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width on Models 1220 and 1221 only). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Models 1223 and 1223-3 - Round Duct Connection Sizes (Duct Dia.):

Model	Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum			
			Single Section	Single Section		Multiple Section	
			Vertical/Horizontal	Vertical	Horizontal	Vertical	Horizontal
Model 1223	24, 34, 36, 46	250/350	4" (102) dia. Overall damper size is 8" x 6" (203 x 152); 8" x 8" (203 x 203) min. for duct sizes over 4" (102) dia.	34" (864) dia.	30" (762) dia.	94" (2388) dia.	94" (2388) dia.
	48	250		34" (864) dia.	30" (762) dia.	94" (2388) dia.	94" (2388) dia.
	48	350		22" (559) dia.	22" (559) dia.	46" (1168) dia.	46" (1168) dia.
Model 1223-3	24, 34, 36, 46	250/350	4" (102) dia. (overall damper size is 8" x 8" [203 x 203] min.).	34" (864) dia.	30" (762) dia.	94" (2388) dia.	n/a
	48	250		34" (864) dia.	30" (762) dia.	94" (2388) dia.	n/a
	48	350		22" (559) dia.	22" (559) dia.	46" (1168) dia.	n/a

Models 1223 and 1223-3 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):

Model	Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum			
			Single Section	Single Section		Multiple Section	
			Vertical/Horizontal	Vertical	Horizontal	Vertical	Horizontal
Model 1223	24, 34, 36, 46	250/350	4" x 4" (102 x 102). Overall damper width is 8" (203) min.; min. overall height is 6" (152) (8" [203] for duct sizes over 16" x 4" [406 x 102]).	34" x 46" (864 x 1168)	30" x 46" (762 x 1168)	142" x 94" (3607 x 2388)	126" x 94" (3200 x 2388)
	48	250		34" x 46" (864 x 1168)	30" x 46" (762 x 1168)	142" x 94" (3607 x 2388)	126" x 94" (3200 x 2388)
	48	350		34" x 22" (864 x 559)	30" x 22" (762 x 559)	142" x 46" (3607 x 1168)	126" x 46" (3200 x 1168)
Model 1223-3	24, 34, 36, 46	250/350	4" x 4" (102 x 102). (overall damper size is 8" x 8" [203 x 203] min.).	34" x 46" (864 x 1168)	30" x 46" (762 x 1168)	118" x 94" (2997 x 2388) (maximum each section is 30" x 48" [762 x 1219]).	n/a
	48	250		34" x 46" (864 x 1168)	30" x 46" (762 x 1168)	118" x 94" (2997 x 2388) (maximum each section is 30" x 48" [762 x 1219]).	n/a
	48	350		34" x 22" (864 x 559)	30" x 22" (762 x 559)	118" x 46" (2997 x 1168) (maximum each section is 30" x 24" [762 x 610]).	n/a

PERFORMANCE DATA:

MODEL SERIES: 1220 - 1 1/2 HOUR LABEL AND 1220-3 - 3 HOUR LABEL

LEAKAGE CLASS:

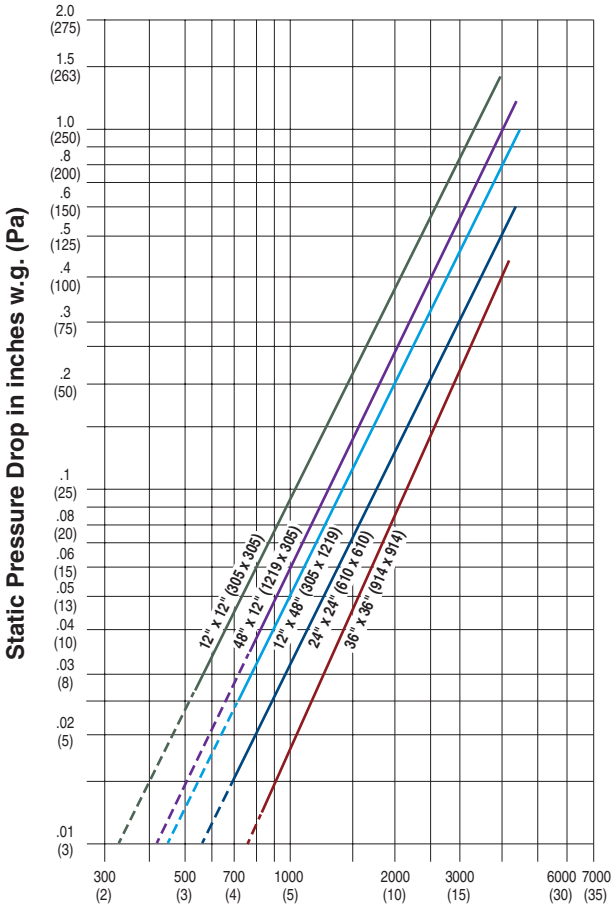
The 1220 Series Combination Fire/Smoke Damper has been designed and qualified under UL 555S in order to provide maximum system design flexibility. They are available with a Class I (currently the lowest available) or Class II leakage rating with all damper/actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C) or 350°F (177°C), dependent on actuator under airflow of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa). The 1220 Series has also qualified under extended testing up to 4000 fpm (20 m/s) and 8" w.g. (2 kPa), with some size and actuator restrictions.

The 1220-3 Series Combination Fire/Smoke Damper has been designed and qualified under UL 555S in order to provide maximum system design flexibility. They are available with a Class I (currently the lowest available) or Class II leakage rating with all damper/actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C) or 350°F (177°C), dependent on actuator under airflow of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa). The 1220-3 Series has also qualified under extended testing up to 4000 fpm (20 m/s) and 8" w.g. (2 kPa), with some size and actuator restrictions.

1220 Series - Maximum Performance Ratings	
UL 555 Fire Rating	1 1/2 Hour
UL 555S Leakage Rating	Class I
Maximum Velocity	4000 fpm (20 m/s)
Maximum Pressure	8 in. w.g. (2 kPa)
Maximum Temperature	350°F (177°C)

1220-3 Series - Maximum Performance Ratings	
UL 555 Fire Rating	3 Hour
UL 555S Leakage Rating	Class I
Maximum Velocity	4000 fpm (20 m/s)
Maximum Pressure	8 in. w.g. (2 kPa)
Maximum Temperature	350°F (177°C)

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

Nailor Industries Inc. certifies that the Models 1220 and 1220-3 Dampers shown herein are licensed to bear the AMCA seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air performance ratings only.

HOW TO ORDER

MODEL SERIES: 1220 - 1 1/2 HOUR LABEL AND 1220-3 - 3 HOUR LABEL COMBINATION FIRE/SMOKE DAMPERS

EXAMPLE: 1221 - 24X24 - V - AUTO - 120 - I - 24 - 250 - ERL - 250 - BO - SL = 16 - 20G - EXT - RH - CL - FL12 - L8

1a. **Models**
Dynamic or Static Applications
1220 Airfoil Blade, 1 1/2 Hour Label
1220-3 Airfoil Blade, 3 Hour Label

1b. **Sleeve/Enclosure Style**
(4th Digit)
0 = No Sleeve
1 = Type A Sleeve
2 = Type B Sleeve Enclosure
3 = Type C Sleeve Enclosure

2. **Duct Size**
Width x Height
inches (mm's)

3. **Mounting**
V Vertical (wall)
H Horizontal (floor)

4. **Actuator Selected By**
AUTO Least Cost (Auto-Select) (default)
BEL Belimo
HON Honeywell
SIE Siemens

5. **Power Requirement**
120 120 VAC
230 230 VAC
24 24 VAC
25 25 psi Pneumatic

6. **Leakage Rating**
I Class I (default)
II Class II

7. **Max. Velocity / Pressure Rating**
24 2000 fpm @ 4" w.g. (default)
34 3000 fpm @ 4" w.g.
36 3000 fpm @ 6" w.g.
46 4000 fpm @ 6" w.g.
48 4000 fpm @ 8" w.g.

8. **Elevated Temperature**
250 250°F (default)
350 350°F

9. **Closure Device**
ERL ERL Electric Resettable Link (default)
PRL PRL Pneumatic Link
DTO Dual Temperature Override Sensor (MLS-400)

10. **Closure Temperature**
ERL /PRL
165 165°F
212 212°F (PRL)
250 250°F (ERL only) (default)
280 280°F (PRL only)
350 350°F (ERL only)
DTO Dual Temperature Override Sensor (MLS-400)
HL 250/165°F
HIL 350/165°F

11. **Bearings**
BO Oilite Bronze (default)
BS Stainless Steel

12. **Duct Smoke Detector**
— None (default)
DSDL Low-Flow, factory mounted
DSDN No-Flow, factory mounted

13a. **Side Mounting Plate**
(No Sleeve models only)
SMP Side Mounting Plate

13b. **Sleeve Length**
SL = Specify
16" (406) standard (default)
16" – 36" (406 – 914)

14. **Sleeve Gauge**
20G 20 Ga. standard (default)
18G 18 Ga.
16G 16 Ga.
14G 14 Ga.
10G 10 Ga.

15. **Transition**
(Sleeve Type C models only)
CR Round
CO Oval
CSR Square/Rectangular

16. **Actuator Mounting**
EXT External (default)
INT Internal

17. **Actuator Location**
RH Right hand (default)
LH Left hand
MH Multi-hand

18. **Actuator Fail Position**
CL Close (default)

19. **Actuator Models**
Electric:

HL1	MS4104F	120VAC
HL2	MS8104F	24VAC
HL3	MS4604F	230VAC
HM1	MS4109F	120VAC
HM2	MS8109F	24VAC
HM3	MS4609F	230VAC
HH1	MS4120F	120VAC
HH2	MS8120F	24VAC
HH3	MS4620F	230VAC
GD2	GGD221	120VAC
GD1	GGD121	24VAC
GD3	GGD321	230VAC
FT12	FSTF120	120VAC
FT23	FSTF230	230VAC
FT24	FSTF24	24VAC
FL12	FSLF120	120VAC
FL23	FSLF230	230VAC
FL24	FSLF24	24VAC
F12	FSNF120	120VAC
F23	FSNF230	230VAC
F24	FSNF24	24VAC
FA12	FSAF120A	120VAC
FA23	FSAF230A	230VAC
FA24	FSAF24A	24VAC

Pneumatic:
296 331-2961
306 331-3060

20. **Damper Location**
L8 8" (203) from sleeve end (default)
LX Other (specify)
8" – 16" (203 – 406)

OPTIONS & ACCESSORIES:

21. **Position Indicator**
— None (default)
300 MLS-300 (4-wire)
(Included with Dual Temperature Override Sensor [DTO])

22. **EP Switch**
— None (default)
EP1 120VAC
EP2 24VAC

23. **Retaining Angles**
— None (default)
QS1 One side
QS2 Both sides (pair)

24. **TDF Flange**
— None (default)
TDF1 One end
TDF2 Both ends

25. **Damper Test Switch**
— None (default)
DTS Damper Test Switch

Notes:

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

2. ERL is standard on all dampers with electric actuators. PRL is standard on all dampers with pneumatic actuators.

An ERL or DTO (MLS-400) may be ordered on dampers with pneumatic actuators, but in addition, an EP switch (factory mounted) is required.

3. EP (electric-pneumatic) switch accessory is applicable only to pneumatic actuators and is optional (shipped loose) when PRL closure device is selected.

4. One DTO (MLS-400) or MLS-300 required per damper assembly. DTO (MLS-400) includes MLS-300 position indicator.

5. Maximum Closure Temperature allowed is equal to Damper Elevated Temperature.

HOW TO SPECIFY

MODEL SERIES: 1220 - 1 1/2 HOUR LABEL
COMBINATION FIRE/SMOKE DAMPERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Combination Fire/Smoke Dampers, as manufactured by Nailor Industries, Inc., which meet or exceed the following criteria:

Dampers shall meet the requirements of NFPA 80, 90A, 92, 101 and 105. Dampers shall be classified by Underwriter's Laboratories and labeled as a 1 1/2 hour Fire Damper under UL 555 and as a (**specifier select class)** Class I **or** Class II Smoke Damper under UL 555S at an elevated temperature of **(specifier select temperature)** 250°F (121°C) **or** 350°F (177°C) for use in dynamic or static Smoke Control Systems. Dampers shall be tested under UL 555 and UL 555S by UL to a minimum velocity/pressure rating of **(specifier to select rating)** 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa) **or** 3000 fpm @ 4" w.g. (15 m/s @ 1 kPa) **or** 4000 fpm @ 4" w.g. (20 m/s @ 1 kPa) **or** 3000 @6" w.g. (15 m/s @1.5 kPa) **or** 4000 @ 6" w.g. (20 m/s @ 1.5kPa) **or** 4000 fpm @ 8" w.g. (20 m/s @ 2 kPa).

Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent galvanized steel formed double-skin airfoil design on 5 1/2" (140) centers. Dampers shall be of opposed blade configuration with an interlocking blade design that provides complete flame and smoke seal under fire conditions at an elevated temperature of 2000°F (1093°C) when in the closed position. Dampers requiring blade seals to maintain leakage class when under elevated temperature conditions are not acceptable. Blades axles shall be 1/2" (13) dia. plated steel, double bolted at each end of blade to ensure positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream. Jamb seals shall be compression type stainless steel. Dampers shall be supplied with factory installed sleeves, length dependent on wall thickness, minimum 16" (406). Wall thickness shall be field verified by contractor. Factory sleeves shall be caulked to UL requirements and shall be 20 ga. (1.0) through 84" (2134) wide and 18 ga. (1.2) above 84" (2134) wide.

Appropriate **(specifier select)** externally **or** internally mounted **(specifier select type)** electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism; external after-market spring mechanisms are not acceptable. Each damper shall be equipped with a UL Classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over center/knee lock linkage, when the duct temperature reaches the maximum degradation temperature of the damper/actuator assembly as required by UL 555S. Closure devices that cause instantaneous closure are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.

Submitted pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Dampers must comply with the requirements of AMCA 511 Certified Ratings Program and be qualified to bear the AMCA Seal for Air Performance. Standard of acceptance shall be Nailor Industries Model Series 1220.

MODEL SERIES: 1220-3 - 3 HOUR LABEL
COMBINATION FIRE/SMOKE DAMPERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Combination Fire/Smoke Dampers as manufactured by Nailor Industries, Inc., which meet or exceed the following criteria:

Dampers shall meet the requirements of NFPA 80, 90A, 92, 101 and 105. Dampers shall be classified by Underwriter's Laboratories and labeled as a 3 hour Fire Damper under UL 555 and as a **(specifier select class)** Class I **or** Class II Smoke Damper under UL 555S at an elevated temperature of **(specifier select temperature)** 250°F (121°C) or 350°F (177°C) for use in dynamic or static Smoke Control Systems. Dampers shall be tested under UL 555 and UL 555S by UL to a minimum velocity/pressure rating of **(specifier to select rating)** 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa) **or** 3000 fpm @ 4" w.g. (15 m/s @ 1 kPa) or 4000 fpm @ 4" w.g. (20 m/s @ 1 kPa) **or** 3000 @6" w.g. (15 m/s @1.5 kPa) **or** 4000 @ 6" w.g. (20 m/s @ 1.5kPa) or 4000 fpm @ 8" w.g. (20 m/s @ 2 kPa).

Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent galvanized steel formed double-skin airfoil design on 5 1/2" (140) centers. Dampers shall be of opposed blade configuration with an interlocking blade design that provides complete flame and smoke seal under fire conditions at an elevated temperature of 2000°F (1093°C) when in the closed position. Dampers requiring blade seals to maintain leakage class when under elevated temperature conditions are not acceptable. Blade axles shall be plated steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream. Jamb seals shall be compression-type stainless steel. Dampers shall be supplied with factory installed sleeves, length dependent on wall thickness, minimum 16" (406). Wall thickness shall be field verified by contractor. Factory sleeves shall be caulked to UL requirements and shall be 20 ga. (1.0) through 84" (2134) wide and 18 ga. (1.2) above 84" (2134) wide.

Appropriate **(specifier select)** externally or internally mounted **(specifier select type)** electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism; external after-market spring mechanisms are not acceptable. Each damper shall be equipped with a UL Classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over center/knee lock linkage when the duct temperature reaches the maximum degradation temperature of the damper/actuator assembly, as required by UL 555S. Closure devices that cause instantaneous closure are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.

Submitted pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Dampers must comply with the requirements of AMCA 511 Certified Ratings Program and be qualified to bear the AMCA Seal for Air Performance. Standard of acceptance shall be Nailor Industries Model Series 1220-3.

- GRILLE MOUNTING/DAMPER RETAINING TABS
- PREMIUM PERFORMANCE
- CLASS I OR II LEAKAGE @ 250°F OR 350°F
- UL 555 CLASSIFIED DYNAMIC FIRE DAMPER
- UL 555S CLASSIFIED SMOKE DAMPER

Models:

1221G 1 1/2 Hour Label

Model 1221G

Model 1221G is a high performance combination fire/smoke damper specifically designed for supply or return ducts that terminate at a grille. The factory sleeve with unique 3/4" (19) grille mounting tabs simplifies installation, saves on field labor and eliminates the requirements for unsightly front retaining angles which commonly protrude from behind the grille. A steel grille installs over and completely hides the mounting tabs. The damper is offset in the sleeve to accommodate a single or double deflection supply air grille, single deflection supply air register or a return air grille or register. The 1221G is ideal for applications where building codes require both a fire damper for the protection of ductwork penetrations in walls or floors that have a fire resistance rating of up to 2 hours and also require a leakage rated damper for operational smoke control in static or dynamic smoke management systems. The 1221G offers premium performance with the lowest leakage class available and a low pressure drop well suited to the majority of commercial applications. Unique, inter-locking double skin blade design eliminates combustible seals and provides flame and smoke seal under fire conditions at temperatures up to 2000°F.

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 hr. Label (File # R9492).**
- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I or II at 250°F or 350°F elevated temperature.**
- **Meets NFPA 80, 90A, 92, 101 and 105 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0106.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**

STANDARD CONSTRUCTION:

Frame: 5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.

Blades: 14 ga. (2.0) equivalent galvanized steel formed airfoil on 5 1/2" (140) centers. Opposed action.

Sleeve: 16" x 20 ga. (406 x 1.0) galvanized steel with 3/4" (19) wide grille mounting tabs.

Linkage: Concealed in frame. 12 ga. (2.7) plated steel.

Bearings: 1/2" (13) dia. self-lubricating oilite bronze.

Axles: 1/2" (13) dia. plated steel double bolted to blades.

Jackshaft: 1/2" (13) dia. cadmium plated steel.

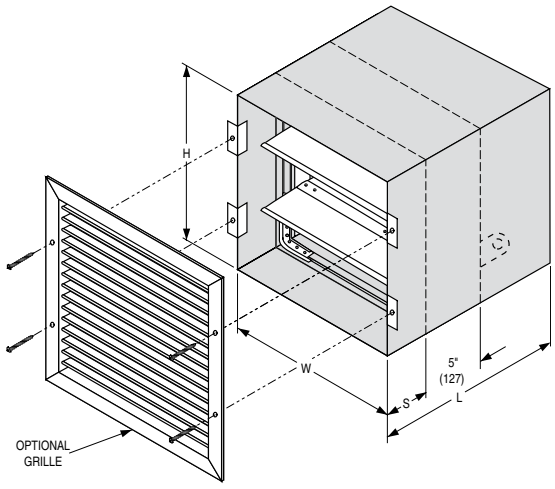
Jamb Seals: Stainless steel.

Heat Responsive Device (Controlled Closure):
ERL (Electric Resettable Link) is standard on dampers with electric actuators: 250°F (121°C) standard. 165°F (74°C), 212°F (100°C) and 350°F (177°C) available. PRL (Pneumatic Replaceable Link) is standard on dampers with pneumatic actuators: 212°F (100°C) standard. 165°F (74°C) and 280°F (138°C) available.

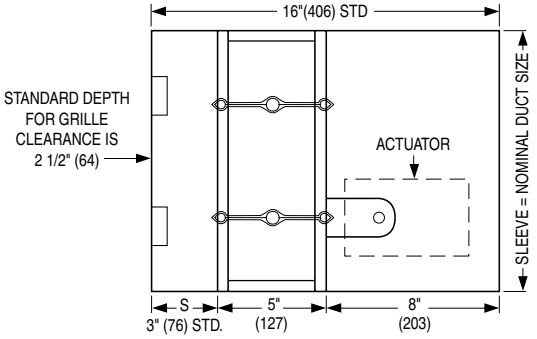
Model 1221G Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum Single Section Vertical/Horizontal	Maximum Single Section Vert./Horiz.
24	250/350	8" x 8" (203 x 203). 8" x 6" (203 x 152) with low profile frame (max. size 18" x 6" [457 x 152].	24" x 24" (610 x 610)

Note: Minimum 6 1/2" (165) wall thickness is required for this installation. Contact factory for non-standard applications.



MODEL 1221G 1 1/2 HOUR LABEL



Note: Standard sleeve is 16" (406) long x 20 ga. (1.0), provides a grille clearance depth of 2 1/2" (64), and requires a minimum wall thickness of 6 1/2" (165) (closed damper blades must remain within the plane of the wall/floor). Damper position 'S' may be reduced to accommodate a thinner wall but grille clearance will reduce accordingly.

PERFORMANCE DATA:

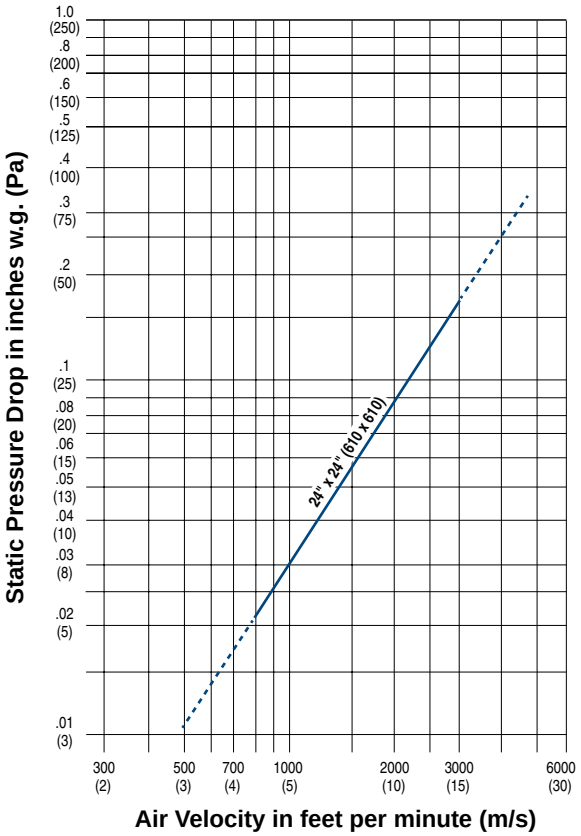
MODEL: 1221G - 1 1/2 HOUR LABEL

LEAKAGE CLASS:

Model 1221G Combination Fire/Smoke Damper for Grilles has been designed and qualified under UL 555S in order to provide maximum system design flexibility. They are available with a Class I (currently the lowest available) or Class II leakage rating with all damper/actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C) or 350°F (177°C), dependent on actuator, under airflow of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).

1221G Series - Maximum Performance Ratings	
UL 555 Fire Rating	1 1/2 Hour
UL 555S Leakage Rating	Class I
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)
Maximum Temperature	350°F (177°C)

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.2.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

HOW TO ORDER

MODEL: 1221G - 1 1/2 HOUR LABEL

COMBINATION FIRE/SMOKE DAMPER FOR GRILLES

EXAMPLE: 1221G - 24X24 - V - AUTO - 120 - I - 24 - 250 - ERL - 250 - BO - SL = 16 - 20G - EXT - RH - CL - FL12 - L8

1a. **Model**
Dynamic or Static Applications
1221G Grille Mount, Airfoil Blade, 1 1/2 Hour Label

1b. **Sleeve/Enclosure Style (4th Digit)**
1 = Type A Sleeve

2. **Duct Size**
Width x Height
inches (mm's)

3. **Mounting**
V Vertical (wall)
H Horizontal (floor)

4. **Actuator Selected By**
AUTO Least Cost (Auto-Select) (default)
BEL Belimo
HON Honeywell
SIE Siemens

5. **Power Requirement**
120 120 VAC (default)
230 230 VAC
24 24 VAC
25 25 psi Pneumatic

6. **Leakage Rating**
I Class I (default)
II Class II

7. **Max. Velocity/Pressure Rating**
24 2000 fpm @ 4" w.g. (default)

8. **Elevated Temperature**
250 250°F (default)
350 350°F

9. **Closure Device**
ERL ERL Electric Resettable Link (default)
PRL PRL Pneumatic Link
DTO Dual Temperature Override Sensor (MLS-400)

10. **Closure Temperature**
ERL/PRL
165 165°F
212 212°F (PRL)
250 250°F (ERL only) (default)
280 280°F (PRL only)
350 350°F (ERL only)
DTO Dual Temperature Override Sensor (MLS-400)
HL 250/165°F
HIL 350/165°F

11. **Bearings**
BO Oilite Bronze (default)
BS Stainless Steel

12. **Duct Smoke Detector**
— None (default)
DSDL Low-Flow, factory mounted
DSDN No-Flow, factory mounted

13. **Sleeve Length**
SL = Specify
16" (406) standard (default)
16" – 36" (406 – 914)

14. **Sleeve Gauge**
20G 20 Ga. standard (default)
18G 18 Ga.
16G 16 Ga.
14G 14 Ga.
10G 10 Ga.

15. **Actuator Mounting**
EXT External (default)
INT Internal

16. **Actuator Location**
RH Right hand (default)
LH Left hand
MH Multi-hand

17. **Actuator Fail Position**
CL Close (default)

18. **Actuator Models**
Electric:

HL1	MS4104F	120VAC
HL2	MS8104F	24VAC
HL3	MS4604F	230VAC
HM1	MS4109F	120VAC
HM2	MS8109F	24VAC
HM3	MS4609F	230VAC
HH1	MS4120F	120VAC
HH2	MS8120F	24VAC
HH3	MS4620F	230VAC
GD2	GGD221	120VAC
GD1	GGD121	24VAC
GD3	GGD321	230VAC
FT12	FSTF120	120VAC
FT23	FSTF230	230VAC
FT24	FSTF24	24VAC
FL12	FSLF120	120VAC
FL23	FSLF230	230VAC
FL24	FSLF24	24VAC
F12	FSNF120	120VAC
F23	FSNF230	230VAC
F24	FSNF24	24VAC
FA12	FSAF120A	120VAC
FA23	FSAF230A	230VAC
FA24	FSAF24A	24VAC

Pneumatic:
296 331-2961
306 331-3060

19. **Damper Location**
L8 8" (203) from sleeve end (default)
8" – 16" (203 – 406)

OPTIONS & ACCESSORIES:

20. **Position Indicator**
— None (default)
300 MLS-300 (4-wire)
(Included with Dual Temperature Override Sensor [DTO])

21. **EP Switch**
— None (default)
EP1 120 VAC
EP2 24 VAC

22. **Retaining Angles**
— None (default)
QS1 One side

23. **TDF Flange**
— None (default)
TDF1 One end

24. **Damper Test Switch**
— None (default)
DTS Damper Test Switch

Notes:

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

2. ERL is standard on all dampers with electric actuators. PRL is standard on all dampers with pneumatic actuators.

An ERL or DTO (MLS-400) may be ordered on dampers with pneumatic actuators, but in addition, an EP switch (factory mounted) is required.

3. EP (electric-pneumatic) switch accessory is applicable only to pneumatic actuators and is optional (shipped loose) when PRL closure device is selected.

4. One DTO (MLS-400) or MLS-300 required per damper assembly. DTO (MLS-400) includes MLS-300 position indicator.

5. Maximum Closure Temperature allowed is equal to Damper Elevated Temperature.

HOW TO SPECIFY

MODEL SERIES: 1221G - 1 1/2 HOUR LABEL
COMBINATION FIRE / SMOKE DAMPERS FOR GRILLES

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Combination Fire/Smoke Dampers approved for use with grilles where ductwork design penetrates and terminates at a fire separation, as manufactured by Nailor Industries, Inc., which meet or exceed the following criteria: Dampers shall meet the requirements of NFPA 80, 90A, 92, 101 and 105. Dampers shall be classified by Underwriter's Laboratories and labeled as 1 1/2 hour Dynamic Fire Damper under UL 555 and as a (**specifier select class**) Class I **or** Class II Smoke Damper under UL 555S at an elevated temperature of (**specifier select temperature**) 250°F (121°C) **or** 350°F (177°C) for use in dynamic or static Smoke Control Systems. Dampers shall be tested under UL 555 and UL 555S by UL to a minimum velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).

Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent galvanized steel formed double-skin airfoil design on 5 1/2" (140) centers. Dampers shall be of opposed blade configuration with an interlocking blade design that provides complete flame and smoke seal under fire conditions at an elevated temperature of 2000°F (1093°C) when in the closed position. Dampers requiring blade seals to maintain leakage class when under elevated temperature conditions are not acceptable. Blade axles shall be plated steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero maintenance, concealed in frame, out of airstream. Jamb seals shall be compression-type stainless steel. Dampers shall be supplied with 16" (406) long factory installed sleeves, length dependent on wall thickness, minimum 16" (406). Wall thickness shall be field verified by contractor. Sleeves shall be caulked to UL requirements and shall be 20 ga. (1.0) galvanized steel with 3/4" (19) wide Nailor grille concealed mounting tabs on one end.

Appropriate (**specifier select**) externally **or** internally mounted (**specifier select type**) electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism; external after-market spring mechanisms are not acceptable. Each damper shall be equipped with a UL Classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over center/knee lock linkage when the duct temperature reaches the maximum degradation temperature of the damper/actuator assembly, as required by UL 555S. Closure devices that cause instantaneous closure are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.

Damper manufacturer shall submit pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries Model 1221G.

- VERTICAL BLADES & BOTTOM MOUNT ACTUATOR
- PREMIUM PERFORMANCE
- CLASS I OR II LEAKAGE @ 250°F
- UL 555 CLASSIFIED DYNAMIC FIRE DAMPER
- UL 555S CLASSIFIED SMOKE DAMPER

Model 1221VB

Model Series:

1220VB 1 1/2 Hour Label

Model 1221VB is a high performance vertical blade combination fire/smoke damper that provides superior protection and versatility. The vertical blade configuration allows for the actuator to be mounted below the damper and is ideal for installations where bottom access is desired or where there is not enough space for a side mounted actuator. The 1221VB Series dampers are ideal for applications where building codes require both a fire damper for the protection of ductwork penetrations in walls that have a fire resistance rating of up to 2 hours and also require a leakage rated damper for operational smoke control in static or dynamic smoke management systems. The 1221VB Series has been especially designed and tested to provide premium performance. It offers the lowest leakage class available and is qualified for installation with airflow in either direction. Airfoil blade design and elimination of blade sills provide a low pressure drop design. Unique, interlocking double skin blade design provides flame and smoke seal under fire conditions at temperatures up to 2000°F (1093°C).

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 hr. Label (File # R9492).**
- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I or II at 250°F elevated temperature.**
- **Meets NFPA 80, 90A, 92, 101 and 105 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0106.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**

STANDARD CONSTRUCTION:

Frame:	5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.
Blades:	14 ga. (2.0) equivalent galvanized steel formed airfoil on 5 1/2" (140) centers. Opposed action.
Linkage:	Concealed in frame. 12 ga. (2.7) plated steel.
Bearings:	1/2" (13) dia. self-lubricating oilite bronze.
Axles:	1/2" (13) dia. plated steel double bolted to blades.
Jackshaft:	1/2" (13) dia. cadmium plated steel.
Jamb Seals:	Stainless steel.

Heat Responsive Device (Controlled Closure):
ERL (Electric Resettable Link) is standard on dampers with electric actuators: 250°F (121°C) standard. 165°F (74°C) and 212°F (100°C) available.

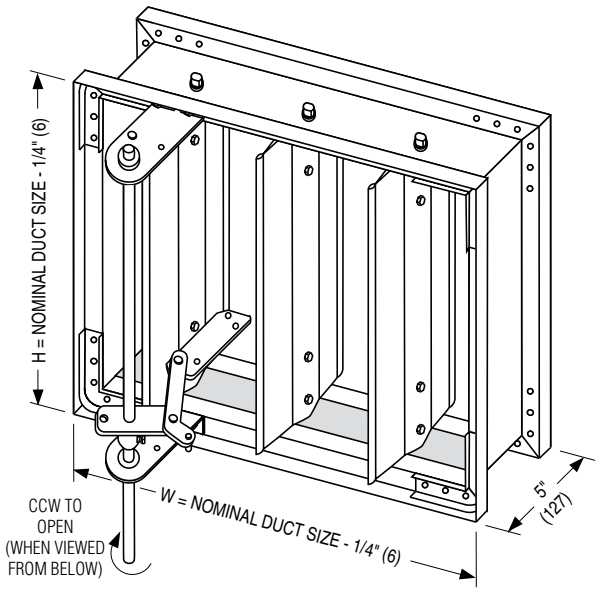
Model 1221VB Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum Single Section Vertical	Maximum Single Section Vertical
24	250	8" x 8" (203 x 203)	48" x 36" (1219 x 914)

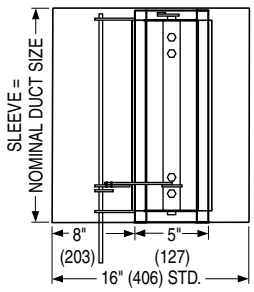
Notes:
1. Dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1222VB). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1223VB).
2. Multiple section assemblies are not permitted.

COMMON OPTIONS:

- DTS Damper Test Switch for cycle testing.
- DSDL/DSDN Duct Smoke Detectors.
- DTO Dual Temperature Override Sensor (MLS-400).
- MLS-300 Position Indicator Switch Pack.
- QS1 & QS2 "Quick-Set" Retaining Angles.
- Factory fitted sleeves in custom lengths, gauges and transition styles.



MODEL 1221VB 1 1/2 HOUR LABEL
(Sleeve not shown)



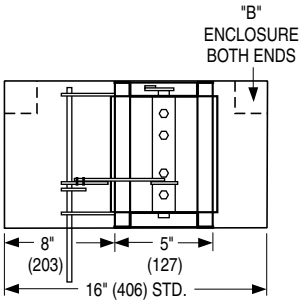
MODEL 1221VB: TYPE A SLEEVE

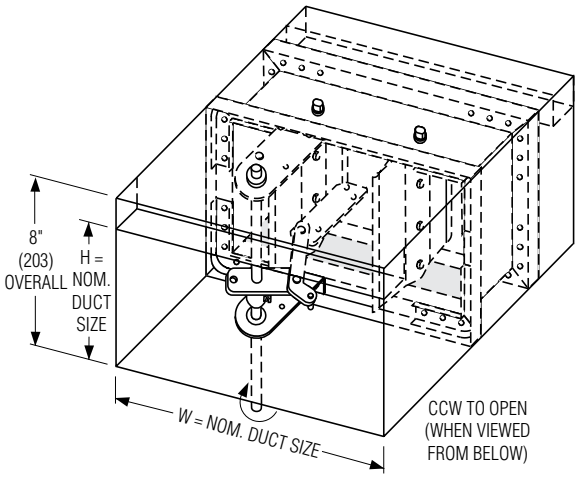
Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

DIMENSIONAL DATA:

Model Series 1221VB (1 1/2 Hr. Label) dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1222VB). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1223VB).

MODEL 1222VB: TYPE B SLEEVE ENCLOSURE





Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

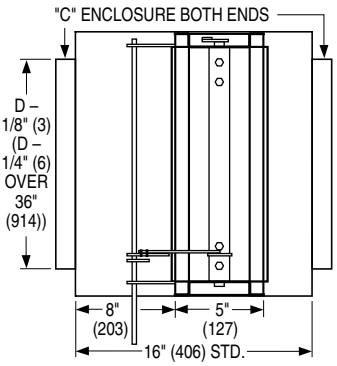
Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

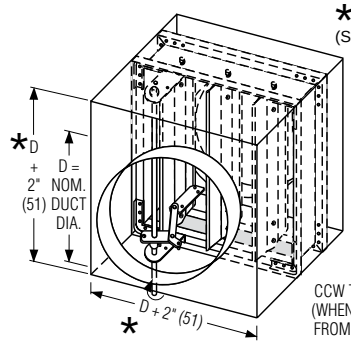
Model 1222VB Sizes (Duct W x H):

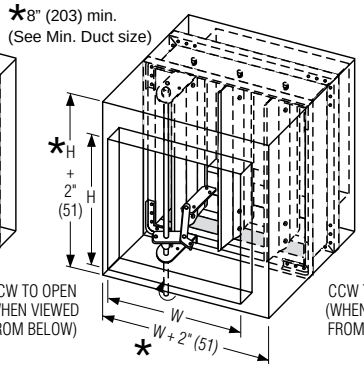
Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum
		Single Section	Single Section
		Vertical	Vertical
24	250	8" x 4" (203 x 102) (overall damper height is 8" [203]).	48" x 7 1/2" (1219 x 191)

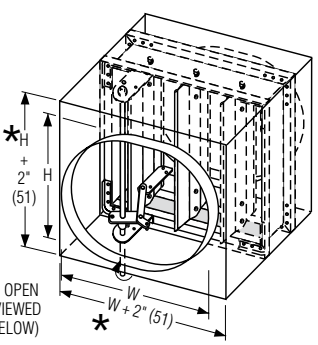
Note: Multiple section assemblies are not permitted.

MODEL 1223VB: TYPE C SLEEVE ENCLOSURES









STYLE CR : FOR ROUND DUCT

STYLE CO : FOR OVAL DUCT

STYLE CSR : FOR SQUARE OR RECTANGULAR DUCT

Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Model 1223VB - Round Duct Connection Sizes (Duct Dia.):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum
		Single Section	Single Section
		Vertical	Vertical
24	250	4" (102) dia. (overall damper size is 8" x 8" [203 x 203]).	34" (864) dia.

Note: Multiple section assemblies are not permitted.

Model 1223VB - Sq., Rec. or Oval Duct Connection Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum
		Single Section	Single Section
		Vertical	Vertical
24	250	4" x 4" (102 x 102) (overall damper size is 8" x 8" [203 x 203] min.).	46" x 34" (1168 x 864)

Note: Multiple section assemblies are not permitted.

HOW TO SPECIFY OR TO ORDER

MODEL SERIES: 1221VB - 1 1/2 HOUR LABEL

VERTICAL BLADE COMBINATION FIRE/SMOKE DAMPERS

EXAMPLE: 1221VB - 24X24 - V - AUTO - 120 - I - 24 - 250 - ERL - 250 - BO - SL = 16 - 20G - EXT - BM - CL - HH1 - L8

1a. **Model**
Dynamic or Static Applications
1220VB Vertical, Airfoil Blade, 1 1/2 Hour Label

1b. **Sleeve/Enclosure Style (4th Digit)**
1 = Type A Sleeve
2 = Type B Sleeve Enclosure
3 = Type C Sleeve Enclosure

2. **Duct Size**
Width x Height
inches (mm's)

3. **Mounting**
V Vertical (wall) (default)

4. **Actuator Selected By**
AUTO Least Cost (Auto-Select) (default)

5. **Power Requirement**
120 120 VAC (default)
230 230 VAC
24 24 VAC

6. **Leakage Rating**
I Class I (default)
II Class II

7. **Max. Velocity/Pressure Rating**
24 2000 fpm @ 4" w.g. (default)

8. **Elevated Temperature**
250 250°F (default)

9. **Closure Device**
ERL ERL Electric Resettable Link (default)
DTO Dual Temperature Override Sensor (MLS-400)

10. **Closure Temperature**
ERL
165 165°F
250 250°F (ERL only) (default)
DTO Dual Temperature Override Sensor (MLS-400)
HL 250/165°F

11. **Bearings**
BO Oilite Bronze (default)
BS Stainless Steel

12. **Duct Smoke Detector**
— None (default)
DSDL Low-Flow, factory mounted
DSDN No-Flow, factory mounted

13. **Sleeve Length**
SL = Specify
16" (406) standard (default)
16" – 36" (406 – 914)

14. **Sleeve Gauge**
20G 20 Ga. standard (default)
18G 18 Ga.
16G 16 Ga.
14G 14 Ga.
10G 10 Ga.

15. **Transition**
(Sleeve Type C models only)
CR Round
CO Oval
CSR Square/Rectangular

16. **Actuator Mounting**
EXT External (default)

17. **Actuator Location**
RH Right hand (default)
LH Left hand
MH Multi-hand
BM Bottom mount, ext. (1221VB only)

18. **Actuator Fail Position**
CL Close (default)

19. **Actuator Models**
Electric:
HM1 MS4109F 120VAC
HM2 MS8109F 24VAC
HM3 MS4609F 230VAC
HH1 MS4120F 120VAC
HH2 MS8120F 24VAC
HH3 MS4620F 230VAC

20. **Damper Location**
L8 8" (203) from sleeve end
LX Other (specify)
8" – 16" (203 – 406)

OTHER OPTIONS & ACCESSORIES:

21. **Position Indicator**
— None (default)
300 MLS-300 (4-wire)
(Included with Dual Temperature Override Sensor [DTO])

22. **Retaining Angles**
— None (default)
QS1 One side
QS2 Both sides (pair)

23. **TDF Flange**
— None (default)
TDF1 One end
TDF2 Both ends

24. **Damper Test Switch**
— None (default)
DTS Damper Test Switch

Notes:

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

2. ERL is standard on all dampers with electric actuators.

3. One DTO (MLS-400) or MLS-300 required per damper assembly. DTO (MLS-400) includes MLS-300 position indicator.

4. Maximum Closure Temperature allowed is equal to Damper Elevated Temperature.

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Vertical Blade Combination Fire/Smoke Dampers, as manufactured by Nailor Industries, Inc., which meet or exceed the following criteria:

Dampers shall meet the requirements of NFPA 80, 90A, 92, 101 and 105. Dampers shall be classified by Underwriter's Laboratories and labeled as a 1 1/2 Fire Damper under UL 555 and as a (**specifier select class**) Class I **or** Class II Smoke Damper under UL 555S at an elevated temperature of 250°F (121°C) for use in dynamic or static Smoke Control Systems. Dampers shall be tested under UL 555 and UL 555S by UL to a minimum velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).

Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent galvanized steel formed double-skin airfoil design on 5 1/2" (140) centers and shall be oriented vertically to allow for bottom mount actuators. Dampers shall be of opposed blade configuration with an interlocking blade design that provides complete flame and smoke seal under fire conditions at an elevated temperature of 2000°F (1093°C) when in the closed position. Dampers requiring blade seals to maintain leakage class when under elevated temperature conditions are not acceptable. Blade axles shall be plated steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream. Jamb seals shall be compression-type stainless steel. Dampers shall be supplied with factory installed sleeves, length dependent on wall thickness, minimum 16" (406). Wall thickness shall be field verified by contractor. Factory sleeves shall be caulked to UL requirements and shall be min. 20 ga. (1.0).

Appropriate externally mounted electric actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism; external after-market spring mechanisms are not acceptable. Each damper shall be equipped with a UL Classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over center/knee lock linkage when the duct temperature reaches the maximum degradation temperature of the damper/actuator assembly, as required by UL 555S. Closure devices that cause instantaneous closure are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.

Submitted pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries Model 1221VB.

- STANDARD PERFORMANCE
- CLASS I OR II LEAKAGE @ 250°F
- UL 555 CLASSIFIED DYNAMIC FIRE DAMPER
- UL 555S CLASSIFIED SMOKE DAMPER

Model Series:

1270 1 1/2 Hour Label

Model 1270

The 1270 Series dampers are ideal for applications where building codes require both a fire damper for the protection of ductwork penetrations in walls or floors that have a fire resistance rating of up to 2 hours and also require a leakage rated damper for operational smoke control in static or dynamic smoke management systems. The 1270 Series has been designed and tested to offer a rugged cost effective damper well suited to the majority of commercial applications.

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 hr. Label (File # R9492).**
- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I or II at 250°F or 350°F elevated temperature.**
- **Meets NFPA 80, 90A, 92, 101 and 105 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. 3225-0935:0106.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**

STANDARD CONSTRUCTION:

Frame:	5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.
Blades:	6" (152) wide on 5 1/2" (140) centers. 16 ga. (1.6) galvanized steel vee groove or double-skin design.
Linkage:	Concealed in frame. 12 ga. (2.7) plated steel.
Bearings:	1/2" (13) dia. self-lubricating oilite bronze.
Axles:	1/2" (13) dia. plated steel double bolted to blades.
Jackshaft:	1/2" (13) dia. cadmium plated steel.
Jamb Seals:	Stainless steel.
Blade Seals:	Silicone.

Heat Responsive Device (Controlled Closure):
ERL (Electric Resettable Link) is standard on dampers with electric actuators: 250°F (121°C) standard. 165°F (74°C), 212°F (100°C) and 350°F (177°C) available.
PRL (Pneumatic Replaceable Link) is standard on dampers with pneumatic actuators: 212°F (100°C) standard. 165°F (74°C) and 280°F (138°C) available.

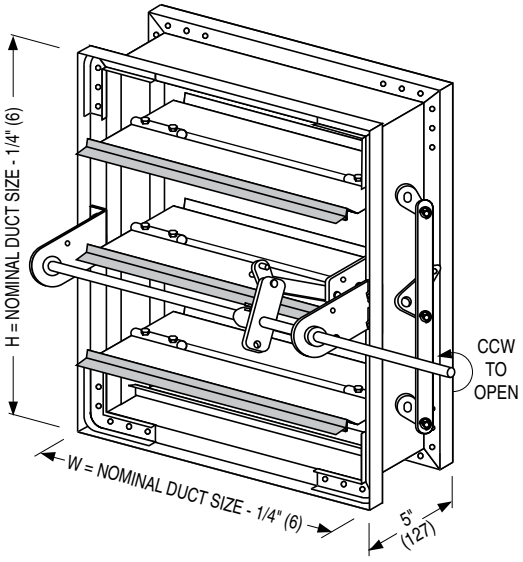
Models 1270 and 1271 Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum			
		Single Section	Single Section		Multiple Section	
		Vertical/Horizontal	Vertical	Horizontal	Vertical	Horizontal
24	250/350	8" x 8" (203 x 203).	36" x 48" (914 x 1219)	30" x 40" (762 x 1016)	72" x 48" (1829 x 1219) or 36" x 96" (914 x 2438)	60" x 40" (1524 x 1016) or 30" x 80" (762 x 2032)

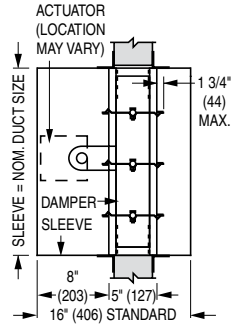
Note: Dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1272). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1273).

COMMON OPTIONS:

- DTS Damper Test Switch for cycle testing.
- DSDL/DSDN Duct Smoke Detectors.
- DTO Dual Temperature Override Sensor (MLS-400).
- MLS-300 Position Indicator Switch Pack.
- QS1 & QS2 "Quick-Set" Retaining Angles.
- Factory fitted sleeves in custom lengths, gauges and transition styles.



MODEL 1270 1 1/2 HOUR LABEL
(Side Mounting Plate/Sleeve not shown)



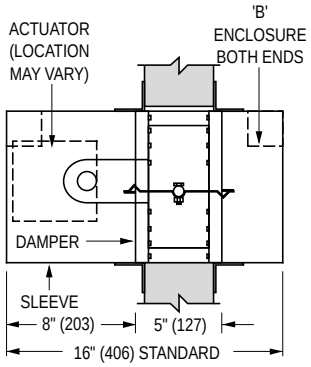
MODEL 1271: TYPE A SLEEVE

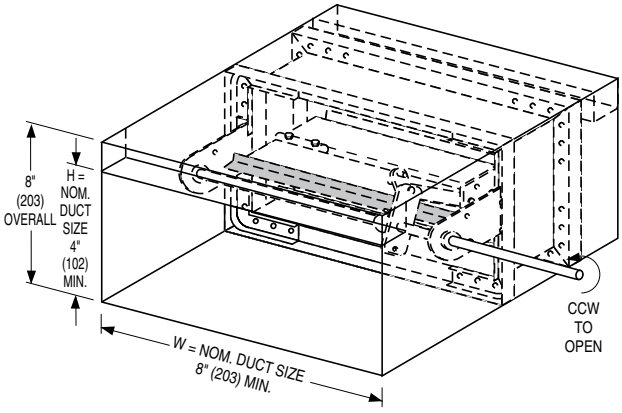
Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

DIMENSIONAL DATA:

Model Series 1270 (1 1/2 Hr. Label) dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1272). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1273).

MODEL 1272: TYPE B SLEEVE ENCLOSURE





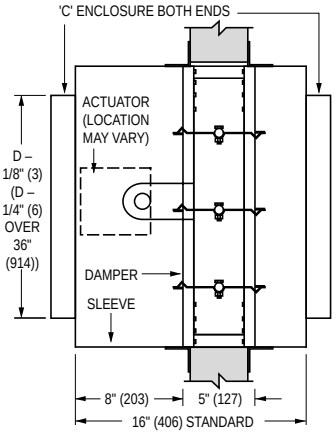
Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

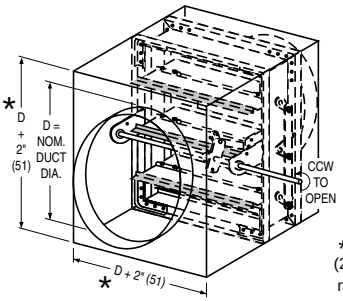
Wall Thickness	Minimum Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Model 1272 Sizes (Duct W x H):

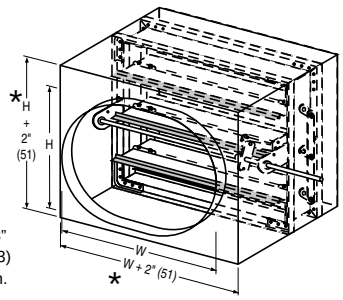
Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum			
		Single Section	Single Section		Multiple Section	
		Vertical/Horizontal	Vertical	Horizontal	Vertical	Horizontal
24	250/350	8" x 4" (203 x 102) Overall damper height is 8" (203).	36" x 7 1/2" (914 x 191)	30" x 7 1/2" (762 x 191)	72" x 7 1/2" (1829 x 191)	60" x 7 1/2" (1524 x 191)

MODEL 1273: TYPE C SLEEVE ENCLOSURES

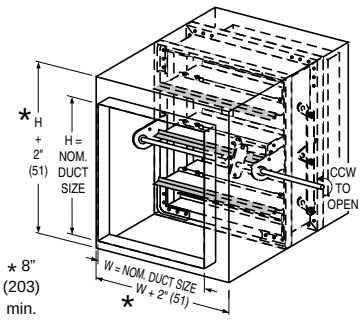




STYLE CR : FOR ROUND DUCT



STYLE CO : FOR OVAL DUCT



STYLE CSR : FOR SQUARE OR RECTANGULAR DUCT

Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Minimum Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Model 1273 - Round Duct Connection Sizes (Duct Dia.):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum			
		Single Section	Single Section		Multiple Section	
		Vert./Horiz.	Vertical	Horizontal	Vertical	Horizontal
24	250/350	4" (102) dia. Overall damper size is 8" x 8" (203 x 203) min.	34" (864) dia.	28" (711) dia.	46" (1168) dia.	38" (965) dia.

Model 1273 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum			
		Single Section	Single Section		Multiple Section	
		Vert./Horiz.	Vertical	Horizontal	Vertical	Horizontal
24	250/350	4" x 4" (102 x 102) Overall damper size is 8" x 8" (203 x 203).	34" x 46" (864 x 1168)	28" x 38" (711 x 965)	70" x 46" (1176 x 1168) or 34" x 94" (864 x 2388)	58" x 38" (1473 x 965) or 28" x 78" (711 x 1981)

PERFORMANCE DATA:

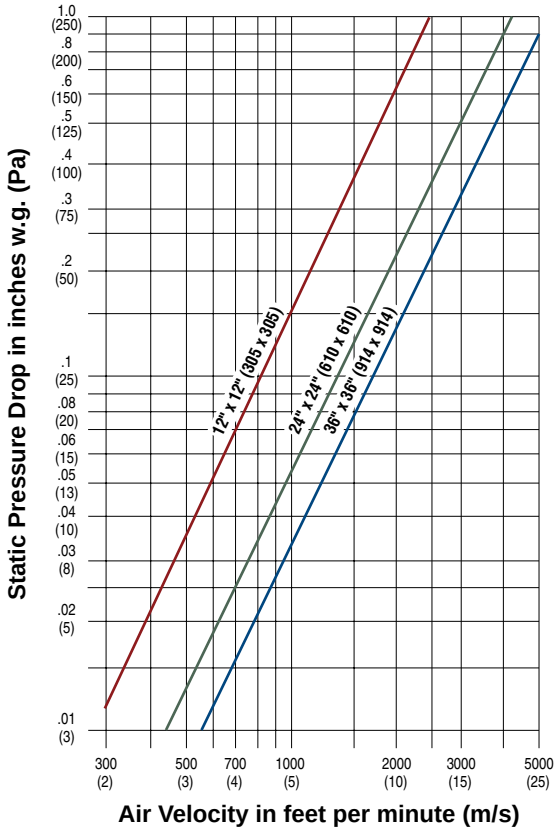
MODEL SERIES: 1270 - 1 1/2 HOUR LABEL

LEAKAGE CLASS:

The 1270 Series Combination Fire/Smoke Damper has been designed and qualified under UL 555S in order to provide maximum system design flexibility. They are available with a Class I or II leakage rating with all damper/actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C) or 350°F (177°C), depending on actuator, under airflow of 2000 fpm @ 4" w.g. (10 m/s @1 kPa).

1270 Series - Maximum Performance Ratings	
UL 555 Fire Rating	1 1/2 Hour
UL 555S Leakage Rating	Class I
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)
Maximum Temperature	350°F (177°C)

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

HOW TO ORDER

MODEL SERIES: 1270 - 1 1/2 HOUR LABEL - VEE GROOVE BLADE
COMBINATION FIRE / SMOKE DAMPERS

EXAMPLE: 1271 - 24X24 - V - AUTO - 120 - I - 24 - 250 - ERL - 250 - BO - SL = 16 - 20G - EXT - RH - CL - FL12 - L8

1a. **Model**
Dynamic or Static Applications
1270 Vee Groove Blade, 1 1/2 Hour Label

1b. **Sleeve/Enclosure Style**
(4th Digit)
0 = No Sleeve
1 = Type A Sleeve
2 = Type B Sleeve Enclosure
3 = Type C Sleeve Enclosure

2. **Duct Size**
Width x Height
inches (mm's)

3. **Mounting**
V Vertical (wall)
H Horizontal (floor)

4. **Actuator Selected By**
AUTO Least Cost (Auto-Select) (default)
BEL Belimo
HON Honeywell
SIE Siemens

5. **Power Requirement**
120 120 VAC (default)
230 230 VAC
24 24 VAC
25 25 psi Pneumatic

6. **Leakage Rating**
I Class I
II Class II (default)

7. **Max. Velocity / Pressure Rating**
24 2000 fpm @ 4" w.g. (default)

8. **Elevated Temperature**
250 250°F (default)
350 350°F

9. **Closure Device**
ERL ERL Electric Resettable Link (default)
PRL PRL Pneumatic Link
DTO Dual Temperature Override Sensor (MLS-400)

10. **Closure Temperature**
ERL /PRL
165 165°F
212 212°F (PRL
250 250°F (ERL only) (default)
280 280°F (PRL only)
350 350°F (ERL only)
DTO Dual Temperature Override Sensor (MLS-400)
HL 250/165°F
HIL 350/165°F

11. **Bearings**
BO Oilite Bronze (default)
BS Stainless Steel

12. **Duct Smoke Detector**
— None (default)
DSDL Low-Flow, factory mounted
DSDN No-Flow, factory mounted

13a. **Side Mounting Plate**
(No Sleeve models only)
SMP Side Mounting Plate

13b. **Sleeve Length**
SL = Specify
16" (406) standard (default)
16" – 36" (406 – 914)

14. **Sleeve Gauge**
20G 20 Ga. standard (default)
18G 18 Ga.
16G 16 Ga.
14G 14 Ga.
10G 10 Ga.

15. **Transition**
(Sleeve Type C models only)
CR Round
CO Oval
CSR Square / Rectangular

16. **Actuator Mounting**
EXT External (default)
INT Internal

17. **Actuator Location**
RH Right hand (default)
LH Left hand
MH Multi-hand

18. **Actuator Fail Position**
CL Close (default)

19. **Actuator Models**
Electric:

HL1	MS4104F	120VAC
HL2	MS8104F	24VAC
HL3	MS4604F	230VAC
HM1	MS4109F	120VAC
HM2	MS8109F	24VAC
HM3	MS4609F	230VAC
HH1	MS4120F	120VAC
HH2	MS8120F	24VAC
HH3	MS4620F	230VAC
GD2	GGD221	120VAC
GD1	GGD121	24VAC
GD3	GGD321	230VAC
FT12	FSTF120	120VAC
FT23	FSTF230	230VAC
FT24	FSTF24	24VAC
FL12	FSLF120	120VAC
FL23	FSLF230	230VAC
FL24	FSLF24	24VAC
F12	FSNF120	120VAC
F23	FSNF230	230VAC
F24	FSNF24	24VAC
FA12	FSAF120A	120VAC
FA23	FSAF230A	230VAC
FA24	FSAF24A	24VAC

Pneumatic:
296 331-2961
306 331-3060

20. **Damper Location**
L8 8" (203) from sleeve end (default)
LX Other (specify)
8" – 16" (203 – 406)

OPTIONS & ACCESSORIES:

21. **Position Indicator**
— None (default)
300 MLS-300 (4-wire)
(Included with Dual Temperature Override Sensor [DTO])

22. **EP Switch**
— None (default)
EP1 120 VAC
EP2 24 VAC

23. **Retaining Angles**
— None (default)
QS1 One side
QS2 Both sides (pair)

24. **TDF Flange**
— None (default)
TDF1 One end
TDF2 Both ends

25. **Damper Test Switch**
— None (default)
DTS Damper Test Switch

Notes:

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

2. ERL is standard on all dampers with electric actuators. PRL is standard on all dampers with pneumatic actuators.

An ERL or DTO (MLS-400) may be ordered on dampers with pneumatic actuators, but in addition, an EP switch (factory mounted) is required.

3. EP (electric-pneumatic) switch accessory is applicable only to pneumatic actuators and is optional (shipped loose) when PRL closure device is selected.

4. One DTO (MLS-400) or MLS-300 required per damper assembly. DTO (MLS-400) includes MLS-300 position indicator.

5. Maximum Closure Temperature allowed is equal to Damper Elevated Temperature.

HOW TO SPECIFY

MODEL SERIES: 1270 - 1 1/2 HOUR LABEL
COMBINATION FIRE/SMOKE DAMPERS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Combination Fire/Smoke Dampers, as manufactured by Nailor Industries, Inc., which meet or exceed the following criteria:

Dampers shall meet the requirements of NFPA 80, 90A, 92, 101 and 105. Dampers shall be classified by Underwriters Laboratories and labeled as a 1 1/2 hour Fire Damper under UL 555 and as a (**specifier select class**) Class I **or** Class II Leakage Rated Smoke Damper under UL 555S at an elevated temperature of (**specifier select temperature**) 250°F (121°C) **or** 350°F (177°C). Dampers shall be qualified for use in dynamic or static Smoke Control Systems. Dampers shall be tested under UL 555 and UL 555S by UL to a minimum velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).

Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be of formed vee groove or double-skin design, 16 ga. (1.6) galvanized steel, on 5 1/2" (140) centers and shall be parallel configuration. Blade axles shall be 1/2" (13) dia. plated steel, double bolted at each end of blade to ensure positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream. Jamb seals shall be compression type stainless steel. Blade seals shall be silicone. Dampers shall be supplied with factory installed sleeves, length dependent on wall thickness, minimum 16" (406). Wall thickness shall be field verified by contractor. Factory sleeves shall be caulked to UL requirements and shall be 20 ga. (1.0) through 84" (2134) wide and 18 ga. (1.2) above 84" (2134) wide.

Appropriate (**specifier select**) externally **or** internally mounted (**specifier select type**) electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism; external after-market spring mechanisms are not acceptable. Each damper shall be equipped with a UL Classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over center/knee lock linkage when the duct temperature reaches the maximum degradation temperature of the damper/actuator assembly, as required by UL 555S. Closure devices that cause instantaneous closure are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.

Damper manufacturer shall submit pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries Model Series 1270.

- GRILLE MOUNTING/DAMPER RETAINING TABS
- STANDARD PERFORMANCE
- CLASS I OR II LEAKAGE @ 250°F OR 350°F
- UL 555 CLASSIFIED DYNAMIC FIRE DAMPER
- UL 555S CLASSIFIED SMOKE DAMPER

Model 1271G

Model:

1271G 1 1/2 Hour Label

Model 1271G combination fire/smoke damper is specifically designed for supply or return ducts that terminate at a grille. The factory sleeve with unique 3/4" (19) grille mounting tabs simplifies installation, saves on field labor and eliminates the requirements for unsightly front retaining angles which commonly protrude from behind the grille. A steel grille installs over and completely hides the mounting tabs. The damper is offset in the sleeve to accommodate a single or double deflection supply air grille, single deflection supply air register or a return air grille or register. The 1271G is ideal for applications where building codes require both a fire damper for the protection of ductwork penetrations in walls or floors that have a fire resistance rating of up to 2 hours and also require a leakage rated damper for operational smoke control in static or dynamic smoke management systems. The 1271G has been designed and tested to offer a rugged cost effective damper well suited to the majority of commercial applications.

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 hr. Label (File # R9492).**
- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I or II at 250°F or 350°F elevated temperature.**
- **Meets NFPA 80, 90A, 92, 101 and 105.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**

STANDARD CONSTRUCTION:

Frame:	5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.
Blades:	6" (152) wide on 5 1/2" (140) centers. 16 ga. (1.6) galvanized steel vee groove or double-skin design.
Sleeve:	16" x 20 ga. (406 x 1.0) galvanized steel with 3/4" (19) wide grille mounting tabs.
Linkage:	Concealed in frame. 12 ga. (2.7) plated steel.
Bearings:	1/2" (13) dia. self-lubricating oilite bronze.
Axles:	1/2" (13) dia. plated steel double bolted to blades.
Jackshaft:	1/2" (13) dia. cadmium plated steel.
Jamb Seals:	Stainless steel.
Blade Seals:	Silicone.

Heat Responsive Device (Controlled Closure):
ERL (Electric Resettable Link) is standard on dampers with electric actuators: 250°F (121°C) standard. 165°F (74°C), 212°F (100°C) and 350°F (177°C) available.
PRL (Pneumatic Replaceable Link) is standard on dampers with pneumatic actuators: 212°F (100°C) standard. 165°F (74°C) and 280°F (138°C) available.

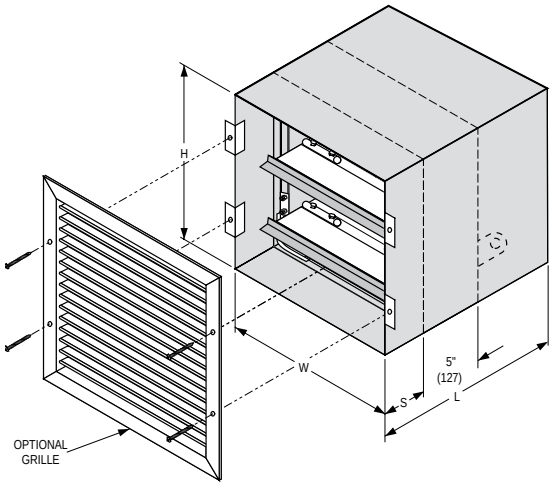
Model 1271G Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum Single Section Vertical/Horizontal	Maximum Single Section Vertical/Horizontal
24	250/350	8" x 8" (203 x 203).	24" x 24" (610 x 610)

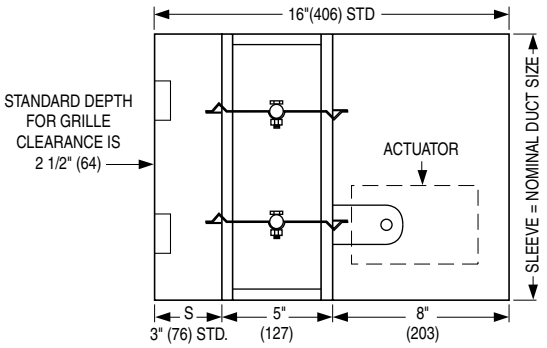
Note: Minimum 6 1/2" (165) wall thickness is required for this installation. Contact factory for non-standard applications.

COMMON OPTIONS:

- DTS Damper Test Switch for cycle testing.
- DTO Dual Temperature Override Sensor (MLS-400).
- MLS-300 Position Indicator Switch Pack.
- QS1 & QS2 "Quick-Set" Retaining Angles.
- Factory fitted sleeves in custom lengths and gauges.



MODEL 1271G 1 1/2 HOUR LABEL



Note: Standard sleeve is 16" (406) long x 20 ga. (1.0), provides a grille clearance depth of 2 1/2" (64), and requires a minimum wall thickness of 6 1/2" (165) (closed damper blades must remain within the plane of the wall/floor). Damper position 'S' may be reduced to accommodate a thinner wall but grille clearance will reduce accordingly.

