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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."

www.nailor.com
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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.
LOUVERS

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 1604JD & 1606JD
EXTRUDED ALUMINUM LOUVERS
DRAINABLE HEAD, ARCHITECTURAL BLADE
Nailor Models 1604JD and 1606JD 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 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 Models 1604JD and 1606JD are AMCA Licensed for Water Penetration and Air Performance.
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 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.
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 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.
**LOUVERS**

**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.

**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 complement 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 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 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 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:

### EXTRUDED ALUMINUM - 1600 Series Louvers by Application

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### FORMED STEEL - 1700 Series Louvers by Application

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**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):
   \[ \text{cfm} \div \text{fpm} = \text{sq. ft. Free Area} \]
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

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

- 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.
### Models:
- **1602J** 2" (51) Deep, J Blade
- **1602K** 2" (51) Deep, K Blade
- **1602D** 2" (51) Deep, Drainable Blade

#### 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 m²). 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 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: 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 up to 120" (3048) wide. Larger assemblies require separate visible frames with downsprouts.
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 m²). Larger louvers will require field assembly of smaller sections.

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 downsprouts 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 downsprouts 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: 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 downsprouts.
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 m²). Larger louvers will require field assembly of smaller sections.
**EXTRUDED ALUMINUM • THINLINE FRAME**

**PERFORMANCE DATA:**

**MODEL: 1602J**

**FREE AREA in Square Feet and Square Meters**

<table>
<thead>
<tr>
<th>Free Area %</th>
<th>45%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Area sq. ft. (sq. m)</td>
<td>7.14 (0.66)</td>
</tr>
<tr>
<td>Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m)</td>
<td>549 fpm (167 m/min.)</td>
</tr>
<tr>
<td>(15 min. test duration)</td>
<td></td>
</tr>
<tr>
<td>Air Volume at Free Area Velocity shown</td>
<td>3920 cfm (1850 l/s)</td>
</tr>
<tr>
<td>Pressure Drop at Free Area Velocity shown</td>
<td>.05 in. w.g. (12 Pa)</td>
</tr>
</tbody>
</table>

**MODEL 1602J PRESSURE DROP**

<table>
<thead>
<tr>
<th>Stat. Pressure Drop in Inches w.g. (Pa)</th>
<th>.%10</th>
<th>.%20</th>
<th>.%30</th>
<th>.%40</th>
<th>.%50</th>
<th>.%60</th>
<th>.%70</th>
<th>.%80</th>
<th>.%90</th>
</tr>
</thead>
<tbody>
<tr>
<td>INAKE</td>
<td>7.00</td>
<td>7.00</td>
<td>7.00</td>
<td>7.00</td>
<td>7.00</td>
<td>7.00</td>
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<td>7.00</td>
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<tr>
<td>EXHAUST</td>
<td>7.00</td>
<td>7.00</td>
<td>7.00</td>
<td>7.00</td>
<td>7.00</td>
<td>7.00</td>
<td>7.00</td>
<td>7.00</td>
<td>7.00</td>
</tr>
</tbody>
</table>

**AIREFLOW/WATER PENETRATION DATA**

for 48" x 48" (1219 x 1219) Louver Size

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

**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: 1602K**

**FREE AREA in Square Feet and Square Meters**

<table>
<thead>
<tr>
<th>Model</th>
<th>1602K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Area %</td>
<td>47%</td>
</tr>
<tr>
<td>Free Area sq. ft. (sq. m)</td>
<td>7.55 (0.70)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Model</th>
<th>1602K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Area %</td>
<td>47%</td>
</tr>
<tr>
<td>Free Area sq. ft. (sq. m)</td>
<td>7.55 (0.70)</td>
</tr>
</tbody>
</table>

**INTAKE**

<table>
<thead>
<tr>
<th>Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m)</th>
<th>401 fpm (122 m/min.) (15 min. test duration)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Volume at Free Area Velocity shown</td>
<td>3028 cfm (1429 l/s)</td>
</tr>
<tr>
<td>Pressure Drop at Free Area Velocity shown</td>
<td>.02 in. w.g. (5 Pa)</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Static Pressure Drop in Inches w.g. (Pa)</th>
<th>.01 (3)</th>
<th>.05 (12)</th>
<th>.10 (25)</th>
<th>.20 (50)</th>
<th>.30 (75)</th>
<th>.50 (124)</th>
</tr>
</thead>
</table>
**PERFORMANCE DATA:**

**MODEL: 1602D**

**FREE AREA in Square Feet and Square Meters**

<table>
<thead>
<tr>
<th>Width in Inches and Meters</th>
<th>8</th>
<th>12</th>
<th>18</th>
<th>24</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
<th>54</th>
<th>60</th>
<th>66</th>
<th>72</th>
<th>78</th>
<th>84</th>
<th>90</th>
<th>96</th>
<th>102</th>
<th>108</th>
<th>114</th>
<th>120</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Free Area %</strong></td>
<td>0.07</td>
<td>0.12</td>
<td>0.19</td>
<td>0.34</td>
<td>0.41</td>
<td>0.49</td>
<td>0.56</td>
<td>0.63</td>
<td>0.70</td>
<td>0.78</td>
<td>0.85</td>
<td>0.92</td>
<td>1.00</td>
<td>1.07</td>
<td>1.14</td>
<td>1.21</td>
<td>1.29</td>
<td>1.36</td>
<td>1.43</td>
<td></td>
</tr>
<tr>
<td><strong>Free Area sq. ft. (sq. m)</strong></td>
<td>6.91 (0.64)</td>
<td>11.79 (1.06)</td>
<td>16.67 (1.50)</td>
<td>21.55 (1.95)</td>
<td>26.42 (2.40)</td>
<td>31.29 (2.85)</td>
<td>36.16 (3.20)</td>
<td>41.03 (3.60)</td>
<td>45.90 (4.05)</td>
<td>50.77 (4.50)</td>
<td>55.64 (5.00)</td>
<td>60.51 (5.50)</td>
<td>65.38 (6.00)</td>
<td>70.25 (6.50)</td>
<td>75.12 (7.00)</td>
<td>80.00 (7.50)</td>
<td>84.87 (8.00)</td>
<td>89.74 (8.50)</td>
<td>94.61 (9.00)</td>
<td></td>
</tr>
</tbody>
</table>

**Height in Inches and Meters**

<table>
<thead>
<tr>
<th><strong>Height</strong></th>
<th>8</th>
<th>12</th>
<th>18</th>
<th>24</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
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<th>60</th>
<th>66</th>
<th>72</th>
<th>78</th>
<th>84</th>
<th>90</th>
<th>96</th>
<th>102</th>
<th>108</th>
<th>114</th>
<th>120</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Static Pressure Drop in Inches w.g. (Pa)</strong></td>
<td>1.0 (25)</td>
<td>1.25 (32)</td>
<td>1.50 (38)</td>
<td>1.75 (45)</td>
<td>2.00 (50)</td>
<td>2.25 (56)</td>
<td>2.50 (62)</td>
<td>2.75 (70)</td>
<td>3.00 (75)</td>
<td>3.25 (80)</td>
<td>3.50 (85)</td>
<td>3.75 (90)</td>
<td>4.00 (95)</td>
<td>4.25 (100)</td>
<td>4.50 (105)</td>
<td>4.75 (110)</td>
<td>5.00 (115)</td>
<td>5.25 (120)</td>
<td>5.50 (125)</td>
<td>5.75 (130)</td>
</tr>
</tbody>
</table>

**AIRFLOW/WATER PENETRATION DATA**

for 48" x 48" (1219 x 1219) Louver Size

<table>
<thead>
<tr>
<th>Model</th>
<th>Free Area %</th>
<th>Free Area sq. ft. (sq. m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1602D</td>
<td>43%</td>
<td>6.91 (0.64)</td>
</tr>
</tbody>
</table>

**INTAKE**

<table>
<thead>
<tr>
<th>Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1123 fpm (342 m/min.)</td>
</tr>
</tbody>
</table>

**Air Volume at Free Area Velocity shown**

7780 cfm (3682 l/s)

**Pressure 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.

**EXHAUST**

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

<table>
<thead>
<tr>
<th>Louver test size: 48&quot; x 48&quot; (1219 x 1219 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard air density @ 0.075 lbs/ft³.</td>
</tr>
<tr>
<td>Tested to AMCA Fig. 5.5 - 6.5.</td>
</tr>
</tbody>
</table>
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) undercut (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 50% 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) undercut (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, 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 50% PVDF coating, with 5 year warranty; color to be (specifier to select: selected from Nailor standard color chart or custom color) 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 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 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.
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 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 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 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 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 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 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 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) 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.
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: 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 m²). 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**