HOW TO ORDER

MODEL: 1271G - 1 1/2 HOUR LABEL

COMBINATION FIRE/SMOKE DAMPER FOR GRILLES

EXAMPLE: 1271G - 24X24 - V - AUTO - 120 - I - 24 - 250 - ERL - 250 - BO - SL = 16 - 20G - EXT - RH - CL - FL12 - L8

1a. **Model**
Dynamic or Static Applications
1271G Grille Mount, Vee Groove Blade, 1 1/2 Hour Label

1b. **Sleeve/Enclosure Style**
(4th Digit)
1 = Type A Sleeve

2. **Duct Size**
Width x Height
inches (mm's)

3. **Mounting**
V Vertical (wall)
H Horizontal (floor)

4. **Actuator Selected By**
AUTO Least Cost (Auto-Select) (default)
BEL Belimo
HON Honeywell
SIE Siemens

5. **Power Requirement**
120 120 VAC (default)
230 230 VAC
24 24 VAC
25 25 psi Pneumatic

6. **Leakage Rating**
I Class I
II Class II (default)

7. **Max. Velocity / Pressure Rating**
24 2000 fpm @ 4" w.g. (default)

8. **Elevated Temperature**
250 250°F (default)
350 350°F

9. **Closure Device**
ERL ERL Electric Resettable Link (default)
PRL PRL Pneumatic Link
DTO Dual Temperature Override Sensor (MLS-400)

10. **Closure Temperature**
ERL /PRL
165 165°F
212 212°F (PRL)
250 250°F (ERL only) (default)
280 280°F (PRL only)
350 350°F (ERL only)
DTO Dual Temperature Override Sensor (MLS-400)
HL 250/165°F
HIL 350/165°F

11. **Bearings**
BO Oilite Bronze (default)
BS Stainless Steel

12. **Sleeve Length**
SL = Specify
16" (406) standard (default)
16" – 36" (406 – 914)

13. **Sleeve Gauge**
20G 20 Ga. standard (default)
18G 18 Ga.
16G 16 Ga.
14G 14 Ga.
10G 10 Ga.

14. **Actuator Mounting**
EXT External (default)
INT Internal

15. **Actuator Location**
RH Right hand (default)
LH Left hand
MH Multi-hand

16. **Actuator Fail Position**
CL Close (default)

17. **Actuator Models**
Electric:

HL1	MS4104F	120VAC
HL2	MS8104F	24VAC
HL3	MS4604F	230VAC
HM1	MS4109F	120VAC
HM2	MS8109F	24VAC
HM3	MS4609F	230VAC
HH1	MS4120F	120VAC
HH2	MS8120F	24VAC
HH3	MS4620F	230VAC
GD2	GGD221	120VAC
GD1	GGD121	24VAC
GD3	GGD321	230VAC
FT12	FSTF120	120VAC
FT23	FSTF230	230VAC
FT24	FSTF24	24VAC
FL12	FSLF120	120VAC
FL23	FSLF230	230VAC
FL24	FSLF24	24VAC
F12	FSNF120	120VAC
F23	FSNF230	230VAC
F24	FSNF24	24VAC
FA12	FSAF120A	120VAC
FA23	FSAF230A	230VAC
FA24	FSAF24A	24VAC

Pneumatic:
296 331-2961
306 331-3060

18. **Damper Location**
L8 8" (203) from sleeve end (default)
LX Other (specify)
8" – 16" (203 – 406)

OPTIONS & ACCESSORIES:

19. **Position Indicator**
— None (default)
300 MLS-300 (4-wire)
(Included with Dual Temperature Override Sensor [DTO])

20. **EP Switch**
— None (default)
EP1 120 VAC
EP2 24 VAC

21. **Retaining Angles**
— None (default)
QS1 One side

22. **TDF Flange**
— None (default)
TDF1 One end

23. **Damper Test Switch**
— None (default)
DTS Damper Test Switch

Notes:

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

2. ERL is standard on all dampers with electric actuators. PRL is standard on all dampers with pneumatic actuators.

An ERL or DTO (MLS-400) may be ordered on dampers with pneumatic actuators, but in addition, an EP switch (factory mounted) is required.

3. EP (electric-pneumatic) switch accessory is applicable only to pneumatic actuators and is optional (shipped loose) when PRL closure device is selected.

4. One DTO (MLS-400) or MLS-300 required per damper assembly. DTO (MLS-400) includes MLS-300 position indicator.

5. Maximum Closure Temperature allowed is equal to Damper Elevated Temperature.

HOW TO SPECIFY

MODEL SERIES: 1271G - 1 1/2 HOUR LABEL
COMBINATION FIRE/SMOKE DAMPERS FOR GRILLES

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, Combination Fire/Smoke Dampers approved for use with grilles where ductwork design penetrates and terminates at a fire separation, as manufactured by Nailor Industries, Inc., which meet or exceed the following criteria: Dampers shall meet the requirements of NFPA 80, 90A, 92, 101 and 105. Dampers shall be classified by Underwriter's Laboratories and labeled as 1 1/2 hour Dynamic Fire Damper under UL 555 and as a (**specifier select class**) Class I **or** Class II Smoke Damper under UL 555S at an elevated temperature of (**specifier select temperature**) 250°F (121°C) **or** 350°F (177°C) for use in dynamic or static Smoke Control Systems. Dampers shall be tested under UL 555 and UL 555S by UL to a minimum velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).

Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be of formed vee groove or double-skin design, 16 ga. (1.6) galvanized steel, on 5 1/2" (140) centers and shall be parallel configuration. Blade axles shall be plated steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero maintenance, concealed in frame, out of airstream. Jamb seals shall be compression-type stainless steel. Blade seals shall be silicone. Dampers shall be supplied with factory installed sleeves, length dependent on wall thickness, minimum 16" (406). Wall thickness shall be field verified by contractor. Sleeves shall be caulked to UL requirements and shall be 20 ga. (1.0) galvanized steel, with 3/4" (19) wide Nailor grille concealed mounting tabs on one end.

Appropriate (**specifier select**) externally **or** internally mounted (**specifier select type**) electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism; external after-market spring mechanisms are not acceptable. Each damper shall be equipped with a UL Classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over center/knee lock linkage when the duct temperature reaches the maximum degradation temperature of the damper/actuator assembly, as required by UL 555S. Closure devices that cause instantaneous closure are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.

Damper manufacturer shall submit pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries Model 1271G.

- MODULATING ACTUATOR FOR VOLUME CONTROL
- PREMIUM PERFORMANCE
- CLASS I LEAKAGE @ 250°F
- UL 555 CLASSIFIED DYNAMIC FIRE DAMPER
- UL 555S CLASSIFIED SMOKE DAMPER

Model Series:

1220M 1 1/2 Hour Label

1220M-3 3 Hour Label

Model 1221M

Model Series 1220M and 1220M-3 modulating dampers are classified for use as a volume control damper in applications where building codes require both a fire damper for the protection of ductwork penetrations in walls or floors that have a fire resistance rating of up to 2 or 4 hours and a leakage rated damper for operational smoke control in static or dynamic smoke management systems.

The Model Series 1220M and 1220M-3 have been designed and tested to provide premium performance. They offer the lowest leakage class available and are qualified for installation with airflow in either direction and inverted mounting. Airfoil blade design and elimination of blade sills, top and bottom, provide a low pressure drop design. Unique, inter-locking double skin blade design provides flame and smoke seal under fire conditions.

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 hr. or 3 hr. Label (File # R9492).**
- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I at 250°F elevated temperature.**
- **Meets NFPA 80, 90A, 92, 101 and 105 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0106.**
- **Maximum velocity: Up to 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**

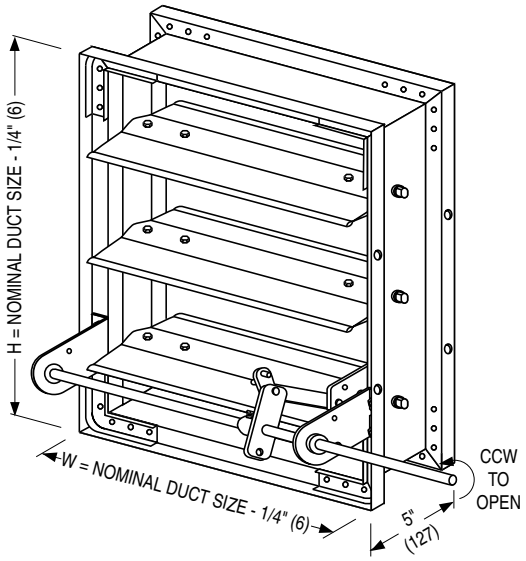
STANDARD CONSTRUCTION:

Frame:	5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.
Blades:	14 ga. (2.0) equivalent galvanized steel formed airfoil on 5 1/2" (140) centers. Opposed action.
Linkage:	Concealed in frame. 12 ga. (2.7) plated steel.
Bearings:	1/2" (13) dia. self-lubricating oilite bronze.
Axles:	1/2" (13) dia. plated steel double bolted to blades.
Jackshaft:	1/2" (13) dia. cadmium plated steel.
Jamb Seals:	Stainless steel.

Heat Responsive Device (Controlled Closure):
ERL (Electric Resettable Link) is standard on dampers with electric actuators: 250°F (121°C) standard. 165°F (74°C) and 212°F (100°C) available.
PRL (Pneumatic Replaceable Link) is standard on dampers with pneumatic actuators: 212°F (100°C) standard. 165°F (74°C) available.

COMMON OPTIONS:

- DTS Damper Test Switch for cycle testing.
- DSDL/DSDN Duct Smoke Detectors.
- DTO Dual Temperature Override Sensor (MLS-400).
- MLS-300 Position Indicator Switch Pack.
- QS1 & QS2 "Quick-Set" Retaining Angles.
- Factory fitted sleeves in custom lengths, gauges and transition styles.

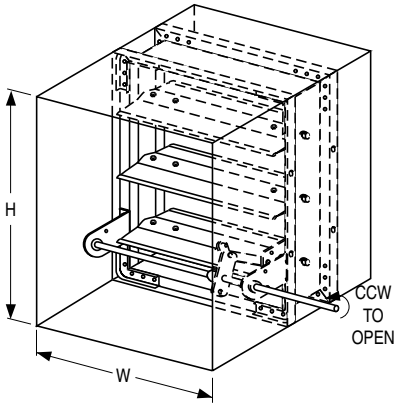


MODEL 1220M 1 1/2 HOUR LABEL
MODEL 1220M-3 3 HOUR LABEL
(Side Mounting Plate/Sleeve not shown)

DIMENSIONAL DATA:

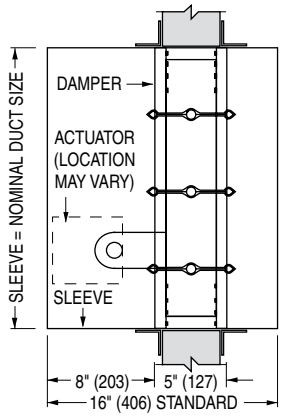
Model Series 1220M (1 1/2 Hr. Label) dampers with duct heights less than 6" (152) (8" [203] if width is over 18" [457]) require a Type 'B' sleeve enclosure (Model 1222M). Model Series 1220M-3 (3 Hr. Label) dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1222M-3). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Models 1223M or 1223M-3).

MODELS 1220M, 1221M, 1220M-3 AND 1221M-3: TYPE A SLEEVE



Models 1220M (no sleeve), 1221M, 1220M-3 (no sleeve) & 1221M-3 Sizes (Duct W x H):

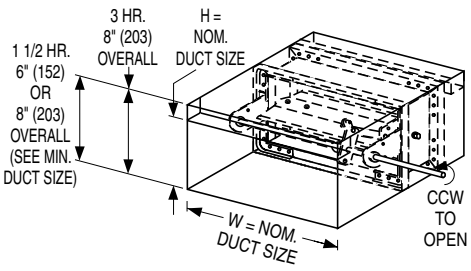
Model	Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum			
			Single Section	Single Section		Multiple Section	
			Vertical/Horizontal	Vertical	Horizontal	Vertical	Horizontal
Model 1220M Model 1221M	24	250	8" x 8" (203 x 203). 6" x 6" (152 x 152) with low profile frame (maximum size is 18" x 6" [457 x 152]).	36" x 48" (914 x 1219)	32" x 48" (813 x 1219)	144" x 96" (3658 x 2438)	128" x 96" (3251 x 2438)
Model 1220M-3 Model 1221M-3	24	250	8" x 8" (203 x 203).	36" x 48" (914 x 1219)	32" x 48" (813 x 1219)	120" x 96" (3048 x 2438) (maximum each section is 30" x 48" [762 x 1219]).	n/a



Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

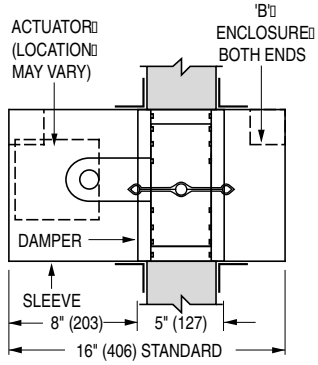
Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

MODELS 1222M AND 1222M-3: TYPE B SLEEVE ENCLOSURE



Models 1222M and 1222M-3 Sizes (Duct W x H):

Model	Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum			
			Single Section	Single Section		Multiple Section	
			Vertical/Horizontal	Vertical	Horizontal	Vertical	Horizontal
Model 1222M	24	250	8" x 4" (203 x 102) (Overall damper height is 8" [203]; 6" [152] on duct sizes 18 x 5 1/2" [457 x 140] and under).	36" x 7 1/2" (914 x 191)	32" x 7 1/2" (813 x 191)	144" x 7 1/2" (3658 x 191)	128" x 7 1/2" (3251 x 191)
Model 1222M-3	24	250	8" x 4" (203 x 102) Overall damper height is 8" (203).	36" x 7 1/2" (914 x 191)	32" x 7 1/2" (813 x 191)	120" x 7 1/2" (3048 x 191) (max. each section is 30" x 7 1/2" [762 x 191]).	n/a



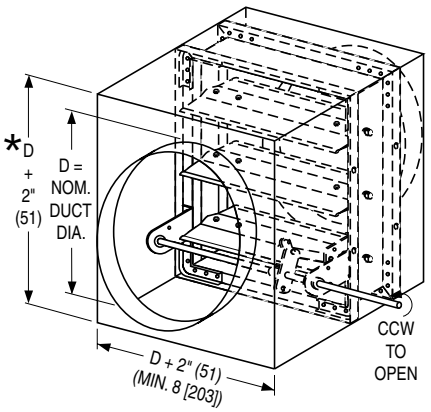
Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

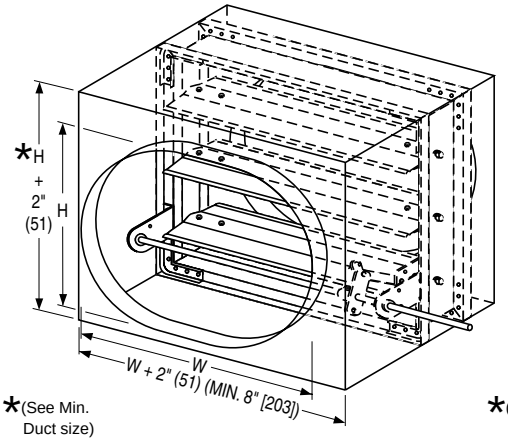
DIMENSIONAL DATA:

Model Series 1220M (1 1/2 Hr. Label) dampers with duct heights less than 6" (152) (8" [203] if width is over 18" [457]) require a Type 'B' sleeve enclosure (Model 1222M). Model Series 1220M-3 (3 Hr. Label) dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1222M-3). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Models 1223M or 1223M-3).

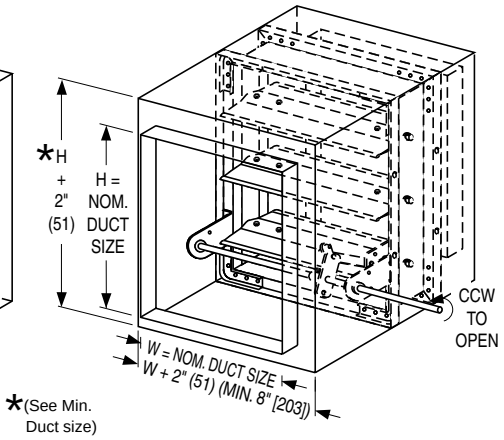
MODELS 1223M AND 1223M-3: TYPE C SLEEVE ENCLOSURES



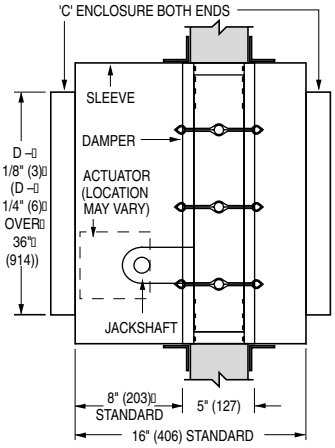
STYLE CR : FOR ROUND DUCT



STYLE CO : FOR OVAL DUCT



STYLE CSR : FOR SQUARE OR RECTANGULAR DUCT



Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Models 1223M and 1223M-3 - Round Duct Connection Sizes (Duct Dia.):

Model	Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum		
			Single Section	Single Section		Multiple Section
			Vertical/Horizontal	Vertical	Horizontal	Vertical/Horizontal
Model 1223M	24	250	4" (102) dia. Overall damper size is 8" x 6" (203 x 152); 8" x 8" (203 x 203) min. for duct sizes over 4" (102).	34" (864) dia.	30" (762) dia.	94" (2388) dia.
Model 1223M-3	24	250	4" (102) dia. (Overall damper size is 8" x 8" [203 x 203] min.).	34" (864) dia.	30" (762) dia.	94" (2388) dia.

Models 1223M and 1223M-3 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):

Model	Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum			
			Single Section	Single Section		Multiple Section	
			Vertical/Horizontal	Vertical	Horizontal	Vertical	Horizontal
Model 1223M	24	250	4" x 4" (102 x 102). (overall damper width is 8" [203] min.; min. overall height is 6" [152]; 8" [203] for duct sizes over 16" x 4" [406 x 102]).	34" x 46" (864 x 1168)	30" x 46" (762 x 1168)	142" x 94" (3607 x 2388)	126" x 94" (3200 x 2388)
Model 1223M-3	24	250	4" x 4" (102 x 102). (overall damper size is 8" x 8" [203 x 203] min.).	34" x 46" (864 x 1168)	30" x 46" (762 x 1168)	118" x 94" (2997 x 2388) (max. each section is 30" x 48" [762 x 1219]).	n/a

PERFORMANCE DATA:

MODEL SERIES: 1220M - 1 1/2 HOUR LABEL AND 1220M-3 - 3 HOUR LABEL

LEAKAGE CLASS:

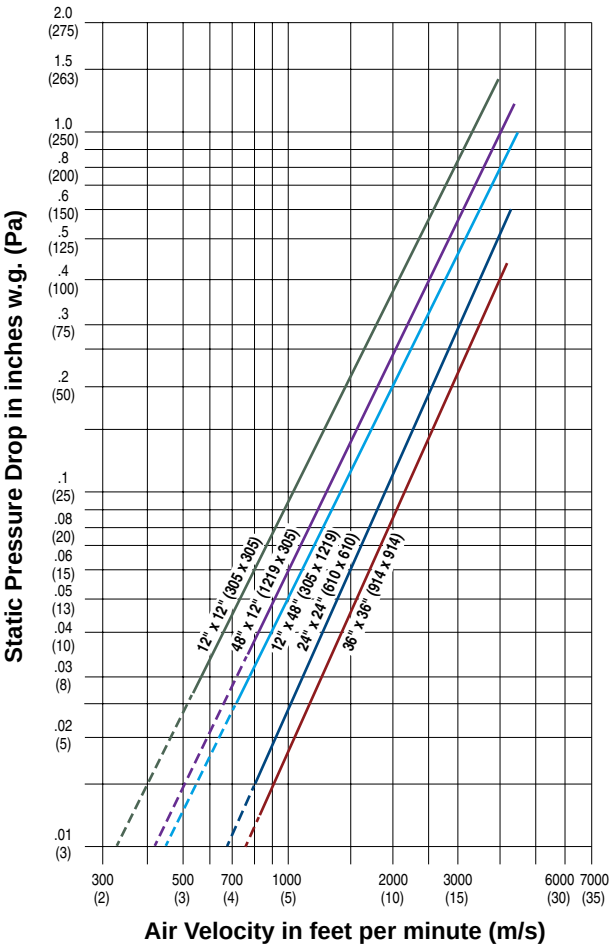
The 1220M Series Modulating Combination Fire/Smoke Damper has been designed and qualified under UL 555S in order to provide maximum system design flexibility. They are available with a Class I (currently the lowest available) leakage rating with all damper/actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C), dependent on actuator, under airflow of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).

The 1220M-3 Series Modulating Combination Fire/Smoke Damper has been designed and qualified under UL 555S in order to provide maximum system design flexibility. They are available with a Class I (currently the lowest available) leakage rating with all damper/actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C), dependent on actuator, under airflow of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).

1220M Series - Maximum Performance Ratings	
UL 555 Fire Rating	1 1/2 Hour
UL 555S Leakage Rating	Class I
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)
Maximum Temperature	250°F (121°C)

1220M-3 Series - Maximum Performance Ratings	
UL 555 Fire Rating	3 Hour
UL 555S Leakage Rating	Class I
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)
Maximum Temperature	250°F (121°C)

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

HOW TO ORDER

MODEL SERIES: 1220M - 1 1/2 HOUR LABEL AND 1220M-3 - 3 HOUR LABEL MODULATING COMBINATION FIRE/SMOKE DAMPERS

EXAMPLE: 1221M - 24X24 - V - AUTO - 120 - I - 24 - 250 - ERL - 250 - BO - SL = 16 - 20G - EXT - RH - CL - FAM - L8

1a. **Models**
Dynamic or Static Applications
1220M Modulating, Airfoil Blade, 1 1/2 Hour Label
1220M-3 Modulating, Airfoil Blade, 3 Hour Label

1b. **Sleeve/Enclosure Style**
(4th Digit)
0 = No Sleeve
1 = Type A Sleeve
2 = Type B Sleeve Enclosure
3 = Type C Sleeve Enclosure

2. **Duct Size**
Width x Height
inches (mm's)

3. **Mounting**
V Vertical (wall)
H Horizontal (floor)

4. **Actuator Selected By**
AUTO Least Cost (Auto-Select) (default)
BEL Belimo
HON Honeywell
SIE Siemens

5. **Power Requirement**
24 24 VAC (default)
25 25 psi Pneumatic

6. **Leakage Rating**
I Class I (default)

7. **Max. Velocity/Pressure Rating**
24 2000 fpm @ 4" w.g. (default)

8. **Elevated Temperature**
250 250°F (default)

9. **Closure Device**
ERL ERL Electric Resettable Link (default)
PRL PRL Pneumatic Link
DTO Dual Temperature Override Sensor (MLS-400)

10. **Closure Temperature**
ERL/PRL
165 165°F
212 212°F (PRL)
250 250°F (ERL only) (default)
DTO Dual Temperature Override Sensor (MLS-400)
HL 250/165°F

11. **Bearings**
BO Oilite Bronze (default)
BS Stainless Steel

12. **Duct Smoke Detector**
— None (default)
DSDL Low-Flow, factory mounted
DSDN No-Flow, factory mounted

13a. **Side Mounting Plate**
(No Sleeve models only)
SMP Side Mounting Plate

13b. **Sleeve Length**
SL = Specify
16" (406) standard (default)
16" – 36" (406 – 914)

14. **Sleeve Gauge**
20G 20 Ga. standard (default)
18G 18 Ga.
16G 16 Ga.
14G 14 Ga.
10G 10 Ga.

15. **Transition**
(Sleeve Type C models only)
CR Round
CO Oval
CSR Square/Rectangular

16. **Actuator Mounting**
EXT External (default)
INT Internal

17. **Actuator Location**
RH Right hand (default)
LH Left hand
MH Multi-hand

18. **Actuator Fail Position**
CL Close (default)

19. **Actuator Models**
Electric:
FAM FSAFB24-SR 24VAC/DC
Pneumatic:
296P 331-2961PR

20. **Damper Location**
L8 8" (203) from sleeve end (default)
LX Other (specify)
8" – 16" (203 – 406)

OPTIONS & ACCESSORIES:

21. **Position Indicator**
— None (default)
300 MLS-300 (4-wire)
(Included with Dual Temperature Override Sensor [DTO])

22. **EP Switch**
— None (default)
EP1 120 VAC
EP2 24 VAC

23. **Retaining Angles**
— None (default)
QS1 One side
QS2 Both sides (pair)

24. **TDF Flange**
— None (default)
TDF1 One end
TDF2 Both ends

25. **Damper Test Switch**
— None (default)
DTS Damper Test Switch

Notes:

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

2. ERL is standard on all dampers with electric actuators. PRL is standard on all dampers with pneumatic actuators.

An ERL or DTO (MLS-400) may be ordered on dampers with pneumatic actuators, but in addition, an EP switch (factory mounted) is required.

3. EP (electric-pneumatic) switch accessory is applicable only to pneumatic actuators and is optional (shipped loose) when PRL closure device is selected.

4. One DTO (MLS-400) or MLS-300 required per damper assembly. DTO (MLS-400) includes MLS-300 position indicator.

5. Maximum Closure Temperature allowed is equal to Damper Elevated Temperature.

HOW TO SPECIFY

MODEL SERIES: 1220M - 1 1/2 HOUR LABEL
MODULATING COMBINATION FIRE / SMOKE DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Modulating Combination Fire/Smoke Dampers suitable for volume control, as manufactured by Nailor Industries, Inc., which meet or exceed the following criteria:
Dampers shall meet the requirements of NFPA 80, 90A, 92, 101 and 105. Dampers shall be classified by Underwriter's Laboratories and labeled as a 1 1/2 Fire Damper under UL 555 and as a Class I Smoke Damper under UL 555S at an elevated temperature of 250°F (121°C). Dampers shall be tested and approved for use in dynamic or static Smoke Control Systems. Dampers shall be tested under UL 555 and UL 555S by UL to a minimum velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).
Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent galvanized steel formed double skin airfoil design on 5 1/2" (140) centers. Dampers shall be of opposed blade configuration with an interlocking blade design that provides complete flame and smoke seal under fire conditions at an elevated temperature of 2000°F (1093°C) when in closed position. Dampers requiring blade seals to maintain leakage class when under elevated temperature conditions are not acceptable. Blade axles shall be plated steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream. Jamb seals shall be compression-type stainless steel. Dampers shall be supplied with factory installed sleeves of minimum 16" (406) length and shall be field verified by contractor, dependent on wall thickness. Factory sleeves shall be caulked to UL requirements and shall be minimum 20 ga. (1.0).
Appropriate (**specifier select**) externally **or** internally mounted (**specifier select type**) electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism; external after-market spring mechanisms are not acceptable. Each damper shall be equipped with a UL Classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over center/knee lock linkage when the duct temperature reaches the maximum degradation temperature of the damper/actuator assembly, as required by UL 555S. Closure devices that cause instantaneous closure are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.
Submitted pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries Model Series 1220M.

MODEL SERIES: 1220M-3 - 3 HOUR LABEL
MODULATING COMBINATION FIRE / SMOKE DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Modulating Combination Fire/Smoke Dampers suitable for volume control, as manufactured by Nailor Industries, Inc., which meet or exceed the following criteria:
Dampers shall meet the requirements of NFPA 80, 90A, 92, 101 and 105. Dampers shall be classified by Underwriter's Laboratories and labeled as a 3 hour Fire Damper under UL 555 and as a Class I Smoke Damper under UL 555S at an elevated temperature of 250°F (121°C). Dampers shall be tested and approved for use in dynamic or static Smoke Control Systems. Dampers shall be tested under UL 555 and UL 555S by UL to a minimum velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).
Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent galvanized steel formed double skin airfoil design on 5 1/2" (140) centers. Dampers shall be of opposed blade configuration with an interlocking blade design that provides complete flame and smoke seal under fire conditions at an elevated temperature of 2000°F (1093°C) when in closed position. Dampers requiring blade seals to maintain leakage class when under elevated temperature conditions are not acceptable. Blade axles shall be plated steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream. Jamb seals shall be compression-type stainless steel. Dampers shall be supplied with factory installed sleeves of minimum 16" (406) length and shall be field verified by contractor, dependent on wall thickness. Factory sleeves shall be caulked to UL requirements and shall be minimum 20 ga. (1.0).
Appropriate (specifier select) externally or internally mounted (specifier select type) electrical or pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism; external after-market spring mechanisms are not acceptable. Each damper shall be equipped with a UL Classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over center/knee lock linkage when the duct temperature reaches the maximum degradation temperature of the damper/actuator assembly, as required by UL 555S. Closure devices that cause instantaneous closure are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.
Submitted pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries Model Series 1220M-3.

- FOR THROUGH PENETRATIONS (DUCTED BOTH SIDES)
- PREMIUM PERFORMANCE
- CLASS I LEAKAGE @ 250°F or 350°F
- UL 555 CLASSIFIED DYNAMIC FIRE DAMPER
- UL 555S CLASSIFIED SMOKE DAMPER

Model 1221-DOW

Model:

1221-DOW 1 1/2 Hour Label

The Model 1221-DOW combination fire/smoke damper is specially designed for "out of wall" (vertical mount) or "out of floor" (horizontal mount) through penetration applications (ductwork is connected to both sides) where the damper cannot be installed within the plane of the wall or floor. The 1221-DOW is ideal for applications where building codes require both a fire damper for the protection of ductwork penetrations in walls or floors that have a fire resistance rating of up to 2 hours and also require a leakage rated damper for operational smoke control in static or dynamic smoke management systems. The 1221-DOW offers premium performance with the lowest leakage class available and is qualified for installation with airflow in either direction. Unique, inter-locking double skin blade design eliminates combustible seals and provides flame and smoke seal under fire conditions at temperatures up to 2000°F (1093°C).

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 hr. Label (File # R9492).**
- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I at 250°F or 350°F elevated temperature.**
- **Meets NFPA 80, 90A, 92, 101 and 105 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0106.**
- **Maximum velocity: Up to 4000 fpm @ 8" w.g. (20 m/s @ 2 kPa).**

STANDARD CONSTRUCTION:

Frame: 5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.

Blades: 14 ga. (2.0) equivalent galvanized steel formed airfoil on 5 1/2" (140) centers. Opposed action.

Sleeve: 21" x 20 ga. (533 x 1.0) galvanized steel standard.

Insulation: Intumescent thermal insulation on four sides.

Linkage: Concealed in frame. 12 ga. (2.7) plated steel.

Bearings: 1/2" (13) dia. self-lubricating oilite bronze.

Axles: 1/2" (13) dia. plated steel double bolted to blades.

Jackshaft: 1/2" (13) dia. cadmium plated steel.

Jamb Seals: Stainless steel.

Heat Responsive Device (Controlled Closure):
ERL (Electric Resettable Link) is standard on dampers with electric actuators: 250°F (121°C) standard. 165°F (74°C), 212°F (100°C) and 350°F (177°C) available.
PRL (Pneumatic Replaceable Link) is standard on dampers with pneumatic actuators: 212°F (100°C) standard. 165°F (74°C) and 280°F (138°C) available.

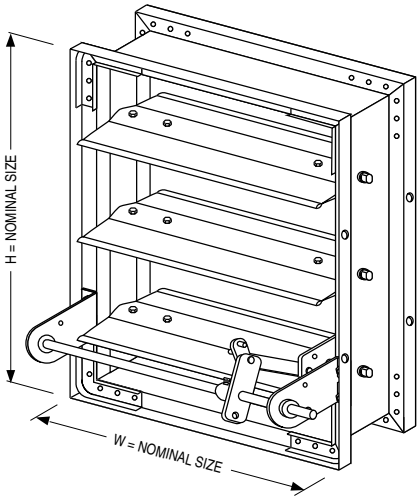
Models 1221-DOW Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum Single Section Vertical/Horizontal	Maximum Single Section Vertical	Maximum Single Section Horizontal
24, 34, 36, 46	250/350	8" x 8" (203 x 203)	36" x 48" (914 x 1219)	32" x 48" (813 x 1219)
48	250		36" x 48"(914 x 1219)	32" x 48" (813 x 1219)
48	350		36" x 24" (914 x 610)	32" x 24" (813 x 610)

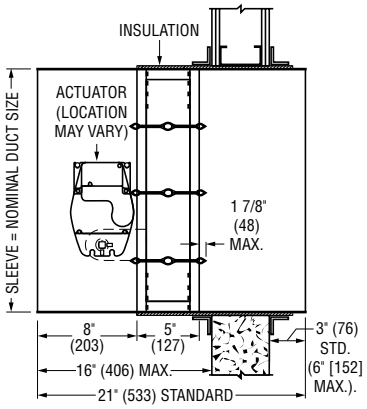
Note: Multiple section assemblies are not permitted.

COMMON OPTIONS:

- DTS Damper Test Switch for cycle testing.
- DTO Dual Temperature Override Sensor (MLS-400).
- MLS-300 Position Indicator Switch Pack.
- QS1 & QS2 "Quick-Set" Retaining Angles.



MODEL 1221-DOW 1 1/2 HOUR LABEL
(Sleeve not shown)



MODEL 1221-DOW

Note: Standard sleeve/damper (for 4" [102] wall) provides 1" (25) offset from wall face to edge of damper frame. For thicker walls or to offset damper farther from wall face (max. 8" [203]), contact factory.

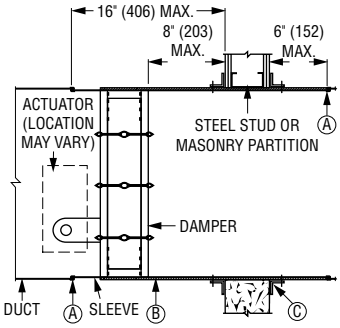
TYPICAL INSTALLATION DETAILS:

ITEMS:

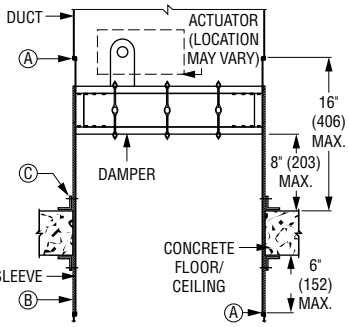
- **A** Duct/sleeve connection.
- **B** Intumescent material (insulation).
- **C** Retaining angles and fasteners.

APPLICATION:

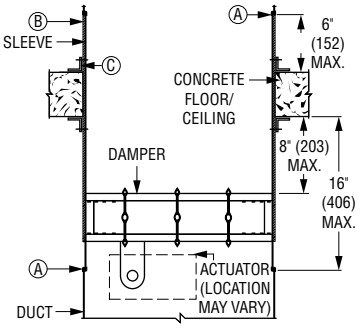
Model 1221-DOW fire/smoke damper is specially designed for "out of wall" (vertical mount) or "out of floor" (horizontal mount) through penetration applications (ductwork is connected to both sides) where the damper cannot be installed within the plane of the wall or floor.



VERTICAL INSTALLATION



ABOVE FLOOR INSTALLATION



BELOW FLOOR INSTALLATION

PERFORMANCE DATA:

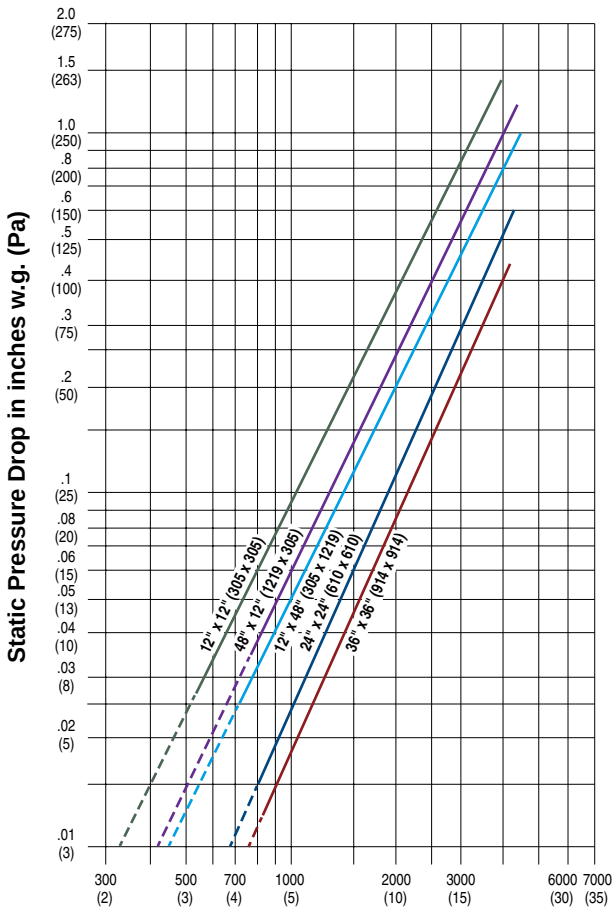
MODEL SERIES: 1221-DOW - 1 1/2 HOUR LABEL

LEAKAGE CLASS:

The 1221-DOW Series Out of Wall Combination Fire/Smoke Damper has been designed and qualified under UL 555S in order to provide maximum system design flexibility. They are available with a Class I leakage rating (currently the lowest available) with all damper/actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C) or 350°F (177°C), dependent on actuator, under airflow of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa). The 1221-DOW Series has also qualified under extended testing up to 4000 fpm (20 m/s) and 8 w.g. (2 kPa), with some size and actuator restrictions.

1221-DOW Series - Maximum Performance Ratings	
UL 555 Fire Rating	1 1/2 Hour
UL 555S Leakage Rating	Class I
Maximum Velocity	4000 fpm (20 m/s)
Maximum Pressure	8 in. w.g. (2 kPa)
Maximum Temperature	350°F (177°C)

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

- GRILLE MOUNT WITH ACTUATOR ACCESS
- PREMIUM PERFORMANCE
- CLASS I LEAKAGE @ 250°F OR 350°F
- UL 555 CLASSIFIED DYNAMIC FIRE DAMPER
- UL 555S CLASSIFIED SMOKE DAMPER

Model 1221-OW

Model:

1221-OW 1 1/2 Hour Label

The Model 1221-OW is an "out of wall" high performance combination fire/smoke damper. It is specifically designed for supply or return ducts that terminate at a grille and provides through the grille access to the damper, actuator and other components. Standard sleeve length accommodates most commercial supply and return grilles/registers. The 1221-OW is ideal for applications where building codes require both a fire damper for the protection of ductwork penetrations in walls or floors that have a fire resistance rating of up to 2 hours and also require a leakage rated damper for operational smoke control in static or dynamic smoke management systems. The 1221-OW offers premium performance with the lowest leakage class available and a low pressure drop well suited to the majority of commercial applications. Unique, inter-locking double skin blade design eliminates combustible seals and provides flame and smoke seal under fire conditions at temperatures up to 2000°F.

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 hr. Label (File # R9492).**
- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I at 250°F or 350°F elevated temperature.**
- **Meets NFPA 80, 90A, 92, 101 and 105 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0106.**
- **Maximum velocity: Up to 4000 fpm @ 8" w.g. (20 m/s @ 2 kPa).**
- **For use in vertical or horizontal concrete partitions and vertical steel stud partitions only.**

STANDARD CONSTRUCTION:

Frame: 5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.

Blades: 14 ga. (2.0) equivalent galvanized steel formed airfoil on 5 1/2" (140) centers. Opposed action.

Sleeve: 16" x 20 ga. (406 x 1.0) galvanized steel with 3/4" (19) flange on one end standard for all dampers over 16" (406) high. Dampers 16" (406) high and under have a 20" (508) long sleeve.

Insulation: Intumescent thermal insulation on four sides.

Linkage: Concealed in frame. 12 ga. (2.7) plated steel.

Bearings: 1/2" (13) dia. self-lubricating oilite bronze.

Axles: 1/2" (13) dia. plated steel double bolted to blades.

Jackshaft: 1/2" (13) dia. cadmium plated steel.

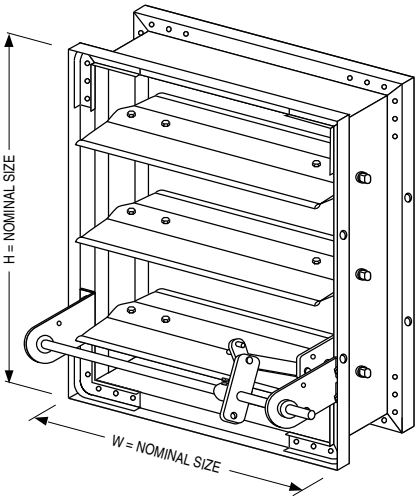
Jamb Seals: Stainless steel.

Heat Responsive Device (Controlled Closure):
ERL (Electric Resettable Link) is standard on dampers with electric actuators: 250°F (121°C) standard. 165°F (74°C), 212°F (100°C) and 350°F (177°C) available. PRL (Pneumatic Replaceable Link) is standard on dampers with pneumatic actuators: 212°F (100°C) standard. 165°F (74°C) and 280°F (138°C) available.

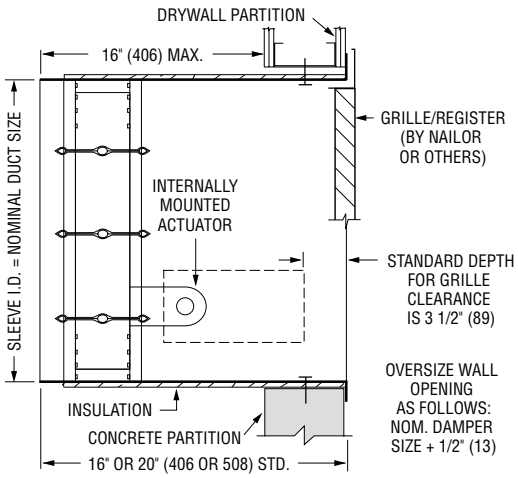
Models 1221-OW Sizes (Duct W x H):

Velocity/ Pressure Rating	Elevated Temp. °F	Minimum Single Section Vertical/Horizontal	Maximum Single Section Vertical	Maximum Single Section Horizontal
24, 34, 36, 46	250/350	12" x 8" (305 x 203) or 8" x 12" (203 x 305) with electric actuator. 8" x 20" (203 x 508) with pneumatic actuator.	36" x 48" (914 x 1219)	32" x 48" (813 x 1219)
48	250		36" x 48"(914 x 1219)	32" x 48" (813 x 1219)
48	350		36" x 24" (914 x 610)	32" x 24" (813 x 610)

Note: Multiple section assemblies are not permitted.



MODEL 1221-OW 1 1/2 HOUR LABEL
(Sleeve not shown)



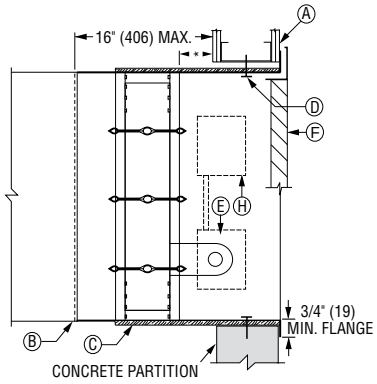
MODEL 1221-OW

Note: Standard 16" (406) long x 20 ga. (1.0) insulated sleeve with 3/4" (19) flange on grille side for all dampers over 16" (406) high. Dampers 16" (406) high and under have a 20" (508) long sleeve.

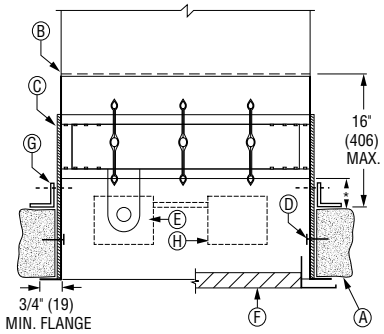
TYPICAL INSTALLATION DETAILS:

ITEMS:

- **A** Typical 2 hour rated vertical steel stud construction or horizontal concrete fire partition.
- **B** Duct connection.
- **C** Intumescent material.
- **D** #10 sheet metal screws.
- **E** Actuator
- **F** Grille/Diffuser
- **G** Rear retaining angle (required for horizontal mounting).
- **H** ERL Electric Resettable Link (Heat Sensor)



VERTICAL MOUNT



HORIZONTAL MOUNT

***Important Note:** Dampers are furnished full ordered size to facilitate grille installation. Opening size in partition should be sized 1/2" (13) larger in all directions to allow for sleeve thickness.

PERFORMANCE DATA:

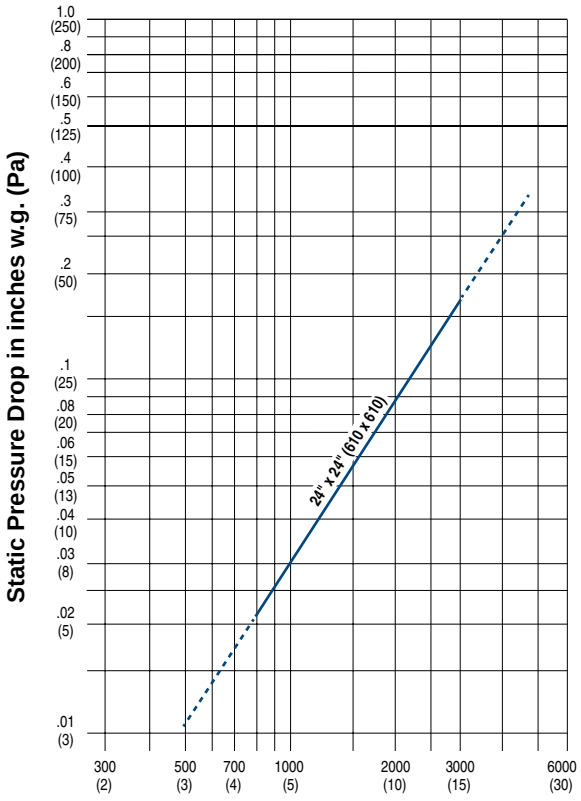
MODEL SERIES: 1221-OW - 1 1/2 HOUR LABEL

LEAKAGE CLASS:

The 1221-OW Series Out of Wall Combination Fire/Smoke Damper has been designed and qualified under UL 555S in order to provide maximum system design flexibility. They are available with a Class I leakage rating (currently the lowest available) with all damper/actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C) or 350°F (177°C), dependent on actuator, under airflow of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa). The 1221-OW Series has also qualified under extended testing up to 4000 fpm (20 m/s) and 8 w.g. (2 kPa), with some size and actuator restrictions.

1221-OW Series - Maximum Performance Ratings	
UL 555 Fire Rating	1 1/2 Hour
UL 555S Leakage Rating	Class I
Maximum Velocity	4000 fpm (20 m/s)
Maximum Pressure	8 in. w.g. (2 kPa)
Maximum Temperature	350°F (177°C)

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.2.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

HOW TO ORDER

MODEL SERIES: 1221DOW - 1 1/2 HOUR LABEL AND 1221-OW - 1 1/2 HOUR LABEL OUT OF WALL COMBINATION FIRE / SMOKE DAMPERS

EXAMPLE: 1221-DOW - 24X24 - V - AUTO - 120 - I - 24 - 250 - ERL - 250 - BO - SL = 21 - 20G - EXT - RH - CL - FL12 - L8

1a. **Models**
Dynamic or Static Applications
1221-DOW Out of Wall Airfoil Blade, 1 1/2 Hour Label, Through Penetrations
1221-OW Out of Wall Airfoil Blade, 1 1/2 Hour Label, Grille Mount

1b. **Sleeve/Enclosure Style**
(4th Digit)
1 = Type A Sleeve

2. **Duct Size**
Width x Height
inches (mm's)

3. **Mounting**
V Vertical (wall)
H Horizontal (floor)

4. **Actuator Selected By**
AUTO Least Cost (Auto-Select) (default)
BEL Belimo
HON Honeywell
SIE Siemens

5. **Power Requirement**
120 120 VAC (default)
230 230 VAC
24 24 VAC
25 25 psi Pneumatic

6. **Leakage Rating**
I Class I (default)

7. **Max. Velocity / Pressure Rating**
24 2000 fpm @ 4" w.g. (default)
34 3000 fpm @ 4" w.g.
36 3000 fpm @ 6" w.g.
46 4000 fpm @ 6" w.g.
48 4000 fpm @ 8" w.g.

8. **Elevated Temperature**
250 250°F (default)
350 350°F

9. **Closure Device**
ERL ERL Electric Resettable Link (default)
PRL PRL Pneumatic Link
DTO Dual Temperature Override Sensor (MLS-400)

10. **Closure Temperature**
ERL /PRL
165 165°F
212 212°F (PRL)
250 250°F (ERL only) (default)
280 280°F (PRL only)
350 350°F (ERL only)
DTO Dual Temperature Override Sensor (MLS-400)
HL 250/165°F
HIL 350/165°F

11. **Bearings**
BO Oilite Bronze (default)
BS Stainless Steel

12. **Sleeve Length**
SL = Specify
21" (533) standard 1221-DOW
16" (406) standard 1221-OW
H > 16" (406)
20" (508) standard 1221-OW
H ≤ 16" (406)

13. **Sleeve Gauge**
20G 20 Ga. standard (default)
18G 18 Ga.
16G 16 Ga.
14G 14 Ga.
10G 10 Ga.

14. **Actuator Mounting**
EXT External (default)
INT Internal - Model 1221-OW only has Internal Actuator Mounting

15. **Actuator Location**
RH Right hand (default)
LH Left hand
MH Multi-hand

16. **Actuator Fail Position**
CL Close (default)

17. **Actuator Models**
Electric:

HL1	MS4104F	120VAC
HL2	MS8104F	24VAC
HL3	MS4604F	230VAC
HM1	MS4109F	120VAC
HM2	MS8109F	24VAC
HM3	MS4609F	230VAC
HH1	MS4120F	120VAC
HH2	MS8120F	24VAC
HH3	MS4620F	230VAC
GD2	GGD221	120VAC
GD1	GGD121	24VAC
GD3	GGD321	230VAC
FT12	FSTF120	120VAC
FT23	FSTF230	230VAC
FT24	FSTF24	24VAC
FL12	FSLF120	120VAC
FL23	FSLF230	230VAC
FL24	FSLF24	24VAC
F12	FSNF120	120VAC
F23	FSNF230	230VAC
F24	FSNF24	24VAC
FA12	FSAF120A	120VAC
FA23	FSAF230A	230VAC
FA24	FSAF24A	24VAC

Pneumatic:
296 331-2961
306 331-3060

18. **Damper Location**
L8 8" (203) 1221-DOW
L9 9" (229) 1221-OW
H > 16" (406)
L16 16" (406) 1221-OW
H ≤ 16" (406)

OPTIONS & ACCESSORIES:

19. **Position Indicator**
— None (default)
300 MLS-300 (4-wire) (Included with Dual Temperature Override Sensor [DTO])

20. **EP Switch**
— None (default)
EP1 120 VAC
EP2 24 VAC

21. **Retaining Angles**
— None (default)
QS1 One side - Model 1221-OW only
QS2 Both sides (pair) - Model 1221-DOW only

22. **TDF Flange**
— None (default)
TDF1 One end - Model 1221-DOW only
TDF2 Both ends - Model 1221-DOW only

Notes:

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

2. ERL is standard on all dampers with electric actuators. PRL is standard on all dampers with pneumatic actuators.

An ERL or DTO (MLS-400) may be ordered on dampers with pneumatic actuators, but in addition, an EP switch (factory mounted) is required.

3. EP (electric-pneumatic) switch accessory is applicable only to pneumatic actuators and is optional (shipped loose) when PRL closure device is selected.

4. One DTO (MLS-400) or MLS-300 required per damper assembly. DTO (MLS-400) includes MLS-300 position indicator.

5. Maximum Closure Temperature allowed is equal to Damper Elevated Temperature.

HOW TO SPECIFY

MODEL SERIES: 1221-DOW - 1 1/2 HOUR LABEL
OUT OF WALL COMBINATION FIRE / SMOKE DAMPER FOR THROUGH PENETRATIONS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Combination Fire/Smoke Dampers approved for through penetration applications (ductwork connected to both sides) that meet or exceed the following criteria:
Dampers shall meet the requirements of NFPA 80, 90A, 92, 101 and 105. Dampers shall be classified by Underwriter's Laboratories and labeled as 1 1/2 hour Fire Damper under UL 555, and Class I Smoke Damper under UL 555S at an elevated temperature of (**specifier select temperature**) 250°F (121°C) **or** 350°F (177°C) for use in dynamic or static Smoke Control Systems. Dampers shall be tested under UL 555 and UL 555S by UL to a minimum velocity/pressure rating of (**specifier to select rating**) 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa) **or** 3000 fpm @ 4" w.g. (15 m/s @ 1 kPa) **or** 4000 fpm @ 4" w.g. (20 m/s @ 1 kPa) **or** 3000 @ 6" w.g. (15 m/s @ 1.5 kPa) **or** 4000 @ 6" w.g. (20 m/s @ 1.5 kPa) **or** 4000 fpm @ 8" w.g. (20 m/s @ 2 kPa).
Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent galvanized steel formed double-skin airfoil design on 5 1/2" (140) centers. Dampers shall be of opposed blade configuration with an interlocking blade design that provides complete flame and smoke seal under fire conditions at an elevated temperature of 2000°F (1093°C) when in the closed position. Dampers requiring blade seals to maintain leakage class when under elevated temperature conditions are not acceptable. Blade axles shall be plated steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero maintenance, concealed in frame, out of airstream. Jamb seals shall be compression-type stainless steel. Dampers shall be supplied with factory installed sleeves of minimum 16" (406) length for dampers over 16" (406) in height and minimum 20" (508) length for dampers 16" or less in height, dependent on wall thickness, and shall be field verified by contractor. Sleeves shall be caulked to UL requirements and shall be 20 ga. (1.0) galvanized steel with 3/4" (19) flange on one end. Sleeves shall be insulated on all four sides with intumescent thermal insulation to reduce heat transfer.
Appropriate (**specifier select**) externally **or** internally mounted (**specifier select type**) electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism; external after-market spring mechanisms are not acceptable. Each damper shall be equipped with a UL Classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over center/knee lock linkage when the duct temperature reaches the maximum degradation temperature of the damper/actuator assembly, as required by UL 555S. Closure devices that cause instantaneous closure are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.
Submitted pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries Model 1221-DOW.

MODEL SERIES: 1221-OW - 1 1/2 HOUR LABEL
OUT OF WALL COMBINATION FIRE/SMOKE DAMPER - GRILLE MOUNT

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Combination Fire/Smoke Dampers as manufactured by Nailor Industries, Inc., approved for use where ductwork design penetrates and terminates at a fire separation and grille, which meet or exceed the following criteria:
Dampers shall meet the requirements of NFPA 80, 90A, 92, 101 and 105. Dampers shall be classified by Underwriter's Laboratories and labeled as 1 1/2 hour Fire Damper under UL 555, and Class I Smoke Damper under UL 555S at an elevated temperature of (**specifier select temperature**) 250°F (121°C) **or** 350°F (177°C) for use in dynamic or static Smoke Control Systems. Dampers shall be tested under UL 555 and UL 555S by UL to a minimum velocity/pressure rating of (**specifier to select rating**) 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa) **or** 3000 fpm @ 4" w.g. (15 m/s @ 1 kPa) **or** 4000 fpm @ 4" w.g. (20 m/s @ 1 kPa) **or** 3000 @ 6" w.g. (15 m/s @ 1.5 kPa) **or** 4000 @ 6" w.g. (20 m/s @ 1.5 kPa) **or** 4000 fpm @ 8" w.g. (20 m/s @ 2 kPa).
Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent galvanized steel formed double-skin airfoil design on 5 1/2" (140) centers. Dampers shall be of opposed blade configuration with an interlocking blade design that provides complete flame and smoke seal under fire conditions at an elevated temperature of 2000°F (1093°C) when in closed position. Dampers requiring blade seals to maintain leakage class when under elevated temperature conditions are not acceptable. Blade axles shall be plated steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero maintenance, concealed in frame, out of airstream. Jamb seals shall be compression-type stainless steel. Dampers shall be supplied with factory installed sleeves of minimum 16" (406) length for dampers over 16" (406) in height and minimum 20" (508) length for dampers 16" (406) or less in height, dependent on wall thickness. Wall thickness shall be field verified by contractor. Sleeves shall be caulked to UL requirements and shall be 20 ga. (1.0) galvanized steel with 3/4" (19) flange on one end. Sleeves shall be insulated on all four sides with intumescent thermal insulation to reduce heat transfer.
Appropriate internally mounted (**specifier select type**) electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism; external after-market spring mechanisms are not acceptable. Each damper shall be equipped with a UL Classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over center/knee lock linkage when the duct temperature reaches the maximum degradation temperature of the damper/actuator assembly, as required by UL 555S. Closure devices that cause instantaneous closure are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.
Submitted pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries Model 1221-OW.

- UL 555 CLASSIFIED CORRIDOR DAMPER
- UL 555S CLASSIFIED SMOKE DAMPER
- TUNNEL CORRIDOR COMBINATION FIRE/SMOKE DAMPER
- HIGH PERFORMANCE

Model 1221C-1

Models:

1221C-1 1 Hour Label - For use with Steel Grille/Diffuser

1221C-2 1 Hour Label - For Ducted Installation

Nailor Models 1221C-1 and 1221C-2 Corridor Dampers are for use where ductwork penetrates the ceiling of an interior corridor of a building, creating a horizontal opening that requires protection. Unique interlocking airfoil blade design provides low pressure drop and ultra-low leakage without the use of blade seals that can burn-off during fire conditions. Model 1221C-1 is suitable for use with a steel grille or diffuser when the duct terminates at the ceiling. Model 1221C-2 is suitable for use when the duct is required to continue down past the ceiling level. Each unit is supplied factory mounted in a suitable sleeve complete with upper retaining angles. For applications where the duct terminates at the ceiling, other manufacturers require full length lower retaining angles with minimum 1" (25) ceiling overlap that protrudes past the grille/diffuser frame causing aesthetic difficulties. Model 1221C-1 is provided with lower mounting tabs that are easily covered by available variety of Nailor steel grilles/diffusers, solving this problem. For Model 1221C-2, lower retaining angles are available from Nailor. Either way, Nailor provides complete protection with reduced installation time and cost.

Model 1221C-1:

STANDARD CONSTRUCTION:

Frame:	5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.
Blades:	14 ga. (2.0) equivalent galvanized steel formed airfoil on 5 1/2" (140) centers. Opposed action.
Sleeve:	16" x 20 ga. (406 x 1.0) standard.
Upper Retaining Angles:	1 1/2" x 1 1/2" x 16 ga. (38 x 38 x 1.6) galv. steel (by Nailor).
Linkage:	Concealed in frame. 12 ga. (2.7) plated steel.
Bearings:	1/2" (13) dia. self-lubricating oilite bronze.
Axles:	1/2" (13) dia. plated steel double bolted to blades.
Jackshaft:	1/2" (13) dia. cadmium plated steel.
Jamb Seals:	Cambered stainless steel.

Heat Responsive Device (Controlled Closure):
ERL (Electric Resettable Link) is standard on dampers with electric actuators: 250°F (121°C) std. 165°F (74°C), 212°F (100°C) and 350°F (177°C) available.
PRL (Pneumatic Replaceable Link) is standard on dampers with pneumatic actuators: 212°F (100°C) standard. 165°F (74°C) and 280°F (138°C) available.

QUALIFICATIONS:

- **UL 555 CLASSIFIED CORRIDOR DAMPER, 1 hr. Fire Resistance Rating (File # R9492).**
- **UL 555S CLASSIFIED SMOKE DAMPER, Leakage Class I at 250°F or 350°F elevated temperature (File # R9492).**
- **Meets the requirements of NFPA 90A, NFPA 92 for Fire/Smoke Dampers.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0106.**
- **Meets the requirements of City of Los Angeles, Uniform Building Code.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**

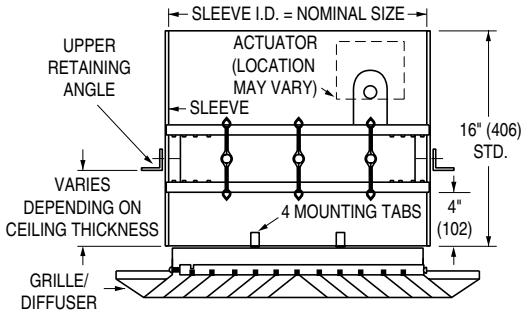
DIMENSIONAL DATA:

Model 1221C-1 Sizes (Duct W x H):

Minimum	Maximum
8" x 8" (203 x 203)	24" x 24" (610 x 610)

COMMON OPTIONS:

- DTS Damper Test Switch for cycle testing.
- DTO Dual Temperature Override Sensor (MLS-400).
- MLS-300 Position Indicator Switch Pack.
- Factory fitted sleeves in custom lengths, gauges and transition styles.



MODEL 1221C-1 (for use with Steel Grille/Diffuser)

Model 1221C-2:

STANDARD CONSTRUCTION:

Frame: 5” x 7/8” x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.

Blades: 14 ga. (2.0) equivalent galvanized steel formed airfoil on 5 1/2” (140) centers. Opposed action.

Sleeve: 16” x 20 ga. (406 x 1.0) standard.

Upper Retaining Angles: 1 1/2” x 1 1/2” x 16 ga. (38 x 38 x 1.6) galv. steel (by Nailor).

Lower Retaining Angles: 1 1/2” x 1 1/2” x 16 ga. (38 x 38 x 1.6) galvanized steel by installing contractor (optionally by Nailor).

Linkage: Concealed in frame. 12 ga. (2.7) plated steel.

Bearings: 1/2” (13) dia. self-lubricating oilite bronze.

Axles: 1/2” (13) dia. plated steel double bolted to blades.

Jackshaft: 1/2” (13) dia. cadmium plated steel.

Jamb Seals: Cambered stainless steel.

Heat Responsive Device (Controlled Closure):
ERL (Electric Resettable Link) is standard on dampers with electric actuators: 250°F (121°C) standard. 165°F (74°C), 212°F (100°C) and 350°F (177°C) available.
PRL (Pneumatic Replaceable Link) is standard on dampers with pneumatic actuators: 212°F (100°C) standard. 165°F (74°C) and 280°F (138°C) available.

QUALIFICATIONS:

- **UL 555 CLASSIFIED CORRIDOR DAMPER, 1 hr. Fire Resistance Rating (File # R9492).**
- **UL 555S CLASSIFIED SMOKE DAMPER, Leakage Class I at 250°F or 350°F elevated temperature (File # R9492).**
- **Meets the requirements of NFPA 90A, NFPA 92 for Fire/Smoke Dampers.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0106.**
- **Meets the requirements of City of Los Angeles, Uniform Building Code.**
- **Maximum velocity: 2000 fpm @ 4” w.g. (10 m/s @ 1 kPa).**

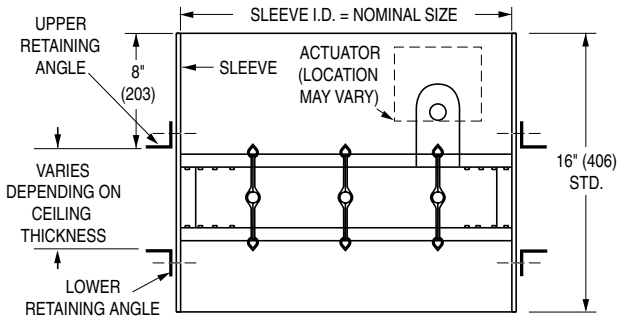
DIMENSIONAL DATA:

Model 1221C-2 Sizes (Duct W x H):

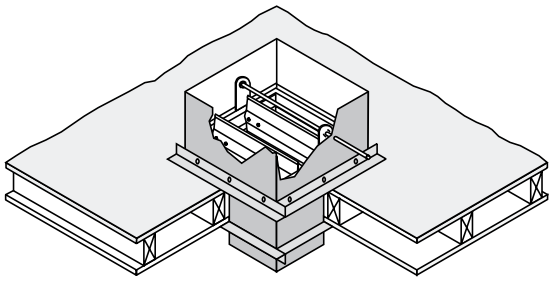
Minimum	Maximum
8” x 8” (203 x 203)	24” x 24” (610 x 610)

COMMON OPTIONS:

- DTS Damper Test Switch for cycle testing.
- DTO Dual Temperature Override Sensor (MLS-400).
- MLS-300 Position Indicator Switch Pack.
- Factory fitted sleeves in custom lengths, gauges and transition styles.



MODEL 1221C-2



Isometric View of typical Model 1221C-2 in 1 hr. wood stud ceiling

- **DUAL USAGE COMBINATION FIRE/SMOKE DAMPER**
- **UL 555 CLASSIFIED CORRIDOR DAMPER**
- **UL 555 CLASSIFIED FIRE DAMPER**
- **UL 555S CLASSIFIED SMOKE DAMPER**

Model:

1221C-3 1 Hour Label & 1 1/2 Hour Label

Model 1221C-3

Nailor Model 1221C-3 is both a 1 hr. rated corridor damper for use in corridor ceilings and a standard 1 1/2 hr. rated combination fire/smoke damper for use in walls and floors. The dual rating makes it ideal for stocking as the unit can be supplied when either type of damper is required by the local customer. Model 1221C-3 is supplied complete with upper retaining angles as well as mounting tabs for use with a steel grille/diffuser. The damper may be installed using the single-side retaining angles method. Lower retaining angles are available for ducted corridor or standard wall/floor combination fire/smoke applications when the two-sided angles installation is utilized.