Nailor Model 1606J is an architecturally styled louver utilizing high performance J style blades, constructed with a continuous architectural appearance that will visually complement 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**
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 m²). 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.
### PERFORMANCE DATA:
**MODEL: 1604J**

**FREE AREA in Square Feet and Square Meters**

<table>
<thead>
<tr>
<th>Height in Inches and Meters</th>
<th>Air Volume at Free Area Velocity shown in Standard air density @ 0.075 lbs/ft³. (61)</th>
<th>AIRFLOW/ WATER PENETRATION DATA for 48&quot; x 48&quot; (1219 x 1219) Louver Size</th>
<th>PRESSURE DROP</th>
<th>Air Velocity in Feet (Meters) Per Minute Through Free Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>.01 (3)</td>
<td>.12</td>
<td>.07 (22)</td>
<td>.02 (5)</td>
</tr>
<tr>
<td>18</td>
<td>.02 (5)</td>
<td>.20</td>
<td>.13 (40)</td>
<td>.04 (9)</td>
</tr>
<tr>
<td>24</td>
<td>.03 (8)</td>
<td>.29</td>
<td>.17 (50)</td>
<td>.05 (10)</td>
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<td>30</td>
<td>.04 (10)</td>
<td>.38</td>
<td>.21 (60)</td>
<td>.06 (12)</td>
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<td>36</td>
<td>.05 (12)</td>
<td>.48</td>
<td>.25 (75)</td>
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<td>42</td>
<td>.06 (14)</td>
<td>.57</td>
<td>.29 (80)</td>
<td>.08 (16)</td>
</tr>
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<td>48</td>
<td>.07 (16)</td>
<td>.66</td>
<td>.33 (90)</td>
<td>.09 (18)</td>
</tr>
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<td>54</td>
<td>.08 (18)</td>
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<td>60</td>
<td>.09 (20)</td>
<td>.84</td>
<td>.41 (112)</td>
<td>.11 (22)</td>
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<td>66</td>
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<td>.45 (125)</td>
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<td>72</td>
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<td>.49 (135)</td>
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<td>78</td>
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<td>84</td>
<td>.13 (28)</td>
<td>1.20</td>
<td>.57 (155)</td>
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<td>90</td>
<td>.14 (30)</td>
<td>1.29</td>
<td>.61 (165)</td>
<td>.16 (32)</td>
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<tr>
<td>96</td>
<td>.15 (32)</td>
<td>1.38</td>
<td>.65 (175)</td>
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<td></td>
<td>.16 (34)</td>
<td>1.47</td>
<td>.69 (185)</td>
<td>.18 (36)</td>
</tr>
</tbody>
</table>

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

---

**Table:**

<table>
<thead>
<tr>
<th>Free Area %</th>
<th>Free Area sq. ft. (sq. m.)</th>
<th>Free Area Velocity at Point of Beginning Water Penetration</th>
<th>Static Pressure Drop in Inches w.g. (Pa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>54%</td>
<td>8.62 (0.80)</td>
<td>722 fpm (220 m/min)</td>
<td>.12 (3)</td>
</tr>
</tbody>
</table>

---

**Pressure Drop Data:**

- **Model:** 1604J
- **Free Area %:** 54%
- **Free Area sq. ft. (sq. m.):** 8.62 (0.80)
- **Free Area Velocity at Point of Beginning Water Penetration:** 722 fpm (220 m/min)
- **Air Volume at Free Area Velocity shown:** 6224 cfm (2937 l/s)
- **Pressure Drop at Free Area Velocity shown:** .09 in. w.g. (22 Pa)
- **Air Velocity in Feet (Meters) Per Minute Through Free Area:**
- **Louvers test size:** 48" x 48" (1219 x 1219 mm).
- **Standard air density:** @ .075 lbs/ft³. (61)
- **Tested to AMCA Fig. 5.5 – 6.5.**
### PERFORMANCE DATA:

**MODEL: 1606J**

**FREE AREA in Square Feet and Square Meters**

<table>
<thead>
<tr>
<th>Width in Inches</th>
<th>Width in Meters</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>0.30</td>
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<tr>
<td>18</td>
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<td>24</td>
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<tr>
<td>114</td>
<td>2.96</td>
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<tr>
<td>120</td>
<td>3.12</td>
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**Height in Inches and Meters**

<table>
<thead>
<tr>
<th>Height in Inches</th>
<th>Height in Meters</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.44</td>
<td>0.07</td>
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<tr>
<td>2.96</td>
<td>0.09</td>
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<td>4.00</td>
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<tr>
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<td>0.23</td>
</tr>
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<td>0.25</td>
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<tr>
<td>10.50</td>
<td>0.41</td>
</tr>
<tr>
<td>11.00</td>
<td>0.43</td>
</tr>
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</table>

### AIRFLOW/WATER PENETRATION DATA

For 48" x 48" (1219 x 1219) Louver Size

<table>
<thead>
<tr>
<th>Width in Inches and Meters</th>
<th>Height in Inches and Meters</th>
<th>Static Pressure Drop in Inches w.g. (Pa)</th>
<th>Pressure Drop in Free Area Velocity shown</th>
<th>Air Volume at Free Area Velocity shown</th>
<th>Pressure Drop at Free Area Velocity shown</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>51%</td>
<td>0.91 (124)</td>
<td>19.32</td>
<td>8366 cfm (3948 l/s)</td>
<td>.13 in. w.g. (32 Pa)</td>
</tr>
</tbody>
</table>

**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**

- **1.0 (249)**
- **0.70 (174)**
- **0.50 (124)**
- **0.35 (95)**
- **0.20 (50)**
- **0.10 (25)**
- **0.05 (12)**
- **0.03 (8)**

**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/ft^3.

Tested to AMCA Fig. 5.5 – 6.5.

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**EXTRUDED ALUMINUM • ARCHITECTURAL BLADE**

Nailor
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 0.51 (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 0.7 mil, with 5 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 0.51 (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.
EXTRUDED ALUMINUM • DRAINABLE HEAD

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

Models:
1604JD  4" (102) Deep
1606JD  6" (152) Deep

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: 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 m²). 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 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: 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 m²). 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.
### AIRFLOW/WATER PENETRATION DATA for 48" x 48" (1219 x 1219 mm) Louver Size

#### Table: Width in Inches and Meters

<table>
<thead>
<tr>
<th>Model</th>
<th>Width in Inches and Meters</th>
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<tbody>
<tr>
<td>12</td>
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<tr>
<td>114</td>
<td>6.19</td>
</tr>
<tr>
<td>120</td>
<td>6.49</td>
</tr>
</tbody>
</table>

#### Performance Data: Model: 1604JD

- **Pressure Drop**
  - **Static Pressure Drop in Inches w.g. (Pa)**
    - 0.01 (3): 85.07
    - 0.02 (5): 63.57
    - 0.03 (10): 42.07
    - 0.05 (20): 20.07
    - 0.10 (40): 10.07
    - 0.12 (50): 5.07
    - 0.16 (60): 3.07
    - 0.20 (80): 2.07
    - 0.25 (100): 1.07
    - 0.30 (120): 0.57

- **Air Velocity**
  - **Maximum Intake Air Flow Rate**
    - 8236 cfm (3887 l/s)

- **Pressure Drop at Free Air Velocity shown**
  - 0.01 (3): 82.36
  - 0.02 (5): 61.57
  - 0.03 (10): 40.78
  - 0.05 (20): 20.07
  - 0.10 (40): 10.07
  - 0.12 (50): 5.07
  - 0.16 (60): 3.07
  - 0.20 (80): 2.07
  - 0.25 (100): 1.07
  - 0.30 (120): 0.57

#### Note:
- To minimize water penetration when sizing intake louvers, select a Free Air Velocity that is the point of beginning water penetration.
### PERFORMANCE DATA:
**MODEL: 1606JD**

#### FREE AREA in Square Feet and Square Meters

<table>
<thead>
<tr>
<th>Height in Inches and Meters</th>
<th>Width in Inches and Meters</th>
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</thead>
<tbody>
<tr>
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<td>114</td>
<td>3.66</td>
</tr>
<tr>
<td>120</td>
<td>3.86</td>
</tr>
</tbody>
</table>

#### AIRFLOW/WATER PENETRATION DATA

**for 48” x 48” (1219 x 1219) Louver Size**

<table>
<thead>
<tr>
<th>Model</th>
<th>Free Area %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1606JD</td>
<td>47%</td>
</tr>
</tbody>
</table>

| Free Area sq. ft. (sq. m.) | 7.45 (0.69) |

| Free Area Velocit at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration) | 1250 fpm (381 m/min.) |

| Air Volume at Free Area Velocity shown | 9313 cfm (4395 l/s) |

| Pressure Drop at Free Area Velocity shown | 21 in. w.g. (52 Pa) |

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

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**AMCA Certified Ratings Seal**

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 516 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Air Performance and Water Penetration ratings.