STANDARD CONSTRUCTION:

Frame:	5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.
Blades:	14 ga. (2.0) equivalent galvanized steel formed airfoil on 5 1/2" (140) centers. Opposed action.
Sleeve:	16" x 20 ga. (406 x 1.0) standard.
Upper Retaining Angles:	1 1/2" x 1 1/2" x 16 ga. (38 x 38 x 1.6) galv. steel (byNailor).
Lower Retaining Angles:	1 1/2" x 1 1/2" x 16 ga. (38 x 38 x 1.6) galvanized steel by installing contractor (optionally by Nailor).
Linkage:	Concealed in frame. 12 ga. (2.7) plated steel.
Bearings:	1/2" (13) dia. self-lubricating oilite bronze.
Axles:	1/2" (13) dia. plated steel double bolted to blades.
Jackshaft:	1/2" (13) dia. cadmium plated steel.
Jamb Seals:	Cambered stainless steel.

Heat Responsive Device (Controlled Closure):
ERL (Electric Resettable Link) is standard on dampers with electric actuators: 250°F (121°C) standard. 165°F (74°C), 212°F (100°C) and 350°F (177°C) available.
PRL (Pneumatic Replaceable Link) is standard on dampers with pneumatic actuators: 212°F (100°C) standard. 165°F (74°C) and 280°F (138°C) available.

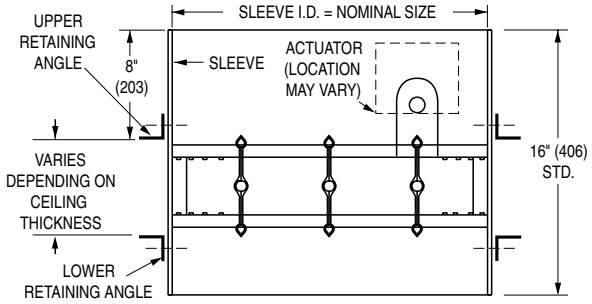
QUALIFICATIONS:

- **UL 555 CLASSIFIED CORRIDOR DAMPER, 1 hr. Fire Resistance Rating (File # R9492).**
- **UL 555 CLASSIFIED FIRE DAMPER, 1 1/2 hr. Fire Resistance Rating (File # R9492).**
- **UL 555S CLASSIFIED SMOKE DAMPER, Leakage Class I at 250°F or 350°F elevated temperature (File # R9492).**
- **Meets the requirements of NFPA 90A, NFPA 92 for Fire/Smoke Dampers.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0106.**
- **Meets the requirements of City of Los Angeles, Uniform Building Code.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**

DIMENSIONAL DATA:

Model 1221C-3 Sizes (Duct W x H):

Minimum	Maximum
8" x 8" (203 x 203)	24" x 24" (610 x 610)



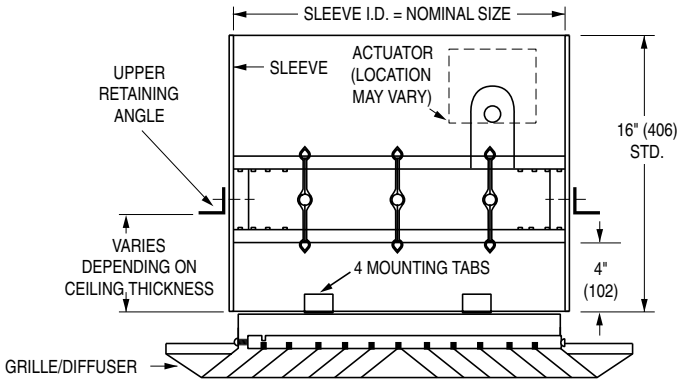
MODEL 1221C-3

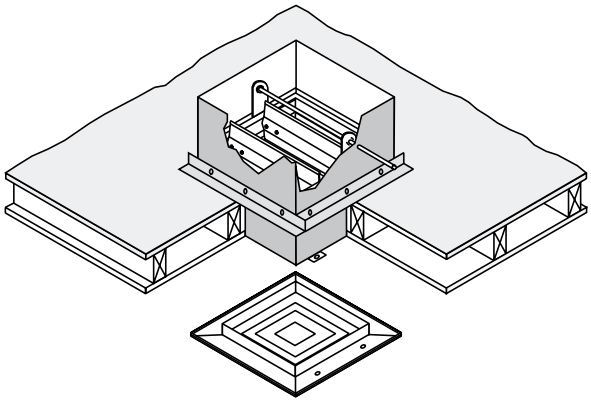
COMMON OPTIONS:

- DTS Damper Test Switch for cycle testing.
- DTO Dual Temperature Override Sensor (MLS-400).
- MLS-300 Position Indicator Switch Pack.
- Factory fitted sleeves in custom lengths, gauges and transition styles.

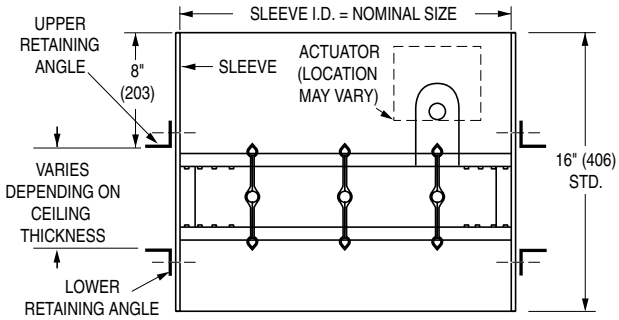
Model 1221C-3 Applications

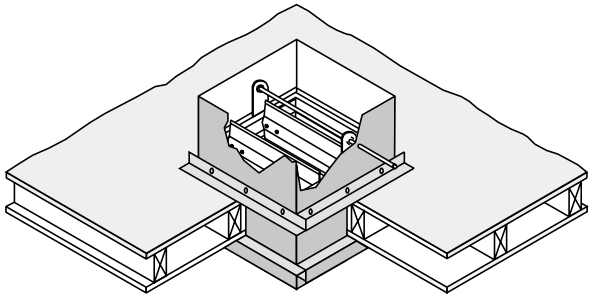
Corridor Damper for use with Steel Grille/Diffuser:



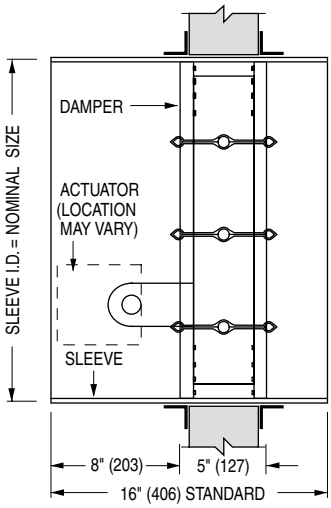


Corridor Damper for Ducted Installations:

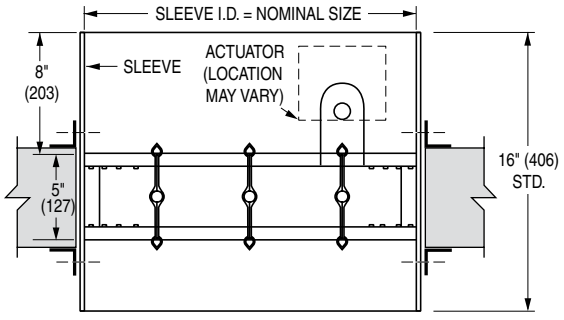




Combination Fire/Smoke Damper for Walls and Floors:



Wall Installation



Floor Installation

PERFORMANCE DATA:
MODELS: 1221C-1 AND 1221C-2 - 1 HOUR LABEL
MODEL: 1221C-3 - 1 HOUR AND 1 1/2 HOUR LABEL

LEAKAGE CLASS:

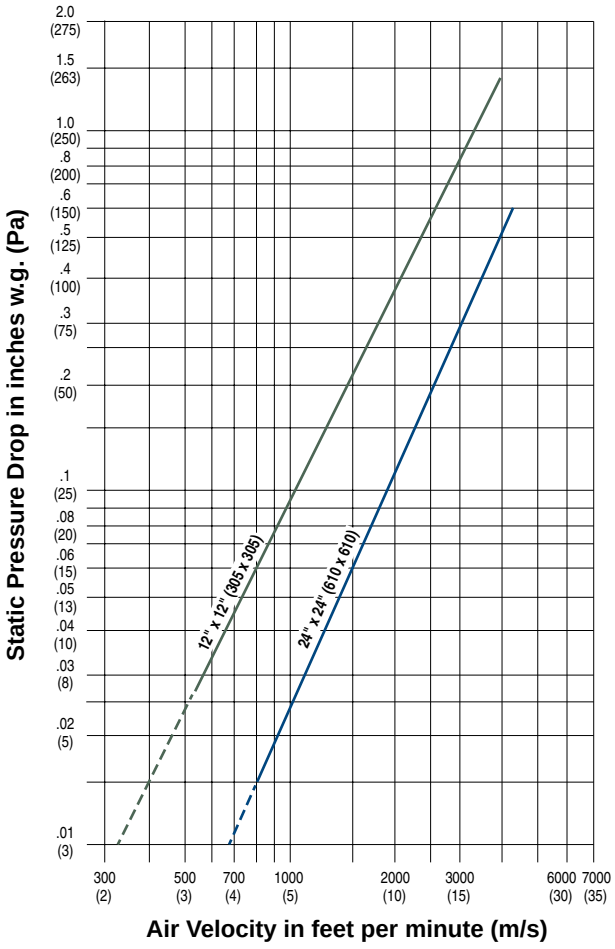
The Model 1221C-1 and Model 1221C-2 Series Corridor Dampers have been designed and qualified under UL 555 and UL 555S in order to provide maximum system design flexibility. They are available with a Class I (currently the lowest available) leakage rating with all damper/actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C) or 350°F (177°C), dependent on actuator, under airflow of 2000 fpm at 4" w.g. (10 m/s @ 1 kPa).

The Model 1221C-3 Series Corridor Combination Fire/Smoke Damper has been designed and qualified under UL 555 and UL 555S in order to provide maximum system design flexibility. It is available with a Class I (currently the lowest available) leakage rating with all damper/actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C) or 350°F (177°C), dependent on actuator, under airflow of 2000 fpm at 4" w.g. (10 m/s @ 1 kPa).

Models 1221C-1 and 1221C-2 Maximum Performance Ratings	
UL 555 Corridor Damper Fire Rating	1 Hour
UL 555S Leakage Rating	Class I
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)
Maximum Temperature	350°F (177°C)

Model 1221C-3 Maximum Performance Ratings	
UL 555 Corridor Damper Fire Rating	1 Hour
UL 555 Fire Damper Fire Rating	1 1/2 Hour
UL 555S Leakage Rating	Class I
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)
Maximum Temperature	350°F (177°C)

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

HOW TO ORDER

MODEL SERIES: 1221C

CORRIDOR DAMPERS

EXAMPLE: 1221C-1 - 24X24 - V - AUTO - 120 - I - 24 - 250 - ERL - 250 - BO - SL = 16 - 20G - EXT - RH - CL - FL12 - L8

1a. **Models**
Dynamic or Static Applications
- 1221C-1 Corridor Damper, Airfoil Blade, 1 Hour Label
- 1221C-2 Corridor Damper, Airfoil Blade, 1 Hour Label
- 1221C-3 Corridor or Combination Fire/Smoke Damper, Airfoil Blade, 1/1 1/2 Hour Label

1b. **Sleeve/Enclosure Style (4th Digit)**
1 = Type A Sleeve

2. Duct Size
Width x Height
or Diameter
inches (mm's)

3. **Mounting**
- V Vertical (wall)
- H Horizontal (floor)

4. **Actuator Selected By**
- AUTO Least Cost (Auto-Select) (default)
- BEL Belimo
- HON Honeywell
- SIE Siemens

5. **Power Requirement**
- 120 120 VAC (default)
- 230 230 VAC
- 24 24 VAC
- 25 25 psi Pneumatic

6. **Leakage Rating**
- I Class I (default)

7. **Max. Velocity / Pressure Rating**
- 24 2000 fpm @ 4" w.g. (default)

8. **Elevated Temperature**
- 250 250°F (default)
- 350 350°F

9. **Closure Device**
- ERL ERL Electric Resettable Link (default)
- PRL PRL Pneumatic Link
- DTO Dual Temperature Override Sensor (MLS-400)

10. **Closure Temperature**
ERL /PRL
- 165 165°F
- 212 212°F (PRL)
- 250 250°F (ERL only) (default)
- 280 280°F (PRL only)
- 350 350°F (ERL only)

DTO Dual Temperature Override Sensor (MLS-400)
- HL 250/165°F
- HIL 350/165°F

11. **Bearings**
- BO Oilite Bronze (default)
- BS Stainless Steel

12. **Sleeve Length**
SL = Specify
16" (406) standard (default)
16" – 36" (406 – 914)

13. **Sleeve Gauge**
- 20G 20 Ga. standard (default)
- 18G 18 Ga.
- 16G 16 Ga.
- 14G 14 Ga.
- 10G 10 Ga.

14. **Actuator Mounting**
- EXT External (default)
- INT Internal

15. **Actuator Location**
- RH Right hand (default)
- LH Left hand
- MH Multi-hand

16. **Actuator Fail Position**
- CL Close (default)

17. **Actuator Models**
Electric:

HL1	MS4104F	120VAC
HL2	MS8104F	24VAC
HL3	MS4604F	230VAC
HM1	MS4109F	120VAC
HM2	MS8109F	24VAC
HM3	MS4609F	230VAC
HH1	MS4120F	120VAC
HH2	MS8120F	24VAC
HH3	MS4620F	230VAC
GD2	GGD221	120VAC
GD1	GGD121	24VAC
GD3	GGD321	230VAC
FT12	FSTF120	120VAC
FT23	FSTF230	230VAC
FT24	FSTF24	24VAC
FL12	FSLF120	120VAC
FL23	FSLF230	230VAC
FL24	FSLF24	24VAC
F12	FSNF120	120VAC
F23	FSNF230	230VAC
F24	FSNF24	24VAC
FA12	FSAF120A	120VAC
FA23	FSAF230A	230VAC
FA24	FSAF24A	24VAC

Pneumatic:
- 296 331-2961
- 306 331-3060

18. **Damper Location**
- L8 8" (203) from sleeve end (default)

OPTIONS & ACCESSORIES:

19. **Position Indicator**
- — None (default)
- 300 MLS-300 (4-wire) (Included with Dual Temperature Override Sensor [DTO])

20. **EP Switch**
- — None (default)
- EP1 120 VAC
- EP2 24 VAC

21. **Upper Angles**
- UNM Upper Angles, Not Mounted (default) Models 1221C-2 and 1221C-3 only
- UFM Upper Angles, Factory Mounted, Specify ceiling thickness Ceiling ____ inches/mm

22. **Lower Angles**
- — None (default)
- LNM Lower Angles, Not Mounted Models 1221C-2 and 1221C-3 only

23. **Angle Location**
- — None (default)
- LO Angle Location

24. **Transition Collar**
- SRT Top Transition _____ dia. specify Models 1221C-1 and 1221C-2 only
- SRB Bottom Transition, Model 1221C-2 only _____ dia. specify
- SR2 Top and Bottom Transition, Model 1221C-2 only _____ dia. specify

25. **Damper Test Switch**
- — None (default)
- DTS Damper Test Switch

Notes:

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

2. ERL is standard on all dampers with electric actuators. PRL is standard on all dampers with pneumatic actuators.

An ERL or DTO (MLS-400) may be ordered on dampers with pneumatic actuators, but in addition, an EP switch (factory mounted) is required.

3. EP (electric-pneumatic) switch accessory is applicable only to pneumatic actuators and is optional (shipped loose) when PRL closure device is selected.

4. One DTO (MLS-400) or MLS-300 required per damper assembly. DTO (MLS-400) includes MLS-300 position indicator.

5. Maximum Closure Temperature allowed is equal to Damper Elevated Temperature.

HOW TO SPECIFY

MODELS: 1221C-1 AND 1221C-2 - 1 HOUR LABEL CORRIDOR DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Corridor Dampers as manufactured by Nailor Industries, Inc., which meet or exceed the following criteria:
Dampers shall meet the requirements of NFPA 90A and 92. Dampers shall be classified by Underwriters Laboratories and labeled as a 1 hour fire resistance rated Corridor Damper and as a Class I Leakage Rated Smoke Damper under UL 555S at an elevated temperature of (**specifier select temperature**) 250°F (121°C) **or** 350°F (177°C). Dampers shall be tested under UL 555 and UL 555S by UL to a minimum velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).
Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent galvanized steel formed double-skin airfoil design on 5 1/2" (140) centers. Dampers shall be of opposed blade configuration with an interlocking blade design that provides complete flame and smoke seal under fire conditions at an elevated temperature of 2000°F (1093°C) when in the closed position. Dampers requiring blade seals to maintain leakage class when under elevated temperature conditions are not acceptable. Blades axles shall be 1/2" (13) dia. plated steel, double bolted at each end of blade to ensure positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame; out of airstream. Jamb seals shall be compression type stainless steel. Dampers shall be supplied with factory installed sleeves, length dependent on wall thickness, minimum 16" (406). Wall thickness shall be field verified by contractor. Factory sleeves shall be caulked to UL requirements and shall be complete with factory supplied upper retaining angles of minimum 1 1/2" x 1 1/2" x 16 ga. (38 x 38 x 1.6) galvanized steel.
Appropriate (**specifier select**) externally **or** internally mounted (**specifier select type**) electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism; external after-market spring mechanisms are not acceptable. Each damper shall be equipped with a UL classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over center/knee lock linkage when the duct temperature reaches the maximum degradation temperature of the damper/actuator assembly, as required by UL 555S. Closure devices that cause instantaneous closure are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.
Damper manufacturer shall submit pressure drop data to be based on tests in accordance with AMCA Standard 500-D. For applications where ductwork terminates at the ceiling, standard of acceptance shall be Nailor Industries Model 1221C-1. For applications where continues down past the ceiling, standard of acceptance shall be Nailor Industries Model 1221C-2.

MODEL: 1221C-3 - 1 HOUR LABEL OR 1 1/2 HOUR LABEL CORRIDOR DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Corridor Dampers as manufactured by Nailor Industries, Inc., which meet or exceed the following criteria:
Dampers shall meet the requirements of NFPA 90A and 92. Dampers shall be classified by Underwriters Laboratories and labeled as a (**specifier select rating**) 1 hour fire resistance rated Corridor Damper **or** 1 1/2 hour Fire Damper under UL 555, and as a Class I Leakage Rated Smoke Damper under UL 555S at an elevated temperature of (**specifier select temperature**) 250°F (121°C) **or** 350°F (177°C). Dampers shall be tested under UL 555 and UL 555S by UL to a minimum velocity/pressure rating of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).
Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent galvanized steel formed double-skin airfoil design on 5 1/2" (140) centers. Dampers shall be of opposed blade configuration with an interlocking blade design that provides complete flame and smoke seal under fire conditions at an elevated temperature of 2000°F (1093°C) when in the closed position. Dampers requiring blade seals to maintain leakage class when under elevated temperature conditions are not acceptable. Blades axles shall be 1/2" (13) dia. plated steel, double bolted at each end of blade to ensure positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream. Jamb seals shall be compression type stainless steel. Dampers shall be supplied with factory installed sleeves of minimum 16" (406) length, dependent on (**specifier select application**) ceiling **or** wall thickness, and shall be field verified by contractor. Factory sleeves shall be caulked to UL requirements and shall be complete with factory supplied upper retaining angles of minimum 1 1/2" x 1 1/2" x 16 ga. (38 x 38 x 1.6) galvanized steel.
Appropriate (**specifier select**) externally **or** internally mounted (**specifier select type**) electrical or pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism; external after-market spring mechanisms are not acceptable. Each damper shall be equipped with a UL classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over center/knee lock linkage when the duct temperature reaches the maximum degradation temperature of the damper/actuator assembly, as required by UL 555S. Closure devices that cause instantaneous closure are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.
Damper manufacturer shall submit pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries Model 1221C-3.

- CORRIDOR DAMPER
- STANDARD PERFORMANCE
- LEAKAGE CLASS I @ 250°F OR 350°F
- UL 555 CLASSIFIED CORRIDOR DAMPER
- UL 555S CLASSIFIED SMOKE DAMPER

Models:

1271C-1 1 Hour Label - For use with Steel Grille/Diffuser

1271C-2 1 Hour Label - For Ducted Installation

Model 1271C-1

Models 1271C-1 and 1271C-2 Corridor Dampers are for use where ductwork penetrates the ceiling of an interior corridor of a building, creating a horizontal opening that requires protection. Vee groove blade design provides low pressure drop and ultra-low leakage without the use of blade seals that can burn-off during fire conditions. Model 1271C-1 is suitable for use with a steel grille or diffuser when the duct terminates at the ceiling. Model 1271C-2 is suitable for use when the duct is required to continue down past the ceiling level. Each unit is supplied factory mounted in a suitable sleeve complete with upper retaining angles. For applications where the duct terminates at the ceiling, other manufacturers require full length lower retaining angles with minimum 1" (25) ceiling overlap that protrudes past the grille/diffuser frame causing aesthetic difficulties. Model 1271C-1 is provided with lower mounting tabs that are easily covered by available variety of Nailor steel grilles/diffusers, solving this problem. For Model 1271C-2, lower retaining angles are available from Nailor. Either way, Nailor provides complete protection with reduced installation time and cost.

Model 1271C-1:

STANDARD CONSTRUCTION:

Frame:	5" x 7/8" x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.
Blades:	6" (152) wide on 5 1/2" (140) centers. 16 ga. (1.6) galvanized vee groove or double-skin design.
Sleeve:	16" x 20 ga. (406 x 1.0) standard.
Upper Retaining Angles:	1 1/2" x 1 1/2" x 16 ga. (38 x 38 x 1.6) galv. steel (by Nailor).
Linkage:	Concealed in frame. 12 ga. (2.7) plated steel.
Bearings:	1/2" (13) dia. self-lubricating oilite bronze.
Axles:	1/2" (13) dia. plated steel double bolted to blades.
Jackshaft:	1/2" (13) dia. cadmium plated steel.
Jamb Seals:	Cambered stainless steel.
Blade Seals:	Silicone.

Heat Responsive Device (Controlled Closure):
ERL (Electric Resettable Link) is standard on dampers with electric actuators: 250°F (121°C) standard. 165°F (74°C), 212°F (100°C) and 350°F (177°C) available.
PRL (Pneumatic Replaceable Link) is standard on dampers with pneumatic actuators: 212°F (100°C) standard. 165°F (74°C) and 280°F (138°C) available.

QUALIFICATIONS:

- **UL 555 CLASSIFIED CORRIDOR DAMPER, 1 hr. Fire Resistance Rating (File # 15441).**
- **UL 555S CLASSIFIED SMOKE DAMPER, Leakage Class I at 250°F or 350°F elevated temperature (File # R9492).**
- **Meets the requirements of NFPA 90A, NFPA 92 for Fire/Smoke Dampers.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0106.**
- **Meets the requirements of City of Los Angeles, Uniform Building Code.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**

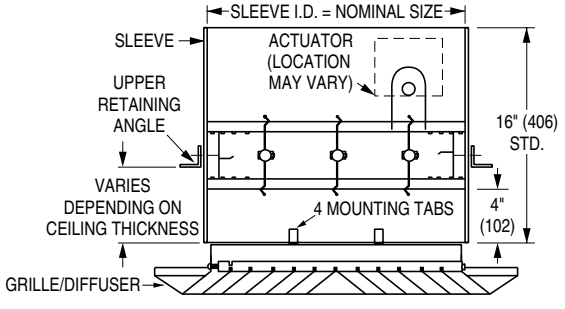
DIMENSIONAL DATA:

Model 1271C-1 Sizes (Duct W x H):

Minimum	Maximum
8" x 8" (203 x 203)	24" x 24" (610 x 610)

COMMON OPTIONS:

- DTS Damper Test Switch for cycle testing.
- DTO Dual Temperature Override Sensor (MLS-400).
- MLS-300 Position Indicator Switch Pack.
- Factory fitted sleeves in custom lengths, gauges and transition styles.



MODEL 1271C-1 (for use with Steel Grille/Diffuser)

Model 1271C-2:

STANDARD CONSTRUCTION:

Frame:	5” x 7/8” x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.
Blades:	6” (152) wide on 5 1/2” (140) centers. 16 ga. (1.6) galvanized vee groove or double-skin design.
Sleeve:	16” x 20 ga. (406 x 1.0) standard.
Upper Retaining Angles:	1 1/2” x 1 1/2” x 16 ga. (38 x 38 x 1.6) galv. steel (by Nailor).
Lower Retaining Angles:	1 1/2” x 1 1/2” x 16 ga. (38 x 38 x 1.6) galvanized steel by installing contractor (optionally by Nailor).
Linkage:	Concealed in frame. 12 ga. (2.7) plated steel.
Bearings:	1/2” (13) dia. self-lubricating oilite bronze.
Axles:	1/2” (13) dia. plated steel double bolted to blades.
Jackshaft:	1/2” (13) dia. cadmium plated steel.
Jamb Seals:	Cambered stainless steel.
Blade Seals:	Silicone.

Heat Responsive Device (Controlled Closure):
ERL (Electric Resettable Link) is standard on dampers with electric actuators: 250°F (121°C) standard. 165°F (74°C), 212°F (100°C) and 350°F (177°C) available. PRL (Pneumatic Replaceable Link) is standard on dampers with pneumatic actuators: 212°F (100°C) standard. 165°F (74°C) and 280°F (138°C) available.

DIMENSIONAL DATA:

Model 1271C-2 Sizes (Duct W x H):

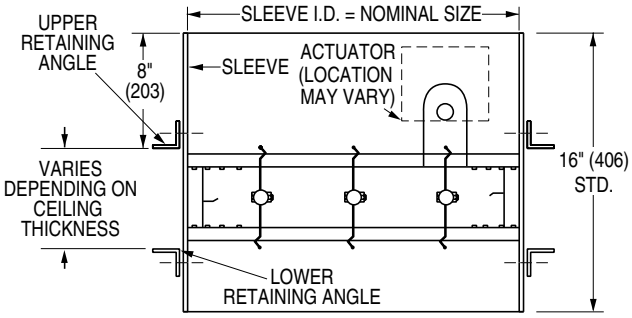
Minimum	Maximum
8” x 8” (203 x 203)	24” x 24” (610 x 610)

COMMON OPTIONS:

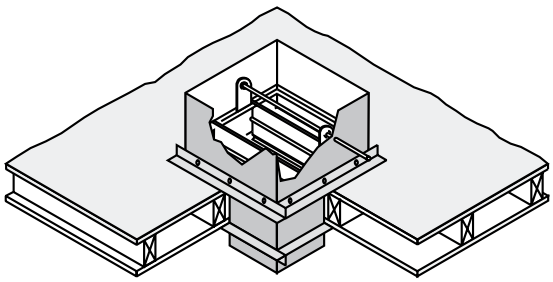
- DTS Damper Test Switch for cycle testing.
- DTO Dual Temperature Override Sensor (MLS-400).
- MLS-300 Position Indicator Switch Pack.
- Factory fitted sleeves in custom lengths, gauges and transition styles.

QUALIFICATIONS:

- **UL 555 CLASSIFIED CORRIDOR DAMPER, 1 hr. Fire Resistance Rating (File # 15441).**
- **UL 555S CLASSIFIED SMOKE DAMPER, Leakage Class I at 250°F or 350°F elevated temperature (File # R9492).**
- **Meets the requirements of NFPA 90A, NFPA 92 for Fire/Smoke Dampers.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0106.**
- **Meets the requirements of City of Los Angeles, Uniform Building Code.**
- **Maximum velocity: 2000 fpm @ 4” w.g. (10 m/s @ 1 kPa).**



MODEL 1271C-2



Isometric View of typical Model 1271C-2 in 1 hr. wood stud ceiling

- **DUAL USAGE CORRIDOR COMBINATION FIRE/SMOKE DAMPER**
- **STANDARD PERFORMANCE**
- **LEAKAGE CLASS I @ 250°F OR 350°F**
- **UL 555 CLASSIFIED CORRIDOR DAMPER**
- **UL 555 CLASSIFIED FIRE DAMPER**
- **UL 555S CLASSIFIED SMOKE DAMPER**

Model 1271C-3

Model:

1271C-3 1 Hour Label & 1 1/2 Hour Label

Model 1271C-3 is both a 1 hr. rated corridor damper for use in corridor ceilings and a standard 1 1/2 hr. rated combination fire/smoke damper for use in walls and floors. The dual rating makes it ideal for stocking as the unit can be supplied when either type of damper is required by the local customer. Model 1271C-3 is supplied complete with upper retaining angles as well as mounting tabs for use with a steel grille/diffuser. The damper may be installed using the single-side retaining angles method. Lower retaining angles are available for ducted corridor or standard wall/floor combination fire/smoke applications when the two-sided angles installation is utilized.

STANDARD CONSTRUCTION:

Frame:	5” x 7/8” x 16 ga. (127 x 22 x 1.6) galvanized steel hat channel.
Blades:	6” (152) wide on 5 1/2” (140) centers. 16 ga. (1.6) galvanized vee groove or double-skin design.
Sleeve:	16” x 20 ga. (406 x 1.0) standard.
Upper Retaining Angles:	1 1/2” x 1 1/2” x 16 ga. (38 x 38 x 1.6) galv. steel (by Nailor).
Lower Retaining Angles:	1 1/2” x 1 1/2” x 16 ga. (38 x 38 x 1.6) galvanized steel by installing contractor (optionally by Nailor).
Linkage:	Concealed in frame. 12 ga. (2.7) plated steel.
Bearings:	1/2” (13) dia. self-lubricating oilite bronze.
Axles:	1/2” (13) dia. plated steel double bolted to blades.
Jackshaft:	1/2” (13) dia. cadmium plated steel.
Jamb Seals:	Cambered stainless steel.
Blade Seals:	Silicone.

Heat Responsive Device (Controlled Closure):
ERL (Electric Resettable Link) is standard on dampers with electric actuators: 250°F (121°C) standard. 165°F (74°C), 212°F (100°C) and 350°F (177°C) available.
PRL (Pneumatic Replaceable Link) is standard on dampers with pneumatic actuators: 212°F (100°C) standard. 165°F (74°C) and 280°F (138°C) available.

QUALIFICATIONS:

- **UL 555 CLASSIFIED CORRIDOR DAMPER, 1 hr. Fire Resistance Rating (File # 15441).**
- **UL 555 CLASSIFIED FIRE DAMPER, 1 1/2 hr. Fire Resistance Rating (File # R9492).**
- **UL 555S CLASSIFIED SMOKE DAMPER, Leakage Class I at 250°F or 350°F elevated temperature (File # R9492).**
- **Meets the requirements of NFPA 90A, NFPA 92 for Fire/Smoke Dampers.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0106.**
- **Meets the requirements of City of Los Angeles, Uniform Building Code.**
- **Maximum velocity: 2000 fpm @ 4” w.g. (10 m/s @ 1 kPa).**

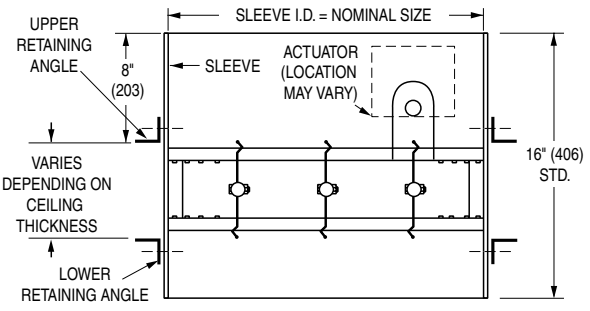
DIMENSIONAL DATA:

Model 1271C-3 Sizes (Duct W x H):

Minimum	Maximum
8” x 8” (203 x 203)	24” x 24” (610 x 610)

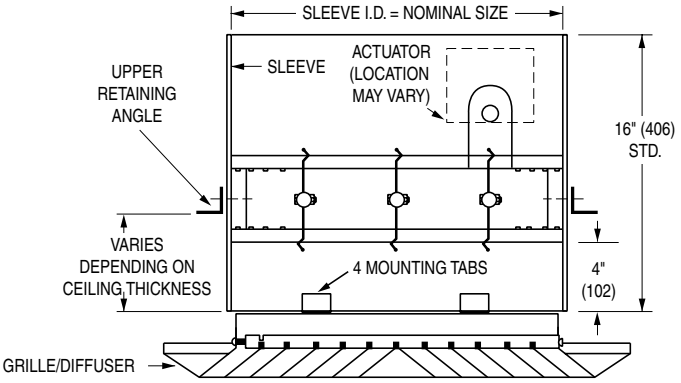
COMMON OPTIONS:

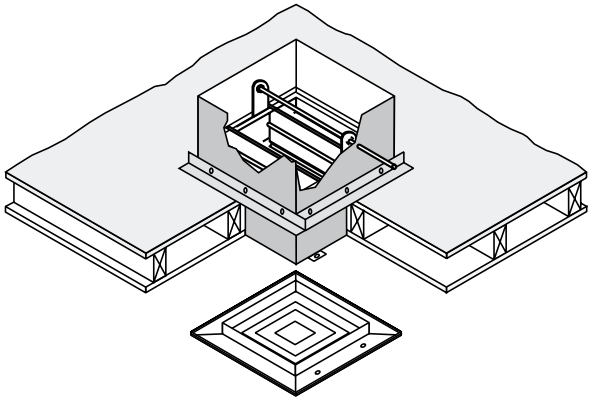
- DTS Damper Test Switch for cycle testing.
- DTO Dual Temperature Override Sensor (MLS-400).
- MLS-300 Position Indicator Switch Pack.
- Factory fitted sleeves in custom lengths, gauges and transition styles.



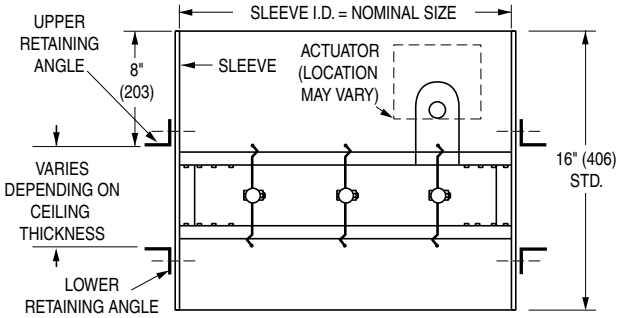
MODEL 1271C-3

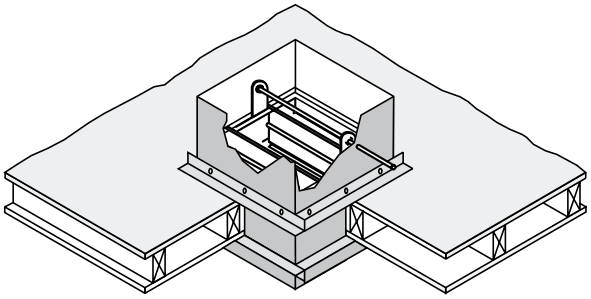
Model 1271C-3 Applications
Corridor Damper for use with Steel Grille/Diffuser:



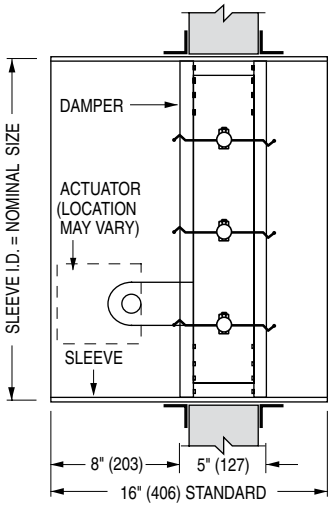


Corridor Damper for Ducted Installations:

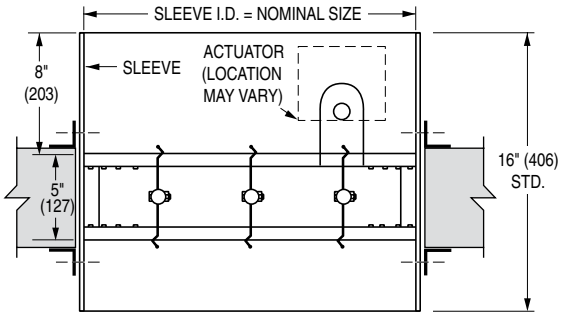




Combination Fire/Smoke Damper for Walls and Floors:



Wall Installation



Floor Installation

COMBINATION FIRE/SMOKE DAMPERS

G

PERFORMANCE DATA:

MODELS: 1271C-1 AND 1271C-2 - 1 HOUR LABEL

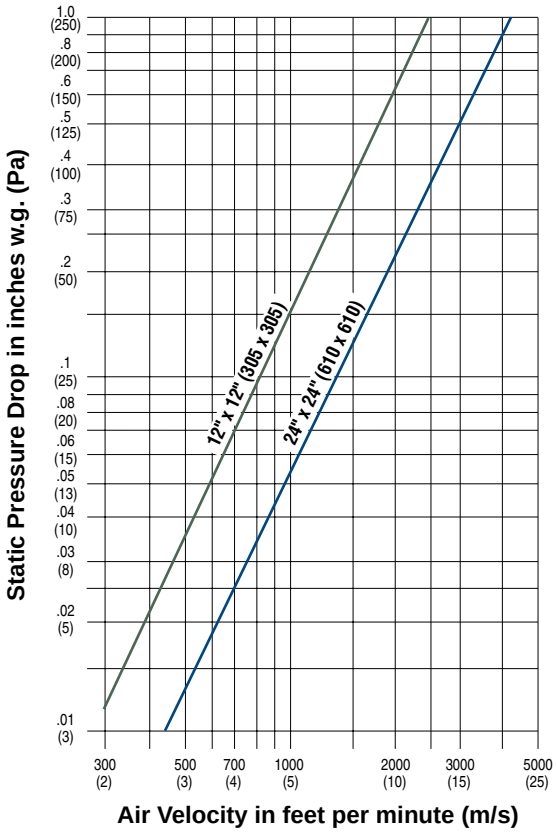
MODEL: 1271C-3 - 1 HOUR AND 1 1/2 HOUR LABEL

LEAKAGE CLASS:

The Model 1271C-1 and Model 1271C-2 Series Corridor Dampers have been designed and qualified under UL 555 and UL 555S in order to provide maximum system design flexibility. They are available with a Class I (currently the lowest available) leakage rating with all damper/actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C) or 350°F (177°C), dependent on actuator, under airflow.

The Model 1271C-3 Series Corridor Combination Fire/Smoke Damper has been designed and qualified under UL 555 and UL 555S in order to provide maximum system design flexibility. It is available with a Class I (currently the lowest available) leakage rating with all damper/actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C) or 350°F (177°C), dependent on actuator, under airflow of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

Models 1271C-1 and 1271C-2 Maximum Performance Ratings	
UL 555 Classified Corridor Damper Fire Resistance Rating	1 Hour
UL 555S Classified Smoke Damper Leakage Rating	Class I
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)
Maximum Temperature	350°F (177°C)

Model 1271C-3 Maximum Performance Ratings	
UL 555 Classified Corridor Damper Fire Resistance Rating	1 Hour
UL 555 Classified Fire Damper Fire Resistance Rating	1 1/2 Hour
UL 555S Classified Smoke Damper Leakage Rating	Class I
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)
Maximum Temperature	350°F (177°C)

HOW TO ORDER

MODEL SERIES: 1271C

TUNNEL CORRIDOR COMBINATION FIRE/SMOKE DAMPERS

EXAMPLE: 1271C-1 - 24X24 - V - AUTO - 120 - I - 24 - 250 - ERL - 250 - BO - SL = 16 - 20G - EXT - RH - CL - FL12 - L8

1a. **Models**
Dynamic or Static Applications
- 1271C-1 Corridor Damper, Vee Groove Blade, Diffuser, 1 Hour Label
- 1271C-2 Corridor Damper, Vee Groove Blade, Ducted, 1 Hour Label
- 1271C-3 Corridor or Combination Fire/Smoke Damper, Vee Groove Blade, 1 / 1 1/2 Hour Label

1b. **Sleeve/Enclosure Style**
(4th Digit)
1 = Type A Sleeve

2. **Duct Size**
Width x Height
inches (mm's)

3. **Mounting**
- V Vertical (wall)
- H Horizontal (floor)

4. **Actuator Selected By**
- AUTO Least Cost (Auto-Select) (default)
- BEL Belimo
- HON Honeywell
- SIE Siemens

5. **Power Requirement**
- 120 120 VAC (default)
- 230 230 VAC
- 24 24 VAC
- 25 25 psi Pneumatic

6. **Leakage Rating**
- I Class I (default)

7. **Max. Velocity/Pressure Rating**
- 24 2000 fpm @ 4" w.g. (default)

8. **Elevated Temperature**
- 250 250°F (default)
- 350 350°F

9. **Closure Device**
- ERL ERL Electric Resettable Link (default)
- PRL PRL Pneumatic Link
- DTO Dual Temperature Override Sensor (MLS-400)

10. **Closure Temperature**
ERL /PRL
- 165 165°F
- 212 212°F (PRL)
- 250 250°F (ERL only) (default)
- 280 280°F (PRL only)
- 350 350°F (ERL only)

DTO Dual Temperature Override Sensor (MLS-400)
- HL 250/165°F
- HIL 350/165°F

11. **Bearings**
- BO Oilite Bronze (default)
- BS Stainless Steel

12. **Sleeve Length**
SL = Specify
16" (406) standard (default)
16" – 36" (406 – 914)

13. **Sleeve Gauge**
- 20G 20 Ga. standard (default)
- 18G 18 Ga.
- 16G 16 Ga.
- 14G 14 Ga.
- 10G 10 Ga.

14. **Actuator Mounting**
- EXT External (default)
- INT Internal

15. **Actuator Location**
- RH Right hand (default)
- LH Left hand
- MH Multi-hand

16. **Actuator Fail Position**
- CL Close (default)

17. **Actuator Models**
Electric:

HL1	MS4104F	120VAC
HL2	MS8104F	24VAC
HL3	MS4604F	230VAC
HM1	MS4109F	120VAC
HM2	MS8109F	24VAC
HM3	MS4609F	230VAC
HH1	MS4120F	120VAC
HH2	MS8120F	24VAC
HH3	MS4620F	230VAC
GD2	GGD221	120VAC
GD1	GGD121	24VAC
GD3	GGD321	230VAC
FT12	FSTF120	120VAC
FT23	FSTF230	230VAC
FT24	FSTF24	24VAC
FL12	FSLF120	120VAC
FL23	FSLF230	230VAC
FL24	FSLF24	24VAC
F12	FSNF120	120VAC
F23	FSNF230	230VAC
F24	FSNF24	24VAC
FA12	FSAF120A	120VAC
FA23	FSAF230A	230VAC
FA24	FSAF24A	24VAC

Pneumatic:
- 296 331-2961
- 306 331-3060

18. **Damper Location**
- L8 8" (203) from sleeve end

OPTIONS & ACCESSORIES:

19. **Position Indicator**
- — None (default)
- 300 MLS-300 (4-wire) (Included with Dual Temperature Override Sensor [DTO])

20. **EP Switch**
- — None (default)
- EP1 120VAC
- EP2 24VAC

21. **Damper Test Switch**
- — None (default)
- DTS Damper Test Switch

22. **Upper Angles**
- UNM Upper Angles, Not Mounted (default) Models 1271C-2 and 1271C-3 only
- UFM Upper Angles, Factory Mounted, Specify ceiling thickness Ceiling ____ inches/mm

23. **Lower Angles**
- — None (default)
- LNM Lower Angles, Not Mounted Models 1271C-2 and 1271C-3 only

24. **Angle Location**
- — None (default)
- LO Angle Location

25. **Transition Collar**
- — None (default)
- SRT Top Transition _____ dia. specify Models 1271C-1 and 1271C-2 only
- SRB Bottom Transition, Model 1271C-2 only _____ dia. specify
- SR2 Top and Bottom Transition, Model 1271C-2 only _____ dia. specify

Notes:

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

2. ERL is standard on all dampers with electric actuators. PRL is standard on all dampers with pneumatic actuators.

An ERL or DTO (MLS-400) may be ordered on dampers with pneumatic actuators, but in addition, an EP switch (factory mounted) is required.

3. EP (electric-pneumatic) switch accessory is applicable only to pneumatic actuators and is optional (shipped loose) when PRL closure device is selected.

4. One DTO (MLS-400) or MLS-300 required per damper assembly. DTO (MLS-400) includes MLS-300 position indicator.

5. Maximum Closure Temperature allowed is equal to Damper Elevated Temperature.

HOW TO SPECIFY

MODELS: 1271C-1 AND 1271C-2 - 1 HOUR LABEL
TUNNEL CORRIDOR COMBINATION FIRE/SMOKE DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Tunnel Corridor Combination Fire/Smoke Dampers as manufactured by Nailor Industries, Inc., which meet or exceed the following criteria:
Dampers shall meet the requirements of NFPA 90A and 92. Dampers shall be classified by Underwriters Laboratories and labeled as a 1 hour fire resistance rated Corridor Damper under UL 555, and as a Class I Leakage Rated Smoke Damper under UL 555S at an elevated temperature of (**specifier select temperature**) 250°F (121°C) **or** 350°F (177°C).
Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be of formed vee groove or double-skin design, 16 ga. (1.6) galvanized steel on 5 1/2" (140) centers, and shall be parallel configuration. Blades axles shall be 1/2" (13) dia. plated steel, double bolted at each end of blade to ensure positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream. Jamb seals shall be cambered stainless steel. Blade seals shall be silicone. Dampers shall be supplied with factory installed sleeves of minimum 16" (406) length, dependent upon ceiling thickness, to be field verified by contractor. Factory sleeves shall be caulked to UL requirements and shall be complete with factory supplied galvanized steel upper retaining angles of minimum 1 1/2" x 1 1/2" x 16 ga. (38 x 38 x 1.6). (Specifier to select, if required) Optional factory supplied galvanized steel lower retaining angles of minimum 1 1/2" x 1 1/2" x 16 ga. (38 x 38 x 1.6) shipped loose for field installation.
Appropriate (**specifier select**) externally **or** internally mounted (**specifier select type**) electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism; external after-market spring mechanisms are not acceptable. Each damper shall be equipped with a UL classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over center/knee lock linkage when the duct temperature reaches the maximum degradation temperature of the damper/actuator assembly, as required by UL 555S. Closure devices that cause instantaneous closure are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.
Damper manufacturer shall submit pressure drop data to be based on tests in accordance with AMCA Standard 500-D. For applications where ductwork terminates at the ceiling, standard of acceptance shall be Nailor Industries Model 1271C-1. For applications where ductwork continues down past ceiling, standard of acceptance shall be Nailor Industries Model 1271C-2.

MODEL: 1271C-3 - 1 HOUR LABEL OR 1 1/2 HOUR LABEL
TUNNEL CORRIDOR COMBINATION FIRE/SMOKE DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Corridor Dampers as manufactured by Nailor Industries, Inc., which meet or exceed the following criteria:
Dampers shall meet the requirements of NFPA 90A and 92. Dampers shall be classified by Underwriters Laboratories and labeled as a (**specifier select rating**) 1 hour fire resistance rated Corridor Damper **or** 1 1/2 hour Fire Damper under UL 555, and as a Class I Leakage Rated Smoke Damper under UL 555S at an elevated temperature of (**specifier select temperature**) 250°F (121°C) **or** 350°F (177°C).
Frame shall be constructed of 16 ga. (1.6) galvanized steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be of formed vee groove or double-skin design, 16 ga. (1.6) galvanized steel, on 5 1/2" (140) centers, and shall be parallel configuration. Blades axles shall be 1/2" (13) dia. plated steel, double bolted at each end of blade to ensure positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream. Jamb seals shall be cambered stainless steel. Blade seals shall be silicone. Dampers shall be supplied with factory installed sleeves of minimum 16" (406) length, dependent upon (**specifier select application**) ceiling **or** wall or floor thickness, to be field verified by contractor. Factory sleeves shall be caulked to UL requirements and shall be complete with factory supplied galvanized steel upper retaining angles of minimum 1 1/2" x 1 1/2" x 16 ga. (38 x 38 x 1.6). (**Specifier to select, if required**) Optional factory supplied galvanized steel lower retaining angles of minimum 1 1/2" x 1 1/2" x 16 ga. (38 x 38 x 1.6) shipped loose for field installation.
Appropriate (**specifier select**) externally **or** internally mounted (**specifier select type**) electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism; external after-market spring mechanisms are not acceptable. Each damper shall be equipped with a UL classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over center/knee lock linkage when the duct temperature reaches the maximum degradation temperature of the damper/actuator assembly, as required by UL 555S. Closure devices that cause instantaneous closure are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation.
Damper manufacturer shall submit pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries Model 1271C-3.

- HARSH ENVIRONMENTS
- PREMIUM PERFORMANCE
- CLASS I OR II LEAKAGE @ 250°F
- UL 555 CLASSIFIED DYNAMIC FIRE DAMPER
- UL 555S CLASSIFIED SMOKE DAMPER
- ULTRA-LOW LEAKAGE

Model Series:

1220SS **1 1/2 Hour Label**

1220SS-3 **3 Hour Label**

Model 1221SS

Model Series 1220SS and 1220SS-3 dampers are ideal for high humidity, mildly corrosive or, with optional Type 316 construction, more severe environment applications where building codes require both a fire damper for the protection of ductwork penetrations in walls that have a fire resistance rating of up to 2 or 4 hours and also require a leakage rated damper for operational smoke control in static or dynamic smoke management systems.

Model Series 1220SS and 1220SS-3 have been designed and tested to provide premium performance. They offer the lowest leakage class available and are qualified for installation with airflow in either direction and inverted mounting. Airfoil blade design and elimination of blade sills, top and bottom, provide a low pressure drop design. Unique, inter-locking double skin blade design provides flame and smoke seal under fire conditions.

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 hr. or 3 hr. Label (File # R9492).**
- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I or II at 250°F elevated temperature.**
- **Meets NFPA 80, 90A, 92, 101 and 105 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0106.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**

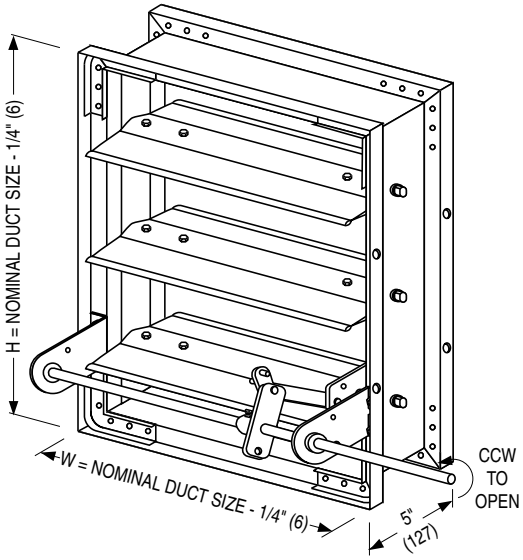
STANDARD CONSTRUCTION:

Frame:	5" x 7/8" x 16 ga. (127 x 22 x 1.6) stainless steel hat channel.
Blades:	14 ga. (2.0) equivalent stainless steel formed airfoil on 5 1/2" (140) centers. Opposed action.
Linkage:	Concealed in frame. 12 ga. (2.7) stainless steel.
Bearings:	1/2" (13) dia. sintered stainless steel.
Axles:	1/2" (13) dia. stainless steel double bolted to blades.
Jackshaft:	1/2" (13) dia. stainless steel.
Jamb Seals:	Cambered stainless steel.

Heat Responsive Device (Controlled Closure):
ERL (Electric Resettable Link) is standard on dampers with electric actuators: 250°F (121°C) standard. 165°F (74°C) and 212°F (100°C) available.
PRL (Pneumatic Replaceable Link) is standard on dampers with pneumatic actuators: 212°F (100°C) standard. 165°F (74°C) available.

COMMON OPTIONS:

- DTS Damper Test Switch for cycle testing.
- DSDL/DSDN Duct Smoke Detectors.
- DTO Dual Temperature Override Sensor (MLS-400).
- MLS-300 Position Indicator Switch Pack.
- QS1 & QS2 "Quick-Set" Retaining Angles.
- Factory fitted sleeves in custom lengths, gauges and transition styles.

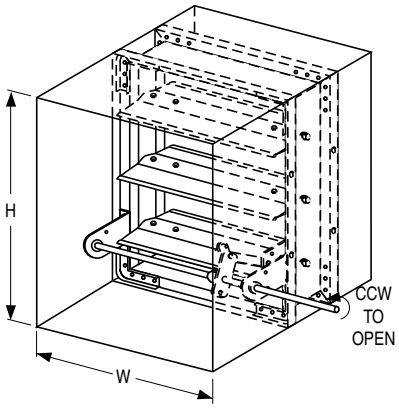


MODEL 1220SS 1 1/2 HOUR LABEL
MODEL 1220SS-3 3 HOUR LABEL
(Side Mounting Plate/Sleeve not shown)

DIMENSIONAL DATA:

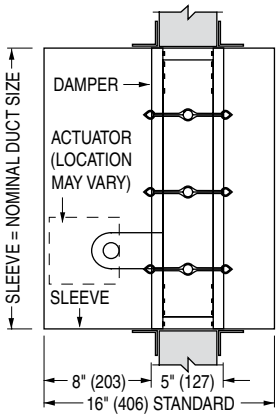
Model Series 1220SS (1 1/2 Hr. Label) and 1220SS-3 (3 Hr. Label) dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1222SS or 1222SS-3). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1223SS or 1223SS-3).

MODELS 1220SS, 1221SS, 1220SS-3 AND 1221SS-3: TYPE A SLEEVE



Models 1220SS (no sleeve), 1221SS, 1220SS-3 (no sleeve) & 1221SS-3 Sizes (Duct W x H):

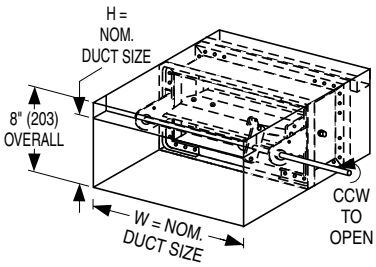
Model	Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum			
			Single Section	Single Section		Multiple Section	
			Vertical	Vertical	Horizontal	Vertical	Horizontal
Model 1220SS Model 1221SS	24	250	8" x 8" (203 x 203)	30" x 48" (762 x 1219)	n/a	120" x 96" (3048 x 2438)	n/a
Model 1220SS-3 Model 1221SS-3	24	250	8" x 8" (203 x 203)	30" x 48" (762 x 1219)	n/a	120" x 96" (3048 x 2438)	n/a



Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

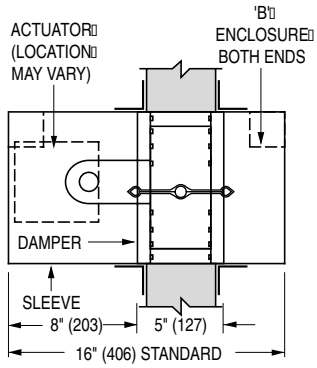
Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

MODELS 1222SS AND 1222SS-3: TYPE B SLEEVE ENCLOSURE



Models 1222SS and 1222SS-3 Sizes (Duct W x H):

Model	Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum			
			Single Section	Single Section		Multiple Section	
			Vertical	Vertical	Horizontal	Vertical	Horizontal
Model 1222SS	24	250	8" x 4" (203 x 102) Overall damper height is 8" (203).	30" x 7 1/2" (762 x 191)	n/a	120" x 7 1/2" (3048 x 191)	n/a
Model 1222SS-3	24	250	8" x 4" (203 x 102) Overall damper height is 8" (203).	30" x 7 1/2" (762 x 191)	n/a	120" x 7 1/2" (3048 x 191)	n/a



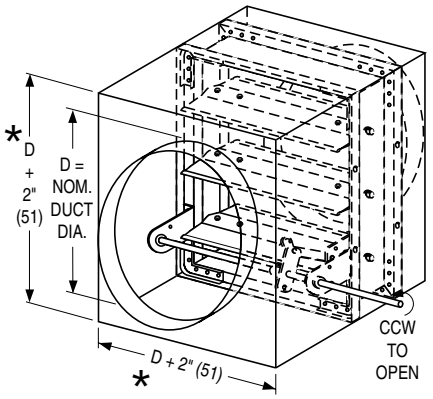
Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

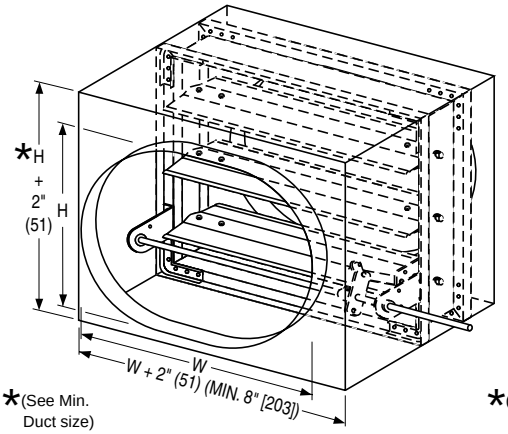
DIMENSIONAL DATA:

Model Series 1220SS (1 1/2 Hr. Label) and 1220SS-3 (3 Hr. Label) dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1222SS or 1222SS-3). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1223SS or 1223SS-3).

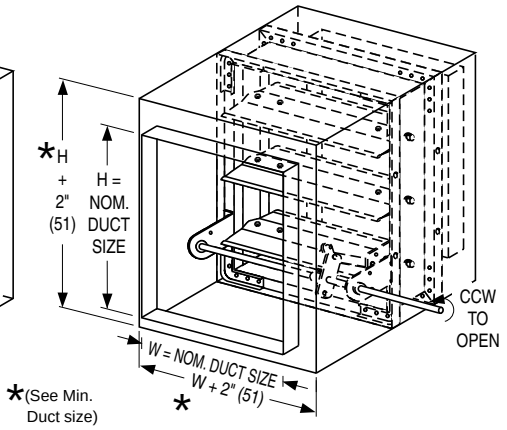
MODELS 1223SS AND 1223SS-3: TYPE C SLEEVE ENCLOSURES



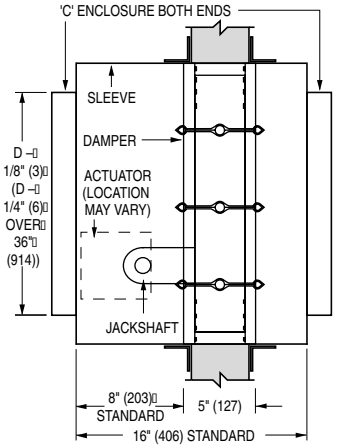
STYLE CR : FOR ROUND DUCT



STYLE CO : FOR OVAL DUCT



STYLE CSR : FOR SQUARE OR RECTANGULAR DUCT



Standard factory sleeve (caulked to UL requirements) 16" long x 20 ga. (406 x 1.0) (18 ga. [1.3] for dampers over 84" [2134] in width). Available up to 36" (914) dependent upon wall thickness and 10 through 20 ga. (3.5 through 1.0).

Wall Thickness	Min. Sleeve Length
4 (102)	16 (406)
8 (203)	20 (508)
12 (305)	24 (610)
16 (406)	28 (711)

Models 1223SS and 1223SS-3 - Round Duct Connection Sizes (Duct Dia.):

Model	Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum			
			Single Section	Single Section		Multiple Section	
			Vertical	Vertical	Horizontal	Vertical	Horizontal
Model 1223SS	24	250	4" (102) dia. (overall damper size is 8" x 8" [203 x 203] min.).	28" (711) dia.	n/a	94" (2388) dia.	n/a
Model 1223SS-3	24	250	4" (102) dia. (overall damper size is 8" x 8" [203 x 203] min.).	28" (711) dia.	n/a	94" (2388) dia.	n/a

Models 1223SS & 1223SS-3 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):

Model	Velocity/ Pressure Rating	Elevated Temp. °F	Minimum	Maximum			
			Single Section	Single Section		Multiple Section	
			Vertical	Vertical	Horizontal	Vertical	Horizontal
Model 1223SS	24	250	4" x 4" (102 x 102) (overall damper size is 8" x 8" [203 x 203] min.).	28" x 46" (711 x 1168)	n/a	118" x 94" (2997 x 2388)	n/a
Model 1223SS-3	24	250	4" x 4" (102 x 102) (overall damper size is 8" x 8" [203 x 203] min.).	28" x 46" (711 x 1168)	n/a	118" x 94" (2997 x 2388)	n/a

PERFORMANCE DATA:

MODEL SERIES: 1220SS - 1 1/2 HOUR LABEL AND 1220SS-3 - 3 HOUR LABEL

LEAKAGE CLASS:

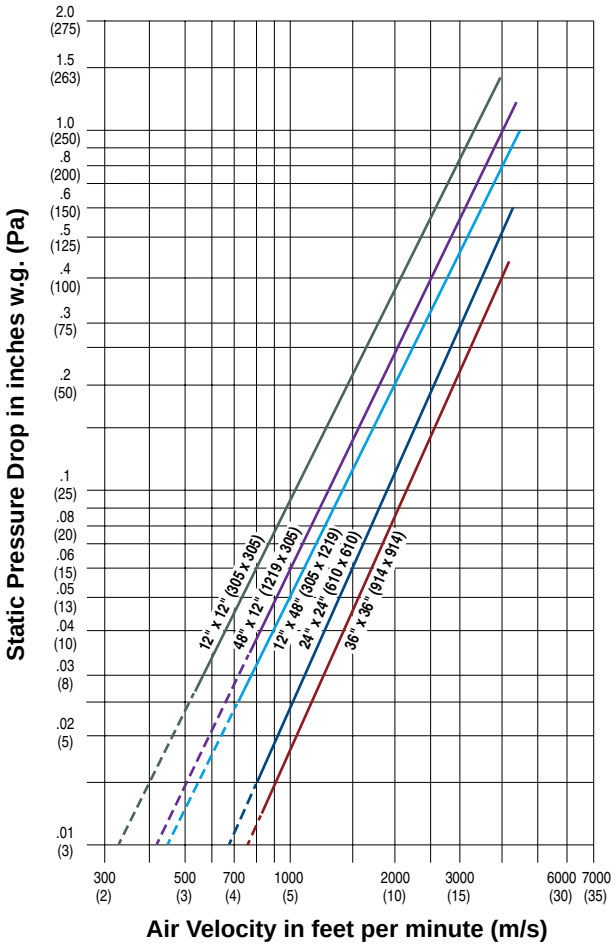
The 1220SS Series Stainless Steel Combination Fire/Smoke Damper has been designed and qualified under UL 555S in order to provide maximum system design flexibility. They are available with a Class I (currently the lowest available) or Class II leakage rating with all damper/actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C), dependent on actuator, under airflow of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).

The 1220SS-3 Series Stainless Steel Combination Fire/Smoke Damper has been designed and qualified under UL 555S in order to provide maximum system design flexibility. They are available with a Class I (currently the lowest available) or Class II leakage rating with all damper/actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C), dependent on actuator, under airflow of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).

1220SS Series - Maximum Performance Ratings	
UL 555 Fire Rating	1 1/2 Hour
UL 555S Leakage Rating	Class I
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)
Maximum Temperature	250°F (121°C)

1220SS-3 Series - Maximum Performance Ratings	
UL 555 Fire Rating	3 Hour
UL 555S Leakage Rating	Class I
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)
Maximum Temperature	250°F (121°C)

PRESSURE DROP:



Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.^{3}.

HOW TO ORDER

STAINLESS STEEL COMBINATION FIRE / SMOKE DAMPERS

MODEL SERIES: 1220SS - 1 1/2 HOUR LABEL AND 1220SS-3 - 3 HOUR LABEL

EXAMPLE: 1221SS - 24X24 - V - AUTO - 120 - I - 24 - 250 - ERL - 250 - BS - SL = 16 - 20G - EXT - RH - CL - FL12 - L8

1a. **Models**
Dynamic or Static Applications
1220SS Stainless Steel, Airfoil Blade, 1 1/2 Hour Label
1220SS-3 Stainless Steel, Airfoil Blade, 3 Hour Label

1b. **Sleeve/Enclosure Style**
(4th Digit)
0 = No Sleeve
1 = Type A Sleeve
2 = Type B Sleeve Enclosure
3 = Type C Sleeve Enclosure

2. **Duct Size**
Width x Height
inches (mm's)

3. **Construction**
304 Type 304 Stainless Steel (default)
316 Type 316 Stainless Steel

4. **Mounting**
V Vertical (wall) (default)

5. **Actuator Selected By**
AUTO Least Cost (Auto-Select) (default)
BEL Belimo
HON Honeywell
SIE Siemens

6. **Power Requirement**
120 120 VAC (default)
230 230 VAC
24 24 VAC
25 25 psi Pneumatic

7. **Leakage Rating**
I Class I (default)
II Class II

8. **Max. Velocity/Pressure Rating**
24 2000 fpm @ 4" w.g. (default)

9. **Elevated Temperature**
250 250°F (default)

10. **Closure Device**
ERL ERL Electric Resettable Link (default)
PRL PRL Pneumatic Link
DTO Dual Temperature Override Sensor (MLS-400)

11. **Closure Temperature**
ERL/PRL
165 165°F
212 212°F (PRL)
250 250°F (ERL only) (default)
DTO Dual Temperature Override Sensor (MLS-400)
HL 250/165°F

12. **Bearings**
BS Stainless Steel

13. **Duct Smoke Detector**
— None (default)
DSDL Low-Flow, factory mounted
DSDN No-Flow, factory mounted

14a. **Side Mounting Plate**
(No Sleeve models only)
SMP Side Mounting Plate

14b. **Sleeve Length**
SL = Specify
16" (406) standard (default)
16" – 36" (406 – 914)

15. **Sleeve Gauge**
20G 20 Ga. standard (default)
18G 18 Ga.
16G 16 Ga.
14G 14 Ga.
10G 10 Ga.

16. **Transition**
(Sleeve Type C models only)
CR Round
CO Oval
CSR Square/Rectangular

17. **Actuator Mounting**
EXT External (default)
INT Internal

18. **Actuator Location**
RH Right hand (default)
LH Left hand
MH Multi-hand

19. **Actuator Fail Position**
CL Close (default)

20. **Actuator Models**
Electric:

HL1	MS4104F	120VAC
HL2	MS8104F	24VAC
HL3	MS4604F	230VAC
HM1	MS4109F	120VAC
HM2	MS8109F	24VAC
HM3	MS4609F	230VAC
HH1	MS4120F	120VAC
HH2	MS8120F	24VAC
HH3	MS4620F	230VAC
GD2	GGD221	120VAC
GD1	GGD121	24VAC
GD3	GGD321	230VAC
FL12	FSLF120	120VAC
FL23	FSLF230	230VAC
FL24	FSLF24	24VAC
F12	FSNF120	120VAC
F23	FSNF230	230VAC
F24	FSNF24	24VAC

Pneumatic:
296 331-2961
306 331-3060

21. **Damper Location**
L8 8" (203) from sleeve end
LX Other (specify)
8" – 16" (203 – 406)

OPTIONS & ACCESSORIES:

22. **Position Indicator**
— None (default)
300 MLS-300 (4-wire)
(Included with Dual Temperature Override Sensor [DTO])

23. **EP Switch**
— None (default)
EP1 120 VAC
EP2 24 VAC

24. **Retaining Angles**
— None (default)
QS1 One side
QS2 Both sides (pair)

25. **Damper Test Switch**
— None (default)
DTS Damper Test Switch

Notes:

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

2. ERL is standard on all dampers with electric actuators. PRL is standard on all dampers with pneumatic actuators. An ERL or DTO (MLS-400) may be ordered on dampers with pneumatic actuators, but in addition, an EP switch (factory mounted) is required.

3. EP (electric-pneumatic) switch accessory is applicable only to pneumatic actuators and is optional (shipped loose) when PRL closure device is selected.

4. One DTO (MLS-400) or MLS-300 required per damper assembly. DTO (MLS-400) includes MLS-300 position indicator.

5. Maximum Closure Temperature allowed is equal to Damper Elevated Temperature.

HOW TO SPECIFY

MODEL SERIES: 1220SS - 1 1/2 HOUR LABEL
STAINLESS STEEL COMBINATION FIRE / SMOKE DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Stainless Steel Combination Fire/Smoke Dampers, as manufactured by Nailor Industries, Inc., which meet or exceed the following criteria:
Dampers shall meet the requirements of NFPA 80, 90A, 92, 101 and 105. Dampers shall be classified by Underwriter's Laboratories and labeled as a 1 1/2 hour Fire Damper under UL 555, and as a (**specifier select class**) Class I **or** Class II Smoke Damper under UL 555S at an elevated temperature of 250°F (121°C) for use in dynamic or static Smoke Control Systems. Dampers shall have been tested by UL to a minimum velocity/pressure rating of 2000 fpm @ 4" w.g.
Frame shall be constructed of 16 ga. (1.6) stainless steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent stainless steel formed double-skin airfoil design on 5 1/2" (140) centers. Dampers shall be of opposed blade configuration with an interlocking blade design that provides complete flame and smoke seal under fire conditions at an elevated temperature of 2000°F (1093°C) when in closed position. Dampers requiring blade seals to maintain leakage class when under elevated temperature conditions are not acceptable. Blade axles shall be stainless steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be sintered stainless steel type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream. Jamb seals shall be cambered stainless steel. Dampers shall be supplied with factory installed sleeves, length dependent on wall thickness, minimum 16" (406). Wall thickness shall be field verified by contractor. Factory sleeves shall be caulked to UL requirements and shall be 20 ga. (1.0) through 84" (2134) wide and 18 ga. (1.2) above 84" (2134) wide.
Appropriate (**specifier select**) internally **or** externally mounted (**specifier select type**) electric **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism; external after-market spring mechanisms are not acceptable. Each damper shall be equipped with a UL Classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over center/knee lock linkage when the duct temperature reaches the maximum degradation temperature of the damper/actuator assembly, as required by UL 555S. Closure devices that cause instantaneous closure are not acceptable.
Submitted pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries Model Series 1220SS.

MODEL SERIES: 1220SS-3 - 3 HOUR LABEL
STAINLESS STEEL COMBINATION FIRE/SMOKE DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Stainless Steel Combination Fire/Smoke Dampers, as manufactured by Nailor Industries, Inc., which meet or exceed the following criteria:
Dampers shall meet the requirements of NFPA 80, 90A, 92, 101 and 105. Dampers shall be classified by Underwriter's Laboratories and labeled as a 3 hour Fire Damper under UL 555, and as a (**specifier select class**) Class I **or** Class II Smoke Damper under UL 555S at an elevated temperature of 250°F (121°C) for use in dynamic or static Smoke Control Systems. Dampers shall have been tested by UL to a minimum velocity/pressure rating of 2000 fpm @ 4" w.g.
Frame shall be constructed of 16 ga. (1.6) stainless steel hat channel with mitered corners reinforced with die-formed corner gussets for strength. Blades shall be 14 ga. (2.0) equivalent stainless steel formed double-skin airfoil design on 5 1/2" (140) centers. Dampers shall be of opposed blade configuration with an interlocking blade design that provides complete flame and smoke seal under fire conditions at an elevated temperature of 2000°F (1093°C) when in closed position. Dampers requiring blade seals to maintain leakage class when under elevated temperature conditions are not acceptable. Blade axles shall be stainless steel, double bolted at each end of blade to provide positive locking connection. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be sintered stainless steel type. Blade linkage shall be zero-maintenance, concealed in frame, out of airstream. Jamb seals shall be cambered stainless steel. Dampers shall be supplied with factory installed sleeves, length dependent on wall thickness, minimum 16" (406). Wall thickness shall be field verified by contractor. Factory sleeves shall be caulked to UL requirements and shall be 20 ga. (1.0) through 84" (2134) wide and 18 ga. (1.2) above 84" (2134) wide.
Appropriate (**specifier select**) internally **or** externally mounted (**specifier select type**) electric **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring return mechanism; external after-market spring mechanisms are not acceptable. Each damper shall be equipped with a UL Classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over center/knee lock linkage when the duct temperature reaches the maximum degradation temperature of the damper/actuator assembly, as required by UL 555S. Closure devices that cause instantaneous closure are not acceptable.
Submitted pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries Model Series 1220SS-3.

- TRUE ROUND DESIGN
- LEAKAGE CLASS I @ 250°F OR 350°F
- UL 555 CLASSIFIED DYNAMIC FIRE DAMPER
- UL 555S CLASSIFIED SMOKE DAMPER

Model:

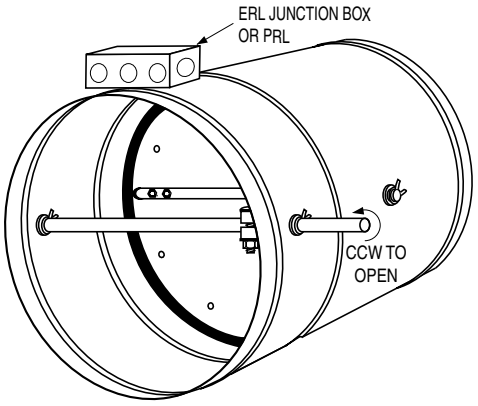
1290FS 1 1/2 Hour Label

Model 1290FS

Model 1290FS True Round Combination Fire/Smoke Damper is ideal for applications where building codes require both a fire damper for the protection of ductwork penetrations in walls or floors that have a fire resistance rating of up to 2 hours and also require a leakage rated damper for operational smoke control in static or dynamic smoke management systems. The 1290FS is an economical damper designed and qualified for round ductwork passing through metal stud drywall partitions or masonry walls. The 1290FS offers the lowest leakage class available and is qualified for installation with airflow in either direction.

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 hr. Label (File # R9492).**
- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I at 250°F or 350°F elevated temperature.**
- **Meets NFPA 80, 90A, 92, 101 and 105 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0106.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**



MODEL 1290FS 1 1/2 HOUR LABEL
(Retaining Plates not shown)

STANDARD CONSTRUCTION:

Frame:	20 ga. (1.0) galvanized steel integral sleeve and retaining plates.
Blades:	2 x 20 ga. (1.0) galvanized steel laminated together. 14 ga. (2.0) equivalent thickness.
Linkage:	Jackshaft to blade.
Bearings:	1/2" (13) dia. self-lubricating oilite bronze.
Axles:	1/2" (13) dia. plated steel double bolted to blades.
Jackshaft:	1/2" (13) dia. cadmium plated steel.
Blade Seal:	Silicone rubber. Peripheral gasket sandwiched between two piece blade.

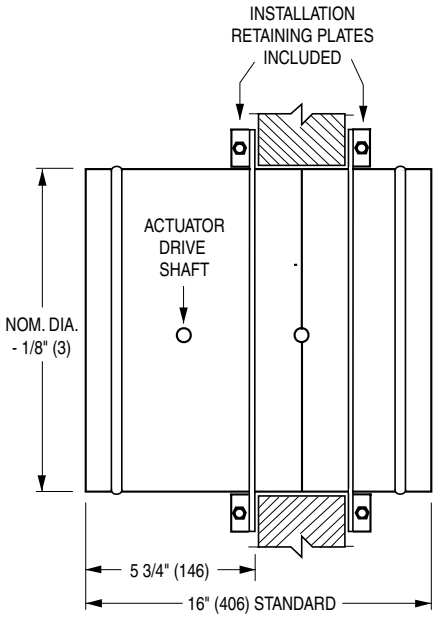
Heat Responsive Device (Controlled Closure):
ERL (Electric Resettable Link) is standard on dampers with electric actuators: 250°F (121°C) standard. 165°F (74°C), 212°F (100°C) and 350°F (177°C) available. PRL (Pneumatic Replaceable Link) is standard on dampers with pneumatic actuators: 212°F (100°C) standard. 165°F (74°C) and 280°F (138°C) available.

Model 1290FS Sizes (Duct Dia.):

Minimum	Maximum
6" (152) dia.	24" (610) dia.

Note: Dampers available in 2" (51) increments.

Wall Thickness	Minimum Sleeve Length
4 to 8 (102 to 203)	16 (406)
10 to 12 (254 to 305)	20 (508)
14 to 16 (356 to 406)	24 (610)



COMMON OPTIONS:

- DTS Damper Test Switch for cycle testing.
- DTO Dual Temperature Override Sensor (MLS-400).
- MLS-300 Position Indicator Switch Pack.
- Factory fitted sleeves in custom lengths and gauges.

- HARSH ENVIRONMENT
- TRUE ROUND DESIGN
- LEAKAGE CLASS I @ 250°F OR 350°F
- UL 555 CLASSIFIED DYNAMIC FIRE DAMPER
- UL 555S CLASSIFIED SMOKE DAMPER

Model:

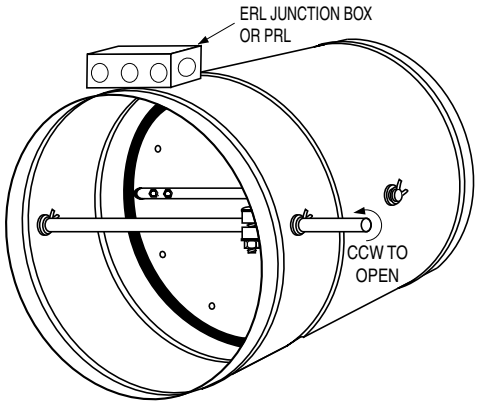
1290FS-SS 1 1/2 Hour Label

Model 1290FS-SS

Model 1290FS-SS True Round Stainless Steel Combination Fire/Smoke Damper is ideal for high humidity or mildly corrosive applications where building codes require both a fire damper for the protection of ductwork penetrations in walls or floors that have a fire resistance rating of up to 2 hours and also require a leakage rated damper for operational smoke control in static or dynamic smoke management systems. The 1290FS-SS damper is designed and qualified for round ductwork passing through metal stud drywall partitions or masonry walls and floors. The 1290FS-SS offers the lowest leakage class available and is qualified for installation with airflow in either direction. It is available in either Type 304 or 316 stainless steel.

QUALIFICATIONS:

- **UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 hr. Label (File # R9492).**
- **UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I at 250°F or 350°F elevated temperature.**
- **Meets NFPA 80, 90A, 92, 101 and 105 as well as IBC and NBC (Canada) Building Code requirements.**
- **City of New York. MEA # 366-03-M.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0106.**
- **Maximum velocity: 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).**



MODEL 1290FS-SS 1 1/2 HOUR LABEL
(Retaining Plates not shown)

STANDARD CONSTRUCTION:

Frame: 20 ga. (1.0) stainless steel integral sleeve and retaining plates.

Blades: 2 x 20 ga. (1.0) stainless steel laminated together. 14 ga. (2.0) equivalent thickness.

Linkage: Stainless steel; jackshaft to blade.

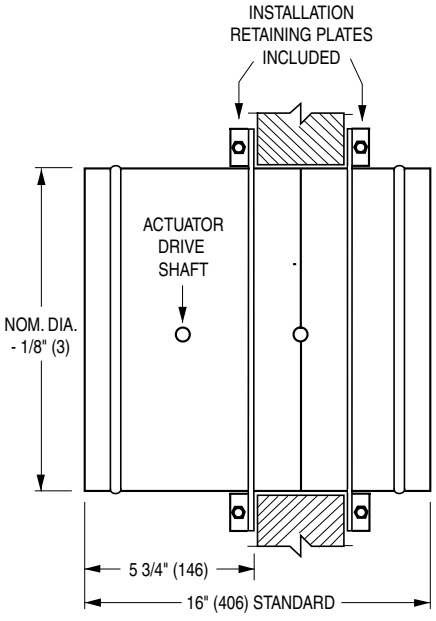
Bearings: 1/2" (13) dia. stainless steel.

Axles: 1/2" (13) dia. stainless steel double bolted to blades.

Jackshaft: 1/2" (13) dia. stainless steel.

Blade Seal: Silicone rubber. Peripheral gasket sandwiched between two piece blade.

Heat Responsive Device (Controlled Closure):
ERL (Electric Resettable Link) is standard on dampers with electric actuators: 250°F (121°C) standard. 165°F (74°C), 212°F (100°C) and 350°F (177°C) available.
PRL (Pneumatic Replaceable Link) is standard on dampers with pneumatic actuators: 212°F (100°C) standard. 165°F (74°C) and 280°F (138°C) available.



Model 1290FS-SS Sizes (Duct Dia.):

Minimum	Maximum
6" (152) dia.	24" (610) dia.

Note: Dampers available in 2" (51) increments.

Wall Thickness	Minimum Sleeve Length
4 to 8 (102 to 203)	16 (406)
10 to 12 (254 to 305)	20 (508)
14 to 16 (356 to 406)	24 (610)

COMMON OPTIONS:

- Type 316 Stainless Steel construction.
- DTS Damper Test Switch for cycle testing.
- DTO Dual Temperature Override Sensor (MLS-400).
- MLS-300 Position Indicator Switch Pack.
- Factory fitted sleeves in custom lengths and gauges.

PERFORMANCE DATA:

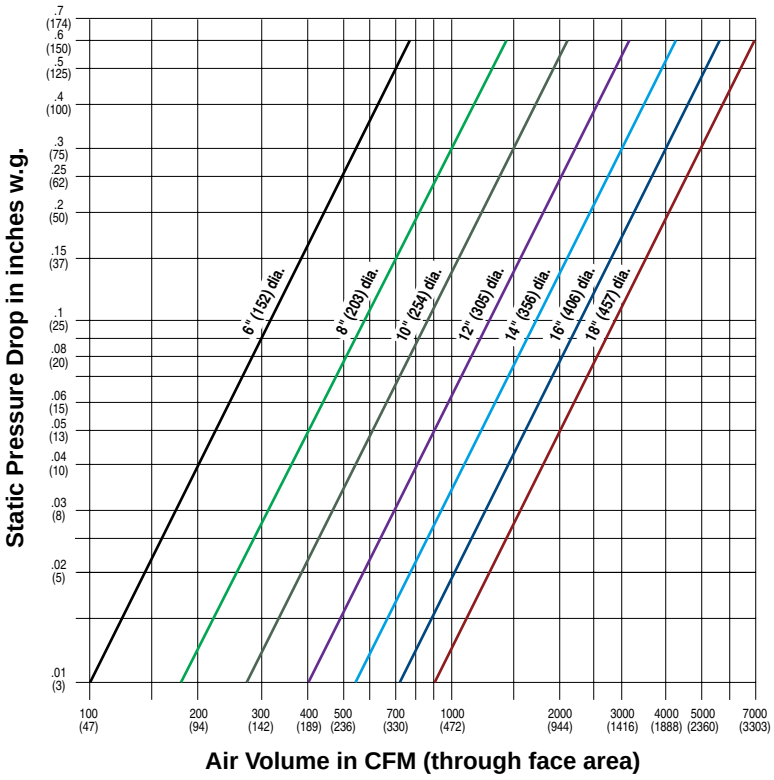
MODEL SERIES: 1290FS - 1 1/2 HOUR LABEL AND 1290FS-SS - 1 1/2 HOUR LABEL

LEAKAGE CLASS:

The Model 1290FS Series Round Combination Fire/Smoke Damper and the Model 1290FS-SS Series Stainless Steel Round Combination Fire/Smoke Damper has been designed and qualified under UL 555S in order to provide maximum system design flexibility. They are available with a Class I leakage rating with all damper/actuator assemblies having been tested successfully at an elevated temperature of 250°F (121°C) or 350°F (177°C), dependent on actuator, under airflow of 2000 fpm @ 4" w.g. (10 m/s @ 1 kPa).

Maximum Performance Ratings	
UL 555 Fire Rating	1 1/2 Hour
UL 555S Leakage Rating	Class I
Maximum Velocity	2000 fpm (10 m/s)
Maximum Pressure	4 in. w.g. (1 kPa)
Maximum Temperature	350°F (177°C)

PRESSURE DROP (damper fully open)



Tested per AMCA standard 500, Fig. 5.5.

HOW TO ORDER

MODEL SERIES: 1290FS - 1 1/2 HOUR LABEL AND 1290FS-SS - 1 1/2 HOUR LABEL TRUE ROUND COMBINATION FIRE/SMOKE DAMPERS

EXAMPLE: 1290-FS - 24 - V - AUTO - 120 - I - 24 - 250 - ERL - 250 - BO - SL = 16 - 20G - EXT - RH - CL - HM1

1a. **Models**
Dynamic or Static Applications
1290FS True Round, 1 1/2 Hour Label
1290FS-SS Stainless Steel, True Round, 1 1/2 Hour Label

2. **Duct Size**
Diameter inches (mm's)

3. **Construction**
(Model 1290FS only)
GLV Galvanized Steel
(Stainless Steel Model 1290FS-SS only)
304 Type 304 Stainless Steel
316 Type 316 Stainless Steel

4. **Mounting**
H/V Horizontal/Vertical

5. **Actuator Selected By**
AUTO Least Cost (Auto-Select) (default)
HON Honeywell
SIE Siemens

6. **Power Requirement**
120 120 VAC (default)
230 230 VAC
24 24 VAC
25 25 psi Pneumatic

7. **Leakage Rating**
I Class I (default)

8. **Max. Velocity / Pressure Rating**
24 2000 fpm @ 4" w.g. (default)

9. **Elevated Temperature**
250 250°F (default)
350 350°F

10. **Closure Device**
ERL ERL Electric Resettable Link (default)
PRL PRL Pneumatic Link
DTO Dual Temperature Override Sensor (MLS-400)

11. **Closure Temperature**
ERL/PRL
165 165°F
212 212°F (PRL)
250 250°F (ERL only) (default)
280 280°F (PRL only)
350 350°F (ERL only)
DTO Dual Temperature Override Sensor (MLS-400)
HL 250/165°F
HIL 350/165°F

12. **Bearings**
BO Oilite Bronze (default)
BS Stainless Steel (default on Model 1290FS-SS)

13. **Sleeve Length**
SL = Specify
16" (406) standard (default)
16" – 36" (406 – 914)

14. **Sleeve Gauge**
20G 20 Ga. standard (default)

15. **Actuator Mounting**
EXT External (default)

16. **Actuator Location**
RH Right hand (default)
LH Left hand
MH Multi-hand

17. **Actuator Fail Position**
CL Close (default)

18. **Actuator Models**
Electric:

HL1	MS4104F	120VAC
HL2	MS8104F	24VAC
HL3	MS4604F	230VAC
HMl	MS4109F	120VAC
HM2	MS8109F	24VAC
HM3	MS4609F	230VAC
FL12	FSLF120	120VAC
FL23	FSLF230	230VAC
FL24	FSLF24	24VAC
F12	FSNF120	120VAC
F23	FSNF230	230VAC
F24	FSNF24	24VAC

Pneumatic:

296	331-2961
482	331-4826

OPTIONS & ACCESSORIES:

19. **Position Indicator**
— None (default)
300 MLS-300 (4-wire) (Included with Dual Temperature Override Sensor [DTO])

20. **EP Switch**
— None (default)
EP1 120 VAC
EP2 24 VAC

21. **Damper Test Switch**
— None (default)
DTS Damper Test Switch

Notes:

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

2. ERL is standard on all dampers with electric actuators. PRL is standard on all dampers with pneumatic actuators.

An ERL or DTO (MLS-400) may be ordered on dampers with pneumatic actuators, but in addition, an EP switch (factory mounted) is required.

3. EP (electric-pneumatic) switch accessory is applicable only to pneumatic actuators and is optional (shipped loose) when PRL closure device is selected.

4. One DTO (MLS-400) or MLS-300 required per damper assembly. DTO (MLS-400) includes MLS-300 position indicator.

5. Maximum Closure Temperature allowed is equal to Damper Elevated Temperature.

HOW TO SPECIFY

MODEL: 1290FS - 1 1/2 HOUR LABEL
TRUE ROUND COMBINATION FIRE / SMOKE DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Round Combination Fire/Smoke Dampers as manufactured by Nailor Industries, Inc., which meet or exceed the following criteria:

Dampers shall meet the requirements of NFPA 80, 90A, 92, 101 and 105. Dampers shall be qualified for use in dynamic or static smoke control systems. Dampers shall be classified by Underwriters Laboratories and labeled as a 1 1/2 hour Dynamic Fire Damper under UL 555 and as a Class I Leakage Rated Smoke Damper under UL 555S at an elevated temperature of (**specifier select temperature**) 250°F (121°C) **or** 350°F (177°C).

Dampers supplied with factory installed sleeves, dependent on wall thickness, minimum 16" (406) length. Sleeve length shall be field verified by contractor. Frame/integral sleeve shall be roll-formed from 20 ga. (1.0) galvanized steel, beaded for structural strength and grooved to accept 20 ga. (1.0) galvanized steel retaining plate. Each damper shall be complete with retaining plate and 20 ga. (1.0) galvanized steel damper plate, supplied by the damper manufacturer to ensure proper fit and installation. Blade shall be of two 20 ga. (1.0) galvanized steel pieces laminated together with an equivalent thickness of 14 ga. (2.0). Blade seal shall be silicone rubber sandwiched between blade pieces and shall completely encircle blade periphery. Blade axles shall be 1/2" (13) dia. plated steel double bolted to blade. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be self-lubricating oilite bronze type.

Appropriate externally mounted (**specifier select type**) electrical **or** pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring mechanism; external after-market spring mechanisms are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation. Each damper shall be equipped with UL Classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over-center/knee lock linkage when the duct temperature reaches the maximum degradation temperature of the damper/actuator assembly, as required by UL 555S. Closure devices that cause instantaneous closure are not acceptable.

Damper manufacturer shall submit pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries Model 1290FS.

MODEL: 1290FS-SS - 1 1/2 HOUR LABEL
STAINLESS STEEL TRUE ROUND COMBINATION FIRE/SMOKE DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, Round Combination Fire/Smoke Dampers as manufactured by Nailor Industries, Inc., which meet or exceed the following criteria:

Dampers shall meet the requirements of NFPA 80, 90A, 92, 101 and 105. Dampers shall be qualified for use in dynamic or static smoke control systems. Dampers shall be classified by Underwriters Laboratories and labeled as a 1 1/2 hour Dynamic Fire Damper under UL 555 and as a Class I Leakage Rated Smoke Damper under UL 555S at an elevated temperature of (**specifier select temperature**) 250°F (121°C) **or** 350°F (177°C).

Dampers supplied with factory installed sleeves, dependent on wall thickness, minimum 16" (406) length. Sleeve length shall be field verified by contractor. Frame/integral sleeve shall be roll-formed from 20 ga. (1.0) stainless steel, beaded for structural strength and grooved to accept 20 ga. (1.0) stainless steel retaining plate. Each damper shall be complete with retaining plate and 20 ga. (1.0) stainless steel damper plate, supplied by the damper manufacturer to ensure proper fit and installation. Blade shall be of two 20 ga. (1.0) stainless steel pieces laminated together with an equivalent thickness of 14 ga. (2.0). Blade seal shall be silicone rubber sandwiched between blade pieces and shall completely encircle blade periphery. Blade axles shall be 1/2" (13) dia. stainless steel double bolted to blade. Hex, square friction-fit or press-fit axles are not acceptable. Bearings shall be stainless steel.

Appropriate externally mounted (**specifier select type**) electrical or pneumatic actuators shall be installed by the damper manufacturer in the factory. Actuators shall incorporate an OEM internal spring mechanism; external after-market spring mechanisms are not acceptable. Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation. Each damper shall be equipped with UL Classified heat responsive device that will cause the damper to close in a controlled manner and lock in a closed position by means of an over-center/knee lock linkage when the duct temperature reaches the maximum degradation temperature of the damper/actuator assembly, as required by UL 555S. Closure devices that cause instantaneous closure are not acceptable.

Damper manufacturer shall submit pressure drop data to be based on tests in accordance with AMCA Standard 500-D. Standard of acceptance shall be Nailor Industries Model 1290FS-SS.

- TOGGLE SWITCH WITH LIGHTS (3 POSITION)
- FOR USE WITH COMBINATION FIRE/SMOKE DAMPERS WITH DTO (MLS-400)

Model:

DCP1 Damper Control Panel

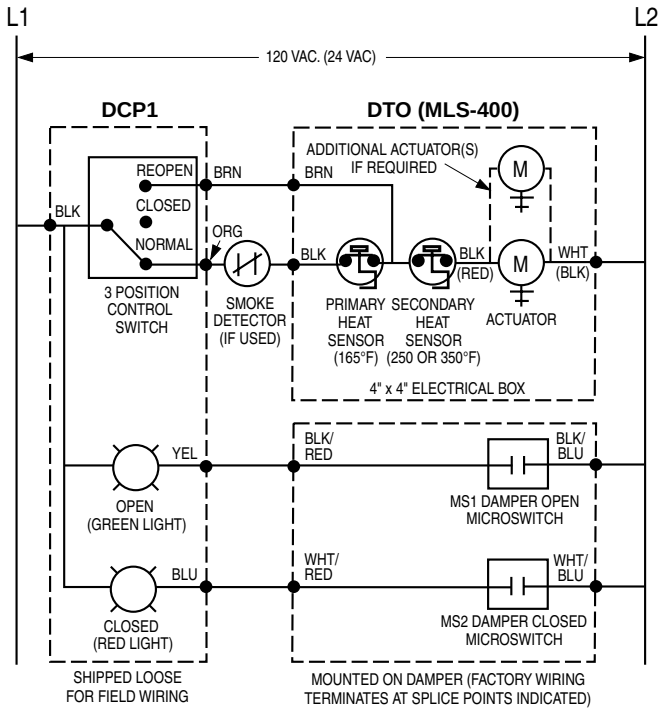
The DCP1 is a toggle switch operated control panel with position indicator lights for use with Nailor Combination Fire/Smoke Dampers equipped with the DTO Dual Temperature Override Sensor (MLS-400) Reopenable Control Option. The DCP1 provides the ability to open or close the damper in a dynamic smoke management system or to test the damper. Indicator lights on the DCP1 panel provide visual confirmation of the damper position.

The toggle switch is a 3 position control switch with the following options:

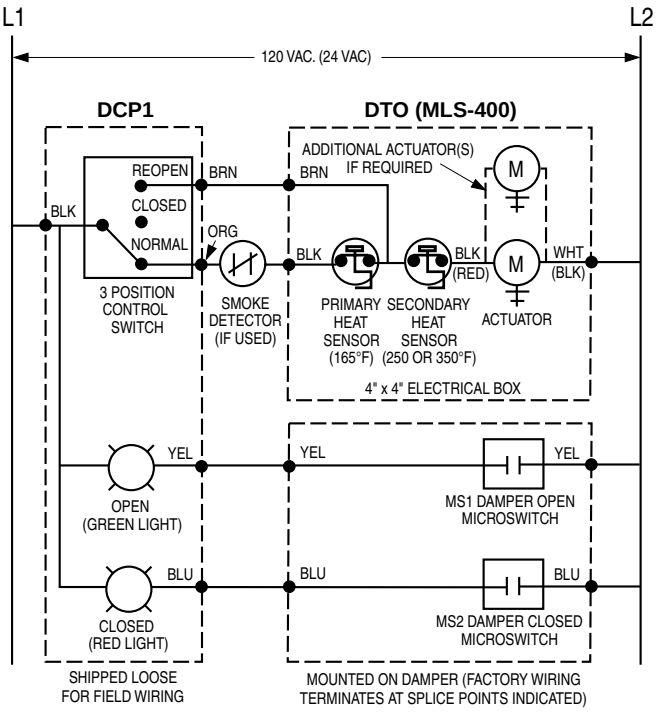
NORMAL: Damper remains open until closed by the primary heat sensor or smoke detector signal.
CLOSED: Damper closes and remains closed regardless of any sensor signal.
REOPEN: The damper opens and remains open (override position) until the secondary hi-limit sensor signals the damper to close and lock.

The DCP1 is shipped loose for field mounting and wiring either near the damper or in a remote location.

WIRING DIAGRAMS:



DCP1/DTO (MLS-400) with Honeywell rotary cam type position indicator package



DCP1/DTO (MLS-400) with Nailor or Honeywell built-in (actuator auxiliary switches) position indicator package

- KEY SWITCH WITH LIGHTS (3 POSITION)
- FOR USE WITH COMBINATION FIRE/SMOKE DAMPERS WITH DTO (MLS-400)

Model:

DCP2 Damper Control Panel

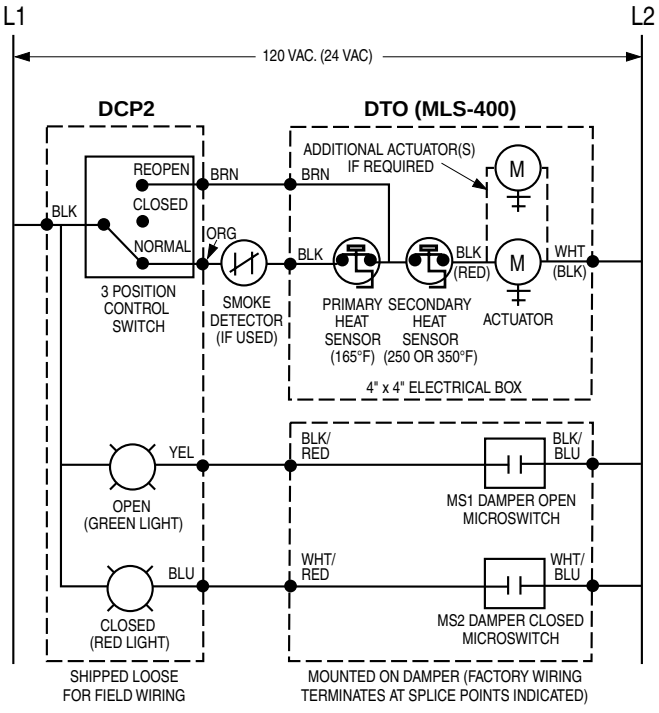
The DCP2 is a key switch operated control panel with position indicator lights for use with Nailor Combination Fire/Smoke Dampers equipped with the DTO Dual Temperature Override Sensor (MLS-400) Reopenable Controls Option. The DCP2 provides the ability to open or close the damper in a dynamic smoke management system or to test the damper. Indicator lights on the DCP2 panel provide visual confirmation of the damper position.

The key switch is a 3 position control switch with the following options:

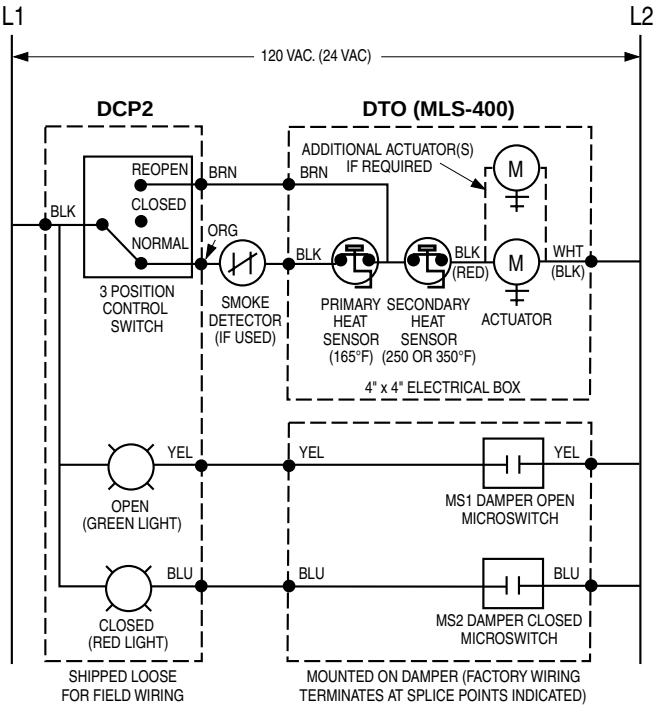
NORMAL: Damper remains open until closed by the primary heat sensor or smoke detector signal.
CLOSED: Damper closes and remains closed regardless of any sensor signal.
REOPEN: The damper opens and remains open (override position) until the secondary hi-limit sensor signals the damper to close and lock.

The DCP2 is shipped loose for field mounting and wiring either near the damper or in a remote location.

WIRING DIAGRAMS:



DCP2/DTO (MLS-400) with Honeywell rotary cam type position indicator package



DCP2/DTO (MLS-400) with Nailor or Honeywell built-in (actuator auxiliary switches) position indicator package

- LIGHTS ONLY
- FOR USE WITH ALL SMOKE AND COMBINATION FIRE/SMOKE DAMPERS

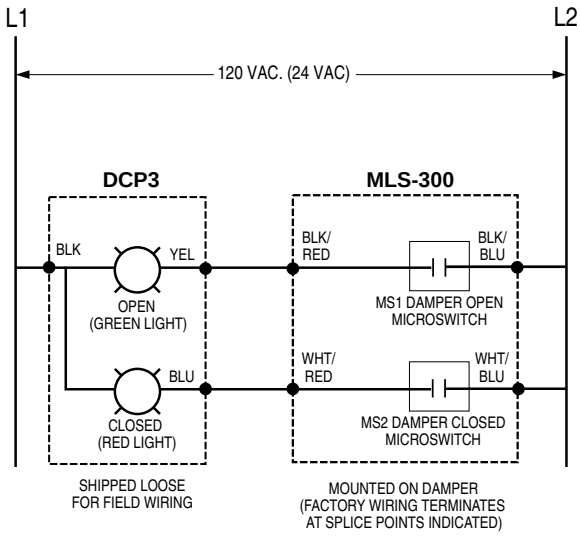
Model:

DCP3 Damper Control Panel

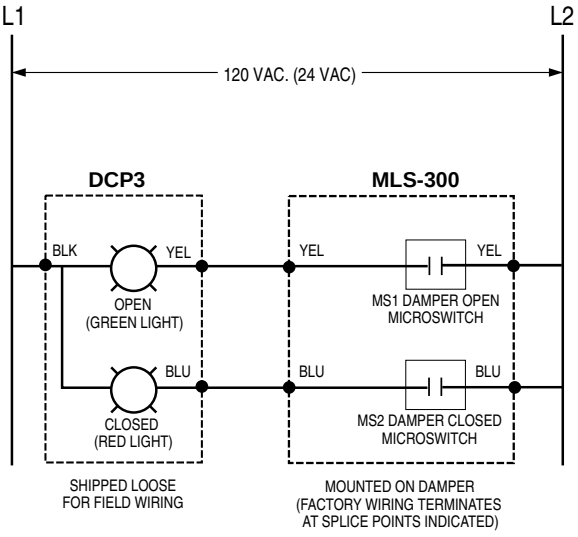
The DCP3 is a single control panel containing indicator lights only and is for use with Nailor Smoke and Combination Fire/Smoke Dampers equipped with the MLS-300 Position Indicator Package. The green light indicates damper is open and the red light indicates damper is closed.

The DCP3 is shipped loose for field mounting and wiring either near the damper or in a remote location.

WIRING DIAGRAMS:



DCP3 with MLS-300 (Honeywell rotary cam type) position indicator package



DCP3 with MLS-300 (Nailor or Honeywell built-in aux. switches) position indicator package

- TEST SWITCH WITH LIGHTS (MOMENTARY)
- FOR USE WITH ALL SMOKE AND COMBINATION FIRE/SMOKE DAMPERS

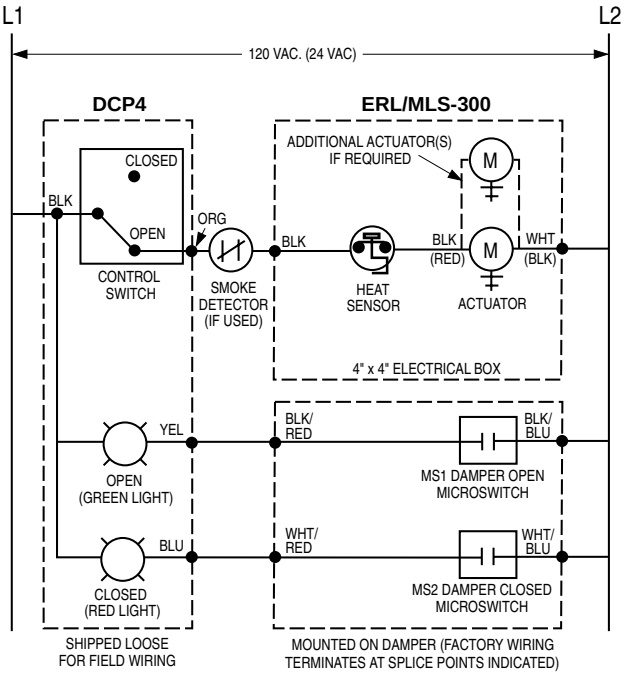
Model:

DCP4 Damper Control Panel

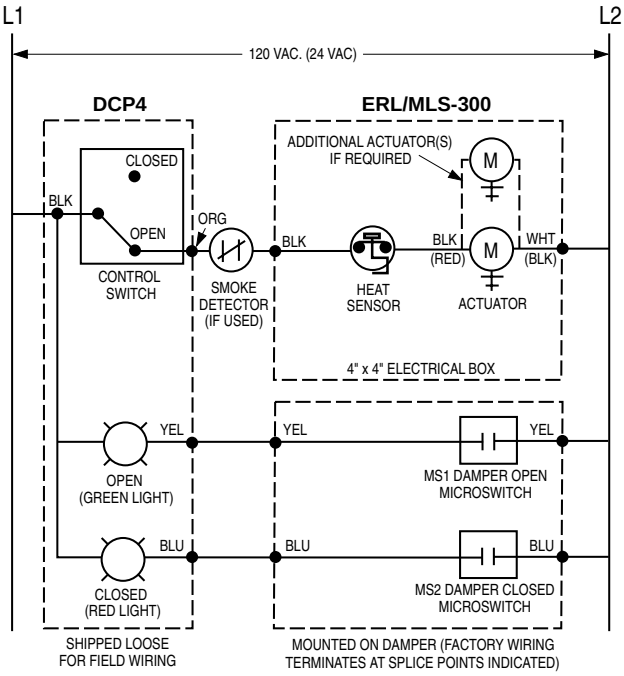
The DCP4 is a “momentary” push button operated control panel with indicator lights for use with all Nailor Smoke and Combination Fire/Smoke Dampers. The push button switch provides the ability to “cycle test” the damper by pushing and holding down the button until the damper has cycled closed. The indicator lights on the DCP4 panel provide a visual confirmation of the damper position when connected to the MLS-300 Position Indicator Package.

The DCP4 is shipped loose for field mounting and wiring either near the damper or in a remote location.

WIRING DIAGRAMS:



DCP4 for combination fire/smoke dampers with MLS-300 (Honeywell rotary cam type) position indicator package



DCP4 for combination fire/smoke dampers with MLS-300 (Nailor or Honeywell built-in aux. switches) position indicator package

- KEY TEST SWITCH WITH LIGHTS (MOMENTARY)
- FOR USE WITH COMBINATION FIRE/SMOKE DAMPERS

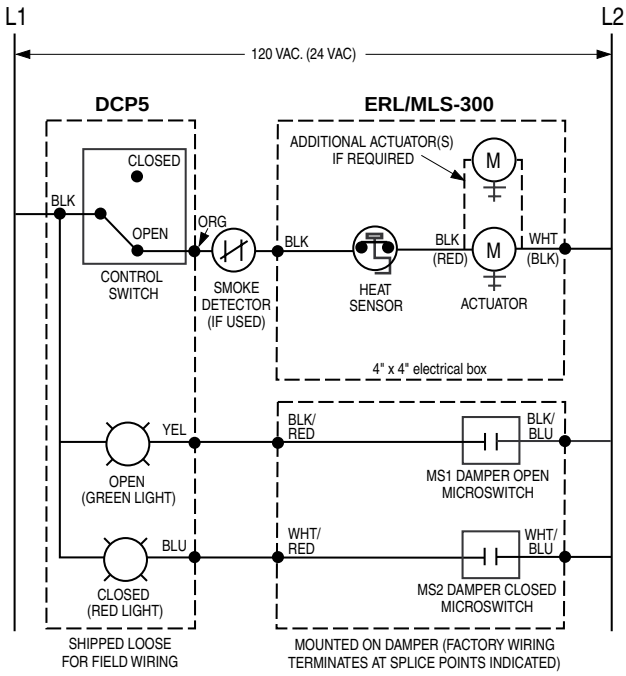
Model:

DCP5 Damper Control Panel

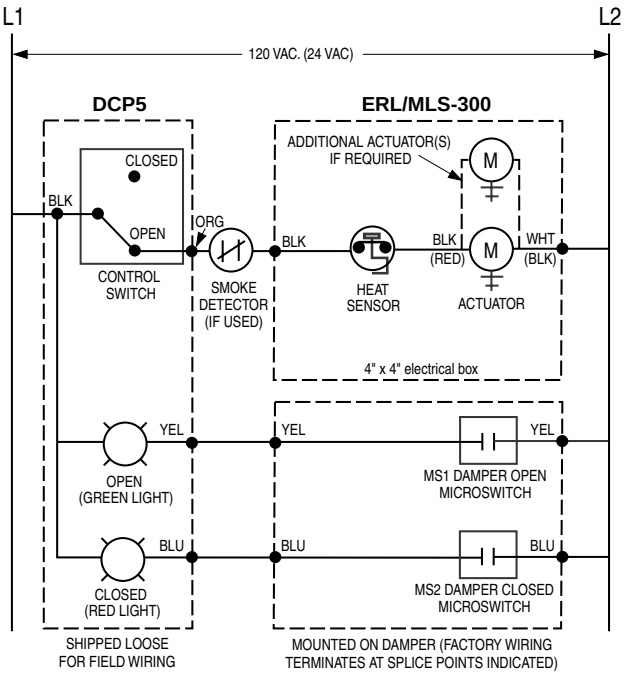
The DCP5 is a “momentary” key switch operated control panel with indicator lights for use with all Nailor Combination Fire/Smoke Dampers. The two position spring loaded key switch provides the ability to “cycle test” the damper by turning and holding the key until the damper has cycled closed. Releasing the key re-energizes the control circuit/actuator and returns the damper to its “normal” open position. The indicator lights on the DCP5 panel provide a visual confirmation of the damper position when connected to the MLS-300 Position Indicator Package.

The DCP5 is shipped loose for field mounting and wiring either near the damper or in a remote location.

WIRING DIAGRAMS:



DCP5 for combination fire/smoke dampers with MLS-300 (Honeywell rotary cam type) position indicator package



DCP5 for combination fire/smoke dampers with MLS-300 (Nailor or Honeywell built-in aux. switches) position indicator package

Options and Accessories

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

CLOSURE DEVICES:

OPTION CODE **ERL**
ELECTRIC RESETTABLE LINK

The ERL Electric Resettable Link (heat sensor) is the standard closure mechanism on all Nailor combination fire/smoke dampers ordered with an electric actuator. The ERL is a thermally responsive bimetal disc/thermostat that opens and closes electrical contacts at a specific calibrated temperature. The ERL is a UL Classified Heat Responsive Device.

The standard ERL on Nailor combination fire/smoke dampers has a fixed temperature setting of 250°F (121°C) which is the UL listed elevated/degradation temperature of the damper/actuator assembly. A 350°F (177°C) elevated temperature classification and ERL is available as an option. A 165°F and 212°F (74°C and 100°C) ERL are also available. Local codes have specified 165°F (74°C) widely in the past.

The ERL performs the same function as the fusible link, that is to sense an abnormally high temperature, as caused by a fire and allow the damper to close in order to prevent the spread of fire and smoke. The sensor interrupts power to the actuator and the actuator's spring return mechanism causes the damper to close and lock.

In smoke control mode, when a signal is detected via a normally closed smoke detector connection, the damper will close and remain closed until the smoke signal ceases. The system will then reset when power is re-applied and the damper will open. The damper may be closed at any time by placing a control switch (optional and by others) in the closed position.

The ERL sensor is of the manual reset type and can be reset after the temperature has cooled down below the sensor set point. This feature is a tremendous advantage where periodic system testing involves application of heat to the sensor to verify correct damper operation. Exposure to actual fire conditions may render these devices unusable. In this case, it is recommended that a careful inspection of the damper, actuator and ERL be performed.

The ERL in combination with all Nailor qualified electric (or pneumatic) actuators provides controlled closure and eliminates the instantaneous damper closure associated with traditional fusible links that can cause damage to the ductwork.

The ERL requires factory installation and wiring together with the associated actuator to meet UL requirements. Note that dampers provided with pneumatic actuators utilize the PRL (see below) as standard (max. 280°F [138°C]) but can be provided with the ERL. An EP switch is required in this case.

OPTION CODE **PRL**
PNEUMATIC REPLACEABLE LINK

The Nailor PRL Pneumatic Replaceable Link is a UL Classified heat responsive device used in conjunction with Nailor combination fire/smoke dampers.

A 212°F (100°C) PRL is supplied as standard on all combination fire/smoke dampers ordered with a pneumatic actuator. A 165°F and 280°F (74°C and 138°C) PRL are also available. An alternative to the PRL would be the Nailor ERL (Electric Resettable Link) with an EP (Electric/Pneumatic) switch.

The PRL is a factory mounted pneumatic release valve/replaceable fusible link assembly. The PRL's function is to sense an abnormally high temperature, as caused by a fire, and allow the damper to close in order to prevent the spread of fire and smoke.

Fire Control Mode: The PRL activates when a fire temperature in excess of 165°F, 212°F or 280°F (74°C, 100°C or 138°C) is detected. When the fusible link melts, air from the pneumatic actuator(s) is exhausted and the actuator spring return mechanism causes the damper to close and lock.

Smoke Control Mode: When a signal is detected via a normally closed smoke detector connection, during system testing or if power failure occurs, the damper will close and remain closed. When the smoke signal ceases (smoke detector reset), the test is completed or power is restored, the damper will automatically reset to the open position.

An EP (electric/pneumatic) switch, by others, must be present in the system.

All pneumatic actuators are factory mounted with a fail close (Normally Closed) damper connection.

Notes:

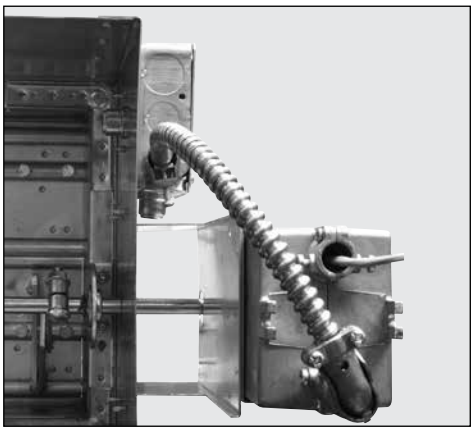
1. The PRL must be installed at the factory and cannot be added in the field, in accordance with UL requirements.
2. A single PRL may be use to control up to a maximum of four pneumatic actuators.
3. Pneumatic actuators are to be field piped per local codes.

CLOSURE DEVICES:

OPTION CODE **DTO** (ML4)
DUAL TEMPERATURE OVERRIDE SENSOR
REOPENABLE CONTROL PACKAGE

- **REOPENABLE HEAT SENSOR W/POSITION INDICATOR SWITCH PACK**
- **FOR USE IN ENGINEERED SMOKE CONTROL SYSTEMS**

The DTO Dual Temperature Override Sensor is a UL Classified reopenable control/status indicator package that is a factory installed option on all Nailor Combination Fire/Smoke dampers.



HOW THE DTO DUAL TEMPERATURE OVERRIDE SENSOR WORKS:

UL 555 permits Combination Fire/Smoke dampers to be equipped with both a primary (low limit) and secondary (high limit) heat responsive closure device. This allows the appropriate authority (from a remote fire fighters' smoke control station) to bypass/override the primary sensor, usually 165°F (74°C), after fire induced closure or smoke detector signal and reopen the damper as may be required for smoke control functions. The damper can be operated in this 'override mode' until the elevated temperature limit of 250°F (121°C) or 350°F (177°C) is sensed at the damper. The secondary heat responsive device, a 250°F (121°C) or 350°F (177°C) manually resettable heat sensor, then returns it to the fire protection mode, permanently reclosing the damper and rendering it inoperable, as required by UL 555 and NFPA 90A.

The built-in damper position indicator switch provides positive indication of either fully open or closed damper status.

A WORD ABOUT "REOPENABLE" CONTROLS....

The dual temperature rated reopenable closure option was originally developed during the 1980's to comply with NFPA 90A requirements that mandated the primary (low limit) closure temperature to be a maximum of 286°F (141°C). The dual temperature closure option permits the damper to close when the primary closure temperature rating of 286°F (141°C) or less (usually 165°F [74°C]) is reached, then be reopened to utilize the duct for smoke removal until the secondary (high limit) closure device temperature rating, usually 350°F (177°C) is reached.

The 1996 edition of NFPA 90A revised the maximum primary closure temperature to 350°F (177°C) or the elevated temperature rating of the damper (250°F [121°C] or 350°F [177°C]). This revision virtually eliminates the need for a "reopenable" type control system as the damper can now remain operational during the HVAC system's designed smoke control mode until 350°F (177°C) is reached. However, there is still a misconception that this dual temperature rating option is necessary to meet the requirements of both NFPA and UL, as well as local building codes, in order for the damper to be utilized for smoke removal until its elevated temperature rating is reached. Although it does provide a method of complying with some building codes that require fire dampers to close at 212°F (121°C) or less, while still providing the potential to reopen the damper for smoke removal reasons, in most cases the disadvantages render it obsolete. The cost of the additional wiring and intricate controls required, when compared to the cost of a single 250°F (121°C) or 350°F (177°C) closure device, can rarely be justified. Also the complexity of the design may in fact hinder its proper use if personnel are not properly trained, at further cost, to operate it during an emergency.

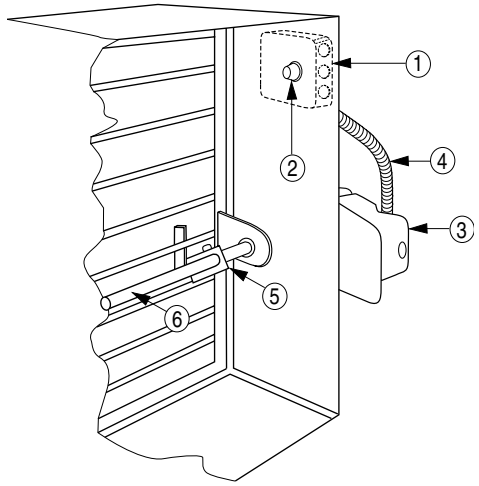
Therefore, as the dual temperature rated closure option and its associated higher costs are no longer required to comply with NFPA 90A, Nailor recommends using a single 250°F (121°C) or 350°F (177°C) closure device in engineered smoke control systems as the logical selection. If the system is designed to accommodate damper open/closed status indication, Nailor's MLS-300 Position Indicator option provides a simple, functional means to a complete smoke control package.

CLOSURE DEVICES:

ADVANTAGES OF NAILOR'S EXTERNAL LOW LIMIT HEAT SENSOR

Nailor's **DTO Dual Temperature Override Sensor** features a low-limit heat sensor that is mounted outside the duct adjacent to the actuator rather than inside the duct. As most fires originate outside the duct, which is commonly insulated, an internally mounted heat sensor would not trip as early. And as most actuators and electrical wiring are located on the external surfaces of the sleeve, they could be subjected to damaging temperatures long before an internally mounted heat sensor trips. Nailor's **DTO Dual Temperature Override Sensor** ensures that the damper will close within the temperature limits of the actuator and before any damage to external components can occur.

The **DTO Dual Temperature Override Sensor** may be used with either a UL Listed Electric Actuator or Pneumatic Actuator. Connections to the junction box are the same.

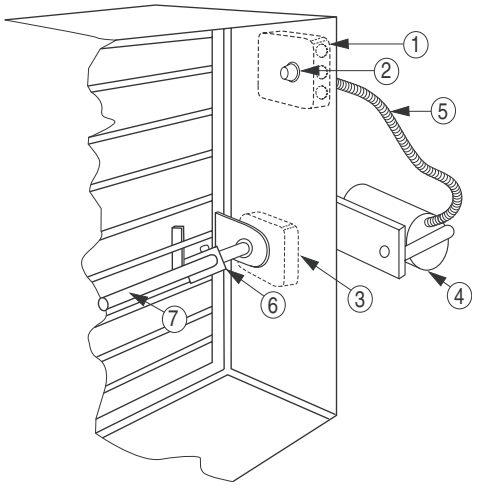


With UL Listed Electric Actuator

Description:

1. Electrical Junction Box with external 165°F (74°C) primary heat sensor
2. High limit secondary heat sensor 250° or 350°F (121° or 177°C)
3. Electric Actuator with auxiliary position indicator switches
4. Flexible Conduit
5. Over-Center Knee Lock
6. Jackshaft

WITH UL LISTED ELECTRIC ACTUATOR



With UL Listed Pneumatic Actuator

Description:

1. Electrical Junction Box with external 165°F (74°C) primary heat sensor and EP switch
2. High limit secondary heat sensor 250° or 350°F (121° or 177°C)
3. Position indicator package
4. Pneumatic Actuator
5. Silicone tubing
6. Over-Center Knee Lock
7. Jackshaft

WITH UL LISTED PNEUMATIC ACTUATOR

CLOSURE TEMPERATURE:

OPTION CODES
165 212 250 280 350
CLOSURE TEMPERATURE

ERL/PRL's for Nailor's Combination Fire/Smoke dampers are available with a choice of several closure temperature ratings. Nailor combination fire/smoke dampers are equipped as standard with a 250°F (121°C) ERL or a 212°F (100°C) PRL. Available 165°F (74°C), 212°F (100°C) or 350°F (177°C) ERL's and 165°F (74°C) or 280°F (138°C) PRL's can be installed on damper at time of manufacturing.

The National Fire Protection Association Standard 90A requires that combination fire/smoke dampers that are part of an engineered smoke-control system shall have a heat responsive device with a temperature rating approximately 50°F (28°C) above the maximum smoke control system designed operating temperature, but not to exceed the UL 555S elevated temperature rating of the damper assembly or a maximum of 350°F (177°C).

OPTION CODE
HL250/165°F OR HL350/165°F
HIGH/LOW CLOSURE TEMPS.
FOR DTO DUAL TEMPERATURE
OVERRIDE SENSOR

Nailors' DTO Dual Temperature Override Sensor reopenable control package utilizes two separate heat responsive devices to automatically close the damper: a 'low limit' primary device rated at 165°F (74°C) or 212°F (100°C) that closes the damper upon sensing heat at selected temperature, but can be overridden from the fire fighters smoke control station to reopen damper for smoke control purposes; a 'high limit' secondary device of either 250°F (121°C) or 350°F (177°C) temperature rating that permanently re-closes the damper upon sensing heat at selected temperature, rendering it inoperable, as required by UL 555 and NFPA 90A. The high limit temperature rating cannot be higher than the elevated temperature rating of the damper assembly as determined by UL 555S Standard for Smoke Dampers. As NFPA 90A requires that the closure device shall have a temperature rating approximately 50°F (28°C) above the maximum smoke control system designed operating temperature, the low limit (primary closure device) temperature rating, either 165°F (74°C) or 212°F (100°C) should be selected based on this criteria.

When selecting the high limit secondary device temperature rating (either 250°F [121°C] or 350°F (177°C), Nailor recommends 350°F [177°C]), as this will provide additional time for the damper to be utilized in smoke control mode until it is closed permanently. Remember that the high limit temperature selected can not be higher than the elevated temperature rating of the damper assembly as determined by UL 555S.

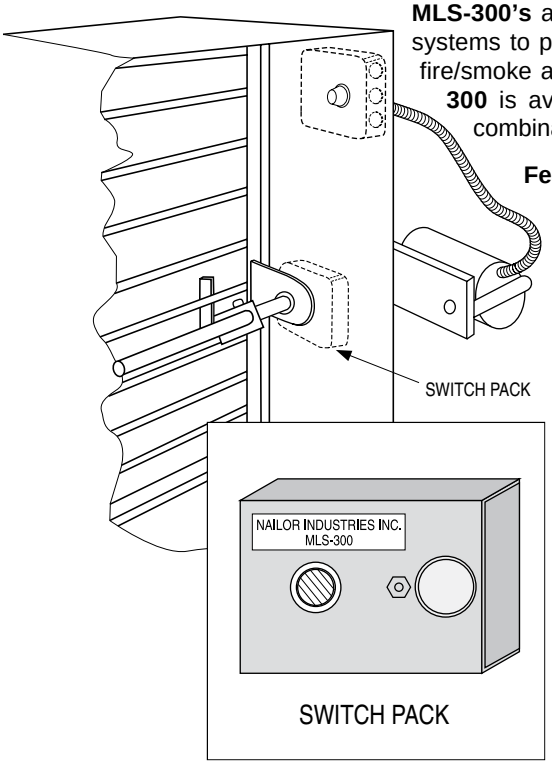
UL 555 Closure Temperature Requirements

As of July 1, 2002, UL 555 Safety Standard for Fire Dampers, Sixth Edition (June 1999) requires that combination fire and smoke dampers have a heat responsive device of minimum 160°F (71°C), maximum 350°F (177°C) temperature rating but it cannot be greater than the UL 555S elevated temperature rating of the damper assembly. For reopenable combination fire and smoke dampers the temperature rating of the primary heat responsive device must be minimum 160°F (71°C), maximum 212°F (100°C). The temperature rating of the secondary heat responsive device must be greater than that of the primary device, but cannot exceed 350°F (177°C) or the UL 555S elevated temperature rating of the damper assembly.

POSITION INDICATORS:

OPTION CODE **300**
MLS-300 POSITION INDICATOR SWITCH PACK

The **MLS-300 Series Position Indicator Switch Pack** is generally utilized to indicate open and closed position of the damper blades. It incorporates two SPDT switches that may be used to operate signal lamps or to provide a start/stop circuit for remote fans or to signal alarms.



MLS-300's are used in active smoke control management systems to positively indicate the status of all combination fire/smoke and smoke dampers in the building. The **MLS-300** is available only as a factory installed option on combination fire/smoke and smoke dampers.

Features:

- Operates as a function of the damper blade position.
- Provides remote indication of damper blade position.
- Provides the ability to remotely control ON/OFF fan stations.
- Provides the ability to remotely signal alarms.

Built-in Actuator Switch Packs

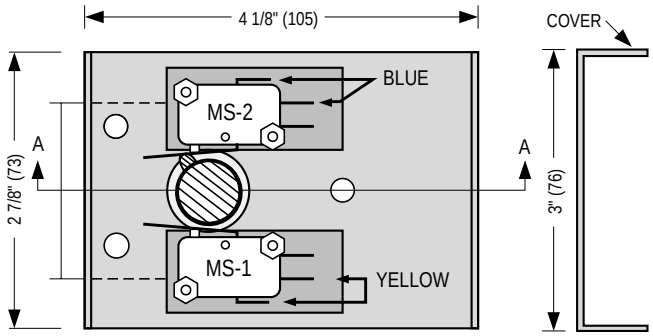
Many of the newer application specific actuators designed for use on fire/smoke dampers feature "add-on" component position indicator switches manufactured and UL tested by the actuator manufacturer. Honeywell MS4109F/MS8109F actuators are examples.

Some actuator models have variants with position indicator switches built right in to the actuator. Honeywell MS4120F/MS8120F and Belimo FSNF24S/FSNF120S actuators are examples.

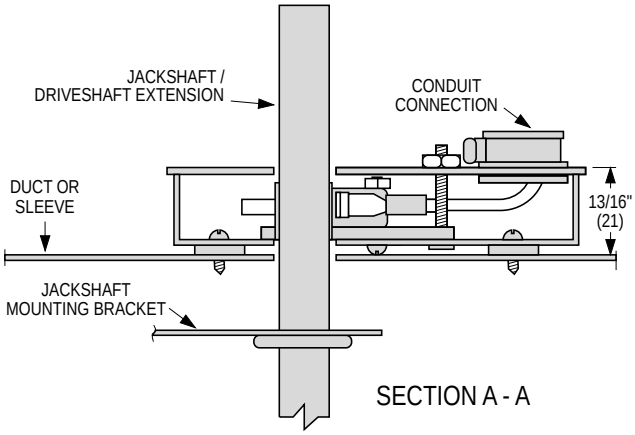
When ordered with the MLS-300 Position Indicator Switch Pack, Nailor combination fire/smoke and smoke dampers that utilize these actuators will usually be supplied with the actuator mounted switch pack, factory installed as required by UL.

POSITION INDICATORS:

MLS-300N (NAILOR) SWITCH DETAILS



EXTERNAL RIGHT HAND MOUNTING: FRONT VIEW (LESS COVER)



TYPICAL JACKSHAFT MOUNTING

Position Indicator Microswitch Data:

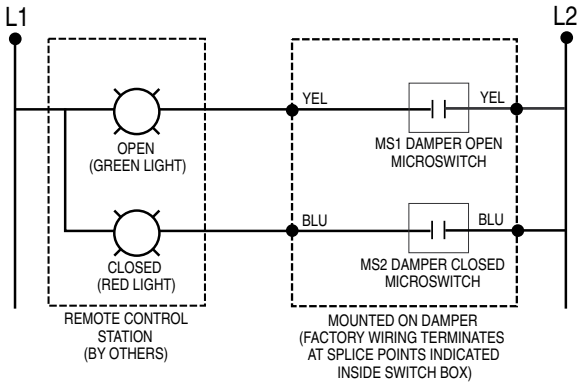
Switch Type: Single Pole double throw (2)
15 Amps, 1/3 HP, 125, 250 Vac or 24 Vdc.
1/2 Amp, 125 Vdc. 1/4 Amp, 250 Vdc.

Standard Mounting:

MS1 is damper open signal.
MS2 is damper closed signal.

Non-Standard Mounting:

Important: Installer must double check continuity of MS1 and MS2 before wiring to determine which switch signals the damper's open or closed position.