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**Airflow 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 concealated 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 jams 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 0.7 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 jams 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.
**EXTRUDED ALUMINUM • DRAINABLE HEAD**

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

**Models:**
- 1604KD  4" (102) Deep
- 1606KD  6" (152) Deep

**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 m²). 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 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: 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 m²). 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.
## Airflow/Water Penetration Data
### for 48" x 48" (1219 x 1219) Louver Size

<table>
<thead>
<tr>
<th>Model</th>
<th>1604KD</th>
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<tr>
<td>Free Area %</td>
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<td>Free Area sq. ft. (sq. m.)</td>
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<tr>
<td>Free Area Velocity at Point of Beginning Water Penetration at 01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)</td>
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<tr>
<td>Air Volume at Free Area Velocity shown</td>
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<td>Pressure Drop at Free Area Velocity shown</td>
<td>.11 in. w.g. (27 Pa)</td>
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</tbody>
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### 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: 1604KD

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<thead>
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<th>Free Area in Square Feet and Square Meters</th>
<th>Width in Inches and Meters</th>
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<tr>
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### Note:
- Width in Inches and Meters
- Height in Inches and Meters
- AIRFLOW/WATER PENETRATION DATA
- PRESSURE DROP

### Certified Ratings Program
The AMCA Certified Ratings Seal applies to Air Performance and Water Penetration ratings.
**FREE AREA in Square Feet and Square Meters**

<table>
<thead>
<tr>
<th>Width in Inches and Meters</th>
<th>12</th>
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<th>30</th>
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**PRESSURE DROP**

<table>
<thead>
<tr>
<th>Model</th>
<th>Free Area %</th>
<th>Free Area sq. ft. (sq. m)</th>
<th>Free Area Velocity at Point of Beginning Water Penetration</th>
<th>Pressure Drop at Free Area Velocity</th>
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</thead>
<tbody>
<tr>
<td>1606KD</td>
<td>50%</td>
<td>7.93 (0.74)</td>
<td>0.107 (310 m/min.)</td>
<td>0.14 in .w.g. (35 Pa)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.017 fpm</td>
<td>.86 in .w.g. (22 Pa)</td>
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**AIRFLOW/WATER PENETRATION DATA**

For 48" x 48" (1219 x 1219) Louver Size

<table>
<thead>
<tr>
<th>Model</th>
<th>Free Area %</th>
<th>Free Area sq. ft. (sq. m)</th>
<th>Intake Air Volume at Free Area Velocity</th>
<th>Pressure Drop at Free Area Velocity</th>
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<tbody>
<tr>
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<td>7.93 (0.74)</td>
<td>8065 cfm (3806 l/s)</td>
<td>.14 in .w.g. (35 Pa)</td>
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**NOTE:** To minimize water penetration when sizing intake louver, select a Free Area Velocity that is less than the point of beginning water penetration.
### 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 downsputs 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 millons 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 downsputs 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 fluropolymer 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)*. 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 fluropolymer 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)*. 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 downsputs 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 millons 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 downsputs 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 fluropolymer 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)*. 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 fluropolymer 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)*. 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.
EXTRUDED ALUMINUM • DRAINABLE BLADE

- 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 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 m²). 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 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 m²). 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.
### PERFORMANCE DATA:

**MODEL: 1604D**

### FREE AREA in Square Inches and Square Meters

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<tr>
<th>Width in Inches and Meters</th>
<th>Height in Inches and Meters</th>
<th>Free Area sq. in. (sq. cm.)</th>
<th>Free Area %</th>
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<tbody>
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<tr>
<td>96</td>
<td>0.36</td>
<td>0.56</td>
<td>&lt;1%</td>
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</table>

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

#### Model 1604D

<table>
<thead>
<tr>
<th>Model</th>
<th>Free Area %</th>
<th>Free Area sq. ft. (sq. m.)</th>
<th>Free Area %</th>
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<td>52%</td>
<td>8.26 (0.77)</td>
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#### Intake