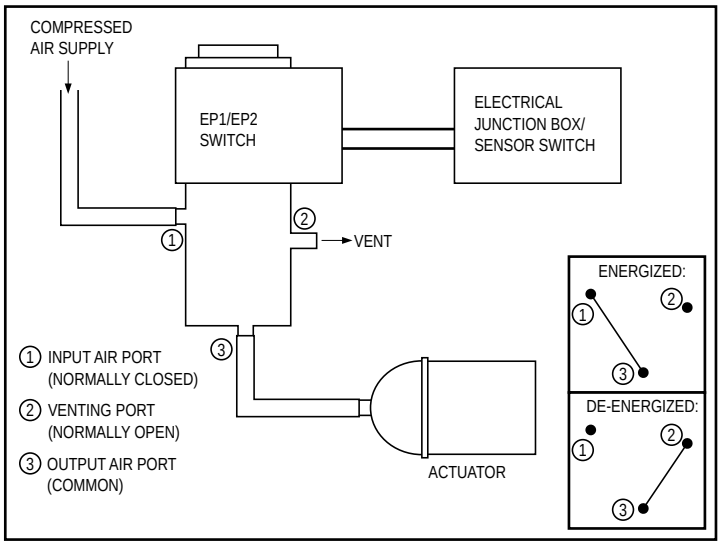


MLS-300 TYPICAL WIRING DETAILS

ELECTRO-PNEUMATIC SWITCHES:

OPTION CODES **EP1** AND **EP2**
EP1 120 VAC E/P SWITCH
EP2 24 VAC E/P SWITCH

Nailor Options **EP1** and **EP2** electro-pneumatic switches are electrically operated, two-position 3-way air valves. They are used to interlock an electrical smoke or fire alarm system with a pneumatic damper actuator. The **EP1 (120 VAC)** and **EP2 (24 VAC)** valves are utilized to alternately apply pressure to, and exhaust pressure from a pneumatic damper actuator by an electrical input that energizes or de-energizes the solenoid of the switch. Barb type pneumatic piping connections are sized for 1/4" (6) O.D. Polyethylene tubing. Units are UL and CSA approved and may be mounted in any position.



OPERATION:

Input air is connected to port 1 (normally closed) and the output to the actuator is connected to port 3 (common). When the solenoid is energized port 1 connects to port 3 allowing the actuator to be controlled by input air, usually holding the damper in open position. When the solenoid is de-energized, port 2 (normally open) is connected to port 3, exhausting the air from the actuator allowing it to return to its normal fail position (fail open or fail closed).

RETAINING ANGLES:

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

FOR USE WITH ALL COMBINATION FIRE/SMOKE DAMPERS (EXCEPT MODEL 1290FS)

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

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.

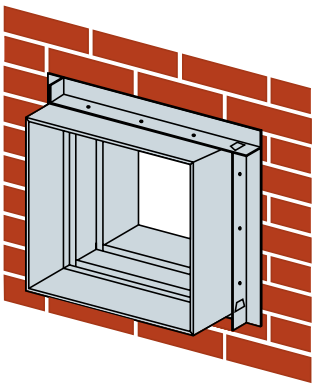
Nailor "Quick-Set" retaining angles are an accessory option for all dampers ordered with factory sleeves.

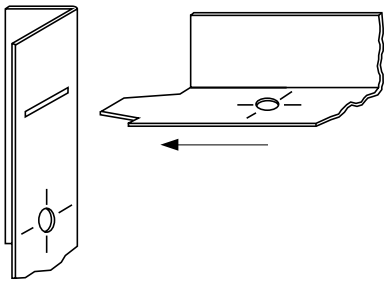
QS2: Two sides (pair). For standard installations where angles are installed on both sides of the fire partition.

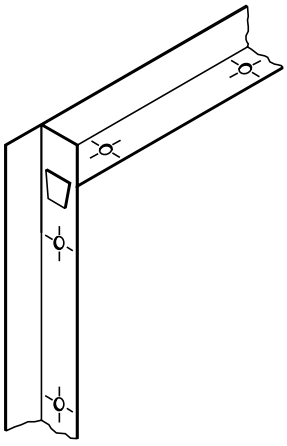
QS1: One side (single set). For use in a single side retaining angle installations and with grille mount and "out of wall" damper models.

"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.

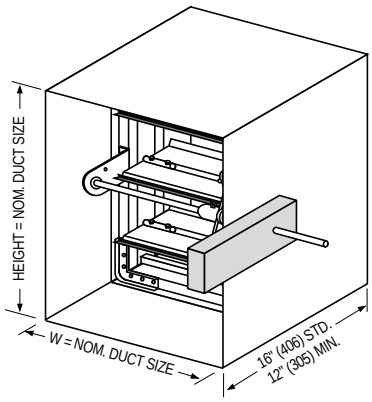
SLEEVES OR SIDE MOUNTING PLATE:

TYPE A SLEEVES
MODELS 1221 and 1271

Nailor strongly recommends that all combination fire/smoke dampers including Type A models, are specified and ordered complete with a factory installed full sleeve (Type B and C models are manufactured as standard with transition casing that acts as a sleeve). A factory installed sleeve allows the units to ship directly to jobsite ready for installation, saving time, money and costly field fabrication and mounting, as well as helping to ensure proper installation and caulking to UL requirements. As all combination fire/smoke dampers are required to be installed in a sleeve, and all actuators must be factory mounted, a factory supplied sleeve provides the easiest and most cost effective method to accomplish this as well as ensuring that the damper/actuator assembly functions properly. Standard sleeve is 16" (406) long. See Models 1221 and 1271 for further damper/sleeve details.

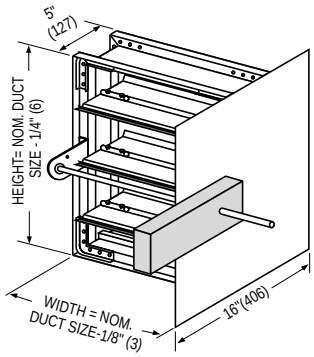
The following indicates model numbers to order for combination fire/smoke dampers with factory fitted Type A sleeves:

STANDARD MODEL #	WITH TYPE A SLEEVE
1220 →	MODEL 1221
1270 →	MODEL 1271



OPTION CODE **SMP**
SIDE MOUNTING PLATE

Although not recommended, Nailors **SMP** Side Mounting Plate provides a method of factory installing an externally mounted actuator onto Model Series 1220 and 1270 combination fire/smoke dampers. UL 555 and UL 555S safety standards latest editions require that actuators shall be factory mounted. This is to help ensure that the damper/actuator assembly functions properly and eliminates possible jobsite installation errors. As with all combination fire/smoke dampers, an appropriate full steel sleeve must be field fabricated for installation of damper in wall or floor.



SIDE MOUNTING PLATE FOR COMBINATION FIRE/SMOKE DAMPERS

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 combination fire/smoke damper Type A sleeve (22 or 20 gauge) 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. Specify which end to be flanged in relation to the jackshaft.

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).

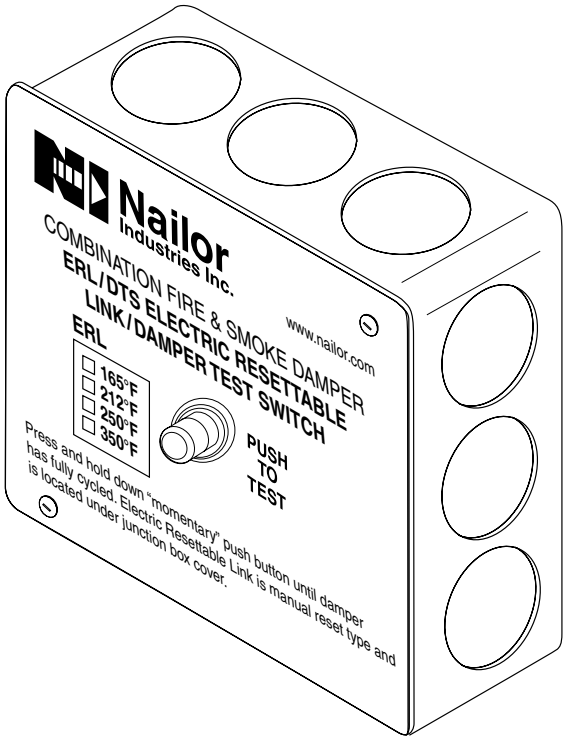
DAMPER TEST SWITCH

OPTION CODE **DTS**
PUSH BUTTON TEST SWITCH

The DTS (Damper Test Switch) is an optional "momentary" push button test switch available on all Nailor smoke and combination fire/smoke dampers. The DTS provides the ability to "cycle test" the damper by pushing and holding down the button until the damper has cycled and closure has been visually verified, either by inspecting the damper through the access door or by confirmation at a remote control panel when equipped with the optional MLS-300 position indicator.

The DTS is mounted right on the damper and enables a single maintenance person to test and cycle the damper, eliminating the need for help from another person in the control room.

When a combination fire/smoke damper is ordered, the DTS is combined with the ERL (Electric Resettable Link).



DTS/ERL Damper Test Switch w/Electric Resettable Link

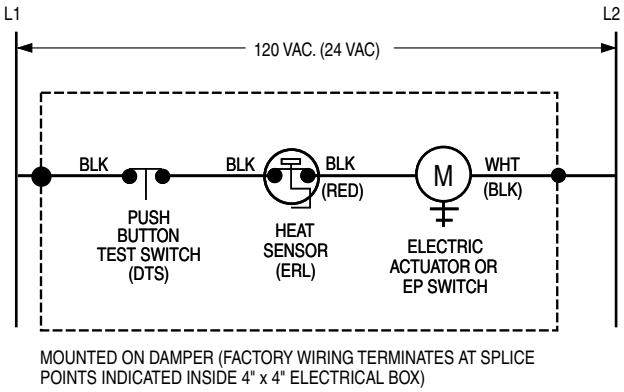


Figure 1. DTS/ERL Damper Test Switch with Electric Resettable Link

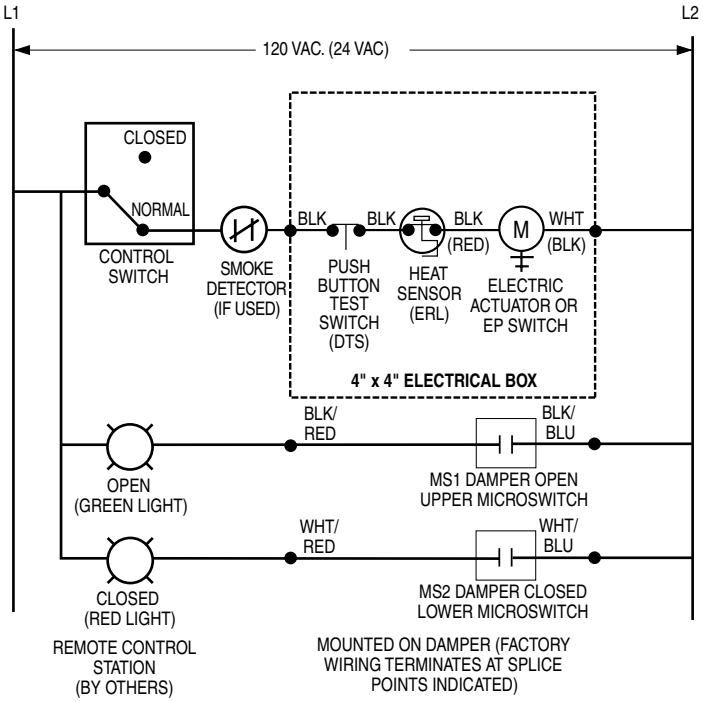


Figure 2. DTS/ERL with MLS-300 (Honeywell) Position Indicator Package (rotary cam type)

DUCT SMOKE DETECTORS:

OPTION CODE **DSDN**
DSD-NF NO-FLOW
DUCT SMOKE DETECTOR

APPLICATION:

Nailor Model DSD-NF duct smoke detector (no-flow) can be utilized with Nailor UL555S Classified combination fire/smoke dampers to detect the presence of smoke within HVAC ductwork, whether or not there is airflow, and close the damper to prevent the smoke from spreading. As most fatalities resulting from fires can be attributed to the effects of toxic smoke, detecting and controlling the smoke from spreading within the HVAC system is vital to preventing injury as well as limiting property damage, including damage to the HVAC system itself. Refer to NFPA Standards 72, 90A and 92 to determine when and where duct smoke detectors are required.

The DSD-NF detector features a low-profile design for optimum pressure drop and will operate with airflow in either direction. It can be factory installed to top of sleeve (side mounting optional) on Nailor Model Series 1220 and 1270 combination fire/smoke dampers.

OPERATION:

Upon detection of smoke, the smoke detector causes the damper to close by cutting off power to the actuator. The actuator return spring forces the damper closed. The detector can be reset only by a momentary power interruption. The standard model DSD-NF detector and smoke damper combination is designed simply to close the damper upon detection of smoke. For applications requiring the detector to be wired into a fire fighters' smoke-control station (FSCS), contact Nailor.

DSD-NF STANDARD SPECIFICATION:

Model: System Sensor 2151 Low-Profile.

Sensor Type: Photoelectronic.

Dimensions: 6.1" (155) dia. flanged base.

Weight: 3.6 oz. (104 g).

Airflow Velocity Range: 0 to 3000 fpm (0 to 15.24 m/s).

Operating Temperature Range: 32°F to 120°F (0°C to 49°C).

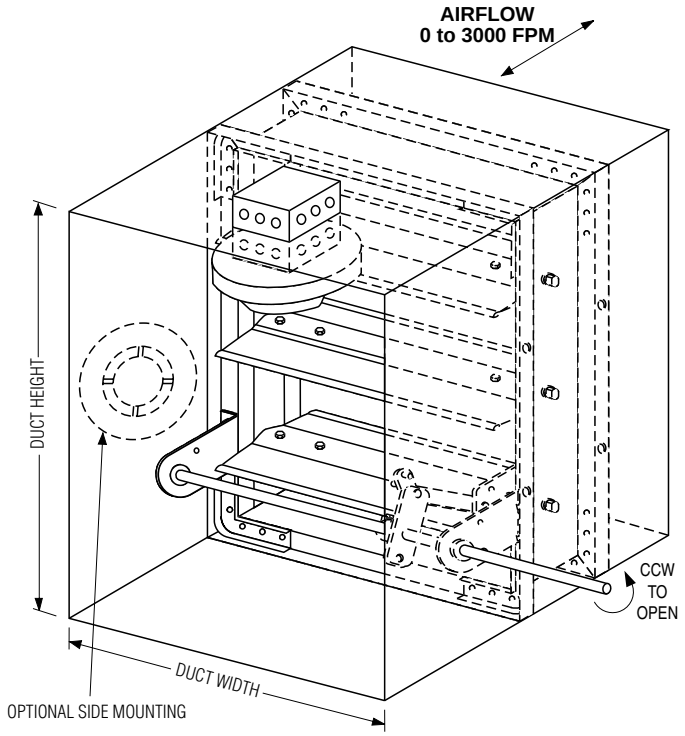
Operating Humidity Range: 10% to 93% Relative Humidity Non-Condensing.

Sensitivity: 3% ± .7%/ft

Voltage: 120 VAC or 24 VAC/DC.

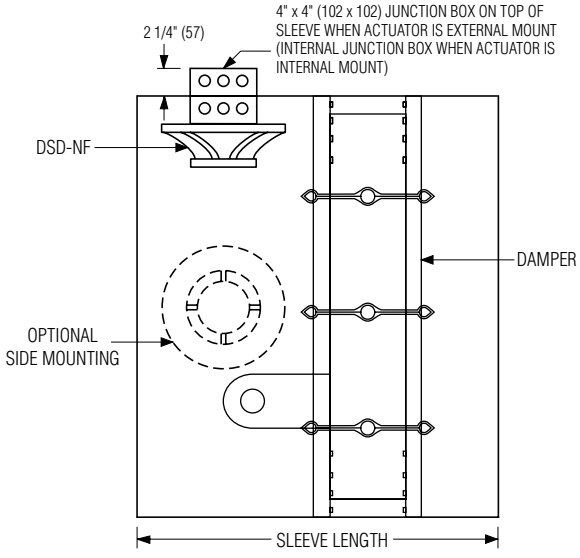
Latching Alarm: Reset by momentary power interruption.

Contact Nailor for minimum damper size and sleeve length for your specific application. See page C13 for general damper size, sleeve length and damper position guidelines.



NOTES:

1. Factory mounted smoke detectors will be factory wired to actuator(s) (or E.P. switch) and heat sensor(s), as applicable, into a 4" x 4" (102 x 102) common junction box in order to provide a single point wiring connection in the field.



DUCT SMOKE DETECTORS:

OPTION CODE **DSDL**
DSD-LF LOW-FLOW
DUCT SMOKE DETECTOR

APPLICATION:

Nailor Model DSD-LF duct smoke detector (low-flow) can be utilized with Nailor UL555S Classified combination fire/smoke dampers to detect the presence of smoke within HVAC ductwork and close the damper to prevent the smoke from spreading. As most fatalities resulting from fires can be attributed to the effects of toxic smoke, detecting and controlling the smoke from spreading within the HVAC system is vital to preventing injury as well as limiting property damage, including damage to the HVAC system itself. Refer to NFPA Standards 72, 90A and 92A to determine when and where duct smoke detectors are required.

The DSD-NF detector can be factory installed to side of sleeve on Nailor Model Series 1220 and 1270 combination fire/smoke dampers.

A minimum airflow velocity of 100 fpm (0.5 m/s) is required for Model DSD-LF.

OPERATION:

Upon detection of smoke, the smoke detector causes the damper to close by cutting off power to the actuator. The actuator return spring forces the damper closed. The detector can be reset only by a momentary power interruption. The standard model DSD-LF detector and smoke damper combination is designed simply to close the damper upon detection of smoke. For applications requiring the detector to be wired into a fire fighters' smoke-control station (FSCS), contact Nailor.

DSD-LF STANDARD SPECIFICATION:

Model: System Sensor D4120.

Sensor Type: Photoelectric.

Dimensions: (Rectangular) 14.38" (365) Length, 5" (127) Width, 2.5" (64) Depth.

Weight: 2.5 lbs. (1.14 kg.).

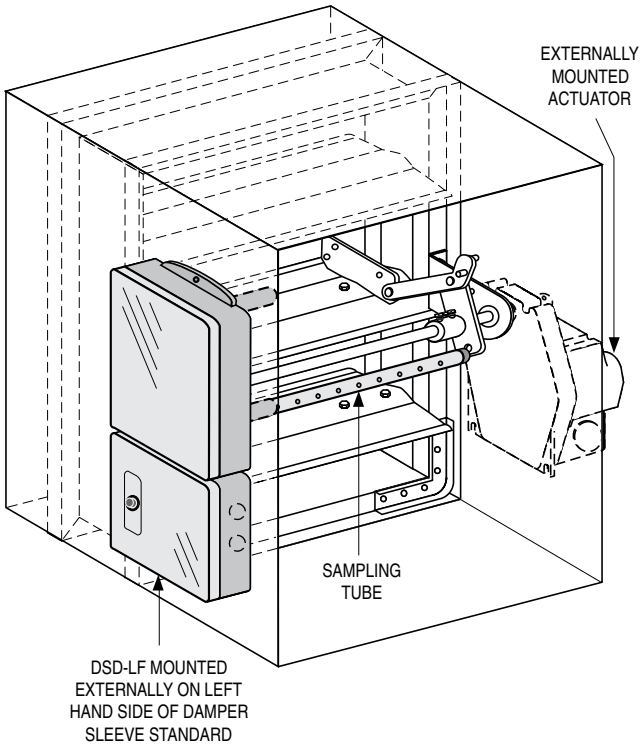
Airflow Velocity Range: 100 to 4000 fpm (0.5 to 20.3 m/s).

Operating Temperature Range: –4°F to 158°F (–20°C to 70°C).

Operating Humidity Range: 0% to 95% Relative Humidity Non-Condensing.

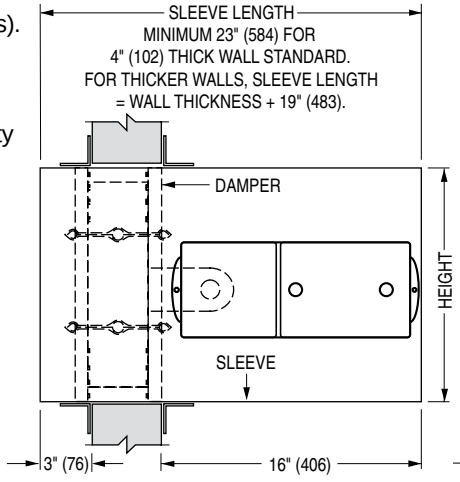
Voltage: 24 VAC/DC or 120 VAC.

Contact Nailor for minimum damper size and sleeve length for your specific application.
See page C13 for general damper size, sleeve length and damper position guidelines.

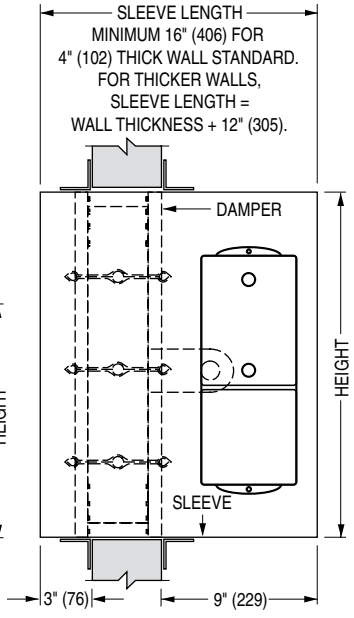


NOTES:

1. Smoke detector is factory mounted externally on left side of sleeve (opposite side of sleeve to the actuator) and will be mounted horizontally on dampers under 20" (508) in height and mounted vertically on dampers 20" (508) in height and over. See orientation details below.
2. Factory mounted smoke detectors will be factory wired to actuator(s) (or E.P. switch) and heat sensor(s), as applicable, into a 4" x 4" (102 x 102) common junction box in order to provide a single point wiring connection in the field.



Height < 20" (508)



Height < 20" (508)

Nailor® Industries Inc.

CEILING DAMPERS

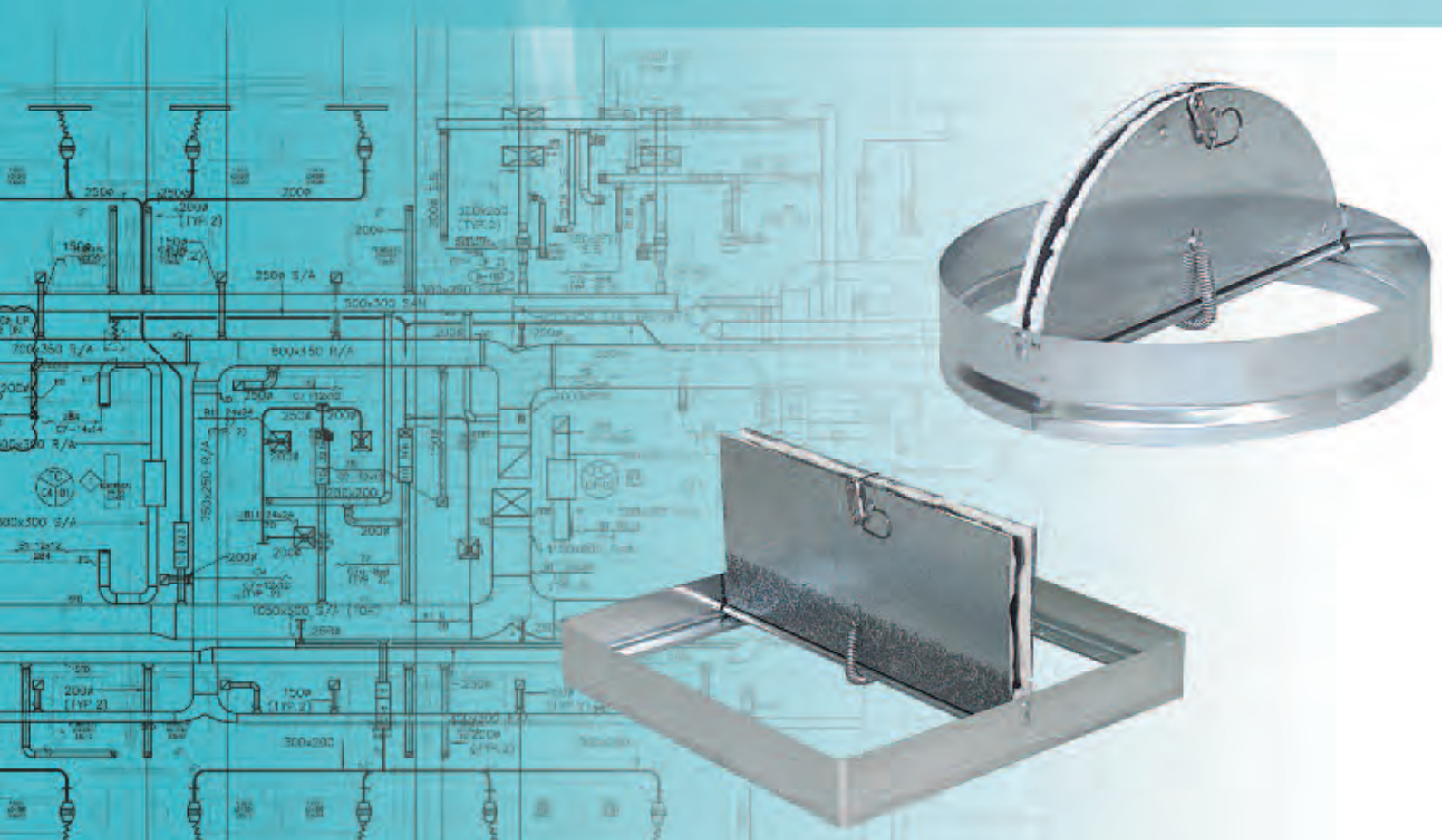


TABLE OF CONTENTS

GENERAL PRODUCT OVERVIEW

Since 1971, Nailor Industries has been committed to the innovation and development of life safety products such as the 0700 Series Ceiling Dampers. This commitment has helped foster industry standards, as well as provide worry free fire protection solutions that benefit today's building designers, owners and occupants. Standard UL 555C tested ceiling dampers are approved for use in lieu of hinged door type dampers in UL floor/ceiling or roof/ceiling assemblies, the Nailor 0700 Series provides a fire and heat barrier that has been tested and qualified to the most exacting standards. For square and rectangular applications, Model 0716 is available with standard blade construction or low profile blades, Model 0716-4. Round duct applications are covered by Model 0722. Nailor Model 0720 features a spring loaded curtain design that maximizes free area while providing a low overall profile. Options such as adjustable volume control are ideal for balancing at the grille/diffuser. Specialty UL 263 tested Models 0755 thru 0763 are specifically for use in wood truss ceiling assemblies and have been developed to meet specific requirements in today's building systems.

MODELS 0716, 0716-4, 0714 & 0722
FOR SQUARE, RECTANGULAR OR ROUND DUCTS

Nailor ceiling dampers, or ceiling radiation dampers as they are commonly called, are designed to function as a fire and heat barrier in air duct openings penetrating fire resistive membrane ceilings. Models 0716, 0716-4 and 0714 are for use in square or rectangular applications and Model 0722 is for use in round applications, in lieu of hinged door type dampers in any UL floor/ceiling or roof/ceiling assembly with up to a 3 hour fire resistance rating where air ducts are allowed.

Models 0716 & 0722

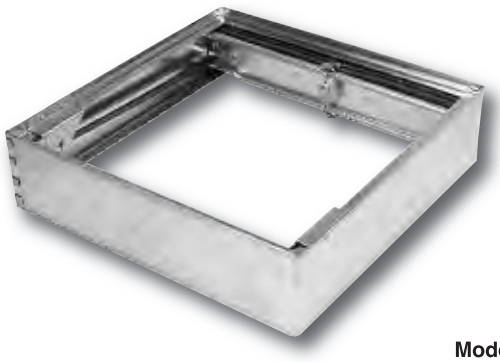
Models 0722A & 0716A

MODELS 0716A, 0716-4A & 0722A
ADJUSTABLE VOLUME CONTROL
FOR SQUARE, RECTANGULAR OR ROUND DUCTS

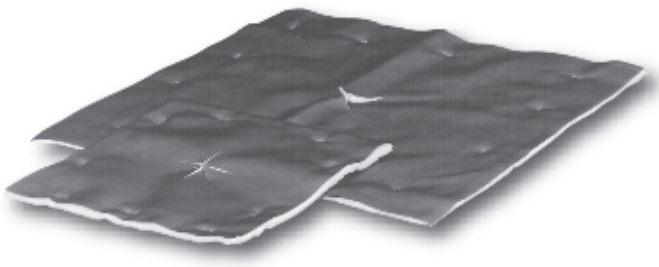
Nailor ceiling dampers with adjustable volume control option are designed to function as a fire and heat barrier in air duct openings penetrating fire resistive membrane ceilings. The adjustable volume control mechanism allows the blades to be adjusted for balancing of airflow through the diffuser. Under fire conditions the fusible link will close the damper, regardless of volume setting. Models 0716A and 0716-4A are for use in square or rectangular applications and Model 0722A is for use in round applications, in lieu of hinged door type dampers in any UL floor/ceiling or roof/ceiling assembly with up to a 3 hour fire resistance rating where air ducts are allowed.

MODEL 0720
CURTAIN TYPE
FOR SQUARE OR RECTANGULAR DUCTS

Model 0720 ceiling radiation damper, which functions as a fire and heat barrier in air duct openings that penetrate fire resistive membrane ceilings, is for use in lieu of hinged door type dampers in any UL floor/ceiling assembly with up to a 3 hour fire resistance rating where air ducts are permitted. Model 0720 features a specially designed 'pull across' insulated curtain that provides a low overall profile, making it ideal for use in applications where the available duct drop height for installation is limited. The compact curtain design also maximizes free area in the open position.



Model 0720



Models 0725 & 0726

MODELS 0725 & 0726
THERMAL INSULATING BLANKETS

Models 0725 and 0726 Thermal Blankets are designed to insulate the exposed back pan area of a steel ceiling diffuser that may be used in UL Classified floor/ceiling or roof/ceiling assemblies with up to a 3 hour rating. The insulation protects the floor/roof structure above from the intense heat that radiates through the diffuser pan during fire conditions. A thermal blanket is used in conjunction with a ceiling radiation damper that protects the neck opening of the diffuser, to provide complete protection of the opening in the ceiling membrane. Model 0725 thermal blanket is for use with 0722 ceiling damper models in round neck applications. Model 0726 thermal blanket is for use with 0714, 0716 and 0720 ceiling damper models in square neck applications.

MODELS 0755(A) & 0756(D)
FOR WOOD TRUSS CEILING ASSEMBLIES

Models 0755(A) and 0756(D) Ceiling Radiation Dampers have been designed and tested for simple installation in specific UL design wood truss ceiling assemblies. They are UL Classified for use in specific 1 hour rated UL floor/ceiling and roof/ceiling designs. Model 0755 ships complete with thermal blanket and top inlet round duct connection. Model 0756 features a factory sheet metal plenum for steel grille/diffuser mount. Model 0756D is for ducted off-AHU applications with up to 3 diffuser/register supply outlet duct collar(s).

Models 0755 & 0756 (L to R)

Models 0757 & 0757D (L to R)

MODEL 0757
FOR WOOD TRUSS CEILING ASSEMBLIES

Designed for steel grille/diffuser mount supply applications. Requires a steel or fiberglass plenum (boot/register box) by others.

MODEL 0757D
FOR WOOD TRUSS CEILING ASSEMBLIES

Designed for ducted off-AHU applications. Requires a steel or fiberglass plenum (by others) with up to 3 duct outlet collars permitted.

MODEL 0763
FOR WOOD TRUSS CEILING ASSEMBLIES

Model 0763 Ceiling Radiation Dampers have been designed and tested for simple installation in specific UL design wood truss ceiling assemblies. They are UL Classified for use in 1 hour rated UL floor/ceiling and roof/ceiling design numbers. Model 0763 ships complete with thermal blanket and top inlet round duct connection. Model 0763 is a round damper designed to mount inside an internally insulated steel plenum (by others) that accommodates a steel grille, register or diffuser, by Nailor or by others.

Model 0763

Models 0757-CB, 0757-DB and 0757-EB (L to R) with Nailor supplied steel plenum/register box.

MODELS 0757 (-CB, -DB, -EB), and 0763 (-FB, -GB)
FOR WOOD TRUSS CEILING ASSEMBLIES

These models are register boxes with integral ceiling dampers. They have been specifically designed and tested to provide protection and simple installation in specific UL design wood truss ceiling assemblies. Model 0757-DB features a 90° side inlet (tapered); Model 0757-CB features a 90° side inlet and is insulated. Model 0763-FB is insulated with a 45° inlet; Model 0757-EB features a tapered top inlet; Model 0763-GB is insulated with a top inlet.

Models 0763-FB and 0763-GB (L to R) with Nailor supplied steel plenum/register box.

CEILING DAMPER BASICS

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

"A device installed to limit radiant heat transfer through an air outlet or air inlet opening in the ceiling of a floor-or roof-ceiling assembly having not less than a 1 hour fire resistance rating."

What is the difference between a Ceiling Damper and a standard Fire Damper?

In order to comprehend the difference we must first understand some of the theory behind fire-rated ceilings. A fire-rated ceiling's primary function is to protect the structure above it from excessive heat and potential subsequent collapse by providing a fire and heat retardant barrier between the fire area and the structural floor above.

Without any openings in the fire-rated ceiling, it would perform as designed by limiting the transfer of heat through the floor above it. Problems arise when we pierce the protective ceiling with big holes to accommodate environmental control devices such as grilles and diffusers. To close these openings should a fire occur, devices called Ceiling Dampers (also commonly called radiation dampers or firestop flaps in Canada) have been developed. If the openings were to remain unobstructed during a fire, generated heat would tend to rapidly flow through in concentration due to a 'funnel effect' created at the openings as the hot combustion gases expand and rise. This focuses the intense heat into the structure area directly above the openings, potentially causing severe structural damage (See Figure 1). Ceiling dampers are specifically designed to protect against this phenomenon by firstly, closing the opening to stop any air flow and secondly, by reducing the amount of heat that is conducted and, most importantly, radiated through the device. This is most important, as a regular fire damper although fine for stopping flame and migratory air flow, is virtually transparent to heat and therefore ineffective in this application.

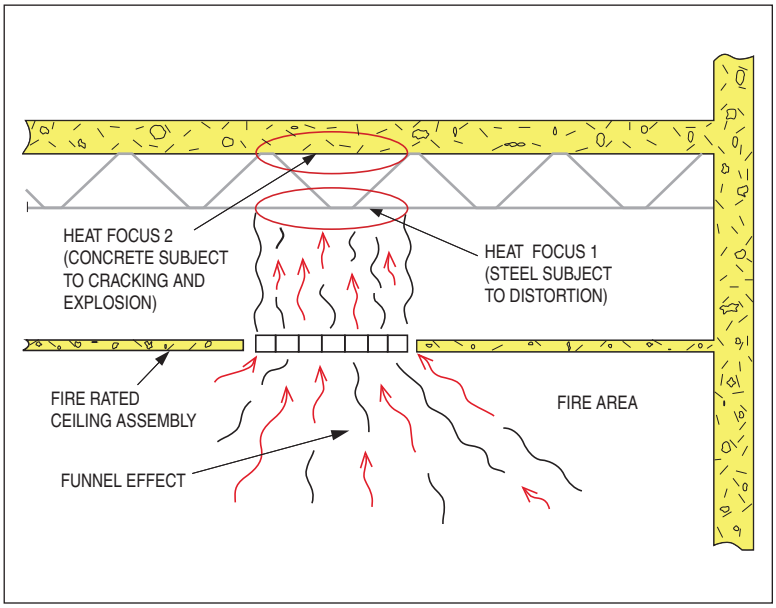


FIGURE 1

- Ceiling Dampers are tested by Underwriter's Laboratories to the strict criteria of UL 555C, Safety Standard for Ceiling Dampers which includes tests for:

  1. Fire Endurance
  2. Closing Reliability
  3. Salt-Spray Exposure
  4. Spring Closing Force (if applicable)

- Ceiling Dampers are not assigned hourly ratings themselves, but rather are listed for use as a component in an assembly designated for use in fire resistance assemblies having specific hourly ratings.

- All Nailor Ceiling Dampers are classified (Category CABS/CABS7) for use in any UL floor/ceiling or roof/ceiling restrained or unrestrained type assembly with up to a 3 hour fire resistance rating.

For a more in depth look into ceiling dampers, see pages C6 – C9.

LOOKING TO SAVE TIME, MONEY AND HASSLES?

As an alternative to assembling separate components,

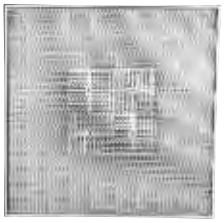
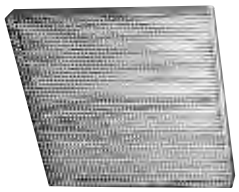
LOOK TO NAILOR FIRE-RATED DIFFUSER AND GRILLE PACKAGES.

As a manufacturer of both **Air Distribution Products** (grilles, diffusers, etc.) and **Air Control Products** (fire dampers, control dampers, louvers, etc.) Nailor can offer **Fire-Rated Packages** as an alternative to assembling separate components from potential separate manufacturers. Nailor is unique in that we can supply **Fire-Rated Packages** at a competitive price, all manufactured at the same facilities for fast lead times and guaranteed Nailor quality . . . no out-sourcing like other major manufacturers.

FEATURES AND BENEFITS:

- **Complete package, including ceiling damper, grille, diffuser etc., factory assembled to save on installation time (and money!) and ensures proper assembly.**
- **Wide variety of quality Nailor diffuser and grille styles to choose from.**
- **UL and ULC Classified assemblies for use in restrained or unrestrained ceilings incorporating an exposed grid with up to a 3 hour rating.**
- **Surface Mount package available for hard ceilings.**
- **Approved for use with Class 0 or 1 Flexible Duct.**
- **Ductless Return Air grilles can be installed with no connecting ductwork, ideal for use when ceiling space is used for return air.**

SOME OF THE NAILOR FIRE-RATED PACKAGES AVAILABLE:

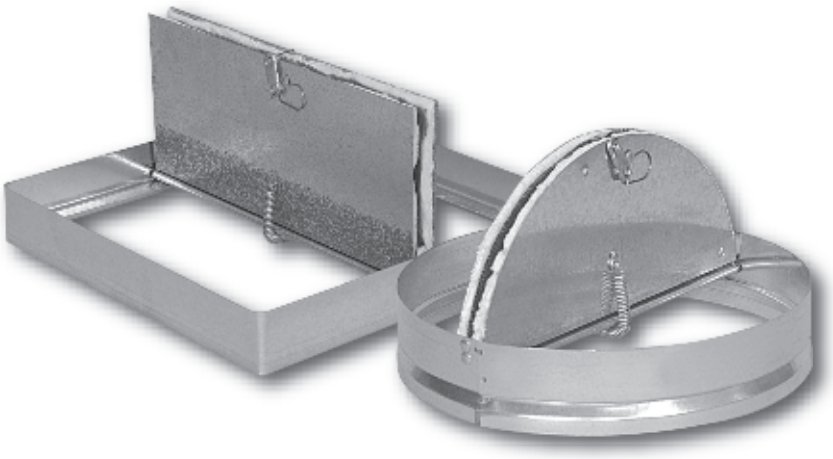
 RNS DIFFUSER SERIES 4000	 PERFORATED FACE SERIES 4000	 MODULAR CORE SERIES 7500 FRD
 PLENUM SLOT SERIES 5500	 EGGCRATE OR PERFORATED DUCTLESS RETURNS SERIES 4100	 LOUVER FACE DUCTLESS RETURNS SERIES 4100

SEE THE NAILOR AIR DISTRIBUTION PRODUCTS CATALOG FOR A COMPLETE SELECTION OF FIRE-RATED PACKAGES.

- FOR SQUARE, RECTANGULAR OR ROUND DUCTS
- UL 555C CLASSIFIED

Models:

0716	**Two Blades Square & Rectangular**
0716-4	**Low Profile**
0714	**Single Blade**
0722	**Round**
0722-SE/ 0722-LE	**Round with Top Extension**



Models 0716 & 0722

Nailor ceiling dampers, or ceiling radiation dampers as they are commonly called, are designed to function as a fire and heat barrier in air duct openings penetrating fire resistive membrane ceilings. Models 0716, 0716-4 and 0714 are for use in square or rectangular applications and Models 0722, 0722-SE and 0722-LE are for use in round applications, in lieu of hinged door type dampers in any UL floor/ceiling or roof/ceiling assembly with up to a 3 hour fire resistance rating where air ducts are allowed.

Model 0716-4 provides a low profile, dual set of blades design, ideal for installation in tight places that require a fire and heat barrier in air duct openings penetrating fire resistive membrane ceilings. Model 0714's single blade design provides maximum free area and no obstruction to airflow when open. The extension collar on Models 0722-SE and 0722-LE minimizes the risk of interference with blade closure in flexible duct installations and helps ensure even airflow into the diffuser neck for optimum performance.

QUALIFICATIONS:

- **UL 555C CLASSIFIED CEILING DAMPER (File # R9660).**
- **CAN4/ULC-S112.2 Ceiling Firestop Flap Assemblies.**
- **Meets the requirements for NFPA 90A, IBC, NBC (Canada) and associated local building codes.**
- **City of New York Board of Standards and Appeals. Cal. No. 460-88-SA.**
- **California State Fire Marshal: Fire Damper Listing No. 3225-0935:0102.**

MODEL: 0716 TWO BLADES (SQUARE OR RECTANGULAR)

STANDARD CONSTRUCTION:

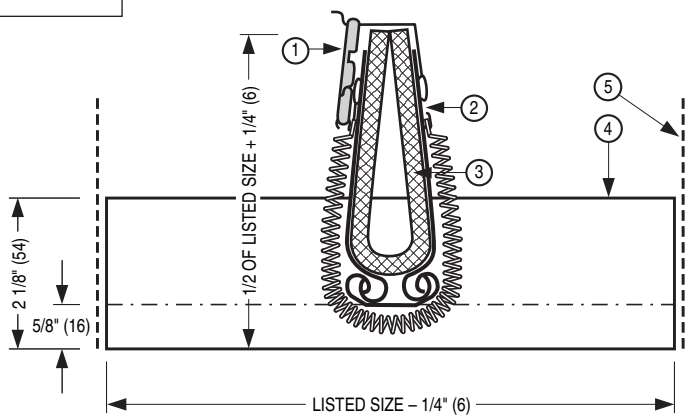
1. **Fusible Link:** UL Listed, 212°F (100°C), standard.
2. **Blades:** 22 ga. (0.85) G60 galvanized steel.
3. **Insulation:** Non-asbestos UL Classified on units over 80 sq. in. (516 sq. cm) finished size, standard. Not required on smaller units.
4. **Frame:** Roll-formed 22 ga. (0.85) G60 galvanized steel.
5. **Duct Drop:** By others.

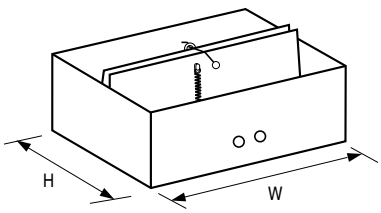
Model 0716 Sizes (Duct W x H):

Minimum	Maximum
6" x 3" (152 x 75)	24" x 24" (610 x 610)

COMMON OPTION:

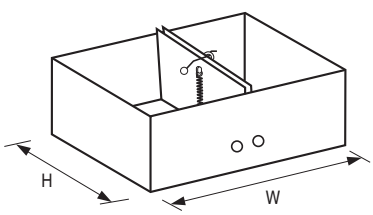
- 165°F (74°C) UL Listed fusible link.





DETAIL 1
(H = 6" [152] or more)

Units manufactured with blade length on long dimension (W) except where short dimension (H) is less than 6" (152). (See Detail 1 above).



DETAIL 2
(H = less than 6" [152])

If short dimension (H) is less than 6" (152), units are manufactured with blade length on short dimension. (See Detail 2 above).

MODEL: 0716-4 LOW PROFILE (SQUARE OR RECTANGULAR)

Model 0716-4 provides a low profile, dual set of blades design, ideal for installation in tight places.

STANDARD CONSTRUCTION:

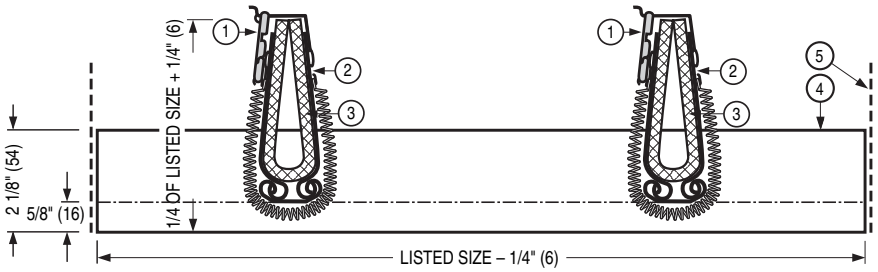
1. **Fusible Link:** UL Listed, 212°F (100°C), standard.
2. **Blades:** 22 ga. (0.85) G60 galvanized steel.
3. **Insulation:** Non-asbestos UL Classified on units over 80 sq. in. (516 sq. cm) finished size, standard. Not required on smaller units.
4. **Frame:** Roll-formed 22 ga. (0.85) G60 galvanized steel.
5. **Duct Drop:** By others.

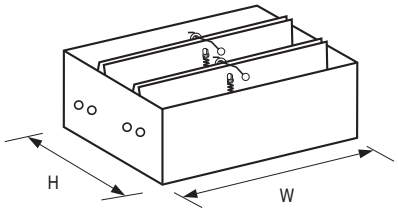
Model 0716-4 Sizes (Duct W x H):

Minimum	Maximum
12" x 6" (305 x 152)	24" x 24" (610 x 610)

COMMON OPTION:

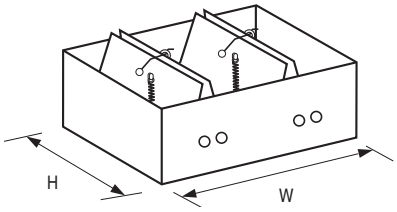
- 165°F (74°C) UL Listed fusible link.





DETAIL 1
(H = 12" [305] or more)

Units manufactured with blade length on long dimension (W) except where short dimension (H) is less than 12" (305). (See Detail 1 above).



DETAIL 2
(H = less than 12" [305])

If short dimension (H) is less than 12" (305), units are manufactured with blade length on short dimension. (See Detail 2 above).

MODEL: 0714 SINGLE BLADE (SQUARE OR RECTANGULAR)

Model 0714's single blade design provides maximum free area and no obstruction to airflow when open.

STANDARD CONSTRUCTION:

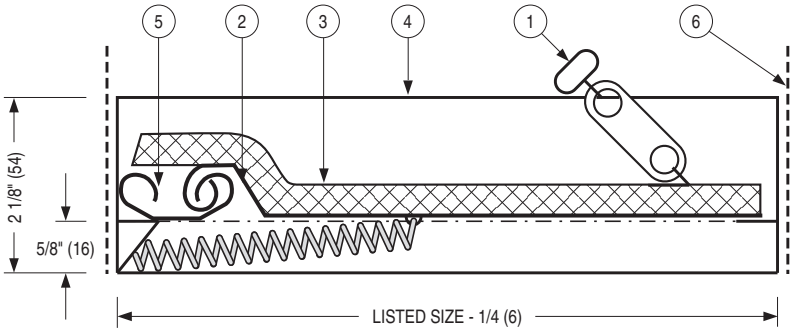
1. **Fusible Link:** UL Listed, 212°F (100°C), standard.
2. **Blades:** 22 ga. (0.85) G60 galvanized steel.
3. **Insulation:** Non-asbestos UL Classified on units over 80 sq. in. (516 sq. cm) finished size, standard. Not required on smaller units.
4. **Frame:** Roll-formed 22 ga. (0.85) G60 galvanized steel.
5. **Hinge**
6. **Duct Drop:** By others.

Model 0714 Sizes (Duct W x H):

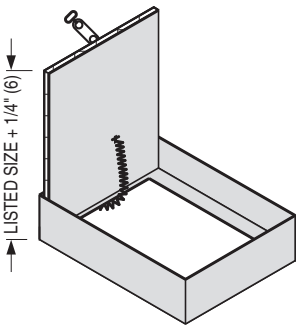
Minimum	Maximum
4" x 4" (102 x 102)	24" x 24" (610 x 610)

COMMON OPTION:

- 165°F (74°C) UL Listed fusible link.



CLOSED POSITION



OPEN POSITION

MODEL: 0722 (ROUND)

STANDARD CONSTRUCTION:

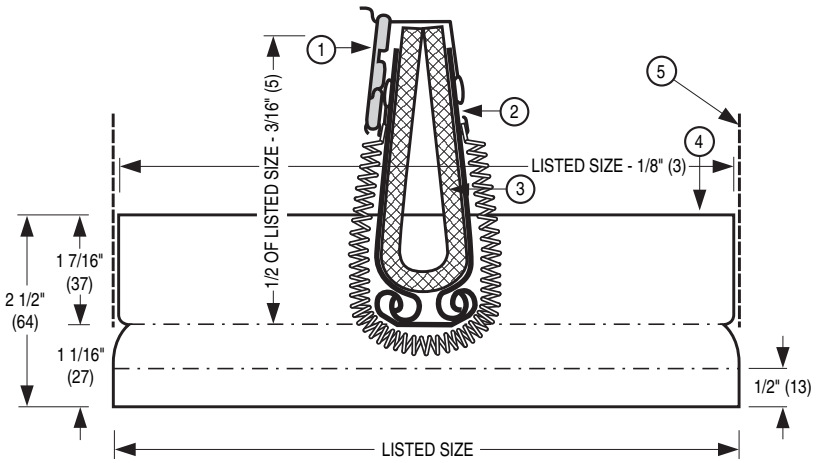
1. **Fusible Link:** UL Listed, 212°F (100°C), standard.
2. **Blades:** 22 ga. (0.85) G60 galvanized steel.
3. **Insulation:** Non-asbestos UL Classified on units 12" (305) dia. and larger. Not required on smaller units.
4. **Frame:** Roll-formed 22 ga. (0.85) G60 galvanized steel.
5. **Duct Drop:** By others.

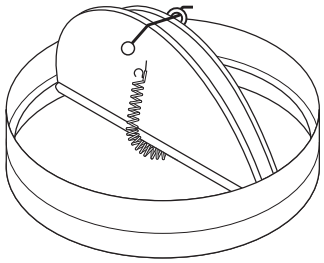
Model 0722 Sizes (Duct Dia.):

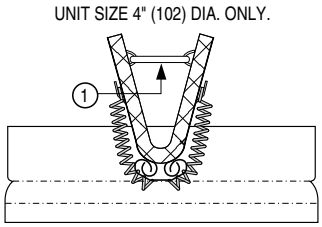
Minimum	Maximum
4" (102) dia.	24" (610) dia.

COMMON OPTION:

- 165°F (74°C) UL Listed fusible link.







MODELS: 0722-SE SHORT TOP EXTENSION (ROUND)
0722-LE LONG TOP EXTENSION (ROUND)

The extension collar on Models 0722-SE and 0722-LE minimizes the risk of interference with blade closure in flexible duct installations and helps ensure even airflow into the diffuser neck for optimum performance.

STANDARD CONSTRUCTION:

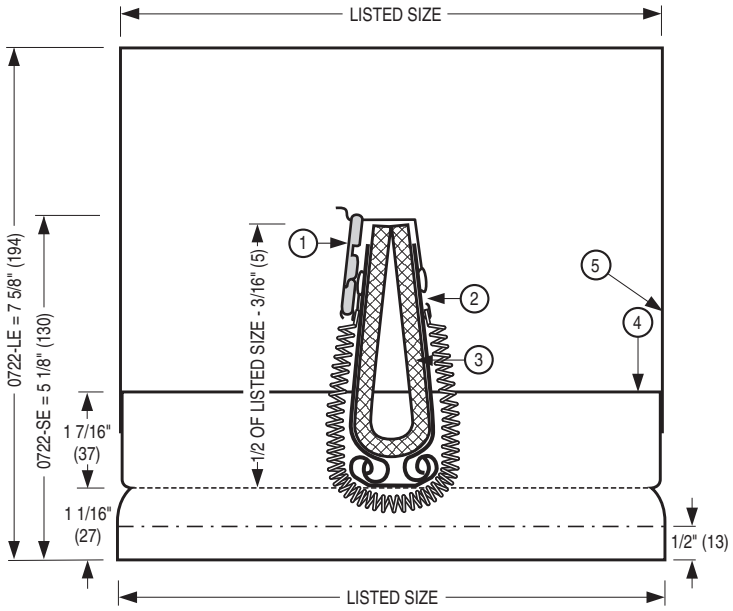
1. **Fusible Link:** UL Listed, 212°F (100°C), standard.
2. **Blades:** 22 ga. (0.85) G60 galvanized steel.
3. **Insulation:** Non-asbestos UL Classified on units 12" (305) dia. and larger. Not required on smaller units.
4. **Frame:** Roll-formed 22 ga. (0.85) G60 galvanized steel.
5. **Top Extention**

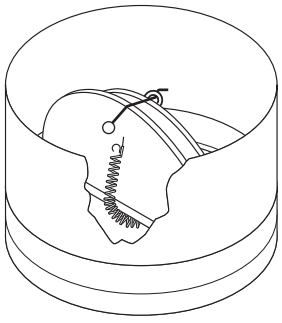
Models 0722-SE and 0722-LE Sizes (Duct Dia.):

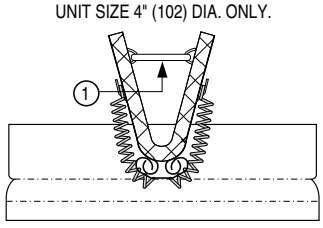
Minimum	Maximum
4" (102) dia.	24" (610) dia.

COMMON OPTION:

- 165°F (74°C) UL Listed fusible link.







HOW TO SPECIFY

MODELS: 0716, 0716-4, 0722, 0722-SE AND 0722-LE
CEILING DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, ceiling dampers as manufactured by Nailor Industries, Inc., which meet the following criteria: Ceiling dampers shall be UL Classified for use in all restrained and unrestrained UL Listed ceiling assemblies with fire resistance ratings of 3 hours or less. Dampers shall be tested and manufactured in accordance with UL 555C Standard for Ceiling Dampers and shall bear a UL label identifying the same.

Frame and blade shall be constructed of 22 ga. (0.85) galvanized steel. Blade insulation shall be non-asbestos UL Classified where required, as determined by overall damper size. Each ceiling damper shall be held open with a (**specifier to select**) 212°F (100°C) **or** 165°F (74°C) UL Listed fusible link. Ceiling dampers shall ship with and be installed in accordance with manufacturer's UL approved installation instructions. Information submitted for approval shall include same UL installation instructions.

Standard of acceptance shall be Nailor Industries (**specifier to select**) Model 0716 for square or rectangular applications **or** Model 0716-4 low profile for square or rectangular applications with limited space **or** Model 0722 for round applications.

(**Specifier to select, if required**) Model 0722-SE short top extension **or** Model 0722-LE long top extension, as deemed suitable by space above ceiling, to ensure flex duct does not interfere with blade closure.

- ADJUSTABLE VOLUME CONTROL
- FOR SQUARE, RECTANGULAR OR ROUND DUCTS
- UL 555C CLASSIFIED

Models:

0716A	**Square & Rectangular**
0716-4A	**Low Profile**
0722A	**Round**
0722A-SE/ 0722A-LE	**Round with Top Extension**

Models 0722A & 0716A

Nailor ceiling dampers, or ceiling radiation dampers as they are commonly called, with **Adjustable Volume Control** option, are designed to function as a fire and heat barrier in air duct openings penetrating fire resistive membrane ceilings. The adjustable volume control mechanism allows the blades to be adjusted for balancing of airflow through the diffuser. Under fire conditions the fusible link will close the damper, regardless of volume setting.

Models 0716A and 0716-4A are for use in square or rectangular applications and Models 0722A is for use in round applications, in lieu of hinged door type dampers in any UL floor/ceiling or roof/ceiling assembly with up to a 3 hour fire resistance rating where air ducts are allowed. Model 0716-4A provides a low profile, dual set of adjustable blades design, ideal for installation in tight places that require a fire and heat barrier in air duct openings penetrating fire resistive membrane ceilings. The extension collar on Models 0722A-SE and 0722A-LE minimizes the risk of interference with blade closure in flexible duct installations and helps ensure even airflow into the diffuser neck for optimum performance. These models incorporate a mechanism to adjust the opening of the blades for balancing airflow through the ceiling diffuser.

QUALIFICATIONS:

- **UL 555C CLASSIFIED CEILING DAMPER (File # R9660).**
- **CAN4/ULC-S112.2 Ceiling Firestop Flap Assemblies.**
- **Meets the requirements NFPA 90A as well as IBC, NBC (Canada) and associated local building codes.**
- **City of New York Board of Standards and Appeals. Cal. No. 460-88-SA.**
- **California State Fire Marshal: Ceiling Damper Listing No. 3226-0935:0102.**

MODEL: 0716A ADJUSTABLE (SQ. OR RECT.)

STANDARD CONSTRUCTION:

1. **Fusible Link:** UL Listed, 212°F (100°C), standard.
2. **Blades:** 22 ga. (0.85) G60 galvanized steel.
3. **Insulation:** Non-asbestos UL Classified on units over 80 sq. in. (516 sq. cm) finished size, standard. Not required on smaller units.
4. **Frame:** Roll-formed 22 ga. (0.85) G60 galvanized steel.
5. **Vol. Control:** Adjustable fusible link assembly permits volume control.
6. **Duct Drop:** By others.

Model 0716A Sizes (Duct W x H):

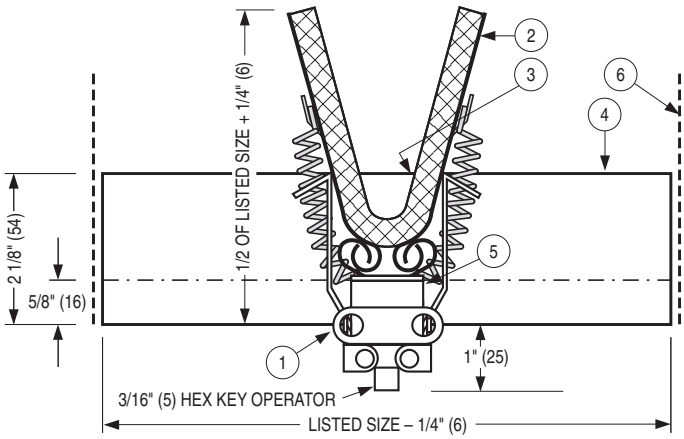
Minimum	Maximum
6" x 3" (152 x 76)	16" x 16" (406 x 406)

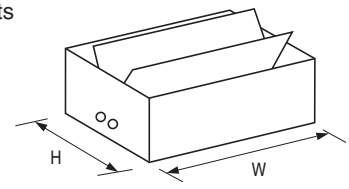
COMMON OPTION:

- 165°F (74°C) UL Listed fusible link.

U.S. Patent No. 4,936,287

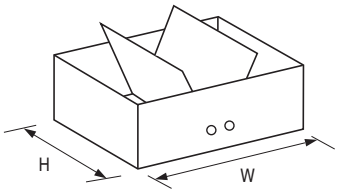
Canadian Patent No. 2,014,587-1





DETAIL 1
(H = 6" [152] or more)

Units manufactured with blade length on dimension (W) except where short dimension (H) is less than 6" (152). (See Detail 1 above).



DETAIL 2
(H = less than 6" [152])

If short dimension (H) is less than 6" (152), units are manufactured with blade length on short dimension. (See Detail 2 above).

MODEL: 0716-4A LOW PROFILE; ADJUSTABLE (SQUARE OR RECTANGULAR)

MODEL 0716-4A provides a low profile, dual set of adjustable blades design, ideal for installation in tight places.

STANDARD CONSTRUCTION:

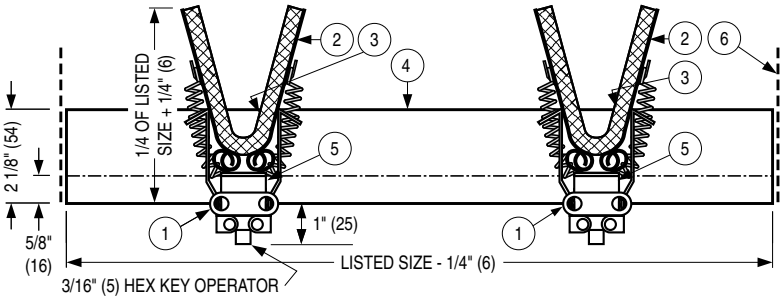
1. **Fusible Link:** UL Listed, 212°F (100°C), standard.
2. **Blades:** 22 ga. (0.85) G60 galvanized steel.
3. **Insulation:** Non-asbestos UL Classified on units over 80 sq. in. (516 sq. cm) finished size, standard. Not required on smaller units.
4. **Frame:** Roll-formed 22 ga. (0.85) G60 galvanized steel.
5. **Vol. Control:** Adjustable fusible link assembly permits volume control.
6. **Duct Drop:** By others.

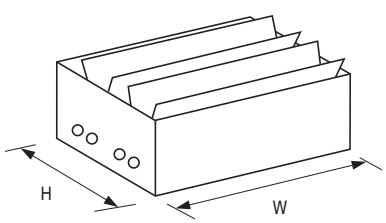
Model 0716-4A Sizes (Duct W x H):

Minimum	Maximum
12" x 6" (305 x 152)	24" x 24" (610 x 610)

COMMON OPTION:

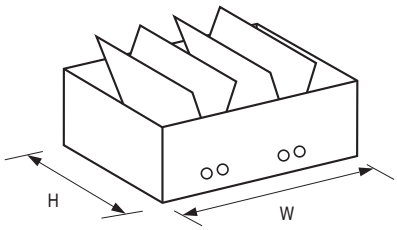
- 165°F (74°C) UL Listed fusible link.





DETAIL 1
(H = 12" [305] or more)

Units manufactured with blade length on dimension (W) except where short dimension (H) is less than 12" (305). (See Detail 1 above).



DETAIL 2
(H = less than 12" [305])

If short dimension (H) is less than 12" (305), units are manufactured with blade length on short dimension. (See Detail 2 above).

MODEL: 0722A ADJUSTABLE (ROUND)

STANDARD CONSTRUCTION:

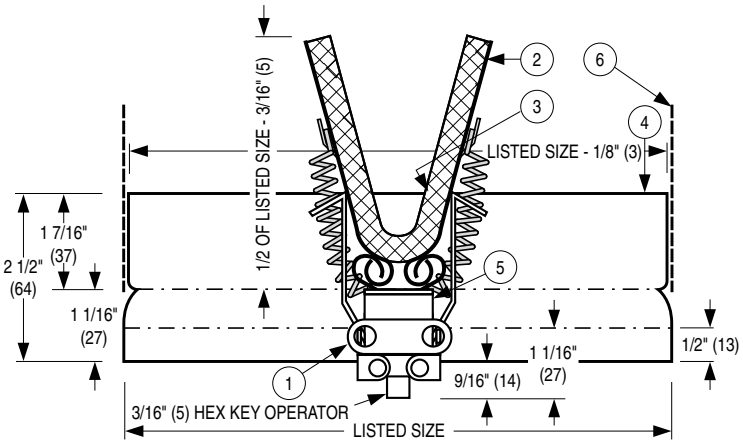
1. **Fusible Link:** UL Listed, 212°F (100°C), standard.
2. **Blades:** 22 ga. (0.85) G60 galvanized steel.
3. **Insulation:** Non-asbestos UL Classified on units 12 in. (305) dia. and larger, standard. Not required on smaller units.
4. **Frame:** Roll-formed 22 ga. (0.85) G60 galvanized steel.
5. **Vol. Control:** Adjustable fusible link assembly permits volume control.
6. **Duct Drop:** By others.

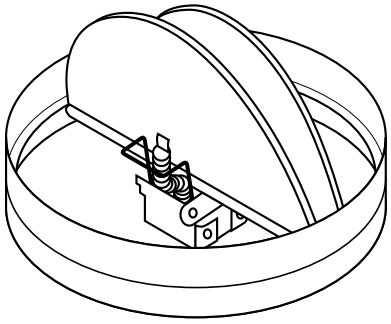
Model 0722A Sizes (Duct Dia.):

Minimum	Maximum
5" (127) dia.	16" (406) dia.

COMMON OPTION:

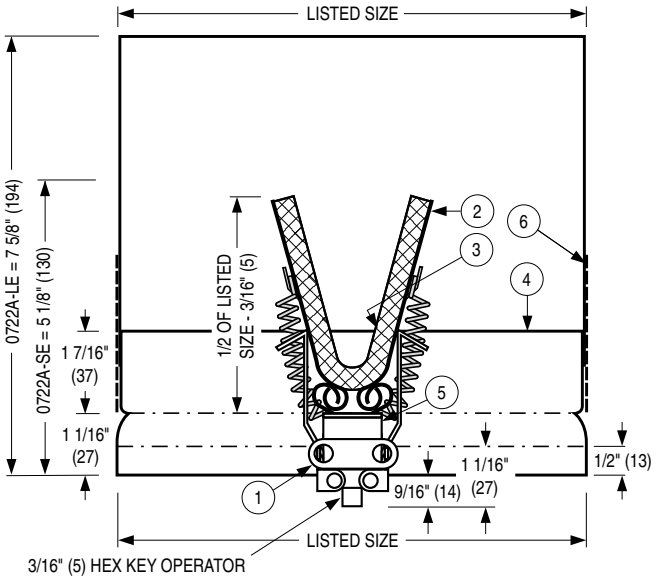
- 165°F (74°C) UL Listed fusible link.





MODELS: 0722A-SE ADJUSTABLE WITH SHORT EXTENSION (ROUND)
0722A-LE ADJUSTABLE WITH LONG EXTENSION (ROUND)

The extension collar on Models 0722A-SE and 0722A-LE minimizes the risk of interference with blade closure in flexible duct installations and helps ensure even airflow into the diffuser neck for optimum performance. These models incorporate a mechanism to adjust the opening of the blades for balancing airflow through the ceiling diffuser.



STANDARD CONSTRUCTION:

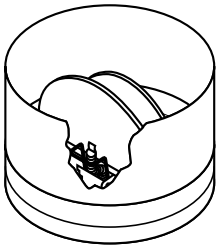
1. **Fusible Link:** UL Listed, 212°F (100°C), standard.
2. **Blades:** 22 ga. (0.85) G60 galvanized steel.
3. **Insulation:** Non-asbestos UL Classified on units 12" (305) dia. and larger, standard. Not required on smaller units.
4. **Frame:** Roll-formed 22 ga. (0.85) G60 galvanized steel.
5. **Vol. Control:** Adjustable fusible link assembly permits volume control.
6. **Duct Drop:** By others.

Models 0722A-SE and 0722A-LE Sizes (Duct Dia.):

Minimum	Maximum
5" (127) dia.	16" (406) dia.

COMMON OPTION:

- 165°F (74°C) UL Listed fusible link.



HOW TO SPECIFY

MODELS: 0716A, 0716-4A, 0722A, 0722A-SE AND 0722A-LE CEILING DAMPERS WITH ADJUSTABLE VOLUME CONTROL

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, ceiling dampers as manufactured by Nailor Industries, Inc., which meet the following criteria: Ceiling dampers shall be UL Classified for use in all restrained and unrestrained UL Listed ceiling assemblies with fire resistance ratings of 3 hours or less. Dampers shall be tested and manufactured in accordance with UL 555C Standard for Ceiling Dampers and shall bear a UL label identifying the same.

Frame and blade shall be constructed of 22 ga. (0.85) galvanized steel. Blade insulation shall be non-asbestos UL Classified where required, as determined by overall damper size. Each ceiling damper shall be held open with a (**specifier to select**) 212°F (100°C) **or** 165°F (74°C) UL Listed fusible link. Ceiling dampers shall ship with and be installed in accordance with manufacturer's UL approved installation instructions. Information submitted for approval shall include same UL installation instructions.

Standard of acceptance shall be Nailor Industries (**specifier to select**) Model 0716A for square or rectangular applications **or** Model 0716-4A low profile for square or rectangular applications with limited space **or** Model 0722A for round applications.

(**Specifier to select, if required**) Model 0722A-SE short top extension **or** Model 0722A-LE long top extension, as deemed suitable by space above ceiling, to ensure flex duct does not interfere with blade closure.

- LOW PROFILE
- CURTAIN TYPE
- FOR SQUARE OR RECTANGULAR DUCTS
- UL 555C CLASSIFIED

Model:

0720 Low Profile Curtain Type

Model 0720

Model 0720 Ceiling Radiation Damper, which functions as a fire and heat barrier in air duct openings that penetrate fire resistive membrane ceilings, is for use in lieu of hinged door type dampers in any UL floor/ceiling assembly with up to a 3 hour fire resistance rating where air ducts are permitted. Model 0720 features a specially designed 'pull across' insulated curtain that provides a low profile, making it ideal for use in applications where the available duct drop height for installation is limited. The compact curtain design also maximizes free area in the open position.

QUALIFICATIONS:

- **UL 555C CLASSIFIED CEILING DAMPER (File # R9660).**
- **CAN4/ULC-S112.2 Ceiling Firestop Flap Assemblies.**
- **Meets the requirements NFPA 90A as well as IBC, NBC (Canada) and associated local building codes.**
- **City of New York MEA. No. 366-03-M.**
- **California State Fire Marshal: Ceiling Damper Listing No. 3226-0935:0102.**

MODEL: 0720

STANDARD CONSTRUCTION:

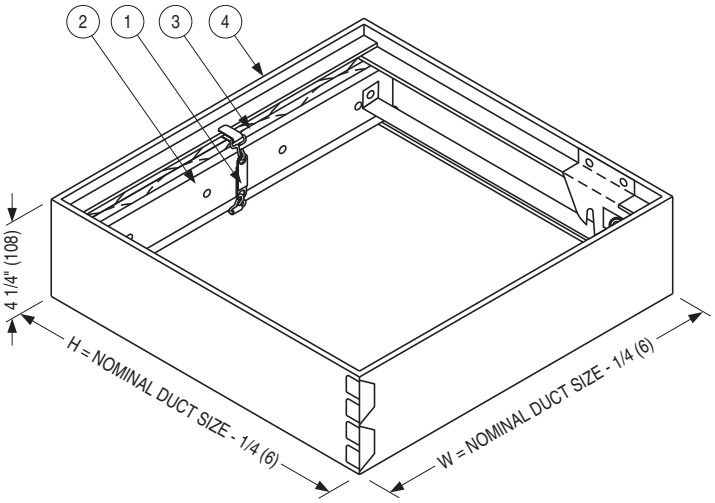
1. **Fusible Link:** UL Listed, 212°F (100°C), standard.
2. **Blades:** 22 ga. (0.85) coating galvanized steel.
3. **Insulation:** Non-asbestos UL Classified.
4. **Frame:** Roll-formed 22 ga. (0.85) coating galvanized steel.
5. **Spring:** Stainless steel negator closure spring.
6. **Ramp:** Curtain blade locking ramp.

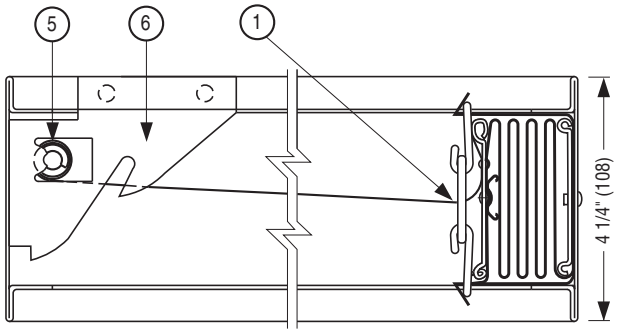
Model 0720 Sizes (Duct W x H):

Minimum	Maximum
6" x 4" (152 x 102)	18" x 18" (457 x 457)

COMMON OPTION:

- 165°F (74°C) UL Listed fusible link.





HOW TO SPECIFY

MODEL: 0720
LOW PROFILE CEILING DAMPERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, low profile ceiling dampers as manufactured by Nailor Industries, Inc., which meet the following criteria: Low Profile Curtain Type Ceiling Fire Dampers shall be UL Classified for use in all restrained and unrestrained UL Listed ceiling assemblies with fire resistance ratings of 3 hours or less. Dampers shall be tested and manufactured in accordance with UL 555C Standard for Ceiling Dampers and shall bear a UL label identifying the same.
Frame and blade shall be constructed of 22 ga. (0.85) galvanized steel. Curtain insulation shall be non-asbestos, UL Classified. Each ceiling damper shall be held open with a (**specifier to select**) 212°F (100°C) **or** 165°F (74°C) UL Listed fusible link. Ceiling dampers shall ship with and be installed in accordance with manufacturer's UL approved installation instructions. Information submitted for approval shall include same UL installation instructions.
Standard of acceptance shall be Nailor Industries Model 0720 Low Profile Curtain Type Ceiling Fire Dampers.

HOW TO ORDER

MODELS: 0714 TO 0722
CEILING RADIATION DAMPERS – UL 555C

EXAMPLE: 0716 - 12" x 6" - 212

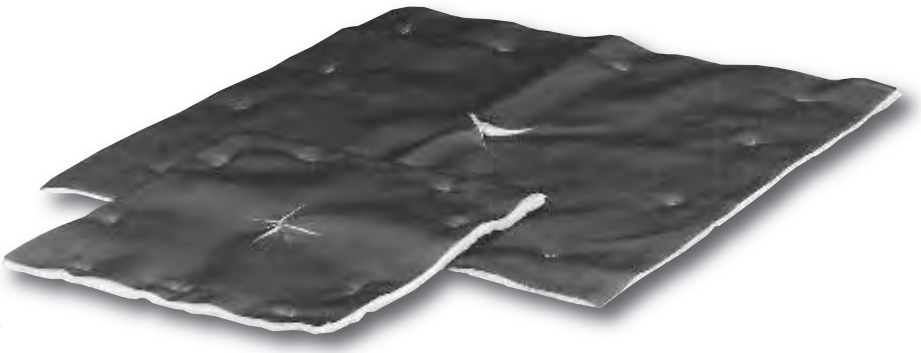
1. **Models**

0714	Square/Rectangular, Single Blade
0716	Square/Rectangular, Two Blades
0716A	Square/Rectangular, Two Blades with Adjustable Volume Control
0716-4	Square/Rectangular, Low Profile
0716-4A	Square/Rectangular, Low Profile with Adjustable Volume Control
0722	Round
0722A	Round, with Adjustable Volume Control
0722-SE	Round, Short Extension
0722-LE	Round, Long Extension
0722A-SE	Round, Short Extension, with Adjustable Volume Control
0722A-LE	Round, Long Extension, with Adjustable Volume Control
0720	Low Profile, Curtain Type

2. **Duct Size**
   Width x Height or Diameter (inches [mm's])
3. **Closure Temperature**

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

- ACCESSORY FOR CEILING DAMPERS
- FOR ROUND AND SQUARE NECK DIFFUSERS
- UL CLASSIFIED



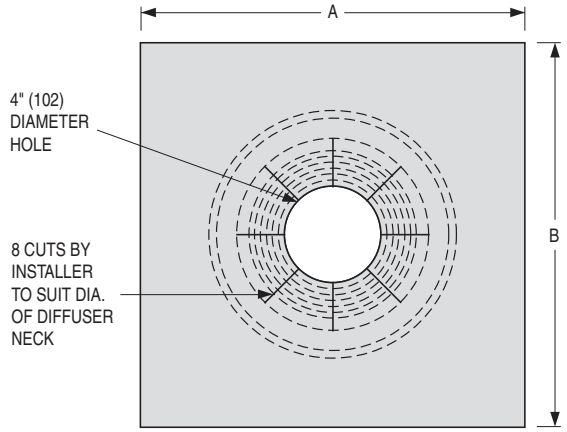
Models 0725 & 0726

Models:

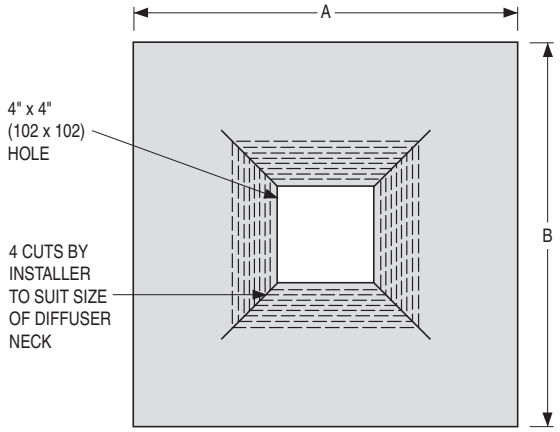
0725 For Round Neck Steel Diffusers

0726 For Square Neck Steel Diffusers

Models 0725 and 0726 Thermal Blankets are designed to insulate the exposed back pan area of a steel ceiling diffuser that may be used in UL Classified floor/ceiling or roof/ceiling assemblies with up to a 3 hour rating. The insulation protects the floor/roof structure above from the intense heat that radiates through the diffuser pan during fire conditions. A thermal blanket is used in conjunction with a ceiling radiation damper that protects the neck opening of the diffuser, to provide complete protection of the opening in the ceiling membrane. Model 0725 thermal blanket is for use with 0722 ceiling damper models in round neck applications. Model 0726 Thermal Blanket is for use with 0714, 0716 and 0720 ceiling damper models in square neck applications.



Model 0725: For round applications



Model 0726: For square applications

Ceiling Diffuser Nominal Size (W x H)		Blanket Size (A x B)	
Imperial Modules	Metric Modules	Imperial Modules	Metric Modules
inches	mm	inches	mm
12 x 12	305 x 305	16 x 16	406 x 406
24 x 12	610 x 305	28 x 16	711 x 406
24 x 24	610 x 610	28 x 28	711 x 711

NOTES:

1. Insulation: Non-asbestos UL Classified.
2. For use on the back of steel lay-in diffusers up to 24" x 24" (610 x 610) nominal face size.
3. Installer to make cuts, as shown, to the desired size of the diffuser neck.

HOW TO ORDER

MODELS: 0725, 0726

THERMAL BLANKET ACCESSORY FOR STEEL DIFFUSERS – UL

EXAMPLE: 0725 - 24" x 24"

1. **Models**
   - 0725 Thermal Blanket for Round Neck, Steel Diffuser
   - 0726 Thermal Blanket for Square Neck, Steel Diffuser
2. **Ceiling Module Size**
   Width x Height or Diameter (inches [mm's])
   12" x 12" (300 x 300)
   24" x 12" (600 x 300)
   24" x 24" (600 x 600)

WOOD TRUSS CEILING DAMPER ASSEMBLY

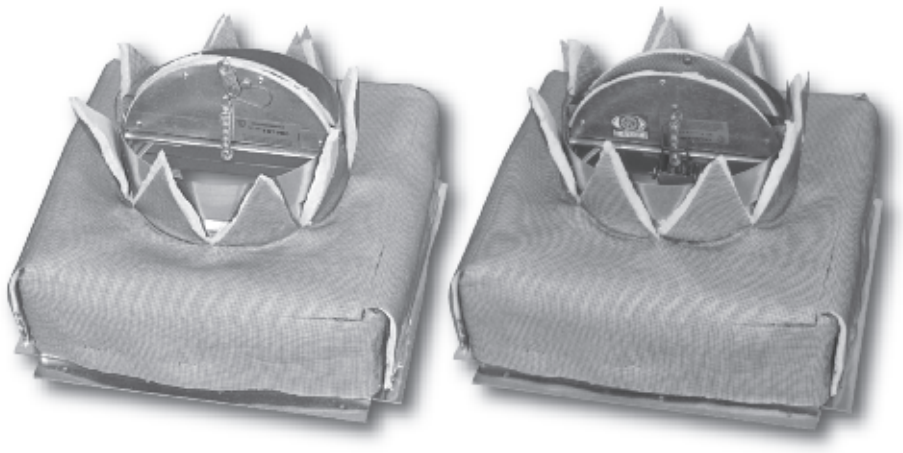
Nailor

- UL 263 CLASSIFIED
- GRILLE/DIFFUSER MOUNT
- TOP INLET
- OPTIONAL ADJUSTABLE VOLUME CONTROL

Models:

0755 Basic Unit

0755A Adjustable with Volume Control



Models 0755 & 0755A

Models 0755 and 0755A Wood Truss Ceiling Damper Assemblies have been designed and tested for simple installation in UL design wood truss ceiling assemblies. They are UL Classified for use in specific 1 hour rated UL floor/ceiling and roof/ceiling designs. Each unit ships complete with integral thermal blanket and a top inlet round duct connection to accept UL Classified Class 0 or 1 flex duct. Be sure to check available ceiling plenum depth to ensure sufficient clearance for attachment and curving of flex duct without damper interference. Model 0755A includes an adjustable volume control mechanism that permits airflow balancing at the diffuser.

QUALIFICATIONS:

- **UL 263 CLASSIFIED CEILING DAMPER. Category CABS. (File # R9660).**
- **1 hour rated for use in UL floor/ceiling design numbers L550/L562/L574/L579/L585/L592/M501/M503/M526 and roof/ceiling design numbers P531/P538/P545/P547/P549/P552/P570. (Other proprietary UL design numbers may be similar. Local approval by AHJ is required to use a Nailor design when not specified).**
- **Meets NFPA 90A requirements.**

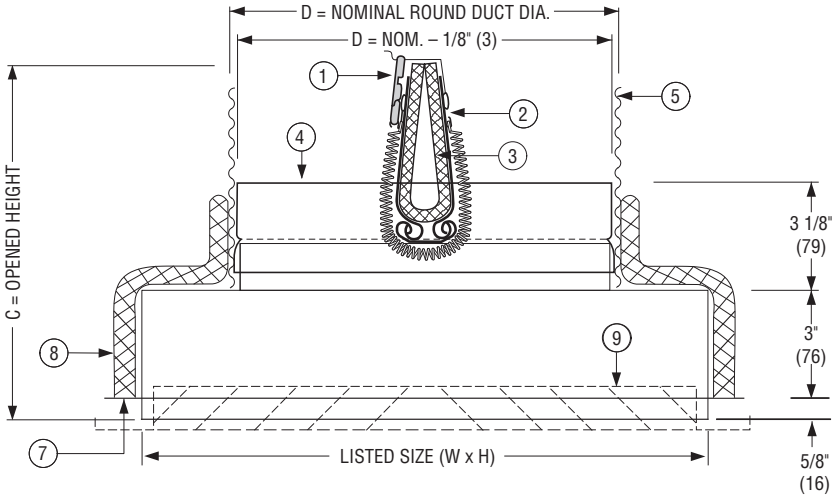
STANDARD CONSTRUCTION:

1. **Fusible Link:** UL Listed, 212°F (100°C), standard.
2. **Blades:** 22 ga. (0.85) galvanized steel.
3. **Insulation:** Ceramic fiber insulation.
4. **Frame:** 22 ga. (0.85) galvanized steel.
5. **Duct:** UL Classified Class 0 or 1 flexible air duct by others.
6. **Vol. Control:** Optional adjustable volume control. (Model 0755A).
7. **Flange:** Plaster flange.
8. **Blanket:** Ceramic fiber thermal blanket.
9. **Steel Grille/ Diffuser:** Optional or by others.

Models 0755 & 0755A Sizes (W x H):

Minimum	Maximum
6" x 6" (152 x 152)	12" x 12" (305 x 305)

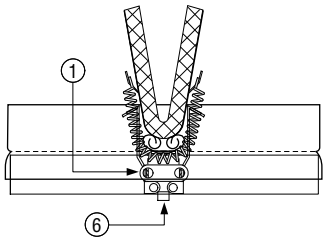
W x H = Nominal Grille/ Register Size



Available Duct Connection Size: 4" through 8" (102 – 203) dia. Building code and UL Classification require damper installation in accordance with manufacturer's instructions.

COMMON OPTIONS:

- 165°F (74°C) UL Listed fusible link.
- Installation Support Angles. 26" (660) long:
  ISA 2 @ 3/4" x 3/4" x 16 ga. (19 x 19 x 1.6).
  ISB 2 @ 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85).



0755A Damper Design

Nominal Duct Size	Opened Height C
*4" (102) 5" (127) 6" (152)	6 1/2" (165) 7" (178) 7 1/2" (191)
7" (178) 8" (203)	8" (203) 8 1/2" (216)

* Not available on Model 0755A

HOW TO SPECIFY OR TO ORDER

MODELS: 0755 AND 0755A
WOOD TRUSS CEILING DAMPERS (ADJUSTABLE VOLUME CONTROL OPTION)

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, ceiling dampers as manufactured by Nailor Industries, Inc., qualified for use in specific wood truss ceiling assemblies with 1 hour fire rating which meet the following criteria: Ceiling Dampers shall be tested in accordance with UL 263 Standard for Fire Tests of Building Construction and Materials, and shall bear a UL label verifying the same. Ceiling Dampers tested and labelled in accordance with UL 555C Standard for Ceiling Dampers are not approved or acceptable.
Frame and blade shall be constructed of 22 ga. (0.85) galvanized steel. Damper assembly shall incorporate a thermal blanket for complete protection of transition housing. Each ceiling damper shall be held open with a (**specifier to select**) 212°F (100°C) **or** 165°F (74°C) UL Listed fusible link. Ceiling dampers shall ship with and be installed in accordance with manufacturer's UL approved installation instructions. Information submitted for approval shall include same UL installation instructions.
Standard of acceptance shall be Nailor Industries Model 0755.
(**Specifier to select, if required**) for Adjustable Volume Control option, Model 0755A, add the following: Ceiling dampers shall incorporate an adjustable volume control mechanism for balancing of airflow at the diffuser. Standard of acceptance: shall be Nailor Industries Model 0755A.

MODELS: 0755, 0755A
WOOD TRUSS CEILING RADIATION DAMPERS – UL 263

EXAMPLE: 0755 - 12" x 6" - 06 - 212

1. **Models**
   - 0755 Top Inlet, Grille Mount
   - 0755A Top Inlet, Grille Mount with Adjustable Volume Control
2. **Ceiling Opening Size**
   Width x Height (inches [mm's])
   - 6" x 6" (150 x 150)
   - 8" x 6" (200 x 150)
   - 8" x 8" (200 x 200)
   - 10" x 8" (254 x 200)
   - 10" x 10" (254 x 254)
   - 12" x 6" (300 x 150)
   - 12" x 8" (300 x 200)
   - 12" x 10" (300 x 254)
   - 12" x 12" (300 x 300)
3. **Neck Size**
   Diameter (inches [mm's])
   - 04 4" (102) Round
   - 05 5" (127) Round
   - 06 6" (152) Round
4. **Fusible Link Temperature**
   - 212 212°F (100°C) (default)
   - 165 165°F (74°C)
5. **Support Angles**
   - ISA 2 @ 3/4" x 3/4" x 16 ga. (19 x 19 x 1.6)
   - ISB 2 @ 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85)

Available Sizes:

Ceiling Opening Size	Round Neck Size*
6" x 6" (152 x 152) 8" x 6" (203 x 152) 10" x 6" (254 x 152) 12" x 6" (305 x 152)	4", 5", 6" (102, 127, 152)
8" x 8" (203 x 203) 10" x 8" (254 x 203) 12" x 8" (305 x 203)	4", 5", 6", 7", 8" (102, 127, 152, 178, 203)
10" x 10" (254 x 254) 12" x 10" (305 x 253)	4", 5", 6", 7", 8" (102, 127, 152, 178, 203)
12" x 12" (305 x 305)	4", 5", 6", 7", 8" (102, 127, 152, 178, 203)

* 4" (102) not available on Model 0755A

- UL 263 CLASSIFIED
- GRILLE/DIFFUSER MOUNT OR DUCTED
- SIDE INLET
- STEEL PLENUM

Models:

0756 Grille/Diffuser Mount

0756D Ducted

Models 0756 and 0756D Ceiling Radiation Damper Assemblies with Steel Plenums have been designed and tested for simple installation in specific wood truss ceiling assemblies. They are UL Classified for use in specific 1 hour rated UL floor/ceiling and roof/ceiling designs. Model 0756 is designed to accommodate a steel grille/diffuser in applications where the plenum terminates at the ceiling. Model 0756D is designed for installation in supply ductwork take-off from an AHU where it penetrates the ceiling and provides a multiple-outlet plenum to feed 0756 grille/diffuser assemblies. The 0756D damper sleeve extends below the ceiling, suitable for ducted connection. Both models feature side connection collars to accept UL Classified Class 0 or 1 flex duct.

QUALIFICATIONS:

- **UL 263 CLASSIFIED CEILING DAMPER. Category CABS. (File # R9660).**
- **1 hour rated for use in UL floor/ceiling design numbers L550/L562/L574/L579/L585/M501/M503 and roof/ceiling design numbers P531/P538/P545/P547/P552. (Other proprietary UL design numbers may be similar. Local approval by AHJ is required to use a Nailor design when not specified).**
- **Meets NFPA 90A requirements.**

MODEL: 0756

STANDARD CONSTRUCTION:

1.	**Fusible Link:**	UL Listed, 212°F (100°C), standard.
2.	**Blades:**	22 ga. (0.85) roll-formed galvanized steel.
3.	**Blade Insulation:**	Non-asbestos UL Classified.
4.	**Damper Frame:**	22 ga. (0.85) galvanized steel.
5.	**Steel Plenum/ Sub-Frame:**	26 ga. (0.55) min. with round connection collar.
6.	**Duct:**	UL Classified Class 0 or 1 flexible air duct connection by others.
7.	**Flange:**	5/8" (16) plaster flange.
8.	**Steel Grille/ Register/Diffuser:**	By Nailor or others. Bottom of damper sub-frame is flush with ceiling. Standard depth for grille clearance is 2 1/2" (64).

Model 0756 Sizes (W x H):

Minimum	Maximum
6" x 4" (152 x 102)	16" x 12" (406 x 305)

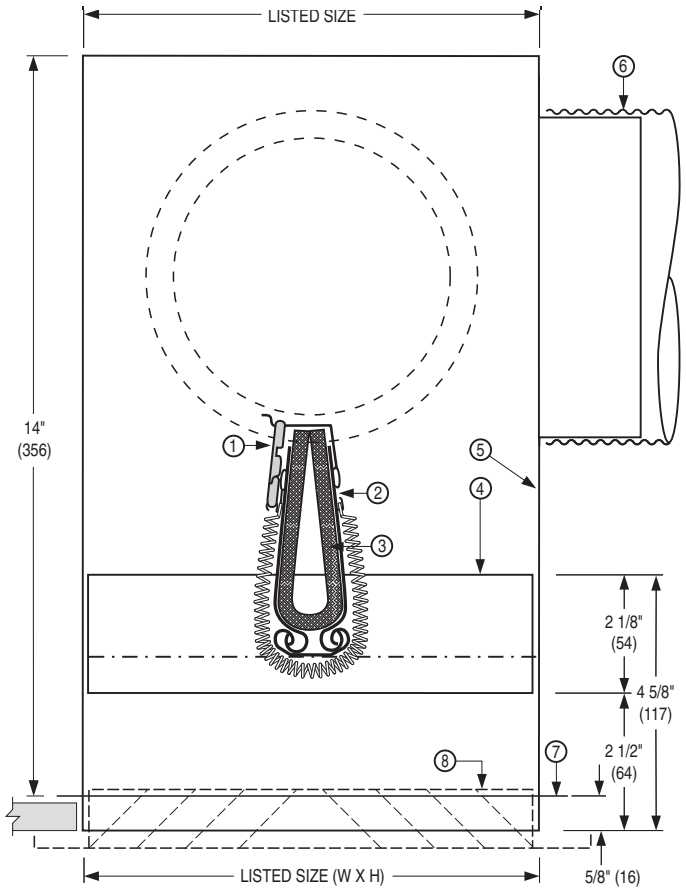
W x H = Nominal Grille/ Register Size

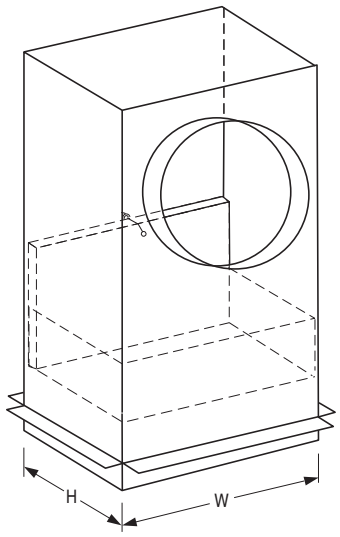
Available Duct Connection Size: 4" through 10" (102 – 254) dia. Building code and UL Classification require damper installation in accordance with manufacturers instructions.

COMMON OPTIONS:

- 165°F (74°C) UL Listed fusible link.
- Damper Style: 0716 Butterfly (Two Blades) Damper standard or 0714 Single Blade Damper.
- Installation Support Angles. 26" (660) long:
  ISA 2 @ 3/4" x 3/4" x 16 ga. (19 x 19 x 1.6).
  ISB 2 @ 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85).

Model 0756





Model 0756 Note:
0716 style damper shown above is standard. 0714 Single Blade is also available (left), which places damper out of the airstream.

MODEL: 0756D DUCTED

STANDARD CONSTRUCTION:

1. **Fusible Link:** UL Listed, 212°F (100°C), standard.
2. **Blades:** 22 ga. (0.85) roll-formed galvanized steel.
3. **Blade Insulation:** Non-asbestos UL Classified.
4. **Damper Frame:** 22 ga. (0.85) galvanized steel.
5. **Steel Plenum/ Sub-Frame:** 26 ga. (0.55) min. with round connection collar(s). Maximum of 3.
6. **Duct:** UL Classified Class 0 or 1 flexible air duct connection by others.
7. **Flange:** Plaster flange.
8. **Damper Mounting:** Damper sleeve is extended below ceiling for ducted connection. Damper is mounted in sub-frame to be flush with ceiling when installed.

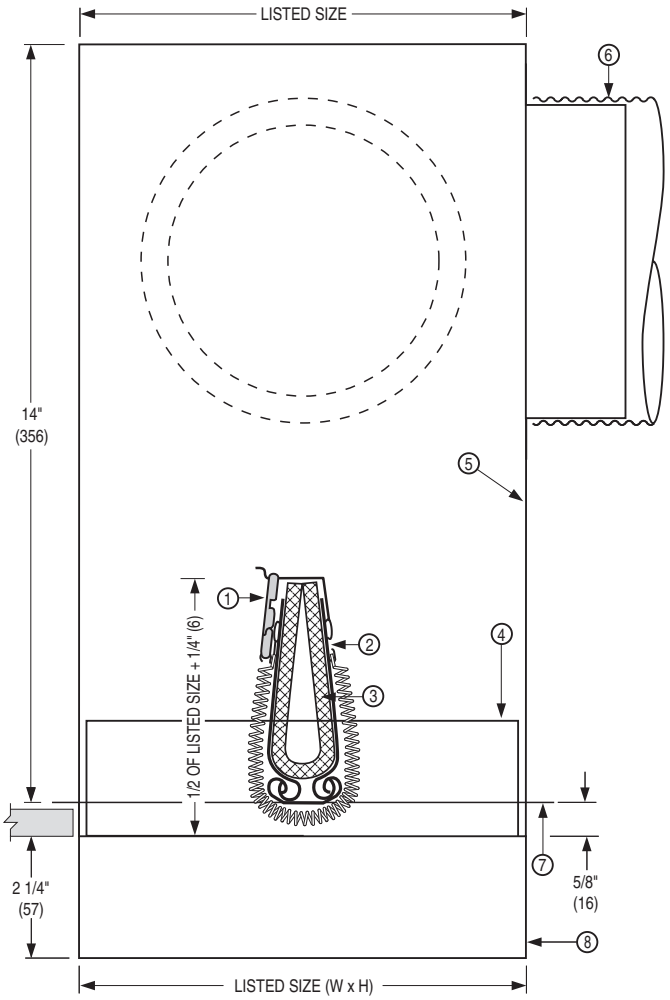
Model 0756D Sizes (Duct W x H):

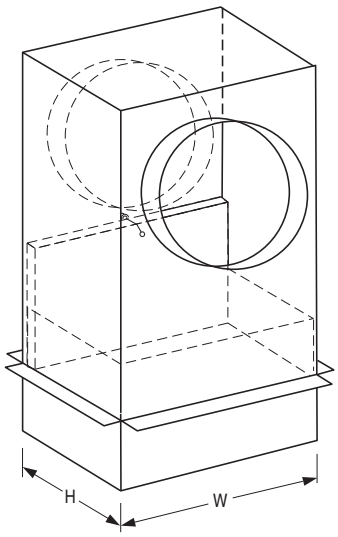
Minimum	Maximum
6" x 4" (152 x 102)	18" x 18" (457 x 457)

Available Duct Connection Size: 4" through 10" (102 – 254) dia. Maximum quantity is three.

COMMON OPTIONS:

- 165°F (74°C) UL Listed fusible link.
- Damper Style: 0716 Butterfly (Two Blades) Damper standard, 0714 Single Blade Damper or 0720 Low Profile Curtain Damper.
- Installation Support Angles. 26" (660) long:
  ISA 2 @ 3/4" x 3/4" x 16 ga. (19 x 19 x 1.6).
  ISB 2 @ 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85).





Model 0756D Note:
0716 style damper shown above is standard. 0714 Single Blade (left), which places damper out of the airstream or 0720 Low Profile Curtain Damper are also available.

HOW TO SPECIFY

MODELS: 0756 AND 0756D

WOOD TRUSS CEILING DAMPERS, GRILLE DIFFUSER MOUNT OR DUCTED ASSEMBLY WITH STEEL PLENUMS

SUGGESTED SPECIFICATION:

Provide and install, as shown on plans and/or schedules, ceiling fire dampers as manufactured by Nailor Industries, Inc., qualified for use in specific wood truss ceiling assemblies with 1 hour fire rating which meet the following criteria: Ceiling Dampers shall be tested in accordance with UL 263 Standard for Fire Tests of Building Construction and Materials, and shall bear a UL label verifying the same. Ceiling Dampers tested and labelled in accordance with UL 555C Standard for Ceiling Dampers are not approved or acceptable.

Frame and blade shall be constructed of 22 ga. (0.85) galvanized steel. Blade insulation shall be non-asbestos, UL Classified. Each ceiling damper shall be held open with a (**specifier to select**) 212°F (100°C) **or** 165°F (74°C) UL Listed fusible link. Ceiling damper assembly shall be provided from the factory with a steel plenum/sub-frame with round connection collar(s) of size indicated on drawings. Ceiling dampers shall ship with and be installed in accordance with manufacturer's UL approved installation instructions. Information submitted for approval shall include same UL installation instructions.

For applications where ductwork terminates at the ceiling, standard of acceptance shall be Nailor Industries Model 0756.

For applications where ductwork is required to continue down past ceiling, plenum (damper sleeve) shall extend down below ceiling suitable for ducted connection. Standard of acceptance shall be Nailor Industries Model 0756D.

WOOD TRUSS CEILING DAMPER ASSEMBLY

Nailor

- UL 263 CLASSIFIED
- STEEL OR FIBERGLASS PLENUM BY OTHERS

Models:

0757 Grille/Diffuser Mount

0757D Ducted

Models 0757 & 0757D

Model 0757 Ceiling Radiation Dampers are designed to function as a heat barrier in air handling openings penetrating fire resistive membrane ceilings. Model Series 0757 has been especially designed and tested to provide protection and simple installation in specific UL design wood truss ceiling assemblies. Model 0757 rectangular ceiling damper requires a field fabricated steel or fiberglass plenum (boot/register box) by others, that accommodates a steel grille, register or diffuser. They are UL Classified for use in specific 1 hour rated UL floor/ceiling and roof/ceiling design numbers.

Available in grille/diffuser mount style Model 0757, or ducted style Model 0757D, both configurations are designed for use with a field fabricated steel or fiberglass plenum (boot/register box) by others, that accommodates a steel grille, register or diffuser. Model 0757 is designed to accommodate a steel grille/diffuser in applications where the plenum terminates at the ceiling. Model 0757D is designed for installation in the supply (or return) ductwork take-off from an AHU where it penetrates the ceiling and provides a single or multiple-outlet plenum to feed Model 0757 supply ceiling damper grille/diffuser assemblies and has a damper sleeve that extends below the ceiling, suitable for ducted connection. May also be used as a return. Model 0757D rectangular ceiling damper requires a field fabricated steel or fiberglass plenum with up to three outlet collars by others.

QUALIFICATIONS:

- **UL 263 CLASSIFIED CEILING RADIATION DAMPER. Category CABS. (File # R9660).**
- **1 hour rated for use in UL floor/ceiling design numbers L550/L562/L574/L579/L585/M501/M503 and roof/ceiling design numbers P531/P538/P545/P547/P552. (Other proprietary UL design numbers may be similar. Local approval by AHJ is required to use a Nailor design when not specified).**
- **Meets NFPA 90A requirements.**

MODEL: 0757 GRILLE/DIFFUSER MOUNT

STANDARD CONSTRUCTION:

1. UL Listed Fusible Link, 212°F (100°C) is standard.
2. Blades: 22 ga. (0.85) G60 roll-formed galvanized steel.
3. Blade Insulation: Non-asbestos UL Classified.
4. Damper Frame: 24 ga. (0.70) G60 galvanized steel.
5. Plaster flange 7/8" (22).

COMMON OPTIONS:

- 165°F (74°C) UL Listed fusible link.
- Damper Style: 0716 Butterfly (Two Blades) Damper standard or 0714 Single Blade Damper.
- Installation Support Angles. 26" (660) long:
  ISA 2 @ 3/4" x 3/4" x 16 ga. (19 x 19 x 1.6).
  ISB 2 @ 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85).

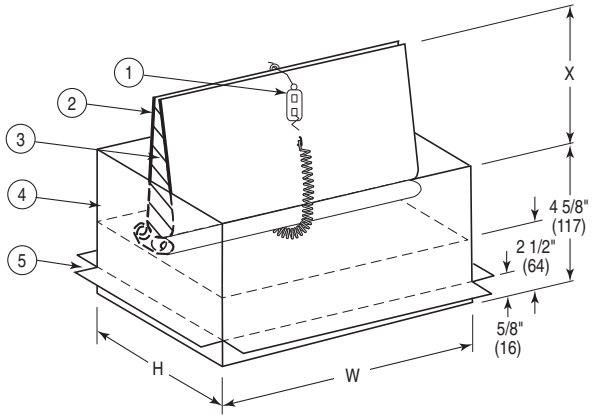
MODEL: 0757D DUCTED

STANDARD CONSTRUCTION:

1. UL Listed Fusible Link, 212°F (100°C) is standard.
2. Blades: 22 ga. (0.85) G60 roll-formed galvanized steel.
3. Blade Insulation: Non-asbestos UL Classified.
4. Damper Frame: 24 ga. (0.70) G60 galvanized steel.
5. Plaster flange 7/8" (22).

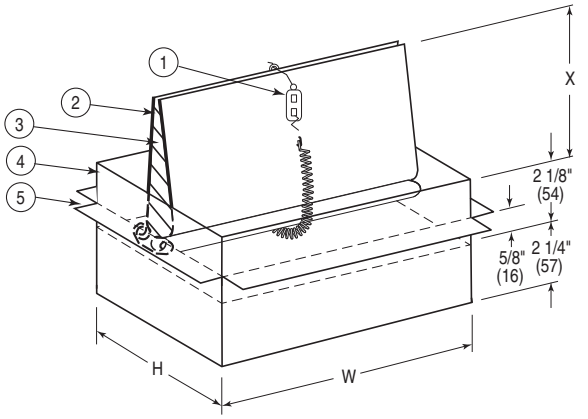
COMMON OPTIONS:

- 165°F (74°C) UL Listed fusible link.
- Damper Style: 0716 Butterfly (Two Blades) Damper standard, 0714 Single Blade Damper or 0720 Low Profile Curtain Damper.
- Installation Support Angles. 26" (660) long:
  ISA 2 @ 3/4" x 3/4" x 16 ga. (19 x 19 x 1.6).
  ISB 2 @ 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85).



NOTE:
X = 1/2 THE LISTED HEIGHT – 1 7/8" (48)

Model 0757 Note:
0716 style damper shown. 0714 Single Blade, which places the damper out of the airstream, is also available.

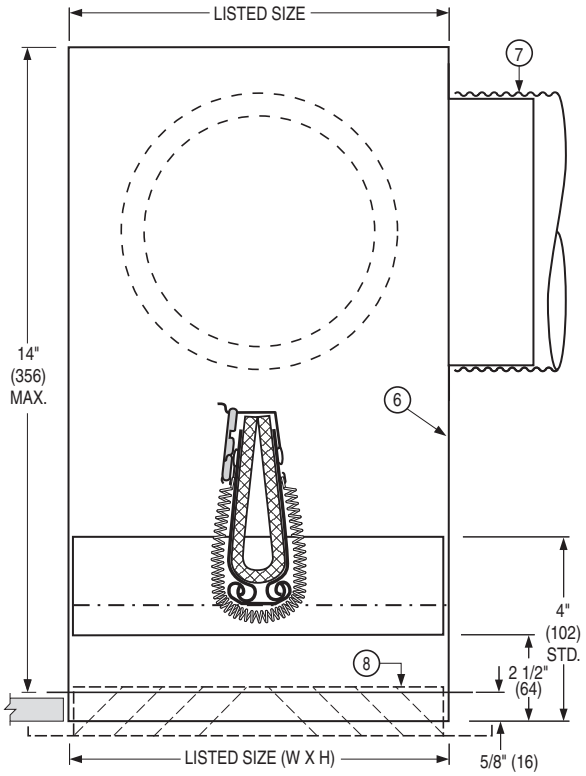


NOTE:
X = 1/2 THE LISTED HEIGHT – 1 7/8" (48)

Model 0757D Note:
0716 Butterfly Type damper shown is standard. 0714 Single Blade or 0720 Low Profile Curtain Damper also available.

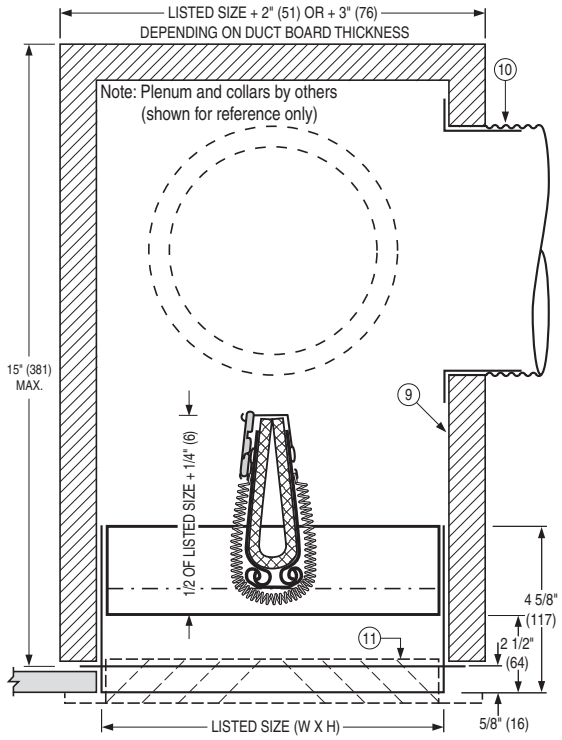
DIMENSIONAL DETAILS:
MODEL: 0757 GRILLE/DIFFUSER MOUNT

Steel Plenum (by OTHERS) (Type A shown)



Plenum Construction	Plenum Type	Description/ Installation	Min. Damper Size	Max. Damper Size	Max. No. of Collars
Steel	A	90° Side Inlet	6 x 4 (152 x 102)	16 x 12 (406 x 305)	5
	C	90° Side Inlet, Insulated	8 x 4 (203 x 102)	12 x 12 (305 x 305)	1
	D	90° Side Inlet, Tapered	8 x 4 (203 x 102)	14 x 8 (356 x 203)	1
	E	Tapered, Top Inlet	8 x 4 (203 x 102)	12 x 12 (305 x 305)	1

Fiberglass Plenum (by OTHERS)



Plenum Construction	Plenum Type	Description/ Installation	Min. Damper Size	Max. Damper Size	Max. No. of Collars
Fiberglass	A	90° Side Inlet	6 x 4 (152 x 102)	21 x 18 (533 x 457)	5

STEEL PLENUM

CONSTRUCTION DETAILS:

6. Steel plenum/sub-frame:

   Uninsulated: 26 ga. (0.55) min. galv. steel with round connection collar.

   Insulated: 28 ga. (0.47) min. galv. steel

   Insulation: Semi rigid Type R-6, 1 1/2" (28) or Type R-8, 2" (51) fiberglass duct liner, min. density 1.5 pcf.

7. UL Classified Class 0 or I Flexible Air Duct connection by others.
8. Steel grille/register/diffuser, 26 ga. (0.55) min., (by Nailor or others). Bottom of damper sub-frame is flush with ceiling. Standard depth for grille clearance is 2 1/2" (64).

FIBERGLASS PLENUM

CONSTRUCTION DETAILS:

9. Fiberglass plenum/sub-frame:

   Duct Board: 1" - 1 1/2" (25 - 38), rigid (R4 - R6)

10. Cutting and Installation of collar for UL Classified Class 0 or I Flexible Air Duct connection by others.
11. Steel grille/register/diffuser, 26 ga. (0.55) min., (by Nailor or others). Bottom of damper sub-frame is flush with ceiling.

    Standard depth for grille clearance is 2 1/2" (64).

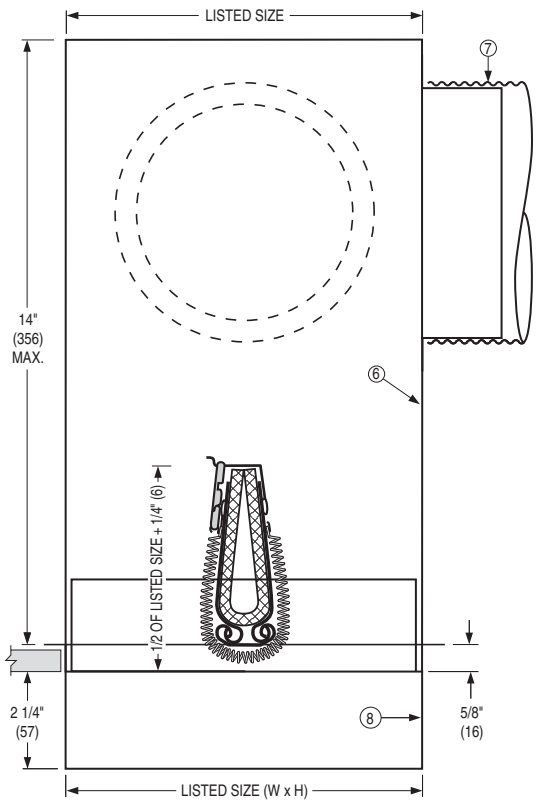
NOTES:

1. See minimum/maximum damper size restriction by Plenum Construction/Plenum Type, above.
2. Refer to document IOM-CRD0757INST for Supplementary Installation Instructions for Field Fabrication of Steel or Fiberglass Plenums (by others).

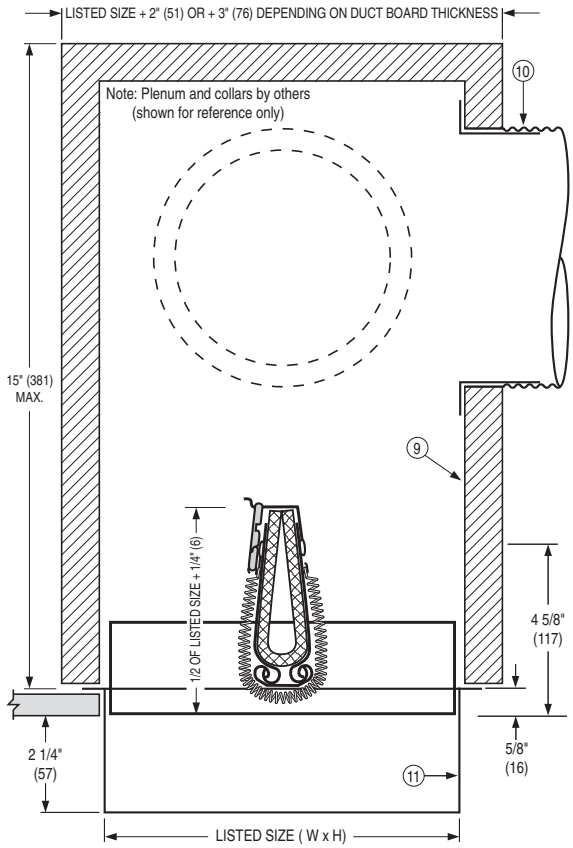
W x H = Nominal Grille/Register Size

DIMENSIONAL DETAILS:
MODEL: 0757D DUCTED

Steel Plenum (by OTHERS) (Type A shown)



Fiberglass Plenum (by OTHERS)



Plenum Construction	Plenum Type	Description/ Installation	Min. Damper Size	Max. Damper Size	Max. Number of Collars
Steel	B	Ducted, 90° Side Inlet	6 x 4 (152 x 102)	18 x 18 (457 x 457)	3

Plenum Construction	Plenum Type	Description/ Installation	Min. Damper Size	Max. Damper Size	Max. Number of Collars
Fiberglass	B	Ducted, 90° Side Inlet	6 x 4 (152 x 102)	21 x 18 (533 x 457)	3

STEEL PLENUM

CONSTRUCTION DETAILS:

6. Steel plenum/sub-frame:

   Uninsulated: 26 ga. (0.55) min. galv. steel with round connection collar.

7. UL Classified Class 0 or I Flexible Air Duct connection by others.
8. Damper sleeve is extended below ceiling for ducted connection.

FIBERGLASS PLENUM

CONSTRUCTION DETAILS:

9. Fiberglass plenum/sub-frame:

   Duct Board: 1" - 1 1/2" (25 - 38), rigid (R4 - R6)

10. Cutting and Installation of collar for UL Classified Class 0 or I Flexible Air Duct connection by others.
11. Damper sleeve is extended below ceiling for ducted connection.

NOTES:

1. See minimum/maximum damper size restriction by Plenum Construction/Plenum Type, above.
2. Refer to document IOM-CRD0757INST for Supplementary Installation Instructions for Field Fabrication of Steel or Fiberglass Plenums (by others).

W x H = Nominal Grille/Register Size

- UL 263 CLASSIFIED
- INSULATED STEEL PLENUM BY OTHERS
- GRILLE/DIFFUSER MOUNT

Models:

0763 Grille/Diffuser Mount

Model 0763

Model 0763 Ceiling Radiation Dampers have been designed for use in a field supplied insulated steel plenum (by others) and tested for simple installation in specific wood truss ceiling assemblies. They are UL Classified for use in specific 1 hour rated UL floor/ceiling and roof/ceiling designs. The field supplied plenum (by others) is designed to accommodate a steel grille/diffuser for applications where the plenum terminates at the ceiling.

QUALIFICATIONS:

- **UL 263 CLASSIFIED CEILING RADIATION DAMPER. Category CABS. (File # R9660).**
- **1 hour rated for use in UL floor/ceiling design numbers L550/L574/L579/L585/M503 and roof/ceiling design numbers P531/P545/P547/P552. (Other proprietary UL design numbers may be similar. Local approval by AHJ is required to use a Nailor design when not specified).**
- **Meets NFPA 90A requirements.**

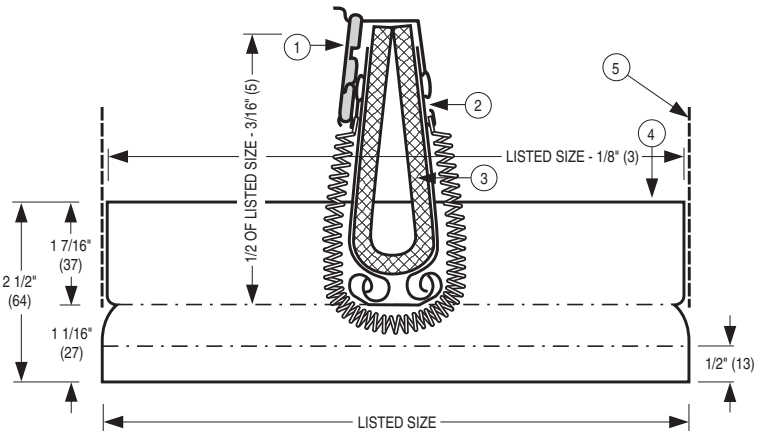
MODEL: 0763 GRILLE/DIFFUSER MOUNT

STANDARD CONSTRUCTION:

1. UL Listed Fusible Link, 212°F (100°C) is standard.
2. Blades: 22 ga. (0.85) G60 roll-formed galvanized steel.
3. Blade Insulation: Non-asbestos UL Classified.
4. Damper Frame: 22 ga. (0.85) G60 galvanized steel.
5. Plenum Collar (by others).

COMMON OPTIONS:

- 165 165°F (74°C) UL Listed fusible link.
- Factory Supplied Steel Plenum (by Nailor):
  Type F 45° Inlet, Insulated.
  Type G Top Inlet, Insulated.
- Installation Support Angles. 26" (660) long:
  ISA 2 @ 3/4" x 3/4" x 16 ga. (19 x 19 x 1.6).
  ISB 2 @ 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85).



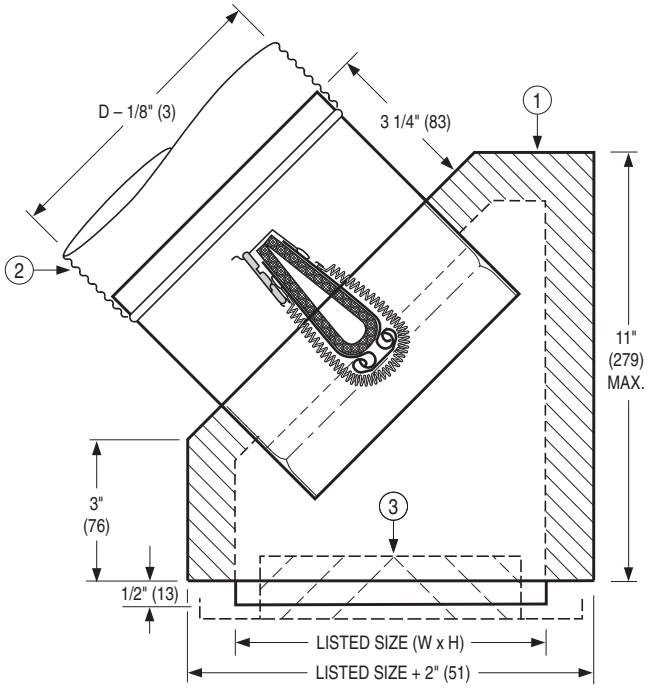
AVAILABLE SIZES:

4", 5", 6", 7", 8" (102, 127, 152, 178, 203) diameter.

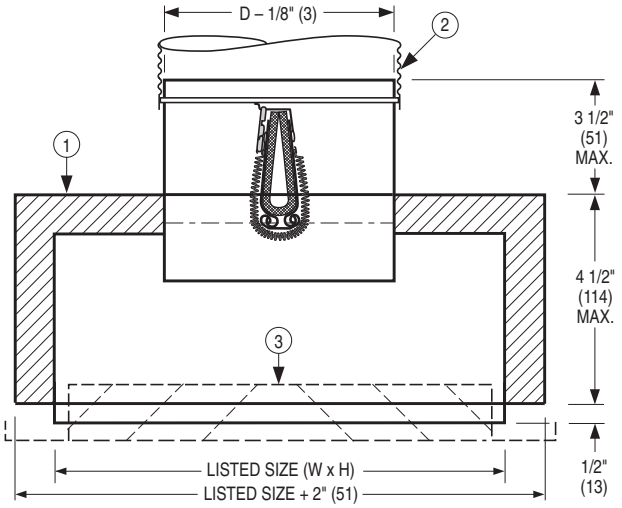
DIMENSIONAL DETAILS:

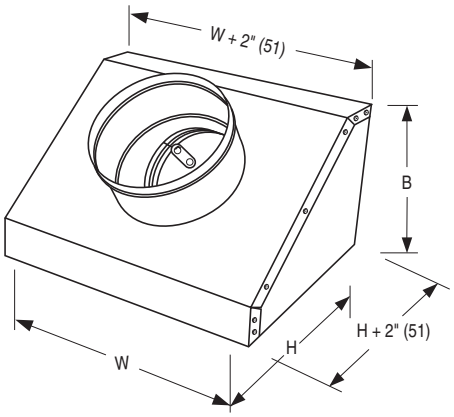
MODEL: 0763

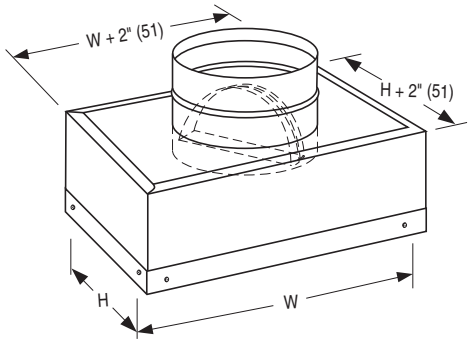
45° Inlet, Insulated Type F Steel Plenum (by OTHERS)



Top Inlet, Insulated Type G Steel Plenum (by OTHERS)







Plenum Construction	Plenum Type	Description/ Installation	Minimum Size	Min. Damper Size	Maximum Size	Maximum Damper Size	Max. Number of Collars
Steel, Insulated	F	45° Inlet	8 x 4 (203 x 102)	4 (102)	14 x 6 (356 x 152)	8 (152) Dia.	1
	G	Top Inlet	8 x 4 (203 x 102)	4 (102)	14 x 8 (356 x 203)	8 (152) Dia.	1

PLENUM CONSTRUCTION DETAILS:

Steel plenum/sub-frame:

1. 28 ga. (0.47) minimum galvanized steel, Insulation: Semi rigid Type R-6, 1 1/2" (28) or Type R-8, 2" (51) fiberglass duct liner, minimum density 1.5 pcf.
2. UL Classified Class 0 or I Flexible Air Duct connection by others.
3. Steel grille/register/diffuser, 26 ga. (0.55) minimum). Bottom of damper sub-frame is flush with ceiling. Standard depth for grille clearance is 2" (51).

NOTES:

1. See minimum/maximum damper size restriction by Plenum Construction/Plenum Type, above.
2. Refer to document IOM-CRD0763INST for Supplementary Installation Instructions for Field Fabrication of Steel Plenums (by others).

HOW TO SPECIFY

MODELS: 0757 AND 0757D

WOOD TRUSS CEILING DAMPERS, GRILLE/DIFFUSER MOUNT OR DUCTED WITH STEEL OR FIBERGLASS PLENUM BY OTHERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, ceiling dampers as manufactured by Nailor Industries, Inc., qualified for use in specific wood truss ceiling assemblies with 1 hour fire rating which meet the following criteria: Ceiling Dampers shall be tested in accordance with UL 263 Standard for Fire Tests of Building Construction and Materials, and shall bear a UL label verifying the same. Ceiling Dampers tested and labelled in accordance with UL 555C Standard for Ceiling Dampers are not approved or acceptable.
Frame and blade shall be constructed of 22 ga. (0.85) galvanized steel. Blade insulation shall be non-asbestos, UL Classified. Each ceiling damper shall be held open with a (**specifier to select**) 212°F (100°C) **or** 165°F (74°C) UL Listed fusible link. Ceiling damper assembly shall be provided from the factory with a steel sub-frame of minimum 22 ga. (0.85) steel and of length to suit application. Each ceiling damper assembly shall be installed with a (**specifier to select**) UL 181 Class 1 Classified fiberglass plenum (by others) **or** steel plenum (by others). Round inlets, of size(s) shown on plans, shall be cut by contractor and collars (by others) installed by contractor. Ceiling dampers shall ship with and be installed in accordance with manufacturer's UL approved installation instructions. Information submitted for approval shall include same UL installation instructions.
(**Specifier to select**) For applications where ductwork terminates at the ceiling, standard of acceptance shall be Nailor Industries Model 0757.
(**Specifier to select**) For applications where ductwork is required to continue down past ceiling, standard of acceptance shall be Nailor Industries Model 0757D.

MODEL: 0763

WOOD TRUSS CEILING DAMPER, ROUND, GRILLE/DIFFUSER MOUNT WITH INSULATED STEEL PLENUM BY OTHERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, ceiling dampers as manufactured by Nailor Industries, Inc., qualified for use in specific wood truss ceiling assemblies with 1 hour fire rating which meet the following criteria: Ceiling Dampers shall be tested in accordance with UL 263 Standard for Fire Tests of Building Construction and Materials, and shall bear a UL label verifying the same. Ceiling Dampers tested and labelled in accordance with UL 555C Standard for Ceiling Dampers are not approved or acceptable.
Frame and blade shall be constructed of 22 ga. (0.85) galvanized steel. Blade insulation shall be non-asbestos, UL Classified. Each ceiling damper shall be held open with a (**specifier to select**) 212°F (100°C) **or** 165°F (74°C) UL Listed fusible link. Each ceiling damper assembly shall be installed with an insulated steel register box (by others). Round inlets, of size(s) shown on plans, shall be cut by contractor and collars (by others) installed by contractor. Ceiling dampers shall ship with and be installed in accordance with manufacturer's UL approved installation instructions. Information submitted for approval shall include same UL installation instructions. Standard of acceptance shall be Nailor Industries Model 0763.

HOW TO ORDER

MODELS: 0756 & 0756D (STEEL PLENUM BY NAILOR)
WOOD TRUSS CEILING RADIATION DAMPERS • UL 263

EXAMPLE: 0756 - 12" x 6" - 06 - 212

1. **Models**
   - 0756 90°, Side Inlet, Steel Plenum, Grille Mount
   - 0756D 90°, Side Outlet(s), Steel Plenum, Ducted
2. **Ceiling Opening Size**
   Width x Height (inches [mm's])

3a. **Round Connection Collar**
- 04 4" (102) Round
- 05 5" (127) Round
- 06 6" (152) Round
- 07 7" (178) Round
- 08 8" (203) Round
- 09 9" (229) Round
- 10 10" (254) Round

3b. **Number of Collars**
(Model 0756D only)
- 1 1 Collar
- 2 2 Collars
- 3 3 Collars

4. **Fusible Link Temperature**
- 212 212°F (100°C) (default)
- 165 165°F (74°C)

5. **Support Angles**
ISA 2 @ 26" x 3/4" x 3/4" x 16 ga.
(660 x 19 x 19 x 1.6)
ISB 2 @ 26" x 1 1/2" x 1 1/2" x 22 ga.
(660 x 38 x 38 x 0.85)

6. **Damper Styles**
- 0716 Butterfly Type (default)
- 0714 Single Blade
- 0720 Low Profile Curtain (0756D only)

Available Sizes:

Model	Minimum	Maximum
0756	6" x 4" (152 x 102)	16" x 12" (406)
0756D	6" x 4" (152 x 102)	18" x 18" (457 x 457)

NOTE

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

MODELS: 0757, 0757D & 0763 (STEEL OR FIBERGLASS PLENUM BY OTHERS)
WOOD TRUSS CEILING RADIATION DAMPERS • UL 263

EXAMPLE: 0757 - 12" x 6" - STL - D - 212

1. **Models**
   - 0757 Grille Mount, (Steel or Fiberglass Plenum by others)
   - 0757D Ducted, (Steel or Fiberglass Plenum by others)
   - 0763 Round, Grille Mount, (Steel Plenum by others)
2. **Ceiling Opening Size**
   Width x Height or Diameter (Model 0763) (inches [mm's])

3a. **Plenum Construction**
(Models 0757, 0757D only)
- FBG Fiberglass (by others)
- STL Steel (by others)

3b. **Plenum Type**
Model 0757:
- A 90° Side Inlet (by others)
- C 90° Side Inlet Insulated (by others)
- D 90° Side Inlet Tapered (by others)
- E Tapered Top Inlet (by others)

Model 0757D:
- B 90° Side Outlet(s) (by others)

Model 0763:
- F 45° Inlet Insulated (by others) (8 x 4 to 14 x 6 Grille [203 x 102 to 356 x 152 Grille])
- G Top Inlet Insulated (by others) (8 x 4 to 14 x 8 Grille [203 x 102 to 356 x 203 Grille])

4. **Fusible Link Temperature**
- 212 212°F (100°C) (default)
- 165 165°F (74°C)

5. **Support Angles** (N/A Model 0763)
ISA 2 @ 26" x 3/4" x 3/4" x 16 ga.
(660 x 19 x 19 x 1.6)
ISB 2 @ 26" x 1 1/2" x 1 1/2" x 22 ga.
(660 x 38 x 38 x 0.85)

6. **Damper Styles** (N/A Model 0763)
- 0716 Butterfly Type (default)
- 0714 Single Blade (N/A 0757 Plenum D)
- 0720 Low Profile Curtain (0757D only)

Available Sizes:

Model	Minimum	Maximum
0763	4" (102) Dia.	8" (711) Dia.

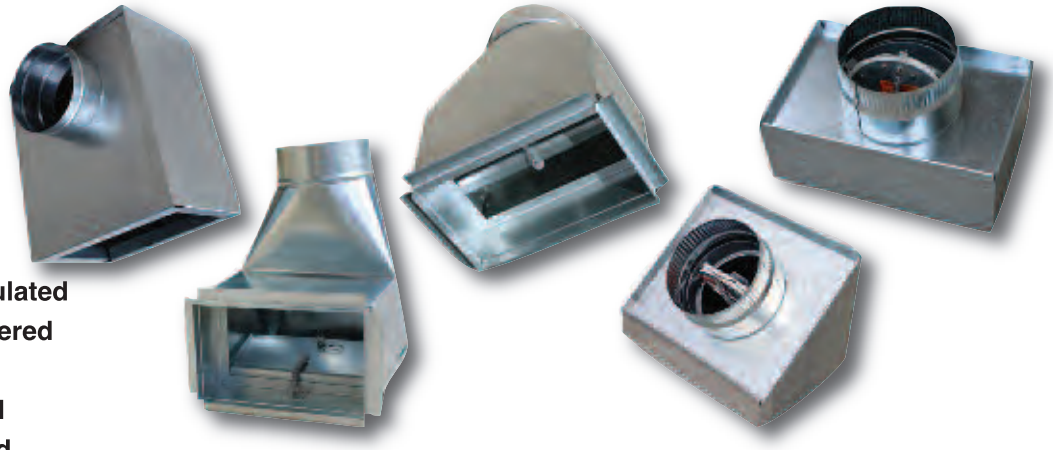
NOTE

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

Available Sizes:

Model	Plenum Construction	Plenum Type	Description	Ceiling Opening/Damper	
				Minimum	Maximum
0757	Steel	A	90° Side Inlet	6" x 4" (152 x 102)	16" x 12" (406 x 305)
		C	90° Side Inlet Insulated	8" x 4" (203 x 102)	12" x 12" (305 x 305)
		D	90° Side Inlet Tapered	8" x 4" (203 x 102)	14" x 8" (356 x 203)
		E	Top Inlet Tapered	8" x 4" (203 x 102)	12" x 12" (305 x 305)
	Fiberglass	A	90° Side Inlet	6" x 4" (152 x 102)	21" x 18" (533 x 457)
0757D	Steel	B	90° Side Inlet	6" x 4" (152 x 102)	18" x 18" (457 x 457)
	Fiberglass	B	90° Side Inlet	6" x 4" (152 x 102)	21" x 18" (533 x 457)

- UL 263 CLASSIFIED
- FACTORY PLENUM/ REGISTER BOX
- GRILLE/DIFFUSER MOUNT



Models 0757-CB, 0757-DB, 0757-EB, 0763-FB and 0763-GB with Factory Plenums (L to R)

Models:

0757-CB 90° Side Inlet, Insulated
0757-DB 90° Side Inlet, Tapered
0757-EB Top Inlet, Tapered
0763-FB 45° Inlet, Insulated
0763-GB Top Inlet, Insulated

Ceiling dampers are designed to function as a heat barrier in air handling openings penetrating fire resistance membrane ceilings. Model 0757, 0763 with factory plenum/register boxes with integral ceiling dampers have been specially designed and tested to provide protection and simple installation in specific UL design wood truss ceiling assemblies. The 0757 design features a dual blade damper design. A single blade damper option is out of the airstream to reduce pressure drop and noise generation, therefore maximizing performance. The 0763 design features a rectangular or round two blade damper. All models are designed to accommodate standard size common residential registers.