<table>
<thead>
<tr>
<th>Intake</th>
<th>Air Velocity at Point of Beginning Water Penetration</th>
<th>Static Pressure Drop in Inches w.g. (Pa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)</td>
<td>906 fpm (272 m/min.)</td>
<td>0.03 (8)</td>
</tr>
<tr>
<td>0.4 oz./sq. ft. (12 ml/sq. m)</td>
<td>2000 fpm (608 m/min.)</td>
<td>0.10 (25)</td>
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#### Pressure Drop at Free Area Velocity shown

<table>
<thead>
<tr>
<th>Pressure Drop at Free Area Velocity shown</th>
<th>.15 in. w.g. (37 Pa)</th>
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<tr>
<td>.10 (25)</td>
<td>3.05 (45)</td>
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<td>.09 (20)</td>
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<td>.01 (0.125)</td>
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### NOTE:

To minimize water penetration when sizing intake louver, select a Free Area Velocity that is below the point of beginning water penetration.
AIRFLOW/WATER PENETRATION DATA
for 48" x 48" (1219 x 1219) Louver Size

<table>
<thead>
<tr>
<th>Width in Inches and Meters</th>
<th>12</th>
<th>16</th>
<th>24</th>
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<th>48</th>
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FREE AREA in Square Feet and Square Meters

Width in Inches and Meters

Height in Inches and Meters

FREE AREA in Square Feet and Square Meters

Width in Inches and Meters

Height in Inches and Meters

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 are certified in accordance with AMCA Certification Programs. The AMCA Certified Ratings Program applies to Air Performance and Water Penetration ratings.
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) or 3/8” (9.5) undersize (or specifier to select: exact size 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 .060” (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 0.040” [1.02] galvanized steel or 0.040” [1.02] galvanized steel with 1” [25] insulation or 0.040” [1.02] 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) or 3/8” (9.5) undersize (or specifier to select: exact size 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 .060” (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 0.040” [1.02] galvanized steel or 0.040” [1.02] galvanized steel with 1” [25] insulation or 0.040” [1.02] 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.
EXTRUDED ALUMINUM • DUAL DRAINABLE BLADE

- 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'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: 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 m²). 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.
EXTRUDED ALUMINUM • DUAL DRAINABLE BLADE

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: Concealed type, factory installed on rear of brackets:
Brackets: 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 m²). 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.
PERFORMANCE DATA:
MODEL: 1604DD

FREE AREA in Square Feet and Square Meters

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<th>Width in Inches and Meters</th>
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NOTE:
To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is below the point of beginning water penetration.

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)

Free Area Velocity at Point of Beginning Water Penetration
at .01 oz./sq. ft. (3 ml/sq. m)
(15 min. test duration)
Air Volume at Free Area Velocity shown 8140 cfm (3841 l/s)
Pressure Drop at Free Area Velocity shown .16 in. w.g. (40 Pa)

PRESSURE DROP

<table>
<thead>
<tr>
<th>Height in Inches</th>
<th>12</th>
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<th>24</th>
<th>30</th>
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<td>.57</td>
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EXHAUST

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.

NOTE: 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 AREA in Square Feet and Square Meters**

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<th>Square Meters</th>
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**PRESSURE DROP**

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<th>Air Velocity in Feet (Meters) Per Minute Through Free Area</th>
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<tr>
<td>.02</td>
<td>Intake</td>
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<tr>
<td>.05</td>
<td>Intake</td>
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</table>

**NOTE:** To minimize water penetration when sizing intake louver, select a Free Area Velocity that is less than the point of beginning water penetration.
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 jams 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 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 jams 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 0.051 (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).

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.
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 m²). 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.
### PERFORMANCE DATA:
**MODEL: 1605WD**

**FREE AREA in Square Feet and Square Meters**

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<th>Width in Inches and Meters</th>
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<th>24</th>
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<td>1.05</td>
<td>1.15</td>
<td>1.25</td>
<td>1.35</td>
<td>1.45</td>
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<td>1.65</td>
<td>1.75</td>
<td>1.85</td>
<td>1.95</td>
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</tbody>
</table>

**AIRFLOW/ WATER PENETRATION DATA**

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

**NOTE:** To minimize water penetration when sizing intake louvers, select a Free Area Velocity that is below the point of beginning water penetration.
**EXTRUDED ALUMINUM • WIND-DRIVEN RAIN RESISTANT**