QUALIFICATIONS:

- **UL 263 CLASSIFIED CEILING RADIATION DAMPER. Category CABS. (File # R9660).**
- **1 hour rated for use in UL floor/ceiling design numbers L550/L562/L574/L579/L585/M501/M503 and roof/ ceiling design numbers P531/P538/P545/P547/P552. (Other proprietary UL design numbers may be similar. Local approval by AHJ is required to use a Nailor design when not specified).**
- **Meets NFPA 90A requirements.**

MODEL: 0757-CB SIDE INLET, INSULATED PLENUM

STANDARD CONSTRUCTION:

1. **Fusible Link:** UL Listed, 212°F (100°C), standard.
2. **Blades:** 22 ga. (0.85) roll-formed galv. steel.
3. **Blade Insulation:** Non-asbestos UL Classified.
4. **Damper Frame:** 22 ga. (0.85) galvanized steel.
5. **Internal Insulation:** 1 1/2" (38) R-6.3 value.
6. **Plenum:** Steel plenum: 28 ga. (0.47) min. with round connection collar.
7. **Duct:** UL Classified Class 0 or 1 flexible air duct connection by others.
8. **Flange:** Plaster flange.
9. **Steel Grille/ Register:** By Nailor or others. Standard depth for grille clearance is 2 1/2" (64).

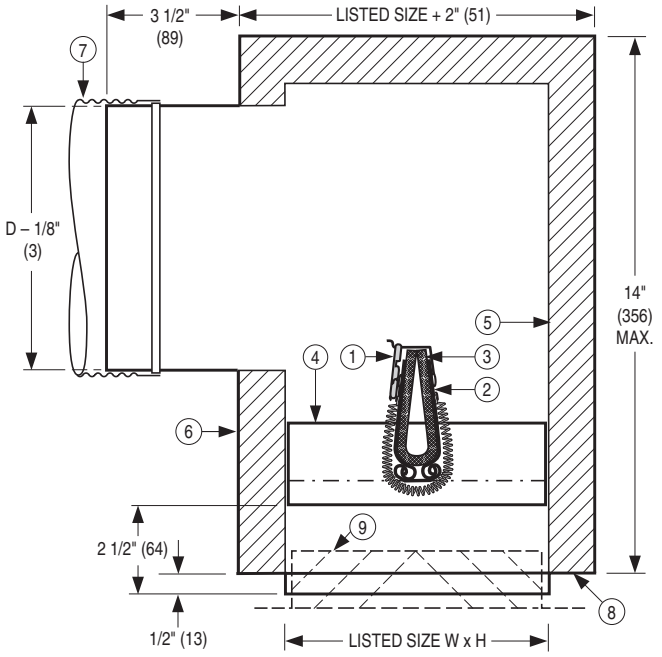
COMMON OPTIONS:

- R8 2" (51) thick R-8 value insulation.
- 165°F (74°C) UL Listed fusible link.
- Damper Style: 0716 Butterfly (Two Blades) Damper standard or 0714 Single Blade Damper.
- Installation Support Angles. 26" (660) long:
  ISA 2 @ 3/4" x 3/4" x 16 ga. (19 x 19 x 1.6).
  ISB 2 @ 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85).

Model 0757-CB Dimensional Data (W x H):

Available Sizes	
W x H	**Nominal Duct Size D**
8" x 4" (203 x 102)	4", 5" (102, 127) dia.
10" x 4" (254 x 102)	4", 5", 6" (102, 127, 152) dia.
12" x 4" (305 x 102)	6", 7", 8" (152, 178, 203) dia.
8" x 6" (203 x 152)	6" (152) dia.
10" x 6" (254 x 152)	5", 6", 7" (127, 152, 178) dia.
12" x 6" (305 x 152)	6", 7", 8", 9" (152, 178, 203, 229) dia.
8" x 8" (203 x 203)	5", 6" (127, 152) dia.
10" x 8" (254 x 203)	7", 8" (178, 203) dia.
12" x 8" (305 x 203)	7", 8" (178, 203) dia.
10" x 10" (254 x 254)	7", 8" (178, 203) dia.
12" x 12" (305 x 305)	8" (203) dia.
	9", 10" (229, 254) dia.

W x H = Nominal Grille/Register Size



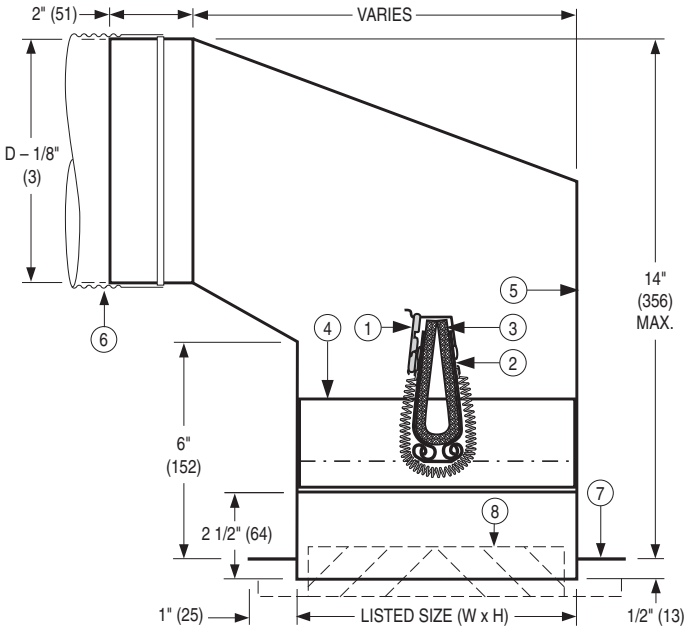
MODEL: 0757-DB 90° SIDE INLET, TAPERED PLENUM

STANDARD CONSTRUCTION:

1. **Fusible Link:** UL Listed, 212°F (100°C), standard.
2. **Blades:** 22 ga. (0.85) roll-formed galv. steel.
3. **Blade Insulation:** Non-asbestos UL Classified.
4. **Damper Frame:** 22 ga. (0.85) galvanized steel.
5. **Plenum:** Steel plenum: 26 ga. (0.55) min. with round connection collar.
6. **Duct:** UL Classified Class 0 or 1 flexible air duct connection by others.
7. **Flange:** Plaster flange.
8. **Steel Grille/ Register:** By Nailor or others. Standard depth for grille clearance is 2 1/2" (64).

COMMON OPTIONS:

- 165°F (74°C) UL Listed fusible link.
- Damper Style: 0716 Butterfly (Two Blades) Damper standard or 0714 Single Blade Damper.
- Installation Support Angles. 26" (660) long:
  ISA 2 @ 3/4" x 3/4" x 16 ga. (19 x 19 x 1.6).
  ISB 2 @ 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85).



Model 0757-DB Sizes/Dimensional Data (W x H):

Available Sizes	
W x H	**Nominal Duct Size D**
8" x 4" (203 x 102)	4", 5" (102, 127) dia.
10" x 4" (254 x 102)	4", 5", 6" (102, 127, 152) dia.
12" x 4" (305 x 102)	6", 7", 8" (152, 178, 203) dia.
14" x 4" (356 x 102)	7" (178) dia.
6" x 6" (152 x 152)	4", 5" (102, 127) dia.
8" x 6" (203 x 152)	6" (152) dia.
10" x 6" (254 x 152)	5", 6", 7" (127, 152, 178) dia.
12" x 6" (305 x 152)	6", 7", 8", 9" (152, 178, 203, 229) dia.
14" x 6" (356 x 152)	6", 7", 8", 9", 10" (152, 178, 203, 229, 254) dia.
8" x 8" (203 x 203)	5", 6" (127, 152) dia.
10" x 8" (254 x 203)	7", 8" (178, 203) dia.
12" x 8" (305 x 203)	7", 8" (178, 203) dia.
14" x 8" (356 x 203)	6", 7", 8", 9", 10" (152, 178, 203, 229, 254) dia.

W x H = Nominal Grille/Register Size

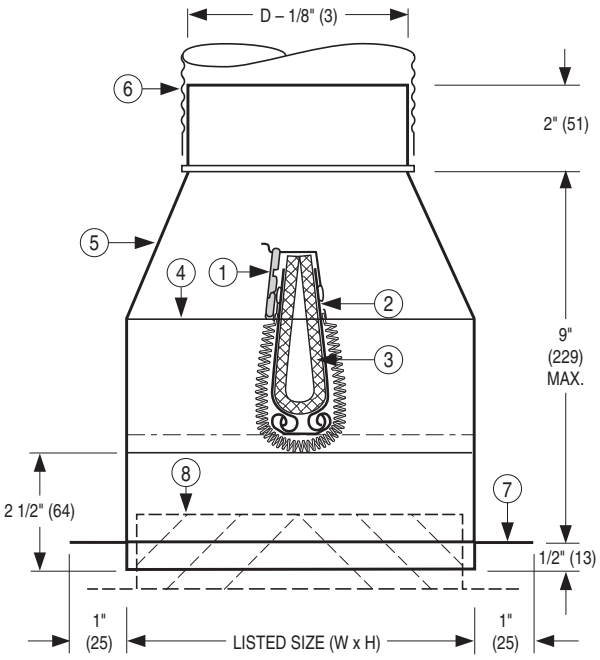
MODEL: 0757-EB TAPERED TOP INLET, PLENUM

STANDARD CONSTRUCTION:

1. **Fusible Link:** UL Listed, 212°F (100°C), standard.
2. **Blades:** 22 ga. (0.85) roll-formed galv. steel.
3. **Blade Insulation:** Non-asbestos UL Classified.
4. **Damper Frame:** 22 ga. (0.85) galvanized steel.
5. **Plenum:** Steel. 26 ga. (0.55) min. with round connection collar.
6. **Duct:** UL Classified Class 0 or 1 flexible air duct connection by others.
7. **Flange:** Plaster flange.
8. **Steel Grille/ Register:** By Nailor or others. Std. depth for grille clearance is 2 1/2" (64).

COMMON OPTIONS:

- 165°F (74°C) UL Listed fusible link.
- Installation Support Angles. 26" (660) long:
  ISA 2 @ 3/4" x 3/4" x 16 ga. (19 x 19 x 1.6).
  ISB 2 @ 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85).



Model 0757-EB Dimensional Data (W x H):

Available Sizes	
W x H	**Nominal Duct Size D**
8" x 4" (203 x 102)	4", 5" (102, 127) dia.
10" x 4" (254 x 102)	4", 5", 6" (102, 127, 152) dia.
12" x 4" (305 x 102)	6", 7", 8" (152, 178, 203) dia.
8" x 6" (203 x 152)	6" (152) dia.
10" x 6" (254 x 152)	5", 6", 7" (127, 152, 178) dia.
12" x 6" (305 x 152)	6", 7", 8", 9" (152, 178, 203, 229) dia.
8" x 8" (203 x 203)	5", 6" (127, 152) dia.
10" x 8" (254 x 203)	7", 8" (178, 203) dia.
12" x 8" (305 x 203)	7", 8" (178, 203) dia.
9" x 9" (229 x 229)	8" (203) dia.
12" x 12" (305 x 305)	8", 9", 10" (203, 229, 254) dia.

W x H = Nominal Grille/Register Size

MODEL: 0763-FB 45° INLET, INSULATED PLENUM

STANDARD CONSTRUCTION:

1. **Fusible Link:** UL Listed, 212°F (100°C), standard.
2. **Blades:** 22 ga. (0.85) roll-formed galv. steel.
3. **Blade Insulation:** Non-asbestos UL Classified.
4. **Damper Frame:** 22 ga. (0.85) galvanized steel.
5. **Internal Insulation:** 1 1/2" (38) R-6.3 value.
6. **Plenum:** Steel plenum: 28 ga. (0.47) min. with round connection collar.
7. **Duct:** UL Classified Class 0 or 1 flexible air duct connection by others.
8. **Flange:** Plaster flange.
9. **Steel Grille/ Register:** By Nailor or others. Standard depth for grille clearance is 2" (51).

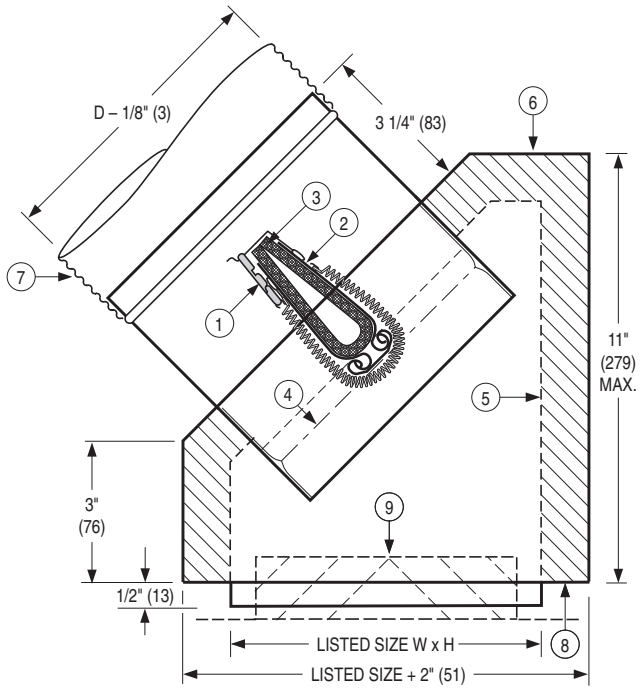
COMMON OPTIONS:

- R8 2" (51) thick R-8 value insulation.
- 165°F (74°C) UL Listed fusible link.
- Installation Support Angles. 26" (660) long:
  ISA 2 @ 3/4" x 3/4" x 16 ga. (19 x 19 x 1.6).
  ISB 2 @ 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85).

Model 0763-FB Dimensional Data (W x H):

Available Sizes	
W x H	**Nominal Duct Size D**
8" x 4" (203 x 102)	4", 5" (102, 127) dia.
10" x 4" (254 x 102)	4", 5", 6" (102, 127, 152) dia.
12" x 4" (305 x 102)	6" (152) dia.
	7" (178) dia.
	8" (203) dia.
14" x 4" (356 x 102)	7" (178) dia.
8" x 6" (203 x 152)	6" (152) dia.
10" x 6" (254 x 152)	5", 6", 7" (127, 152, 178) dia.
12" x 6" (305 x 152)	6", 7" (152, 178) dia.
14" x 6" (356 x 152)	6", 7", 8" (152, 178, 203) dia.

W x H = Nominal Grille/Register Size



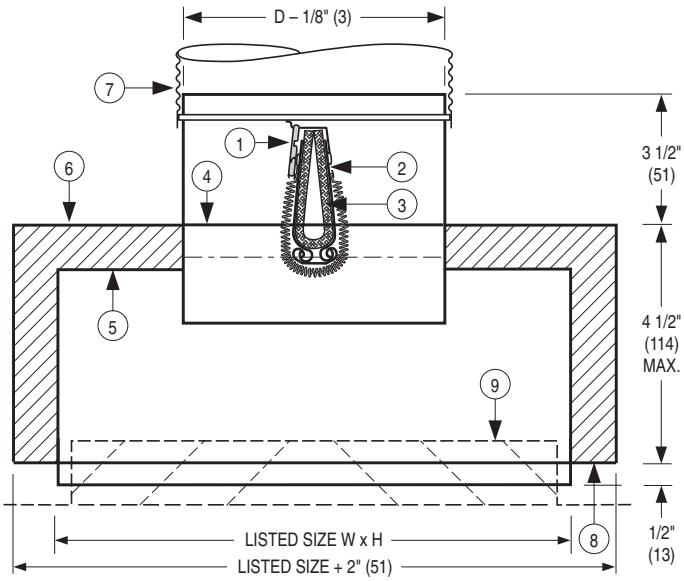
MODEL: 0763-GB TOP INLET, INSULATED PLENUM

STANDARD CONSTRUCTION:

1. **Fusible Link:** UL Listed, 212°F (100°C), standard.
2. **Blades:** 22 ga. (0.85) roll-formed galv. steel.
3. **Blade Insulation:** Non-asbestos UL Classified.
4. **Damper Frame:** 22 ga. (0.85) galvanized steel.
5. **Internal Insulation:** 1 1/2" (38) R-6.3 value..
6. **Plenum:** Steel. 28 ga. (0.47) min. with round connection collar.
7. **Duct:** UL Classified Class 0 or 1 flexible air duct connection by others.
8. **Flange:** Plaster flange.
9. **Steel Grille/Reg.:** By Nailor or others. Min. depth for grille clearance is 2" (51).

COMMON OPTIONS:

- R8 2" (51) thick R-8 value insulation.
- 165°F (74°C) UL Listed fusible link.
- Installation Support Angles. 26" (660) long:
  ISA 2 @ 3/4" x 3/4" x 16 ga. (19 x 19 x 1.6).
  ISB 2 @ 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85).

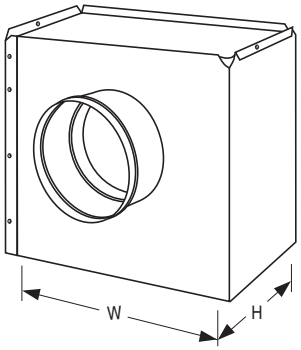


Model 0763-GB Dimensional Data (W x H):

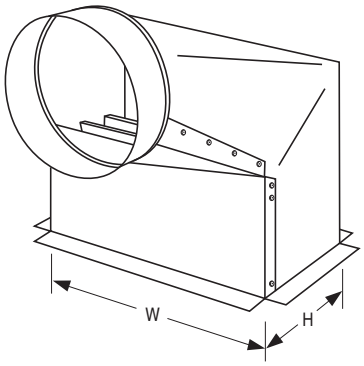
Available Sizes	
W x H	**Nominal Duct Size D**
8" x 4" (203 x 102)	4", 5" (102, 127) dia.
10" x 4" (254 x 102)	4", 5", 6" (102, 127, 152) dia.
12" x 4" (305 x 102)	6", 7", 8" (152, 178, 203) dia.
8" x 6" (203 x 152)	6" (152) dia.
10" x 6" (254 x 152)	5", 6", 7" (127, 152, 178) dia.
12" x 6" (305 x 152)	6", 7", 8" (152, 178, 203) dia.
14" x 6" (356 x 152)	6", 7", 8" (152, 178, 203) dia.
8" x 8" (203 x 203)	5", 6" (127, 152) dia.
10" x 8" (254 x 203)	7", 8" (178, 203) dia.
12" x 8" (305 x 203)	7", 8" (178, 203) dia.
14" x 8" (356 x 203)	6", 7", 8" (152, 178, 203) dia.

W x H = Nominal Grille/Register Size

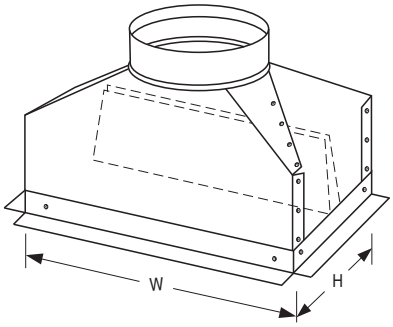
ISOMETRIC DETAILS: NAILOR PLENUM TYPES (FACTORY MOUNTED)
MODELS: 0757 (-CB, -DB, -EB) AND 0763 (-FB, -GB)



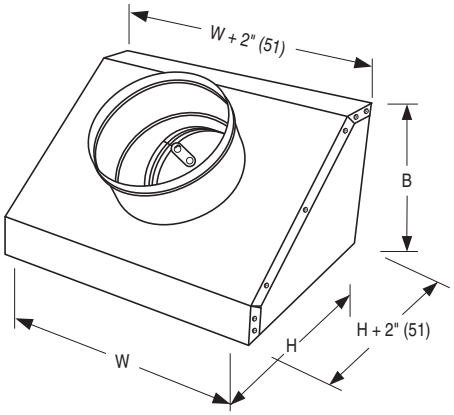
Model 0757-CB
90° Side Inlet. Insulated Register Box
Rectangular ceiling damper.
Min. size: 8" x 4" (203 x 102), 4" (102) dia. inlet
Max. size: 12" x 12" (305 x 305), 10" (305) dia. inlet



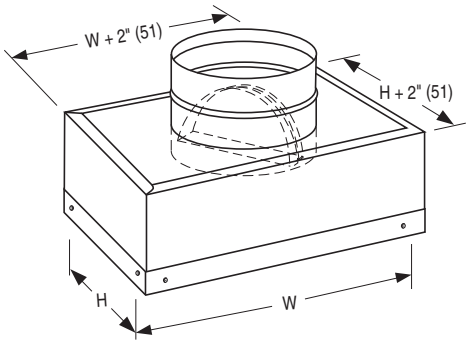
Model 0757-DB
Register Box. Tapered Side Inlet
Rectangular ceiling damper
Min. size: 8" x 4" (203 x 102), 4" (102) inlet
Max. size: 14" x 8" (356 x 203), 10" (254) Inlet



Model 0757-EB
Tapered Top Inlet. Register Box
Rectangular ceiling damper.
Min. Size: 8" x 4" (203 x 102), 4" (102) dia. inlet
Max. size: 12" x 12" (305 x 305), 10" (305) dia. inlet



Model 0763-FB
45° Side Inlet. Insulated Register Box
Round ceiling damper in inlet collar.
Min. size: 8" x 4" (203 x 102), 4" (102) dia. inlet
Max. size: 14" x 6" (356 x 152), 8" (229) dia. inlet



Model 0763-GB
Top Inlet. Insulated Register Box
Round ceiling damper in inlet collar.
Min. size: 8" x 4" (203 x 102), 4" (102) dia. inlet
Max. size: 14" x 8" (356 x 203), 8" (203) dia. inlet

HOW TO SPECIFY

MODELS: 0757 (-CB, -DB, -EB) AND 0763 (-FB, -GB)
WOOD TRUSS CEILING DAMPER REGISTER BOXES

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, ceiling fire dampers as manufactured by Nailor Industries, Inc., qualified for use in specific wood truss ceiling assemblies with 1 hour fire rating which meet the following criteria: Ceiling Dampers shall be tested in accordance with UL 263 Standard for Fire Tests of Building Construction and Materials, and shall bear a UL label verifying the same. Ceiling Dampers tested and labelled in accordance with UL 555C Standard for Ceiling Dampers are not approved or acceptable.
Frame and blade shall be constructed of 22 ga. (0.85) galvanized steel. Blade insulation shall be non-asbestos, UL Classified. Each ceiling damper shall be held open with a (**specifier to select**) 212°F (100°C) **or** 165°F (74°C) UL Listed fusible link. Ceiling damper assembly shall be provided from the factory with a steel register box with round connection collar of size indicated on drawings.

Ceiling Damper Model/Register Box type shall be (**specifier to select**):
0757-CB 90 degree side inlet, insulated plenum boot.
0757-DB 90 degree side inlet, tapered plenum boot.
0757-EB Top inlet, tapered plenum boot.
0763-FB 45 degree inlet, insulated plenum boot.
0763-GB Top inlet, insulated plenum boot.

Ceiling dampers shall ship with and be installed in accordance with manufacturer's UL approved installation instructions. Information submitted for approval shall include same UL installation instructions.
Standard of acceptance shall be Nailor Industries Model 0757 and/or 0763 with factory supplied and mounted plenum/boot.

HOW TO ORDER

MODELS: 0757-CB, 0757-DB, 0757-EB, 0763-FB & 0763-GB
WOOD TRUSS CEILING RADIATION DAMPERS REGISTER BOXES

EXAMPLE: 0757-CB - 14" x 6" - 06 - 212 - ISA

1. **Models**
   - 0757-CB Register Box, 90° Side Inlet, Insulated
   - 0757-DB Register Box, Tapered 90° Side Inlet
   - 0757-EB Register Box, Tapered Top Inlet
   - 0763-FB Register Box, 45° Side Inlet, Insulated
   - 0763-GB Register Box, Top Inlet, Insulated
2. **Register Size**
   Width x Height (inches [mm's])
   - 0606 6" x 6" (152 x 152)
   - 0804 8" x 4" (203 x 102)
   - 0806 8" x 6" (203 x 152)
   - 0808 8" x 8" (203 x 203)
   - 0909 9" x 9" (229 x 229)
   - 1004 10" x 4" (254 x 102)
   - 1006 10" x 6" (254 x 152)
   - 1008 10" x 8" (254 x 203)
   - 1010 10" x 10" (254 x 254)
   - 1204 12" x 4" (305 x 102)
   - 1206 12" x 6" (305 x 152)
   - 1208 12" x 8" (305 x 203)
   - 1212 12" x 12" (305 x 305)
   - 1404 14" x 4" (356 x 102)
   - 1406 14" x 6" (356 x 152)
   - 1408 14" x 8" (356 x 203)
3. **Inlet Size**
   Diameter (inches [mm's])
   - 04 4" (102) Round
   - 05 5" (127) Round
   - 06 6" (152) Round
   - 07 7" (178) Round
   - 08 8" (203) Round
   - 09 9" (229) Round
   - 10 10" (254) Round
4. **Fusible Link Temperature**
   - 212 212°F (100°C) (default)
   - 165 165°F (74°C)
5. **Insulation**
   (Type -CB, -FB, -GB only)
   - R6 R-6 Value, 1 1/2" (38) (default)
   - R8 R-8 Value, 2" (51)
6. **Installation Accessory**
   ISA Support Angles
   2 @ 26" x 3/4" x 3/4" x 16 ga.
   (660 x 19 x 19 x 1.6)
   ISB Support Angles
   2 @ 26" x 1 1/2" x 1 1/2" x 22 ga.
   (660 x 38 x 38 x 0.85)
7. **Damper Styles**
   - 0716 Butterfly Type (default)
   - 0714 Single Blade (Models 0757-CB and 0757-DB only)

NOTES

1. Refer to table or submittal for available sizes.
2. Not all variants and options are available on all models. Refer to individual model for selection availability.

Available Sizes:

Nominal Register Size W x H	Round Inlet (Duct) Size	Model				
		0757-CB	0757-DB	0757-EB	0763-FB	0763-GB
8" x 4" (203 x 102)	4", 5" (102, 127)	√	√	√	√	√
10" x 4" (254 x 102)	4", 5", 6" (102, 127, 152)	√	√	√	√	√
12" x 4" (305 x 102)	6", 7", 8" (152, 178, 203)	√	√	√	√	√
14" x 4" (356 x 102)	7" (178)	—	√	—	√	—
6" x 6" (152 x 152)	4", 5" (102, 127)	—	√	—	—	—
8" x 6" (203 x 152)	6" (152)	√	√	√	√	√
10" x 6" (254 x 152)	5", 6", 7" (127, 152, 178)	√	√	√	√	√
12" x 6" (305 x 152)	6", 7" (152, 178)	√	√	√	√	√
	8" (203)	√	√	√	—	√
	9" (229)	√	√	√	—	—
14" x 6" (356 x 152)	6", 7", 8" (152, 178, 203)	—	√	—	√	√
	9", 10" (229, 254)	—	√	—	—	√
8" x 8" (203 x 203)	5", 6" (127, 152)	√	√	√	—	√
10" x 8" (254 x 203)	7", 8" (178, 203)	√	√	√	—	√
12" x 8" (305 x 203)	7", 8" (178, 203)	√	√	√	—	√
14" x 8" (356 x 203)	6", 7", 8" (152, 178, 203)	—	√	—	—	√
	9", 10" (229, 254)	—	√	—	—	—
9" x 9" (229 x 229)	8" (203)	—	—	√	—	—
10" x 10" (254 x 254)	7", 8" (178, 203)	√	—	—	—	—
12" x 12" (305 x 305)	8", 9", 10" (203, 229, 254)	√	—	√	—	—

Nailor® Industries Inc.

ACCESS DOORS

TABLE OF CONTENTS

GENERAL PRODUCT OVERVIEW

Fire dampers need inspecting and testing, coils need cleaning and controls need adjusting. Nailor Industries offers a range of duct and plenum access doors that have been designed to allow easy and convenient access to such equipment within HVAC ductwork, without compromising safety or ventilation, to meet different duct styles and application needs. The economical 08SCL and 08SH Models feature quality double skin construction that meets SMACNA requirements, with quick simple installation. The ultra-low leakage 0800 Flat Oval Series provides premium quality that optimizes access area and ease of installation. For round duct applications, the 0890 and 0895 Models provide easy mounting and positive closure. All models are available in a wide variety of sizes to suit each specific application and manufactured with pride by members of the Sheet Metal Workers International Association S.M.W.I.A.

MODELS 08SCL & 08SH
SQUARE OR RECTANGULAR ACCESS DOORS

These economical quality access doors meet SMACNA requirements for systems up to 2" w.g. (500 Pa) and provide quick, simple installation wherever duct access is required; available in 20 sizes to meet all access requirements. Design features include a rugged die-formed 22 ga. (0.85) frame and double skin door panels for extra strength, camlock operation for positive seal and easy opening and notched knock-over tabs for a clean and easy installation.

Models 08SCL & 08SH

Model Series 0800

MODELS SERIES 0800
FLAT OVAL ACCESS DOORS

The Nailor 0800 Series Flat Oval duct access doors are engineered to provide a premium quality, ultra-low leakage door with optimum ergonomics in mind. The unique oval shape was designed after careful study of the needs of site engineering and maintenance personnel. Each door allows a different degree of access, enabling the most appropriate unit to be specified, depending on duct size and likely maintenance requirements. The 0800 Series is available in two frame styles for use with steel duct: a double flange screw hole mounting type (M1) or a knock-over tab type (M2). Both styles come with a simple installation cut-out template which makes the oval shape openings extra easy to cut.

MODEL 0800-5
POSITIVE PRESSURE TYPE ACCESS DOORS

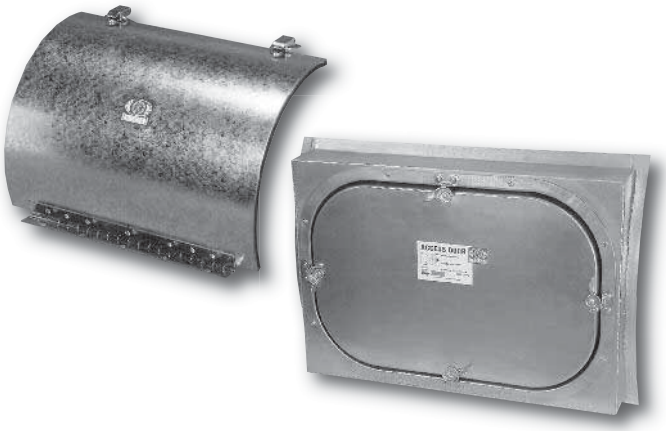
Nailor Model 0800-5 Access Door was designed for use in higher pressure applications, yet it is suitable for use in medium and low pressure applications where the security of a positive pressure type access door is desired. The design of the 0800-5 is such that as positive static pressure in the duct increases, the force exerted on the door compresses the seal, eliminating any leakage possibilities. The ultra-low leakage design features include rugged die-formed construction, safety handles for assured opening and closing, and wing nut fasteners for secure attachment and alignment.

Model 0800-5

MODEL 0840-6
PLENUM ACCESS DOOR

Nailor Model 0840-6 ultra-low leakage plenum access door provides easy access to larger plenums and equipment housings and is suitable for use in high, medium or low pressure applications. The design features include positive seal gasketing and insulation which provide assured low-leakage performance. The die-formed frame, hinged door and die-cast closure handles provide extra strength and maximum operational convenience.

Model 0840-6



Model 0890

Model 0895

MODELS 0890 & 0895
FOR ROUND DUCT

Nailor Model 0890 is an economical round duct access door suitable for use in low pressure applications. A durable hinge permits the heavy duty 16 ga. (1.6) door to swing open fully, allowing unobstructed access to the duct, while the zinc plated strikes and catches and polyurethane foam gasketing provide a tight, positive seal when closed.

Model 0895 turret style access doors provide heavy duty construction with easy opening, suitable for use in medium and high pressure round duct systems. Features include an all-welded turret box and saddle formed to duct radius, and a high-pressure 0800 Series access door that is caulked and fastened to turret. Zinc plated progressive camlocks and bulb type door gasket provide a secure, tight seal.

MODEL 0900-1 & 0900-2
UTILITY ACCESS DOORS
FIRE RATED & GENERAL USE

Nailor Model 0900-1 fire-rated access door is for use whenever it is necessary to provide service access to utilities located within fire separations such as corridor walls, stairwells and ceilings. The 2" (51) thick insulation, which acts as a heat barrier, is also ideal for reducing sound transmission through access opening. The flush key operated latch provides convenient and secure opening and closing. Model 0900-2 is a multi-purpose access door designed to provide convenient access to utilities contained within walls or ceilings. This versatile access door installs flush in drywall, masonry block or tile, and plaster walls and ceilings with a clean unobtrusive finish. Both models are offered in an array of standard sizes, with special sizes available upon request.

Model 0900-1

Model 0900-2

- SQUARE & RECTANGULAR
- MEETS SMACNA STANDARDS
- INSULATED
- FOR STEEL OR FIBERGLASS DUCT (OPTION)

Models:

08SCL Removable with Camlocks

08SH Hinged with Camlock Closure

Model 08SCL

Model 08SH

These economical quality access doors meet SMACNA requirements for systems up to 2" w.g. (500 Pa) and provide quick, simple installation wherever duct access is required. Available in 20 sizes to meet all field requirements, with common sizes available in stock for quick delivery. Design features include rugged die-formed 22 ga. (0.85) frame and double skin door panels for extra strength, camlock operation for positive seal and easy opening and notched knock-over tabs for a clean and easy installation.

QUALIFICATIONS:

- **Meets SMACNA construction specifications for systems up to 2" w.g. (500 Pa).**

STANDARD CONSTRUCTION:

1. **Frame:** Die-formed 22 ga. (0.85) galvanized steel flange frame for strength.
2. **Door Panel:** Die-formed double skin 22 ga. (0.85) galvanized steel door panel for extra strength.
3. **Insulation:** 1" (25) dual density insulation.
4. **Tabs:** Notched knock-over tabs.
5. **Fasteners:** Plated steel camlock fasteners. See note.
6. **Gasket:** Positive seal polyethylene gasket.
7. **Safety Chain:** Safety retaining chain standard on removable door Model 08SCL.
8. **Hinge:** Continuous piano-type hinge standard on Model 08SH.

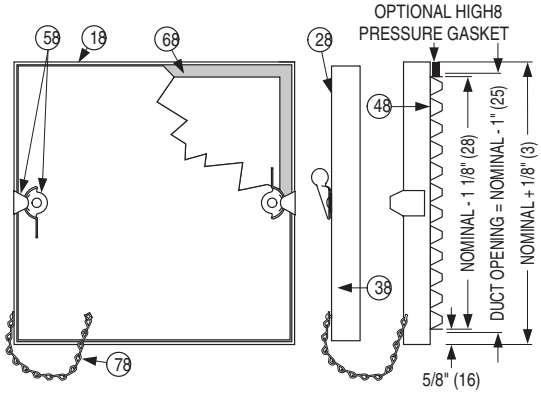
NOTE: Removable door Model 08SCL is furnished with four camlocks on sizes over 14" (356) in width or height. Hinged door Model 08SH is furnished with two camlocks on sizes over 14" (356) in height.

COMMON OPTIONS:

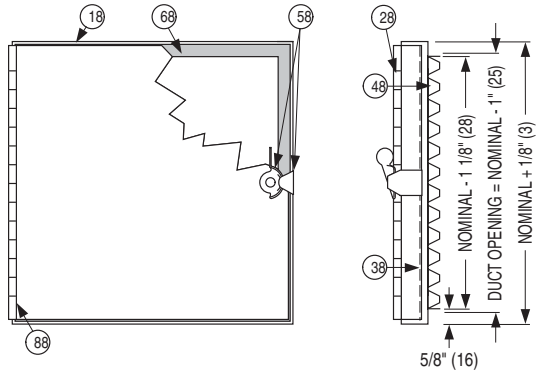
F10 for 1" (25) fiberglass duct.
F15 for 1 1/2" (32) fiberglass duct.
HP High Pressure. Adds second gasket on underside of frame for frame to duct seal.

Available Sizes (Nominal W x H):

6 x 6 (152 x 152)	16 x 14 (406 x 356)
8 x 8 (203 x 203)	16 x 16 (406 x 406)
10 x 8 (254 x 203)	18 x 12 (457 x 304)
10 x 10 (254 x 254)	18 x 14 (457 x 356)
12 x 10 (305 x 254)	18 x 16 (457 x 406)
12 x 12 (305 x 305)	18 x 18 (457 x 457)
14 x 10 (356 x 254)	20 x 16 (508 x 406)
14 x 12 (356 x 305)	20 x 20 (508 x 508)
14 x 14 (356 x 356)	24 x 18 (610 x 457)
16 x 12 (406 x 305)	24 x 24 (610 x 610)

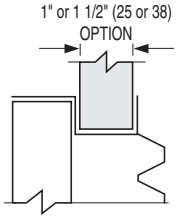


MODEL 08SCL REMOVABLE DOOR (PAIRED CAMLOCKS)



MODEL 08SH HINGED DOOR (WITH CAMLOCK CLOSURE)

FIBERGLASS DUCT OPTION



HOW TO ORDER OR TO SPECIFY

MODELS: 08SCL AND 08SH DUCT ACCESS DOORS

EXAMPLE: 08SCL -2424 - HP - F10

1. **Models**
   - 08SCL Removable Door (Paired Camlocks)
   - 08SH Hinged Door (with Camlock Closure)

2. **Nominal Size**
   Width x Height

Code	inches	(mm's)
0606	6" x 6"	(152 x 152)
0808	8" x 8"	(203 x 203)
1008	10" x 8"	(254 x 203)
1010	10" x 10"	(254 x 254)
1210	12" x 10"	(305 x 254)
1212	12" x 12"	(305 x 305)
1410	14" x 10"	(356 x 254)
1412	14" x 12"	(356 x 305)
1414	14" x 14"	(356 x 356)
1612	16" x 12"	(406 x 305)
1614	16" x 14"	(406 x 356)
1616	16" x 16"	(406 x 406)
1812	18" x 12"	(457 x 305)
1814	18" x 14"	(457 x 356)
1816	18" x 16"	(457 x 406)
1818	18" x 18"	(457 x 457)
2016	20" x 16"	(508 x 406)
2020	20" x 20"	(508 x 508)
2418	24" x 18"	(610 x 457)
2424	24" x 24"	(610 x 610)

OPTIONS:

3. **High Pressure Gasketing**
   - HP High Pressure. Adds second gasket on underside of frame for frame to duct seal.

4. **Fiberglass Duct**
   - F10 1" (25) Fiberglass Duct Frame
   - F15 1 1/2" (32) Fiberglass Duct Frame

SUGGESTED SPECIFICATION:
Provide and install as shown on plans and/or schedules and at each fire damper location, duct access doors as manufactured by Nailor Industries, Inc., which meet the following criteria: Access door shall meet SMACNA requirements for systems up to 2 in. w.g. (500 Pa). Frame shall be constructed of die-formed 22 ga. (0.85) galvanized steel, complete with notched knock-over tabs for quick installation. Door shall be constructed of double skin die-formed 22 ga. (0.85) galvanized steel with 1" (25) insulation fully enclosed within door panel. A positive seal, polyethylene gasket shall be secured to each door.
For a fully removable access door secured with double camlocks and safety chain, standard of acceptance shall be Nailor Industries Model 08SCL.
For a hinged access door with camlock closure, standard of acceptance shall be Nailor Industries Model 08SH.

- PREMIUM PERFORMANCE
- FLAT OVAL DESIGN
- ULTRA-LOW LEAKAGE
- ERGONOMIC SIZING
- INSULATED

Model:

0800 Flat Oval

Mounting Types:

M1 Double Flange

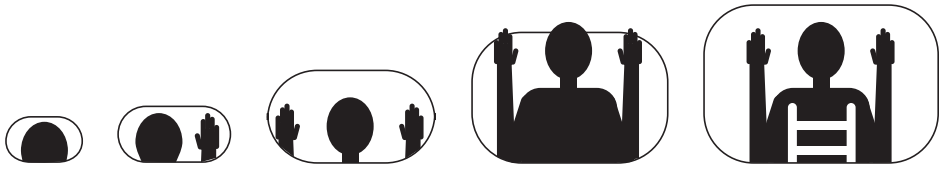
M2 Knock-over Tabs

0800 Series

The Nailor 0800 Series Flat Oval Duct Access Doors were engineered to provide a premium quality, ultra-low leakage door with optimum ergonomics in mind. The unique oval shape was designed after careful study of the needs of site engineering and maintenance personnel. Each door allows a different degree of access, enabling the most appropriate unit to be specified depending on duct size and likely maintenance requirements. The 0800 Series is available in two frame styles for use with steel duct: a double flange screw hole mounting type (M1) or a knock-over tab type (M2). Both styles come with a cut-out template which makes the oval shape openings extra easy to cut, ensuring a simple and clean installation. The rugged die-formed frame, die-formed double skin door panel with secure continuous bulb seal gasket and progressive camlock operation make the 0800 Series a solid performer. These doors are continuously batch tested to 8 in. w.g. (2 kPa) static pressure in order to meet British Standard DW144 Class C for leakage. Suitable for use in low, medium and high pressure duct systems.

Ergonomic Sizing Guide

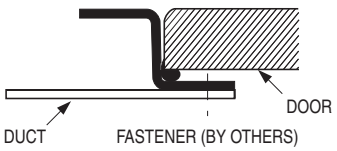
Use the following guide to select appropriate access door size



8" x 5" (203 x 127) hand/sight	12" x 6" (305 x 152) one hand and sight	18" x 10" (457 x 254) two hands and head sight	21" x 14" (533 x 356) head and shoulders	25" x 17" (635 x 432) body entry plus ladder

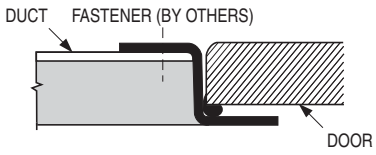
Mounting Positions

EXTERIOR



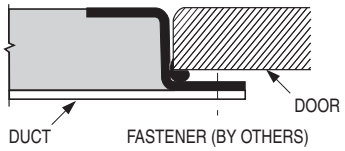
Frame Style M1 – Exterior mounting

FLUSH



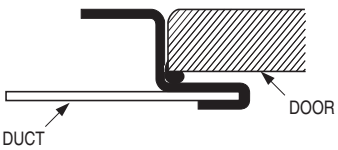
Frame Style M1 – Flush mounting
Suitable for internally insulated ductwork

FLUSH



Frame Style M1 – Exterior mounting
with externally insulated ductwork

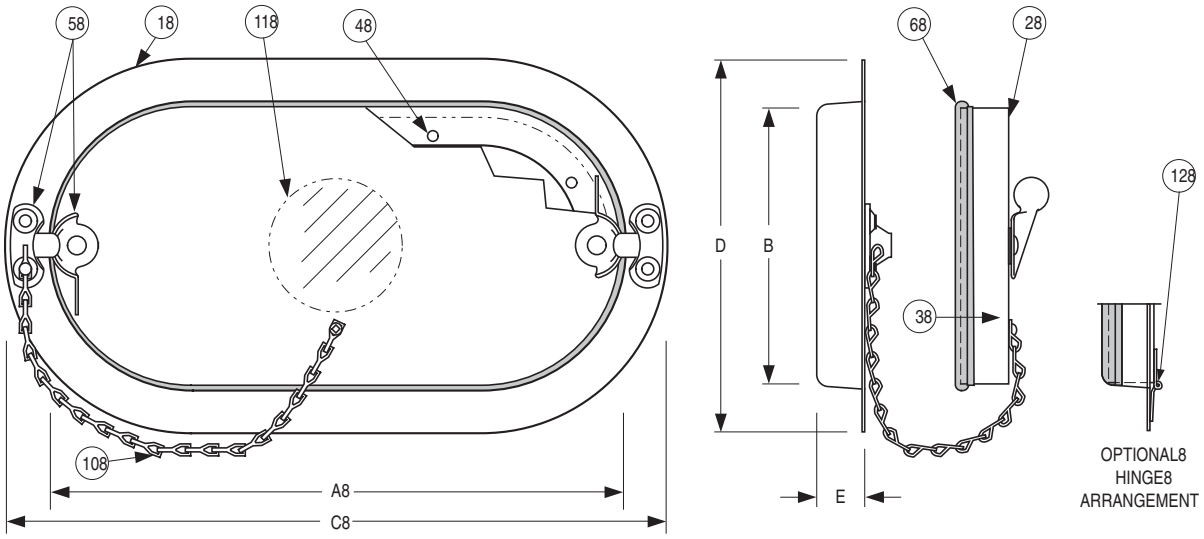
EXTERIOR



Frame Style M2 – Exterior knock-over tabs mounting
(Available in 8 x 5, 12 x 6, 18 x 10 [203 x 127, 305 x 152, 457 x 254])

DIMENSIONAL DATA:

MODEL 0800 TYPE M1 DOUBLE FLANGE FRAME



Dimensional Data (W x H):

Nominal Size	A	B	C	D	E	Viewport
8 x 5 (203 x 127)	8 (203)	5 (127)	9 1/2 (241)	6 1/2 (165)	1 1/8 (29)	n/a
12 x 6 (305 x 152)	11 3/4 (298)	5 3/4 (146)	13 3/4 (349)	7 3/4 (197)	1 1/8 (29)	2 3/4 dia. (70)
18 x 10 (457 x 254)	17 3/4 (451)	9 3/4 (248)	19 3/4 (502)	11 3/4 (298)	1 1/8 (29)	5 1/2 dia. (140)
21 x 14 (533 x 356)	20 3/4 (527)	13 3/4 (349)	22 3/4 (578)	15 3/4 (400)	1 1/8 (29)	5 1/2 dia. (140)
25 x 17 (635 x 432)	24 3/4 (629)	16 3/4 (425)	26 3/4 (679)	18 3/4 (476)	1 1/8 (29)	5 1/2 dia. (140)

Note: See Ergonomic Sizing Guide on page I7 for sizing assistance.

STANDARD CONSTRUCTION:

1. **Frame:** Die-formed 22 ga. (0.85) galvanized steel flange frame for strength.
2. **Door Panel:** Die-formed 22 ga. (0.85) galvanized steel door panel for extra strength.
3. **Insulation:** 1" (25) dual density insulation with 22 ga. (.85) galvanized steel backing plate.
4. **Mounting:** 3/16" (5) dia. pre-punched attachment holes on inner flange for surface mounting.
5. **Fasteners:** Plated steel camlock fasteners.
6. **Seal:** Positive bulb flexible PVC door seal.
7. **Template:** Layout template included.
8. **Opening:** Oval shaped opening adaptable to all ducts 5" (127) or over.

COMMON OPTIONS:

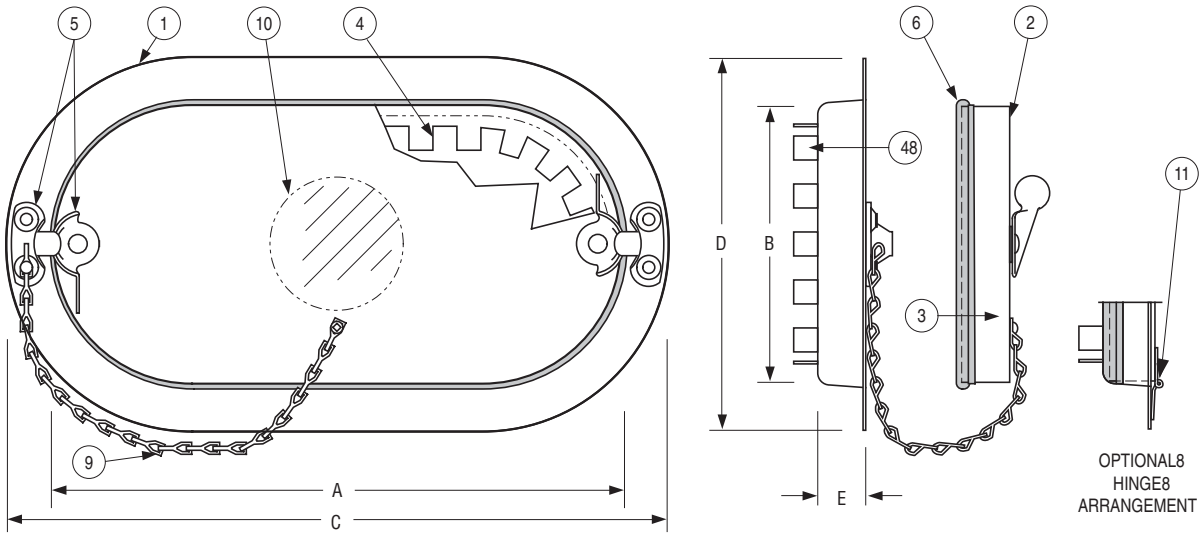
9. **Mounting:** 3/16" (5) dia. pre-punched attachment holes for flush mounting.
10. **Safety Chain:** Safety chain.
11. **Viewport:** Viewport (not available on size 8" x 5" [203 x 127]).
12. **Hinge:** Hinge arrangement.
13. **Camlocks:** Pair of additional camlocks.

LEAKAGE INFORMATION:

Conforms to British Standard DW144 Class A, B and C.
Maximum allowable leakage at 8" w.g. (2 kPa):
8" x 5" (203 x 127): 0.036 cfm (1.02 l/min.)
12" x 6" (304 x 152): 0.064 cfm (1.8 l/min.)
18" x 10" (457 x 254): 0.133 cfm (3.78 l/min.)
21" x 14" (533 x 356): 0.206 cfm (5.82 l/min.)
25" x 17" (635 x 432): 0.286 cfm (8.1 l/min.)

DIMENSIONAL DATA:

MODEL 0800 TYPE M2 KNOCK-OVER TABS



Dimensional Data (W x H):

Nominal Size	A	B	C	D	E	Viewport
8 x 5 (203 x 127)	8 (203)	5 (127)	9 1/2 (241)	6 1/2 (165)	1 1/8 (29)	n/a
12 x 6 (305 x 152)	11 3/4 (298)	5 3/4 (146)	13 3/4 (349)	7 3/4 (197)	1 1/8 (29)	2 3/4 dia. (70)
18 x 10 (457 x 254)	17 3/4 (451)	9 3/4 (248)	19 3/4 (502)	11 3/4 (298)	1 1/8 (29)	5 1/2 dia. (140)

Note: See Ergonomic Sizing Guide on page I7 for sizing assistance.

STANDARD CONSTRUCTION:

1. **Frame:** Die-formed 22 ga. (0.85) galvanized steel flange frame for strength.
2. **Door Panel:** Die-formed 22 ga. (0.85) galvanized steel door panel for extra strength.
3. **Insulation:** 1" (25) dual density insulation with 22 ga. (.85) galvanized steel backing plate.
4. **Tabs:** Notched knock-over tabs.
5. **Fasteners:** Plated steel camlock fasteners.
6. **Seal:** Positive bulb flexible PVC door seal.
7. **Template:** Layout template included.
8. **Opening:** Oval shaped opening adaptable to all ducts 5" (127) or over.

COMMON OPTIONS:

9. **Safety Chain:** Safety chain.
10. **Viewport:** Viewport (not available on size 8" x 5" [203 x 127]).
11. **Hinge:** Hinge arrangement.
12. **Camlocks:** Pair of additional camlocks.

LEAKAGE INFORMATION:

Conforms to British Standard DW144 Class A, B and C.
Maximum allowable leakage at 8" w.g. (2 kPa):
8" x 5" (203 x 127): 0.036 cfm (1.02 l/min.)
12" x 6" (304 x 152): 0.064 cfm (1.8 l/min.)
18" x 10" (457 x 254): 0.133 cfm (3.78 l/min.)

HOW TO ORDER OR TO SPECIFY

MODEL: 0800 FLAT OVAL ACCESS DOOR

EXAMPLE: 0800 - 1206 - M1 - IN - HG - SC - VP - PO

1. **Models**
   - 0800 Removable Door (Paired Camlocks), Double Flange Frame
2. **Nominal Size**
   Width x Height

Code	inches	(mm's)
0805	8" x 5"	(203 x 127)
1206	12" x 6"	(305 x 152)
1810	18" x 10"	(457 x 254)
2114	21" x 14"	(533 x 356)
2517	25" x 17"	(635 x 432)

3. **Frame/Mounting Style**
   - M1 Double Flange (available on all sizes).
   - M2 Knock-over Tabs (available only on 8" x 5", 12" x 6", 18" x 10" [203 x 127, 305 x 152, 457 x 254]).
4. **Insulation**
   - IN Insulated (standard).
   - UI Uninsulated.

OPTIONS:

5. HG Hinge arrangement.
6. SC Safety Chain.
7. VP Viewport (not available on 8" x 5" [203 x 127] door).
8. CL Pair of additional camlocks for size 18" x 10" (457 x 254) (for static pressures above 4" w.g./1 kPa).
9. PO Pre-punched holes on outer flange of Type M1 frame.

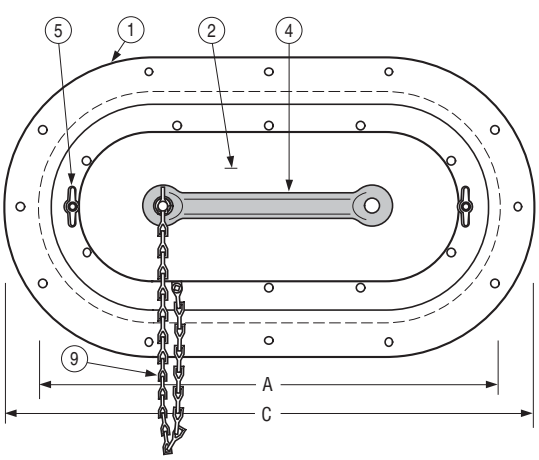
SUGGESTED SPECIFICATION:
Provide and install as shown on plans and/or schedules and at each fire damper location, duct access doors as manufactured by Nailor Industries, Inc., which meet the following criteria: Access doors shall meet British Standard DW144 Class C for leakage. Manufacturer shall submit leakage data tested to minimum of 8 in. w.g. (2 kPa). Frame shall be of flat oval design, constructed of die-formed 22 ga. (0.85) galvanized steel. Door shall be constructed of die-formed 22 ga. (0.85) galvanized steel and be of double skin construction with 1" (25) insulation fully enclosed within the door panel. Bulb type seal shall be integrally fastened to door for positive seal. Standard of Acceptance shall be Nailor Industries Model 0800.

- POSITIVE PRESSURE TYPE DOOR
- ULTRA-LOW LEAKAGE
- ERGONOMIC SIZING
- INSULATED
- FOR STEEL DUCT

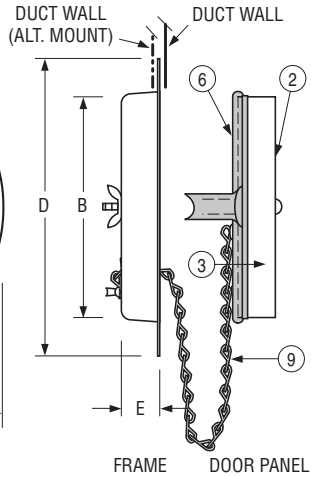
Model: 0800-5

Model 0800-5

Nailor Model 0800-5 Access Door was designed for use in higher pressure applications, yet it is suitable for use in medium and low pressure applications where the security of a positive pressure type access door is desired. The design of the 0800-5 is such that as positive static pressure in the duct increases, the force exerted on the door compresses the seal, eliminating any leakage possibilities. The ultra-low leakage design features include rugged die-formed construction, safety handles for assured opening and closing, and wing nut fasteners for secure attachment and alignment.



FRAME AND DOOR PANEL ASSEMBLY



Dimensional Data (W x H):

Nominal Size	A	B	C	D	E
8 x 5 (203 x 127)	8 (203)	5 (127)	9 1/2 (241)	6 1/2 (165)	1 1/8 (29)
12 x 6 (305 x 152)	11 3/4 (298)	5 3/4 (146)	13 3/4 (349)	7 3/4 (197)	1 1/8 (29)
18 x 10 (457 x 254)	17 3/4 (451)	9 3/4 (248)	19 3/4 (502)	11 3/4 (298)	1 1/8 (29)
21 x 14 (533 x 356)	20 3/4 (527)	13 3/4 (349)	22 3/4 (578)	15 3/4 (400)	1 1/8 (29)
25 x 17 (635 x 432)	24 3/4 (629)	16 3/4 (425)	26 3/4 (679)	18 3/4 (476)	1 1/8 (29)

Note: See Ergonomic Sizing Guide on page I7 for sizing assistance.

STANDARD CONSTRUCTION:

1. **Frame:** Die-formed 22 ga. (0.85) galvanized steel flange frame for strength.
2. **Door Panel:** Die-formed 22 ga. (0.85) galvanized steel door panel for extra strength.
3. **Insulation:** 1" (25) dual density insulation with 22 ga. (.85) galvanized steel backing plate.
4. **Handle:** Safety handle for easy, controlled opening.
5. **Fasteners:** Plated steel wing nut fasteners.
6. **Seal:** Positive bulb flexible PVC door seal.
7. **Template:** Layout template included.
8. **Opening:** Oval shaped opening adaptable to all ducts 7" (178) or over.

COMMON OPTIONS:

9. **Safety Chain:** Safety chain (optional).

LEAKAGE INFORMATION:

Conforms to British Standard DW144 Class A, B and C.
Maximum allowable leakage at 8" w.g. (2 kPa):
8" x 5" (203 x 127): 0.036 cfm (1.02 l/min.)
12" x 6" (304 x 152): 0.064 cfm (1.8 l/min.)
18" x 10" (457 x 254): 0.133 cfm (3.78 l/min.)
21 x 14 (533 x 356): 0.206 cfm (5.82 l/min.)
25 x 17 (635 x 432): 0.286 cfm (8.1 l/min.)

HOW TO ORDER OR TO SPECIFY

MODEL: 0800-5 POSITIVE PRESSURE ACCESS DOOR

EXAMPLE: 0800-5 - 1206 - SC

1. **Models**
   0800-5 Positive Pressure Access Doors

2. **Nominal Size**
   Width x Height

Code	inches	(mm's)
0805	8" x 5"	(203 x 127)
1206	12" x 6"	(305 x 152)
1810	18" x 10"	(457 x 254)
2114	21" x 14"	(533 x 356)
2517	25" x 17"	(635 x 432)

OPTIONS:

3. SC Safety Chain.

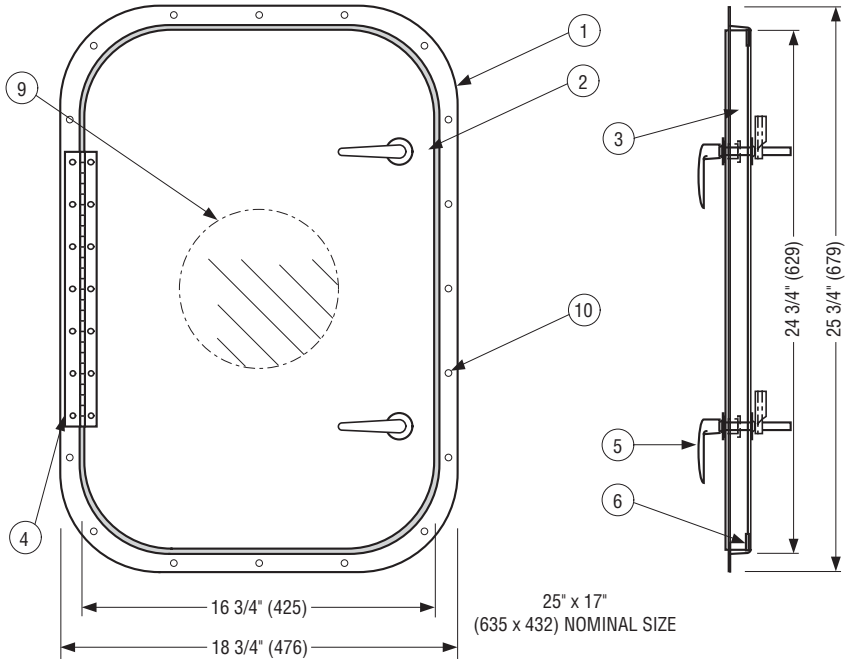
SUGGESTED SPECIFICATION:
Provide and install as shown on plans and/or schedules and at each fire damper location, duct access doors as manufactured by Nailor Industries, Inc., which meet the following criteria: Access doors shall meet British Standard DW144 Class C for leakage. Manufacturer shall submit leakage data tested to minimum of 8 in. w.g. (2 kPa). Frame shall be of oval design, die-formed of minimum 22 ga. (0.85) galvanized steel with 3/16" (5) dia. pre-punched mounting holes. Door shall be constructed of double skin die-formed 22 ga. (0.85) galvanized steel with 1" (25) insulation fully enclosed within the door panel. Door shall be complete with safety handles, quantity dependent on overall size, for secure and controlled opening. Door shall be secured with plated steel wing nut fasteners, with bulb type seal integrally fastened to door providing positive seal. Standard of acceptance shall be Nailor Industries Model 0800-5.

- PLENUM ACCESS DOOR
- HINGED
- INSULATED
- ULTRA-LOW LEAKAGE

Model: 0840-6

Model 0840-6

The Nailor Model 0840-6 ultra-low leakage plenum access door provides easy access to larger plenums and equipment housings and is suitable for use in high, medium or low pressure applications. The design features include positive seal gasketing and insulation which provide assured low-leakage performance. The die-formed frame, hinged door and die-cast closure handles provide extra strength and maximum operational convenience.



STANDARD CONSTRUCTION:

1. **Frame:** Die-formed 22 ga. (0.85) galvanized steel flange frame for strength.
2. **Door Panel:** Die-formed 22 ga. (0.85) galvanized steel door panel for extra strength.
3. **Insulation:** 1" (25) dual density insulation with 22 ga. (0.85) galvanized steel backing plate.
4. **Hinge:** Zinc plated piano hinge.
5. **Fasteners:** Die-cast closure hatches.
6. **Seal:** Positive bulb flexible PVC door seal.
7. **Template:** Layout template included.
8. **Mounting:** 3/16" (5) dia. pre-punched attachment holes on inner flange for surface mounting.

COMMON OPTIONS:

9. **Viewport:** Viewport - 5 1/2" (140) dia..
10. **Mounting:** 3/16" (5) dia. pre-punched attachment holes on outer flange for flush mounting.

LEAKAGE INFORMATION:

Conforms to British Standard DW144 Class A, B and C.
Maximum allowable leakage at 8" w.g. (2 kPa):
0.286 cfm (8.1 l/min.)

HOW TO ORDER OR TO SPECIFY

MODEL: 0840-6 PLENUM ACCESS DOOR

EXAMPLE: 0840-6 - 2517 - VP - PO

1. **Model**
   0840-6 Plenum Access Door,
   25" x 17" (635 x 432) only

OPTIONS:

2. VP Viewport.
3. PO Pre-punched holes on outer flange.

SUGGESTED SPECIFICATION:
Provide and install as shown on plans and/or schedules, plenum access doors as manufactured by Nailor Industries, Inc., which meet the following criteria: Access doors shall meet British Standard DW144 Class C for leakage. Manufacturer shall submit leakage data tested to minimum of 8 in. w.g. (2 kPa). Frame shall be of oval design, constructed of die-formed 22 ga. (0.85) galvanized steel. Door shall constructed of double skin die-formed 22 ga. (0.85) galvanized steel with 1" (25) insulation fully enclosed within the door panel. Door shall be attached to frame with continuous plated steel piano hinge and shall close securely by means of two die-cast closure handles. Bulb type seal shall be integrally fastened to door for positive seal. Standard of acceptance shall be Nailor Industries Model 0840-6.

- OUT-SWING FRAME (NEGATIVE PRESSURE)
- THERMAL BREAK PLENUM ACCESS DOOR
- EXTRUDED ALUMINUM FRAME
- INSULATED STEEL DOOR PANELS

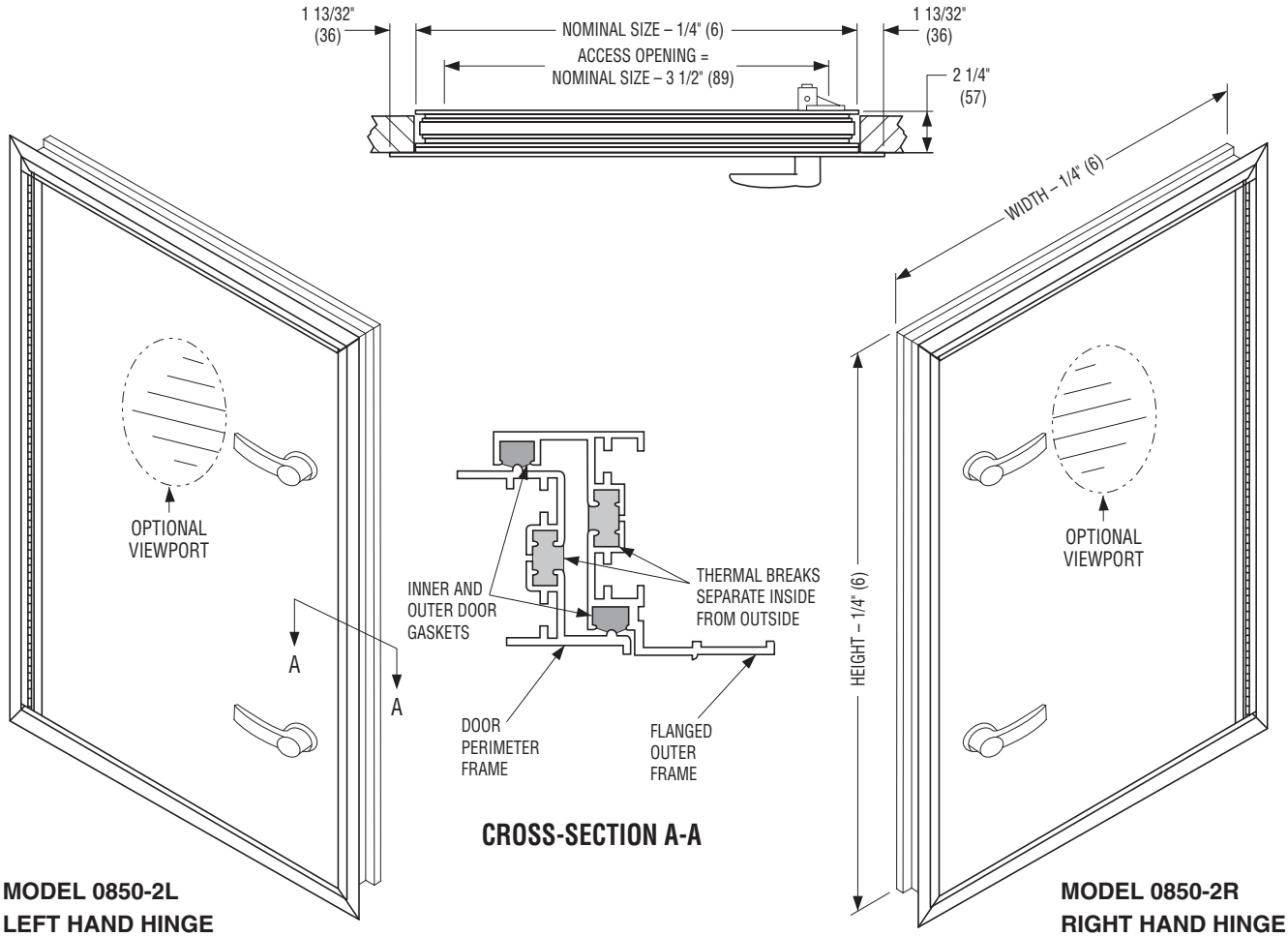
Models:
0850-2L Left Hinge
0850-2R Right Hinge

Standard Sizes:

12 x 12 (305 x 305)	30 x 72 (762 x 1829)
18 x 18 (457 x 457)	36 x 36 (914 x 914)
18 x 24 (457 x 610)	36 x 48 (914 x 1219)
24 x 24 (610 x 610)	36 x 60 (914 x 1524)
24 x 36 (610 x 914)	36 x 72 (914 x 1829)
24 x 48 (610 x 1219)	36 x 84 (914 x 2134)
24 x 60 (610 x 1524)	48 x 48 (1219 x 1219)
24 x 72 (610 x 1829)	48 x 60 (1219 x 1524)
30 x 36 (762 x 914)	48 x 72 (1219 x 1829)
30 x 48 (762 x 1219)	48 x 84 (1219 x 2134)
30 x 60 (762 x 1524)	48 x 96 (1219 x 2438)

Model 0850-2R
(with optional viewport)

Nailor Model Series 0850 thermal break plenum access doors are ultra-low leakage, premium quality doors designed for out-swing (negative pressure) applications. Design features include extruded aluminum frames with attractive mitered corner construction, thermal break door and frame design that utilizes pour-and-debridging technology to achieve levels of thermal isolation unsurpassed by other methods and double door gaskets to assure low levels of leakage. A standard 3 lb. density insulation is used between the 20 ga. (1.0) galvanized steel inner and outer door panels. Ergonomic adjustable door latches have cam-locking surfaces for smooth operation and positive seal. All units feature full length stainless steel piano type hinges, for either left hand or right hand operation.



CROSS-SECTION A-A

MODEL 0850-2L
LEFT HAND HINGE

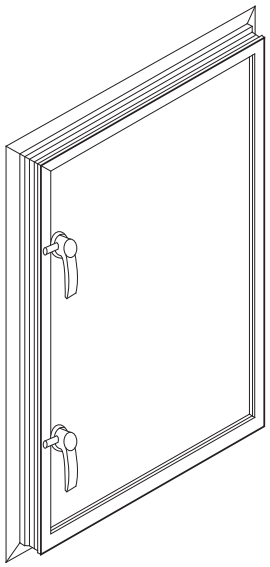
MODEL 0850-2R
RIGHT HAND HINGE

- IN-SWING FRAME (POSITIVE PRESSURE)
- THERMAL BREAK PLENUM ACCESS DOOR
- EXTRUDED ALUMINUM FRAME
- INSULATED STEEL DOOR PANELS

Models:
0855-2L Left Hinge
0855-2R Right Hinge

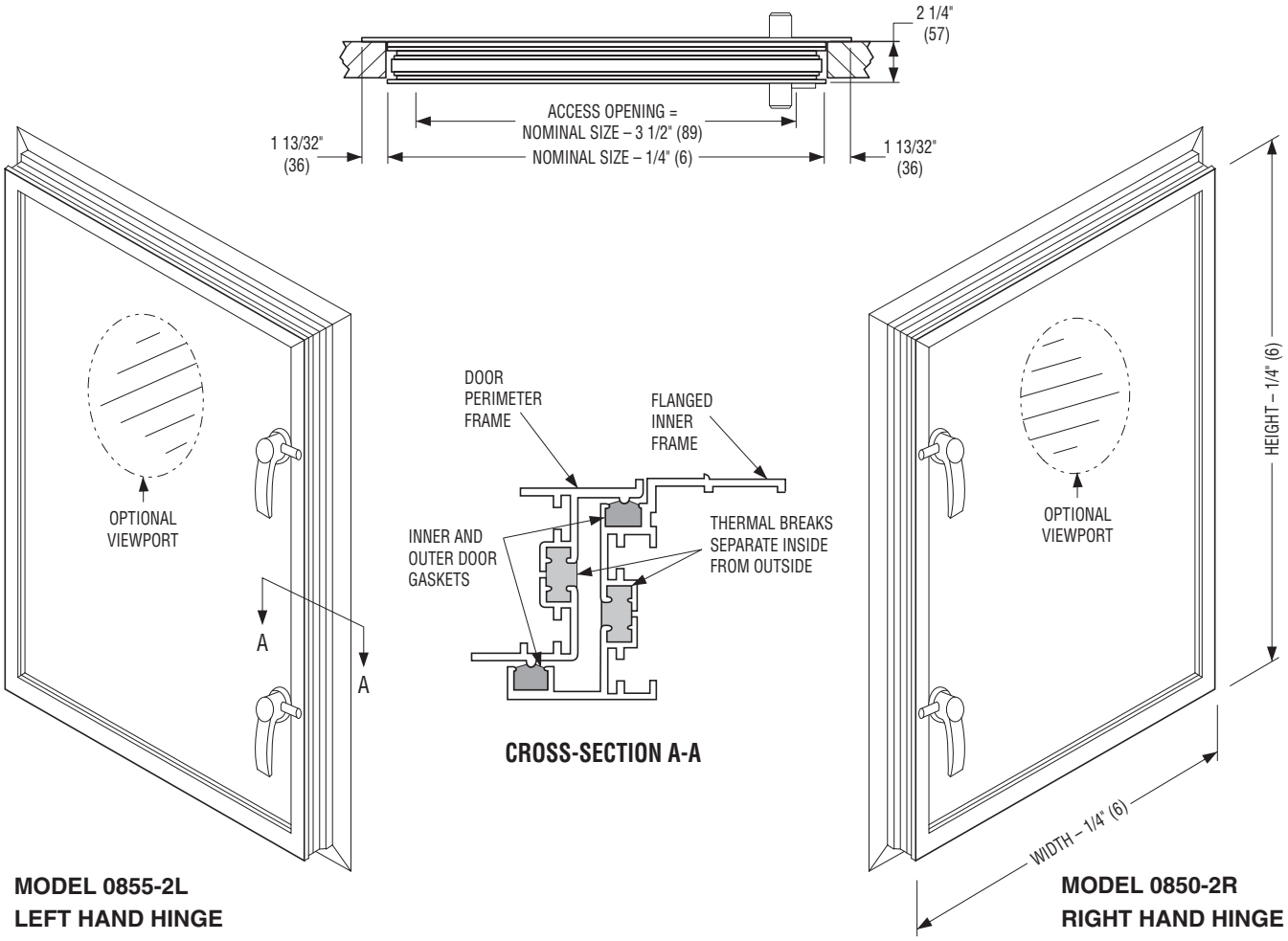
Standard Sizes:

12 x 12 (305 x 305)	30 x 72 (762 x 1829)
18 x 18 (457 x 457)	36 x 36 (914 x 914)
18 x 24 (457 x 610)	36 x 48 (914 x 1219)
24 x 24 (610 x 610)	36 x 60 (914 x 1524)
24 x 36 (610 x 914)	36 x 72 (914 x 1829)
24 x 48 (610 x 1219)	36 x 84 (914 x 2134)
24 x 60 (610 x 1524)	48 x 48 (1219 x 1219)
24 x 72 (610 x 1829)	48 x 60 (1219 x 1524)
30 x 36 (762 x 914)	48 x 72 (1219 x 1829)
30 x 48 (762 x 1219)	48 x 84 (1219 x 2134)
30 x 60 (762 x 1524)	48 x 96 (1219 x 2438)



Model 0855-2R

Nailor Model Series 0855 thermal break plenum access doors are ultra-low leakage, premium quality doors designed for in-swing (positive pressure) applications. Design features include extruded aluminum frames with attractive mitered corner construction, thermal break door and frame design that utilizes pour-and-debridging technology to achieve levels of thermal isolation unsurpassed by other methods and double door gaskets to assure low levels of leakage. A standard 3 lb. density insulation is used between the 20 ga. (1.0) galvanized steel inner and outer door panels. Ergonomic adjustable door latches have cam-locking surfaces for smooth operation and positive seal. All units feature full length stainless steel piano type hinges, for either left hand or right hand operation.



CROSS-SECTION A-A

MODEL 0855-2L
LEFT HAND HINGE

MODEL 0850-2R
RIGHT HAND HINGE

HOW TO ORDER OR TO SPECIFY

MODELS: 0850-2L, 0850-2R, 0855-2L & 0855-2R THERMAL BREAK PLENUM ACCESS DOORS

EXAMPLE: 0855-2L - DH2 - VP8

1. **Models**

Negative Pressure

0850-2L Negative Pressure, Out-swing Frame, Right Hand Hinge

0850-2R Negative Pressure, Out-swing Frame, Left Hand Hinge

Positive Pressure

0855-2L Positive Pressure, In-swing Frame, Left Hand Hinge

0855-2R Positive Pressure, In-swing Frame, Right Hand Hinge

OPTIONS:

2. **Door Handles**

DH0 None, Prep Only.

DH2 2 Per Door (recommended min. for door heights under 60" [1524]).

DH3 3 Per Door (recommended min. for door heights 60" [1524] through 80" [2032]).

DH4 4 Per Door (recommended min. for door heights over 80" [2032]).

3. **View Port**

Dual Pane, hermetically sealed Lexan view glass window.

VP8 8" (203) round. Minimum door size is 18" x 18" [457 x 457]).

VP12 12" (305) round. Minimum door size is 24" x 24" [610 x 610]).

SUGGESTED SPECIFICATION:

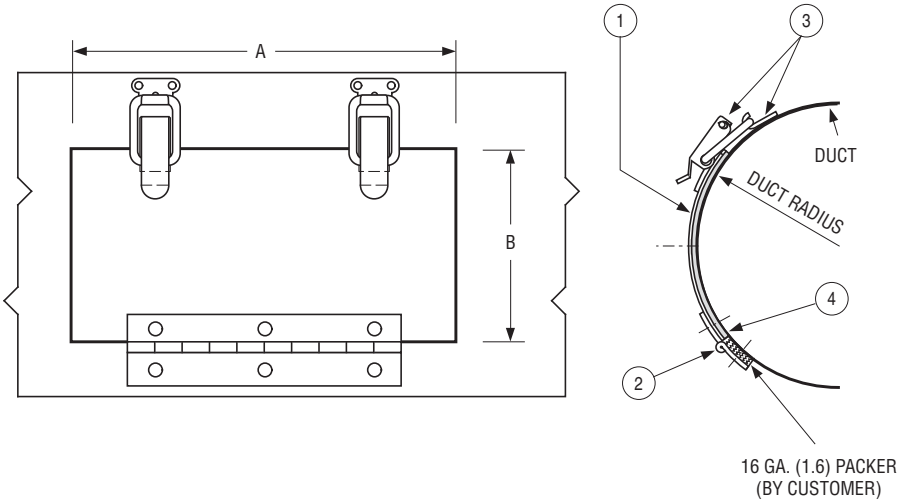
Provide and install as shown on plans and/or schedules, thermal break plenum access doors as manufactured by Nailor Industries, Inc., which meet the following criteria: Frames shall be extruded aluminum with mitered corner construction. Door panels shall be constructed of 20 ga. (1.0) galvanized steel. Insulation between door panels shall be 3 lb. density. Thermal isolation shall be achieved utilizing pour-and-debridging technology and each door shall be complete with double gaskets assuring low leakage performance. Door shall be attached to frame with continuous stainless steel piano type hinge and shall close securely by means of die cast closure handles. 1. Out-swing (negative pressure) operation. Standard of acceptance shall be Nailor Industries Model (**specifier to select**) 0850-2L with left hand hinge **or** 0850-2R with right hand hinge **or** 2. In-swing (positive pressure) operation. Standard of acceptance shall be Nailor Industries Model (**specifier to select**) 0855-2L with left hand hinge **or** 0855-2R with right hand hinge.

- FOR ROUND DUCT
- FOR LOW PRESSURE SYSTEMS
- HINGED

Model:
0890 Low Pressure Access Door

Model 0890

Nailor Model 0890 is an economical round duct access door suitable for use in low pressure applications. A durable hinge permits the heavy duty 16 ga. (1.6) door to swing open fully, allowing unobstructed access to the duct, while the zinc plated strikes and catches and polyurethane foam gasketing provide a tight, positive seal when closed.



STANDARD CONSTRUCTION:

1. **Door:** 16 ga. (1.6) galvanized steel.
2. **Door Hinge**
3. **Fasteners:** Strike and Catch. Zinc plated steel.
4. **Gasket:** Polyurethane foam.

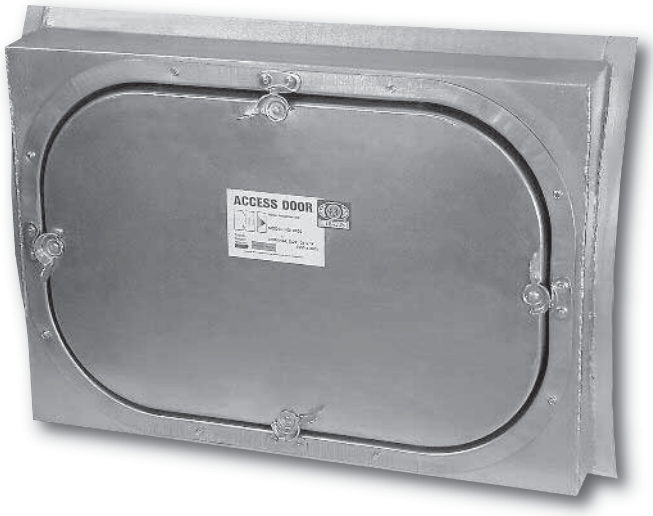
Dimensional Data (W x H):

Duct Diameter	Door Size (A x B)
5 (127)	7 x 4 (178 x 102)
6 (152)	8 x 5 (203 x 127)
7 (178)	9 x 6 (229 x 152)
8 (203)	10 x 7 (254 x 178)
9 (229)	11 x 8 (279 x 203)
10 (254)	12 x 9 (305 x 229)
12 (305)	14 x 10 (356 x 254)
14 (356)	16 x 12 (406 x 305)
16 (406)	16 x 12 (406 x 305)
18 (457)	18 x 14 (457 x 356)
20 (508)	18 x 16 (457 x 406)
24 (610)	18 x 16 (457 x 406)

Additional sizes are available; contact factory.

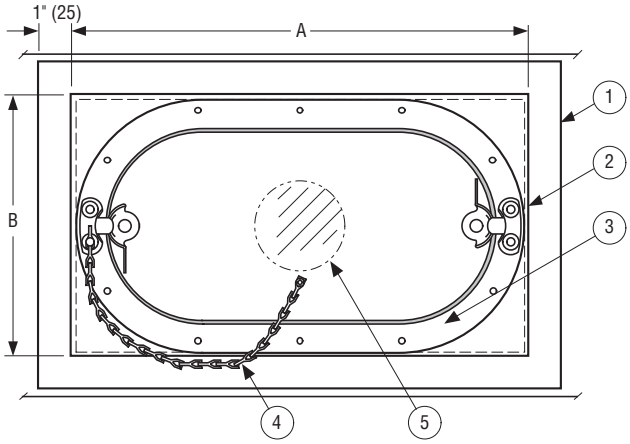
- FOR ROUND DUCT
- FOR HIGH PRESSURE SYSTEMS
- HEAVY DUTY SADDLE AND TURRET

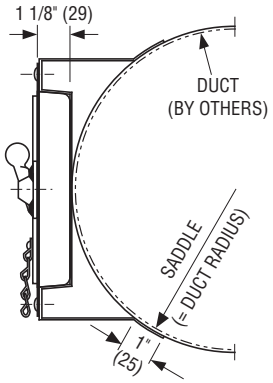
Model:
0895 High Pressure Access Door

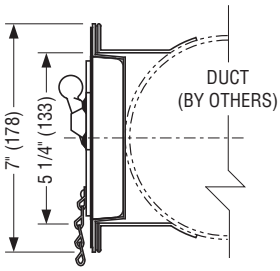


Model 0895

Model 0895 turret style access doors provide heavy duty construction with easy opening, suitable for use in medium and high pressure round duct systems. Features include an all-welded turret box and saddle formed to duct radius, and a high-pressure 0800 Series access door that is caulked and fastened to turret. Zinc plated progressive camlocks and bulb type door gasket provide a secure, tight seal.







TURRET STYLE USED ON
6" (152) DUCT SIZE ONLY

Dimensional Data (W x H):

Duct Diameter	Nominal Door Size	Turret Dimensions (A x B)	Optional Viewport
6 to 12 (152 to 305)	8 x 5 (203 x 127)	10 x 7 (254 x 178)	n/a
8 to 20 (203 to 508)	12 x 6 (305 x 152)	14 1/4 x 8 1/4 (362 x 209)	2 3/4 dia. (70)
12 to 24 (305 to 610)	18 x 10 (457 x 254)	20 1/4 x 12 1/4 (514 x 311)	5 1/2 dia. (140)
16 to 36 (406 to 914)	21 x 14 (533 x 356)	23 1/4 x 16 1/4 (590 x 413)	5 1/2 dia. (140)
24 to 60 (610 to 1524)	25 x 17 (635 x 432)	27 1/4 x 19 1/4 (692 x 489)	5 1/2 dia. (140)

STANDARD CONSTRUCTION:

1. **Frame:** 16 ga. (1.6) galvanized steel saddle formed to duct radius.
2. **Turret Box:** Turret box welded to saddle.
3. **Access Door:** High pressure access door caulked and screwed or riveted to turret.

COMMON OPTIONS:

4. **Safety Chain:** Safety chain.
5. **Viewport:** Viewport (not available on size 8" x 5" [203 x 127]).

LEAKAGE INFORMATION:

Maximum allowable leakage at 8" w.g. (2 kPa):
8" x 5" (23 x 127): 0.036 cfm (1.02 l/min.)
12" x 6" (304 x 152): 0.064 cfm (1.8 l/min.)
18" x 10" (457 x 254): 0.133 cfm (3.78 l/min.)
21" x 14" (533 x 356): 0.206 cfm (5.82 l/min.)
25" x 17" (635 x 432): 0.286 cfm (8.1 l/min.)

HOW TO ORDER OR TO SPECIFY

MODEL: 0890 LOW PRESSURE ROUND DUCT ACCESS DOOR

EXAMPLE: 0890 - 20

1. **Model**
   0890 Low Pressure Round Duct Access Door

2. **Duct Diameter/Door Size**

Duct Diameter			Door Size	
Code	inches	(mm's)	inches	(mm's)
05	5"	(127)	7" x 4"	(178 x 102)
06	6"	(152)	8" x 5"	(203 x 127)
07	7"	(178)	9" x 6"	(229 x 152)
08	8"	(203)	10" x 7"	(254 x 178)
09	9"	(229)	11" x 8"	(279 x 203)
10	10"	(254)	12" x 9"	(305 x 229)
12	12"	(305)	14" x 10"	(356 x 254)
14	14"	(356)	16" x 12"	(406 x 305)
16	16"	(406)	16" x 12"	(406 x 305)
18	18"	(457)	18" x 14"	(457 x 356)
20	20"	(508)	18" x 16"	(457 x 406)
24	24"	(610)	18" x 16"	(457 x 406)

SUGGESTED SPECIFICATION:
Provide and install as shown on plans and/or schedules and at each fire damper location, low pressure duct access doors for round duct as manufactured by Nailor Industries, Inc., which meet the following criteria: Door shall be formed to circumference of duct, constructed of 16 ga. (1.6) galvanized steel with a hinge and zinc plated strikes and catches for secure closing. Door shall be complete with full gasketing to minimize leakage. Standard of acceptance shall be Nailor Industries Model 0890.

MODEL: 0895 HIGH PRESSURE TURRET ROUND DUCT ACCESS DOOR

EXAMPLE: 0895 - 20 - 2517 - SC - VP

1. **Model**
   0895 High Pressure Round Duct Turret Access Door

2. **Duct Diameter**
   Width x Height

Code	inches	(mm's)
06	6"	(152)
in 1" (25) increments to		
60	60"	(1524)

3. **Nominal Door Size**

Code	inches	(mm's)
0805	8" x 5"	(203 x 127)
1206	12" x 6"	(305 x 152)
1810	18" x 10"	(457 x 254)
2114	21" x 14"	(533 x 356)
2517	25" x 17"	(635 x 432)

OPTIONS:

4. SC Safety Chain.
5. VP Viewport.

SUGGESTED SPECIFICATION:
Provide and install as shown on plans and/or schedules and at each fire damper location, high pressure duct access doors for round duct as manufactured by Nailor Industries, Inc., which meet the following criteria: Access doors shall meet British Standard DW144 Class C for leakage. Manufacturer shall submit leakage data tested to minimum of 8 in. w.g. (2 kPa). Door assembly shall be factory installed and caulked onto a 16 ga. (1.6) galvanized steel welded turret and saddle, formed to match duct circumference. Door frame shall be of oval design, constructed of die-formed 22 ga. (0.85) galvanized steel. Door shall be constructed of double skin die-formed 22 ga. (0.85) galvanized steel 1" (25) insulation fully enclosed within door panels. Bulb type seal shall be integrally fastened to door for positive seal. Standard of acceptance shall be Nailor Industries Model 0895.

- UL RATED FOR 1 1/2 HR. 'B' LABEL
- WARNOCH HERSEY RATED
- INSULATED
- CORROSION RESISTANT

Model: 0900-1

1 1/2 HR. 'B' LABEL IN WALLS

2 HR. LABEL IN CEILINGS
3 HR. LABEL IN WALLS

Model 0900-1

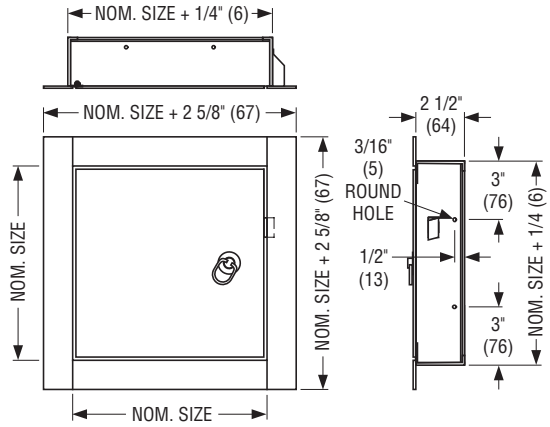
Nailor Model 0900-1 is a Fire-Rated Access Door ideal for use whenever it is necessary to provide service access to utilities located within fire separations such as corridor walls, stairwells and ceilings. The 0900-1 meets ANSI-UL 10B standards and is approved by Underwriters Laboratories for 1 1/2 hours, 250°F (121°C) max. temperature rise ('B' label) in walls, and by Warnock Hersey for 2 hours in ceilings and 3 hours in walls, allowing the same door to be used in walls or ceilings. Frame is equipped with pre-punched bolt holes and masonry anchors to facilitate installation in a variety of wall constructions. Door closes flush to frame and is furnished with a self-closing spring mechanism for fail-safe use. The 2" (51) thick insulation, which acts as a heat barrier, is also ideal for reducing sound transmission through access opening. The flush key operated latch provides convenient and secure opening and closing.

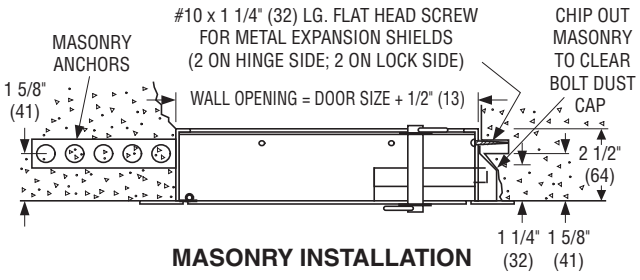
STANDARD CONSTRUCTION:

Material: Corrosion-resistant coated steel. 20 ga. (1.0) door and 16 ga. (1.6) frame.
Finish: Primed white finish standard.
Door: Flush to frame. Self-closing.
Frame: 4 piece welded frame with masonry mounting straps.
Hinge: Concealed pivot pins.
Closure Spring: Heavy duty. An extra spring for ceiling installations is provided with every door. Both springs must be attached to the door to ensure it will close when installed in the ceiling.
Latch: Flush mounted, interchangeable turn ring operator and key operator latch.
Insulation: Roxul 1280. 2" (51) thick.
Packaging: One door per carton.

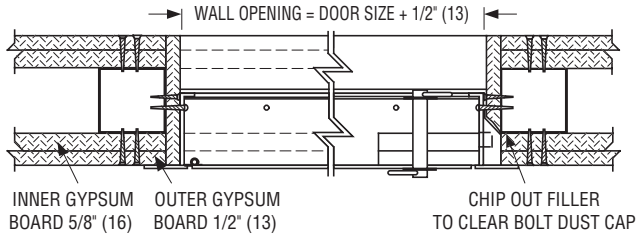
Standard Sizes (W x H):

Nominal Size		Shipping Weight lbs.
inches	mm	
8 x 8	203 x 203	10.0
12 x 12	305 x 305	14.0
16 x 16	406 x 406	16.5
18 x 18	457 x 457	19.0
24 x 24	610 x 610	30.0





MASONRY INSTALLATION



DRYWALL INSTALLATION

- UNIVERSAL ACCESS
- FOR DRYWALL, MASONRY OR PLASTER WALLS & CEILINGS

Model: 0900-2

Model 0900-2

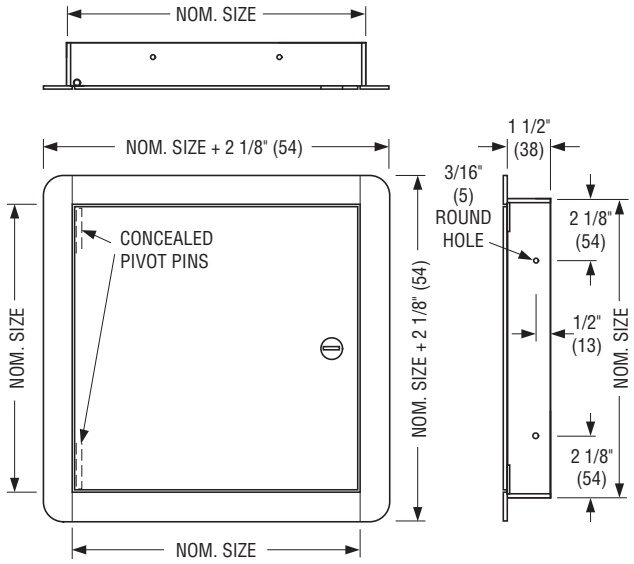
The Nailor 0900-2 Series is a multi-purpose access door designed to provide convenient access to utilities contained within walls or ceilings. This versatile access door installs flush in drywall, masonry block or tile, and plaster walls and ceilings with a clean unobtrusive finish. The frame features rounded safety corners, a concealed hinge that allows the rigid formed door to close flush, and pre-punched mounting holes for easy installation. A slotted screwdriver type catch is standard, with an optional keyed cylinder lock available. White prime coat provides a smooth finish suitable for painting to match building interior. The 0900-2 Series is offered in an array of standard sizes, with special sizes available upon request.

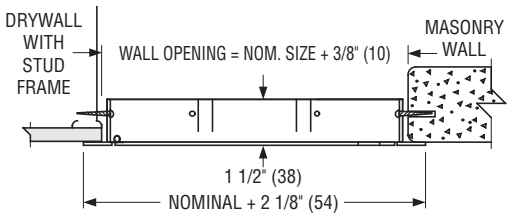
STANDARD CONSTRUCTION:

Material: Corrosion-resistant coated steel. 14 ga. (2.0) door and 16 ga. (1.6) frame.
Door: Flush to frame. Turned back around edges for extra rigidity.
Frame: The frame has pre-punched holes for simple installation.
Finish: Primed white finish standard.
Hinge: Concealed pivot pins.
Latch: Flush mounted screwdriver operated cam is standard.

Standard Sizes (W x H):

Nominal Size		Shipping Weight lbs.
inches	mm	
8 x 8	203 x 203	2.8
10 x 10	254 x 254	3.8
12 x 12	305 x 305	5.0
16 x 16	406 x 406	7.9
18 x 18	457 x 457	9.8
24 x 24	610 x 610	15.9





INSTALLATION DETAIL

HOW TO ORDER OR TO SPECIFY

MODEL: 0900-1 FIRE RATED ACCESS DOOR

EXAMPLE: 0900-1 - 2424 - KC - VP

1. **Model**
   0900-1 Fire Rated Access Door

2. **Door Size**
   Width x Height

Code	inches	(mm's)
0808	8" x 8"	(203 x 203)
1212	12" x 12"	(305 x 305)
1616	16" x 16"	(406 x 406)
1818	18" x 18"	(457 x 457)
2424	24" x 24"	(610 x 610)

OPTIONS:

3. **Lockable Latch**
   KC Cylinder Lock with Key.
4. **Material**
   SS Stainless Steel Construction.
5. **Special Size**
   — Specify special door size.

SUGGESTED SPECIFICATION:
Provide and install as shown on plans and/or schedules and at each fire damper location, fire rated access doors as manufactured by Nailor Industries, Inc., which meet the following criteria: Access doors shall be approved by Underwriters Laboratories for 1 1/2 hours, with 250°F (121°C) max. temperature rise 'B' Label rating in walls. Access doors shall also be approved by Warnock Hersey for 2 hours in ceilings and 3 hours in walls. Frame shall be constructed of 16 ga. (1.6) corrosion resistant steel. Door panel shall be constructed of 20 ga. (1.0) corrosion resistant steel and shall be filled with minimum 2" (51) thick mineral insulation to reduce heat and sound transfer. Door and latch shall be self-closing. Finish shall be prime coat. Standard of acceptance shall be Nailor Industries Model Series 0900-1.

MODEL 0900-2 UNIVERSAL ACCESS DOOR

EXAMPLE: 0900-2 - 2424 - KC - VP

1. **Model**
   0900-2 Universal Drywall Access Door

2. **Door Size**
   Width x Height

Code	inches	(mm's)
0808	8" x 8"	(203 x 203)
1212	12" x 12"	(305 x 305)
1616	16" x 16"	(406 x 406)
1818	18" x 18"	(457 x 457)
2424	24" x 24"	(610 x 610)

OPTIONS:

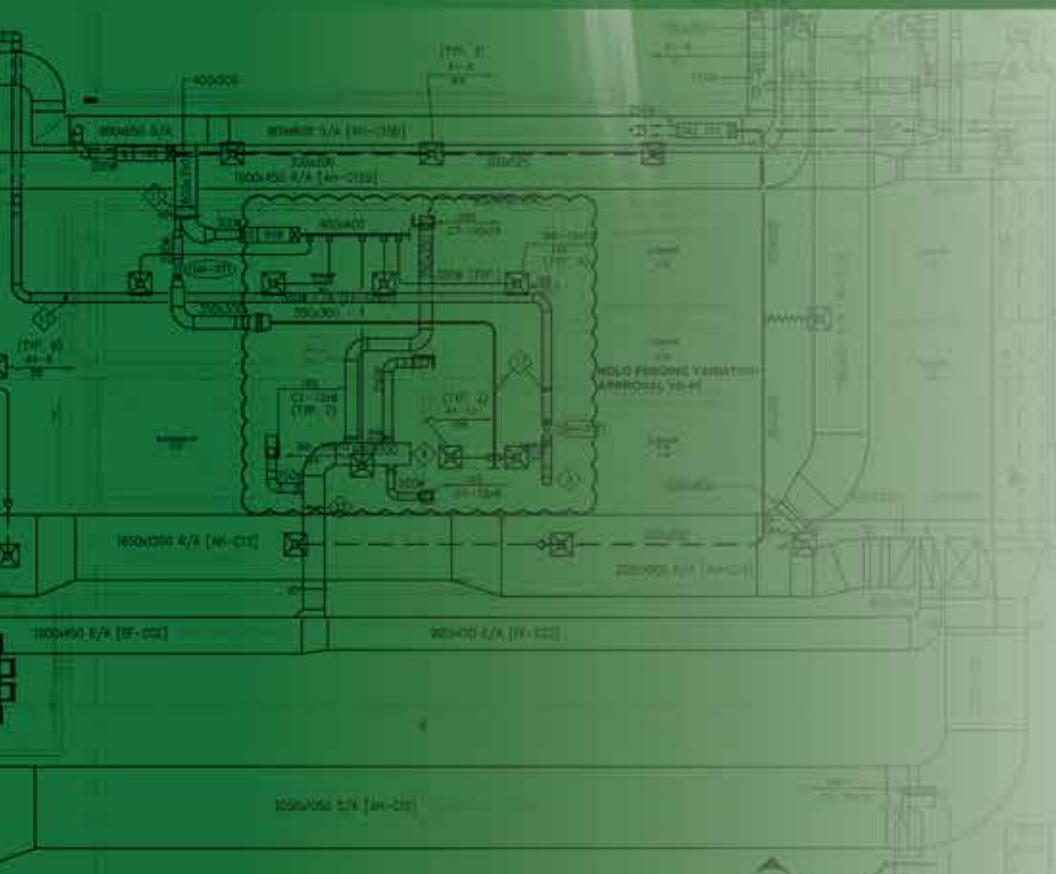
3. **Lockable Latch**
   KC Cylinder Lock with Key.
4. **Material**
   SS Stainless Steel Construction.
5. **Special Size**
   — Specify special door size.

SUGGESTED SPECIFICATION:
Provide and install as shown on plans and/or schedules, universal access doors for wall or ceiling mount as manufactured by Nailor Industries, Inc., which meet the following criteria:. Frame shall be constructed of 16 ga. (1.6) corrosion resistant steel with rounded corners and 3/16" (5) dia. pre-punched mounting holes. Door shall be constructed of 16 ga. (1.6) corrosion resistant steel with concealed hinges, and shall close flush with face of frame. Door latch shall be slotted screwdriver operated. Finish shall be prime coat suitable for field painting to match building interior. Standard of acceptance shall be Nailor Industries Model Series 0900-2.

NOTES:

Nailor® Industries Inc.

ENGINEERING FORMULAE & INDEX



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PRESSURE MEASUREMENT

Pressure Measurement

Concepts of pressure. Pressure is force per unit area. This may also be defined as energy per unit volume of fluid. There are three categories of pressure — Total Pressure, Static Pressure and Velocity Pressure that are associated with air handling. Unit of pressure is expressed in inches of water, designated **in. w.g.**

Static Pressure is the normal force per unit area at a small hole in the wall of a duct or other boundaries. It is a function of air density and degree of compression. It may be thought of as the pressure in a tire or in a tank; extends in all directions.

Velocity Pressure is the force per unit area capable of causing an equivalent velocity in moving air. Velocity pressure is a function of air density and velocity. At standard air density, the relationship between velocity pressure and velocity is expressed in the following formula:

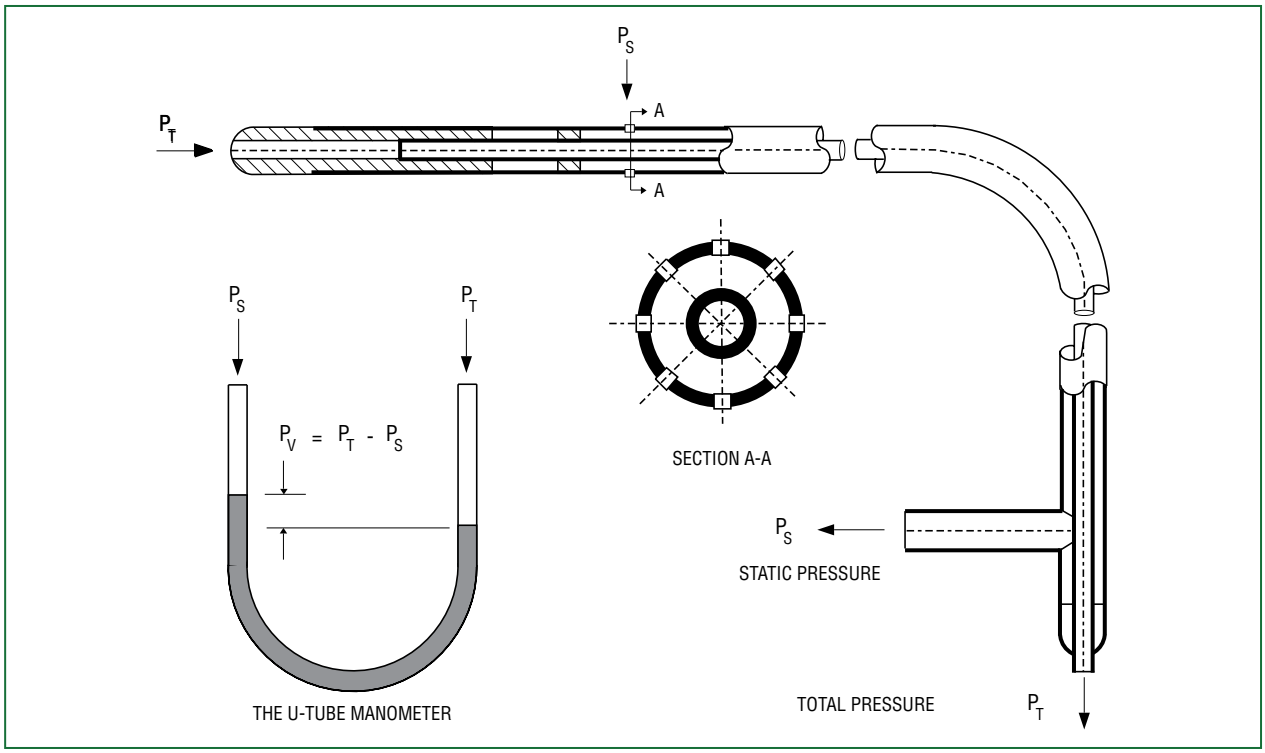
$$Pv = \left(\frac{V}{4005}\right)^2 \text{ or } V = 4005\sqrt{Pv}$$

Where: V = Air Velocity (FPM)
Pv = Velocity Pressure (in. w.g.)

Total Pressure, as its name implies, is the sum of static pressure and velocity pressure.

The Pitot Static Tube is an instrument used to measure pressure and velocities as illustrated below. It is constructed of two tubes. The inner, or impact, tube senses the total pressure as the impact opening faces upstream. The outer tube senses only the static pressure, which communicates with the airstream through small holes in its wall.

The V-Tube Manometer connects both parts of the Pitot static tube. The manometer functions as a subtracting device to give a reading of velocity pressure.



VELOCITY PRESSURE CONVERSION CHART

CONVERSION CHART for converting *VELOCITY PRESSURE* in inches of water to *VELOCITY* in feet per minute

Note: This chart is based upon standard air conditions of 70° Fahrenheit and 29.92 inches of mercury (barometric pressure), and assumes that the airflow is essentially non-compressible (under 10 inches of water pressure); as reflected by the following formula.

$$\text{Velocity (fpm)} = 4005 \sqrt{\text{Velocity Pressure in inches of water}}$$

VP	V	VP	V	VP	V	VP	V	VP	V	VP	V	VP	V	VP	V	VP	V	VP	V	VP	V
.001"	127	.062"	996	.123"	1404	.184"	1718	.245"	1982	.306"	2215	.367"	2426	.77"	3514	1.38"	4705	1.99"	5651	2.60"	6458
.002"	179	.063"	1004	.124"	1410	.185"	1723	.246"	1987	.307"	2219	.368"	2429	.78"	3537	1.39"	4722	2.00"	5664	2.61"	6470
.003"	219	.064"	1012	.125"	1416	.186"	1727	.247"	1991	.308"	2223	.369"	2433	.79"	3560	1.40"	4739	2.01"	5678	2.62"	6482
.004"	253	.065"	1020	.126"	1422	.187"	1732	.248"	1995	.309"	2226	.370"	2436	.80"	3582	1.41"	4756	2.02"	5692	2.63"	6495
.005"	283	.066"	1029	.127"	1427	.188"	1737	.249"	1999	.310"	2230	.371"	2439	.81"	3604	1.42"	4773	2.03"	5706	2.64"	6507
.006"	310	.067"	1037	.128"	1433	.189"	1741	.250"	2003	.311"	2233	.372"	2443	.82"	3625	1.43"	4790	2.04"	5720	2.65"	6519
.007"	335	.068"	1045	.129"	1439	.190"	1746	.251"	2007	.312"	2236	.373"	2445	.83"	3657	1.44"	4806	2.05"	5734	2.66"	6532
.008"	358	.069"	1052	.130"	1444	.191"	1750	.252"	2011	.313"	2239	.374"	2449	.84"	3669	1.45"	4823	2.06"	5748	2.67"	6544
.009"	380	.070"	1060	.131"	1449	.192"	1755	.253"	2015	.314"	2242	.375"	2453	.85"	3690	1.46"	4840	2.07"	5762	2.68"	6556
.010"	400	.071"	1067	.132"	1455	.193"	1759	.254"	2019	.315"	2245	.376"	2456	.86"	3709	1.47"	4856	2.08"	5776	2.69"	6569
.011"	420	.072"	1075	.133"	1461	.194"	1764	.255"	2023	.316"	2248	.377"	2459	.87"	3729	1.48"	4873	2.09"	5790	2.70"	6581
.012"	439	.073"	1082	.134"	1466	.195"	1768	.256"	2027	.317"	2251	.378"	2462	.88"	3758	1.49"	4889	2.10"	5804	2.71"	6593
.013"	457	.074"	1089	.135"	1471	.196"	1773	.257"	2031	.318"	2254	.379"	2466	.89"	3779	1.50"	4905	2.11"	5817	2.72"	6605
.014"	474	.075"	1097	.136"	1477	.197"	1777	.258"	2035	.319"	2257	.380"	2469	.90"	3800	1.51"	4921	2.12"	5831	2.73"	6617
.015"	491	.076"	1104	.137"	1482	.198"	1782	.259"	2039	.320"	2260	.381"	2472	.91"	3821	1.52"	4938	2.13"	5845	2.74"	6629
.016"	507	.077"	1111	.138"	1488	.199"	1787	.260"	2042	.321"	2264	.382"	2475	.92"	3842	1.53"	4954	2.14"	5859	2.75"	6641
.017"	522	.078"	1119	.139"	1493	.200"	1791	.261"	2046	.322"	2268	.383"	2479	.93"	3863	1.54"	4970	2.15"	5872	2.76"	6654
.018"	537	.079"	1125	.140"	1498	.201"	1795	.262"	2050	.323"	2272	.384"	2481	.94"	3884	1.55"	4986	2.16"	5886	2.77"	6666
.019"	552	.080"	1133	.141"	1504	.202"	1800	.263"	2054	.324"	2276	.385"	2485	.95"	3904	1.56"	5002	2.17"	5899	2.78"	6678
.020"	566	.081"	1140	.142"	1509	.203"	1804	.264"	2058	.325"	2280	.386"	2488	.96"	3924	1.57"	5018	2.18"	5913	2.79"	6690
.021"	580	.082"	1147	.143"	1515	.204"	1809	.265"	2062	.326"	2284	.387"	2491	.97"	3945	1.58"	5034	2.19"	5927	2.80"	6702
.022"	594	.083"	1154	.144"	1520	.205"	1813	.266"	2066	.327"	2289	.388"	2495	.98"	3965	1.59"	5050	2.20"	5940	2.81"	6714
.023"	607	.084"	1161	.145"	1525	.206"	1818	.267"	2070	.328"	2293	.389"	2499	.99"	3985	1.60"	5066	2.21"	5954	2.82"	6725
.024"	620	.085"	1167	.146"	1530	.207"	1822	.268"	2074	.329"	2297	.390"	2501	1.00"	4005	1.61"	5082	2.22"	5967	2.83"	6737
.025"	633	.086"	1175	.147"	1536	.208"	1827	.269"	2078	.330"	2301	.40"	2533	1.01"	4025	1.62"	5098	2.23"	5981	2.84"	6749
.026"	645	.087"	1181	.148"	1541	.209"	1831	.270"	2081	.331"	2304	.41"	2563	1.02"	4045	1.63"	5114	2.24"	5994	2.85"	6761
.027"	658	.088"	1188	.149"	1546	.210"	1835	.271"	2085	.332"	2308	.42"	2595	1.03"	4064	1.64"	5129	2.25"	6008	2.86"	6773
.028"	670	.089"	1193	.150"	1551	.211"	1839	.272"	2089	.333"	2311	.43"	2626	1.04"	4084	1.65"	5144	2.26"	6021	2.87"	6785
.029"	682	.090"	1201	.151"	1556	.212"	1844	.273"	2093	.334"	2315	.44"	2656	1.05"	4103	1.66"	5160	2.27"	6034	2.88"	6797
.030"	694	.091"	1208	.152"	1561	.213"	1848	.274"	2097	.335"	2318	.45"	2687	1.06"	4123	1.67"	5175	2.28"	6047	2.89"	6809
.031"	705	.092"	1215	.153"	1567	.214"	1853	.275"	2101	.336"	2322	.46"	2716	1.07"	4142	1.68"	5191	2.29"	6060	2.90"	6820
.032"	716	.093"	1222	.154"	1572	.215"	1857	.276"	2105	.337"	2325	.47"	2746	1.08"	4162	1.69"	5206	2.30"	6074	2.91"	6832
.033"	727	.094"	1228	.155"	1577	.216"	1862	.277"	2119	.338"	2329	.48"	2775	1.09"	4181	1.70"	5222	2.31"	6087	2.92"	6844
.034"	738	.095"	1234	.156"	1582	.217"	1866	.278"	2113	.339"	2332	.49"	2804	1.10"	4200	1.71"	5237	2.32"	6100	2.93"	6855
.035"	749	.096"	1241	.157"	1587	.218"	1870	.279"	2116	.340"	2335	.50"	2832	1.11"	4219	1.72"	5253	2.33"	6113	2.94"	6867
.036"	759	.097"	1247	.158"	1592	.219"	1875	.280"	2119	.341"	2338	.51"	2860	1.12"	4238	1.73"	5268	2.34"	6126	2.95"	6879
.037"	770	.098"	1254	.159"	1597	.220"	1879	.281"	2123	.342"	2342	.52"	2888	1.13"	4257	1.74"	5283	2.35"	6139	2.96"	6890
.038"	780	.099"	1260	.160"	1602	.221"	1883	.282"	2127	.343"	2345	.53"	2916	1.14"	4276	1.75"	5298	2.36"	6152	2.97"	6902
.039"	791	.100"	1266	.161"	1607	.222"	1887	.283"	2131	.344"	2349	.54"	2943	1.15"	4295	1.76"	5313	2.37"	6165	2.98"	6913
.040"	801	.101"	1273	.162"	1612	.223"	1892	.284"	2135	.345"	2352	.55"	2970	1.16"	4314	1.77"	5328	2.38"	6179	2.99"	6925
.041"	811	.102"	1279	.163"	1617	.224"	1896	.285"	2139	.346"	2356	.56"	2997	1.17"	4332	1.78"	5343	2.39"	6191	3.00"	6937
.042"	821	.103"	1285	.164"	1622	.225"	1900	.286"	2143	.347"	2360	.57"	3024	1.18"	4350	1.79"	5359	2.40"	6204	3.01"	6948
.043"	831	.104"	1292	.165"	1627	.226"	1905	.287"	2147	.348"	2363	.58"	3050	1.19"	4368	1.80"	5374	2.41"	6217	3.02"	6960
.044"	840	.105"	1298	.166"	1632	.227"	1909	.288"	2151	.349"	2366	.59"	3076	1.20"	4386	1.81"	5388	2.42"	6230	3.03"	6971
.045"	849	.106"	1304	.167"	1637	.228"	1913	.289"	2154	.350"	2369	.60"	3102	1.21"	4405	1.82"	5403	2.43"	6243	3.04"	6983
.046"	859	.107"	1310	.168"	1642	.229"	1917	.290"	2157	.351"	2372	.61"	3127	1.22"	4423	1.83"	5418	2.44"	6256	3.05"	6994
.047"	868	.108"	1316	.169"	1646	.230"	1921	.291"	2161	.352"	2376	.62"	3153	1.23"	4442	1.84"	5433	2.45"	6269	3.06"	7006
.048"	877	.109"	1322	.170"	1651	.231"	1925	.292"	2164	.353"	2379	.63"	3179	1.24"	4460	1.85"	5447	2.46"	6281	3.07"	7017
.049"	887	.110"	1328	.171"	1656	.232"	1929	.293"	2168	.354"	2383	.64"	3204	1.25"	4478	1.86"	5462	2.47"	6294	3.08"	7028
.050"	896	.111"	1334	.172"	1661	.233"	1933	.294"	2171	.355"	2386	.65"	3229	1.26"	4495	1.87"	5477	2.48"	6307	3.09"	7040
.051"	904	.112"	1340	.173"	1666	.234"	1937	.295"	2175	.356"	2389	.66"	3254	1.27"	4513	1.88"	5491	2.49"	6319	3.10"	7051
.052"	913	.113"	1346	.174"	1670	.235"	1941	.296"	2179	.357"	2393	.67"	3279	1.28"	4531	1.89"	5506	2.50"	6332	3.11"	7063
.053"	922	.114"	1352	.175"	1675	.236"	1945	.297"	2182	.358"	2396	.68"	3303	1.29"	4549	1.90"	5521	2.51"	6345	3.12"	7074
.054"	931	.115"	1358	.176"	1680	.237"	1950	.298"	2186	.359"	2400	.69"	3327	1.30"	4566	1.91"	5535	2.52"	6358	3.13"	7085
.055"	939	.116"	1364	.177"	1685	.238"	1954	.299"	2189	.360"	2403	.70"	3351	1.31"	4583	1.92"	5550	2.53"	6370	3.14"	7097
.056"	948	.117"	1370	.178"	1690	.239"	1958	.300"	2193	.361"	2406	.71"	3375	1.32"	4601	1.93"	5564	2.54"	6383	3.15"	7108
.057"	956	.118"	1376	.179"	1695	.240"	1962	.301"	2197	.362"	2410	.72"	3398	1.33"	4619	1.94"	5579	2.55"	6395	3.16"	7119
.058"	964	.119"	1382	.180"	1699	.241"	1966	.302"	2200	.363"	2413	.73"	3422	1.34"	4636	1.95"	5593	2.56"	6408	3.17"	7131
.059"	973	.120"	1387	.181"	1704	.242"	1970	.303"	2204	.364"	2416	.74"	3445	1.35"	4653	1.96"	5608	2.57"	6420	3.18"	7142
.060"	981	.121"	1393	.182"	1709	.243"	1974	.304"	2208	.365"	2420	.75"	3468	1.36"	4671	1.97"	5623	2.58"	6433	3.19"	7153
.061"	989	.122"	1399	.183"	1713	.244"	1978	.305"	2212	.366"	2423	.76"	3491	1.37"	4688	1.98"	5637	2.59"	6445	3.20"	7164

MISCELLANEOUS

Equivalent Measures of Pressure

1 lb. per square inch	=	144 lbs. per sq. ft. 2.036 in. Mercury at 32°F. 2.311 ft. Water at 70°F. 27.74 in. Water at 70°F.
1 ounce per square inch	=	1272 in. Mercury at 32°F. 1.733 in. Water at 70°F.
1 Atmosphere	=	14.696 lbs. per sq. in. 2116.3 lbs. per sq. ft. 33.96 ft. Water at 70°F. 29.92 in. Mercury at 32°F.
1 inch Water at 70°F	=	.03609 lb. per sq. in. .5774 oz. per sq. in. 5.196 lbs. per sq. ft.
1 foot Water at 70°F	=	.433 lbs. per sq. in. 62.31 lbs. sq. ft.
1 inch Mercury at 32°F	=	.491 lbs. per sq. in. 7.86 oz. per sq. in. 1.136 ft. Water at 70°F. 13.63 in. Water at 70°F.

Sheet Metal Thickness (Inches) and Weight (Lbs./Sq. Ft.)

Gauge NO.	Steel		Galvanized Steel		Aluminum	
	Thickness	Weight	Thickness	Weight	Thickness	Weight
3	.2391	10.000			.2294	3.23
4	.2242	9.375			.2043	2.88
5	.2092	8.750			.1819	2.56
6	.1943	8.125			.1620	2.29
7	.1793	7.500			.1443	2.04
8	.1644	6.875	.1681	7.031	.1285	1.81
9	.1495	6.250	.1532	6.406	.1144	1.61
10	.1345	5.625	.1382	5.781	.1019	1.44
11	.1196	5.000	.1233	5.156	.0907	1.28
12	.1046	4.375	.1084	4.531	.0808	1.14
13	.0897	3.750	.0934	3.906	.0720	1.02
14	.0747	3.125	.0785	3.281	.0641	.905
15	.0673	2.812	.0710	2.969	.0571	.806
16	.0598	2.500	.0635	2.656	.0508	.717
17	.0538	2.250	.0575	2.406	.0453	.639
18	.0478	2.000	.0516	2.156	.0403	.569
19	.0418	1.750	.0456	1.906	.0359	.507
20	.0359	1.500	.0396	1.656	.0320	.452
21	.0329	1.375	.0366	1.531	.0285	.402
22	.0299	1.250	.0336	1.406	.0254	.357
23	.0269	1.125	.0306	1.281	.0226	.319
24	.0239	1.000	.0276	1.156	.0201	.284
25	.0209	.875	.0247	1.031	.0179	.253
26	.0179	.750	.0217	.906	.0159	.224
27	.0164	.688	.0202	.844	.0142	.200
28	.0149	.625	.0187	.781	.0126	.178
29	.0135	.562	.0172	.719	.0113	.159
30	.0120	.500	.0157	.656	.0100	.141
31	.0105	.438	.0142	.594	.0089	.126
32	.0097	.406	.0134	.563	.0080	.113

† Steel – U.S. Standard (Revised)
Galvanized – Galvanized Gauge No.
Aluminum – American Gauge and Brown & Sharpe

Round Duct Area and Circumference

Dia. In Inches	Area Sq. Ft.	Circum. Inches	Dia. In Inches	Area Sq. Ft.	Circum. Inches
1	.00545	3.142	26	3.687	81.68
2	.0218	6.283	27	3.976	84.82
3	.0491	9.425	28	4.276	87.96
4	.0873	12.57	29	4.587	91.11
5	.1364	15.71	30	4.909	94.25
6	.1963	18.85	31	5.241	97.39
7	.2673	21.99	32	5.585	100.5
8	.3491	25.13	33	5.940	103.7
9	.4418	28.27	34	6.305	106.8
10	.5454	31.42	35	6.681	110.0
11	.6600	34.56	36	7.069	113.1
12	.7854	37.70	37	7.467	116.2
13	.9218	40.84	38	7.876	119.4
14	1.069	43.98	39	8.296	122.5
15	1.227	47.12	40	8.727	125.7
16	1.396	50.27	41	9.168	128.8
17	1.576	53.41	42	9.621	131.9
18	1.767	56.55	43	10.08	135.1
19	1.969	59.69	44	10.56	138.2
20	2.182	62.83	45	11.04	141.4
21	2.405	65.97	46	11.54	144.5
22	2.640	69.12	47	12.05	147.7
23	2.885	72.26	48	12.57	150.8
24	3.142	75.40	49	13.09	153.9
25	3.409	78.54	50	13.64	157.1

MISCELLANEOUS

Common Fractions Reduced to Decimals

8ths	16ths	32ds	64ths		8ths	16ths	32ds	64ths		8ths	16ths	32ds	64ths	
			1	.015625				23	.359375				45	.703125
		1	2	.03125	3	6	12	24	.375			23	46	.71875
			3	.046875				25	.390625				47	.734375
	1	2	4	.0625			13	26	.40625	6	12	24	48	.75
			5	.078125				27	.421875				49	.765625
		3	6	.09375		7	14	28	.4375			25	50	.78125
			7	.109375				29	.453125				51	.796875
1	2	4	8	.125			15	30	.46875		13	26	52	.8125
			9	.140625				31	.484375				53	.828125
		5	10	.15625	4	8	16	32	.5			27	54	.84375
			11	.171875				33	.515625				55	.859375
	3	6	12	.1875			17	34	.53125	7	14	28	56	.875
			13	.203125				35	.546875				57	.890625
		7	14	.21875		9	18	36	.5625			29	58	.90625
			15	.234375				37	.578125				59	.921875
2	4	8	16	.25			19	38	.59375		15	30	60	.9375
			17	.265625				39	.609375				61	.953125
		9	18	.28125	5	10	20	40	.625			31	62	.96875
			19	.296875				41	.640625				63	.984375
	5	10	20	.3125			21	42	.65625	8	16	32	64	1.
			21	.328125				43	.671875					
		11	22	.34375		11	22	44	.6875					

Mathematical Formulae

To find the CIRCUMFERENCE of a:

Circle — Multiply the diameter by 3.14159265 (usually 3.1416).

To find the AREA of a:

Circle — Multiply the square of the diameter by .785398 (usually .7854).
Rectangle — Multiply the length of the base by the height.
Sphere (surface) — Multiply the square of the radius by 3.1416 and multiply by 4.
Square — Square the length of one side.
Trapezoid — Add the two parallel sides, multiply by the height and divide by 2.
Triangle — Multiply the base by the height and divide by 2.

To find the VOLUME of a:

Cone — Multiply the square of the radius of the base by 3.1416, multiply by the height, and divide by 3.
Cube — Cube the length of one edge.
Cylinder — Multiply the square of the radius of the base by 3.1416 and multiply by the height.
Pyramid — Multiply the area of the base by the height and divide by 3.
Rectangular Prism — Multiply the length by the width by the height.
Sphere — Multiply the cube of the radius by 3.1416, multiply by 4 and divide by 3.

MISCELLANEOUS

Definitions and Formulae

CFM = Cubic Feet per Minute
FPM = Feet per Minute (Velocity)
Ak = Area Factor Expressed in Square Feet
TP = Total Pressure Expressed in Inches of Water
SP = Static Pressure Expressed in Inches of Water
VP = Velocity Pressure Expressed in Inches of Water
VP = $(FPM \div 4005)^2$
ΔP = Differential Pressure
ΔP_S = Static Differential Pressure
ΔP_T = Total Differential Pressure

$CFM = FPM \times Ak$
$FPM = CFM \div Ak$
$VP = TP - SP$
$TP = SP + VP$
$SP = TP - VP$
$\Delta P_T = TP_1 - TP_2$
$\Delta P_S = SP_1 - SP_2$

Measures of Force and Pressure

Dyne = force necessary to accelerate a 1-gram mass 1 centimeter per second squared = 0.000072 poundal.

Poundal = force necessary to accelerate a 1-pound mass 1 foot per second squared = 13,825.5 dynes = 0.138255 newtons.

Newton = force needed to accelerate a 1-kilogram mass 1 meter per second squared.

Pascal (pressure) = 1 newton per square meter = 0.020885 pound per square foot.

Atmosphere (air pressure at sea level) = 2,116.102 pounds per square foot = 14.6952 pounds per square inch = 1.0332 kilograms per square centimeter = 101,323 newtons per square meter.

METRIC CONVERSION

Metric Guide Conversion Factors

Quantity	Imperial Unit	Metric Unit		From Imperial To Metric Multiply By:	From Metric To Imperial Multiply By:
Area	square foot	square meter	(m^2)	0.0929	10.764
	square inch	square millimeter	(mm^2)	645.16	.00155
Density	pounds per cubic foot	kilograms per cubic meter	(kg/M^3)	16.018	.0624
Energy	British thermal unit (BTU)	joule	(J)	1055.056	.000948
	kilowatt hour	megajoule	(MJ)	3.6	.2778
	watts per second	joule	(J)	1	1
	horsepower hour	megajoule	(MJ)	2.6845	.3725
Force	ounce force	newton	(N)	.278	3.597
	pound force	newton	(N)	4.4482	.2248
	kilogram force	newton	(N)	9.8067	.102
Heat	BTU per hour	watt	(W)	.2931	3.412
	BTU per pound	joules per kilogram	(J/kg)	2326	.00043
Length	inch	millimeter	(mm)	25.4	.0394
	foot	millimeter	(mm)	304.8	.00328
	foot	meter	(m)	.3048	3.2808
	yard	meter	(m)	.9144	1.0936
Mass (weight)	ounce (avoirdupois)	gram	(g)	28.35	.0353
	pound (avoirdupois)	kilogram	(kg)	.4536	2.2046
Power	horsepower	kilowatt	(kW)	.7457	1.341
	horsepower (boiler)	kilowatt	(kW)	9.8095	.1019
	foot pound - force per minute	watt	(W)	.0226	44.254
	ton of refrigeration	kilowatt	(kW)	3.517	.2843
Pressure	inch of water column	kilopascal	(kPa)	.2486	4.0219
	foot of water column	kilopascal	(kPa)	2.9837	.3352
	inch of mercury column	kilopascal	(kPa)	3.3741	.2964
	ounces per square inch	kilopascal	(kPa)	.4309	2.3206
	pounds per square inch	kilopascal	(kPa)	6.8948	.145
Temperature	Fahrenheit	Celsius	(°C)	5/9(°F-32)	(9/5°C)+32
Torque	ounce - force inch	millinewton-meter	(mN.m)	7.0616	.1416
	pound - force inch	newton-meter	(N.m)	.113	8.8495
	pound - force foot	newton-meter	(N.m)	1.3558	.7376
Velocity	feet per second	meters per second	(m/s)	.3048	3.2808
	feet per minute	meters per second	(m/s)	.00508	196.85
	miles per hour	meters per second	(m/s)	.44704	2.2369
Volume (capacity)	cubic foot	liter	(l)	28.3168	.03531
	cubic inch	cubic centimeter	(cm^2)	16.3871	.06102
	cubic yard	cubic meter	(m^3)	.7646	1.308
	gallon (U.S.)	liter	(l)	3.785	.2642
	gallon (imperial)	liter	(l)	4.546	.212
Volume (flow)	cubic feet per minute (cfm)	liters per second	(l/s)	.4719	2.119
	cubic feet per minute (cfm)	cubic meters per second	(m^3/s)	.0004719	2119
	cubic feet per hour (cfh)	milliliters per second	(ml/s)	7.8658	.127133
	gallons per minute (U.S.)	liters per second	(l/s)	.06309	15.85
	gallons per minute (imperial)	liters per second	(l/s)	0.07577	13.198

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"Complete Air Control and Distribution Solutions"

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