**PERFORMANCE DATA:**
**MODEL: 1605WD**

### PRESSURE DROP

<table>
<thead>
<tr>
<th>Static Pressure Drop in Inches Water (in. w.g.)</th>
<th>Free Area Ventilation, Rate in fpm (m/s)</th>
</tr>
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<tbody>
<tr>
<td>0.02 (0.5)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>0.04 (1.0)</td>
<td>98 (0.5)</td>
</tr>
<tr>
<td>0.06 (1.5)</td>
<td>197 (1.0)</td>
</tr>
<tr>
<td>0.08 (2.0)</td>
<td>295 (1.5)</td>
</tr>
<tr>
<td>0.10 (2.5)</td>
<td>394 (2.0)</td>
</tr>
<tr>
<td>0.12 (3.0)</td>
<td>492 (2.5)</td>
</tr>
<tr>
<td>0.14 (3.5)</td>
<td>591 (3.0)</td>
</tr>
<tr>
<td>0.16 (4.0)</td>
<td>689 (3.5)</td>
</tr>
</tbody>
</table>

### TESTED PRESSURE DROP IN Inches w.g. (Pa)

<table>
<thead>
<tr>
<th>Air Velocity in Feet (Meters) Per Minute Through Free Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Louver test size: 48&quot; x 48&quot; (1219 x 1219 mm).</td>
</tr>
<tr>
<td>Standard air density = 0.075 lbs/ft³.</td>
</tr>
<tr>
<td>Tested to AMCA Fig. 5.5 – 6.5.</td>
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</table>

### WIND-DRIVEN RAIN PERFORMANCE

<table>
<thead>
<tr>
<th>Core Ventilation, Rate in fpm (m/s)</th>
<th>Free Area Ventilation, Rate in fpm (m/s)</th>
<th>Effectiveness Ratio (%)</th>
<th>Penetration Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>100</td>
<td>A</td>
</tr>
<tr>
<td>98 (0.5)</td>
<td>181 (0.9)</td>
<td>100</td>
<td>A</td>
</tr>
<tr>
<td>197 (1.0)</td>
<td>364 (1.8)</td>
<td>100</td>
<td>A</td>
</tr>
<tr>
<td>295 (1.5)</td>
<td>545 (2.8)</td>
<td>100</td>
<td>A</td>
</tr>
<tr>
<td>394 (2.0)</td>
<td>727 (3.7)</td>
<td>100</td>
<td>A</td>
</tr>
<tr>
<td>492 (2.5)</td>
<td>908 (4.6)</td>
<td>100</td>
<td>A</td>
</tr>
<tr>
<td>591 (3.0)</td>
<td>1091 (5.5)</td>
<td>100</td>
<td>A</td>
</tr>
<tr>
<td>689 (3.5)</td>
<td>1272 (6.5)</td>
<td>100</td>
<td>A</td>
</tr>
</tbody>
</table>

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.)

**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 20 ga. [1.0] galvanized steel and/or 0.040" (1.02) thick aluminum sheet or Kynar 500/Hylar 5000 70% 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, 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.
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: 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 m²). 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.
## PERFORMANCE DATA:
**MODEL: 1604Y**

### FREE AREA in Square Feet and Square Meters

<table>
<thead>
<tr>
<th>Width in Inches and Meters</th>
<th>12</th>
<th>18</th>
<th>24</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
<th>54</th>
<th>60</th>
<th>66</th>
<th>72</th>
<th>78</th>
<th>84</th>
<th>90</th>
<th>96</th>
<th>102</th>
<th>108</th>
<th>114</th>
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<td>0.61</td>
<td>0.76</td>
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</tr>
</tbody>
</table>

### 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./ft^3.
Tested to AMCA Fig. 5.5 – 6.5.

**Graph:**
- **Pressure Drop** vs. **Static Pressure Drop**
- **Air Velocity** vs. **Static Pressure Drop**

**Legend:**
- **Honey or Exhaust**
- **Aluminum Exhaust**

**Note:**
- Width in Inches and Meters
- Height in Inches and Meters
- Width in Meters
- Height in Meters
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 Nailor standard 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' (61) Deep, J Blade
- **1602K**: 2' (61) Deep, K Blade
- **1604J**: 4' (122) Deep, J Blade
- **1604JD**: 4' (122) Deep, J Blade, Drainable Head
- **1604KD**: 4' (122) Deep, K Blade, Drainable Head
- **1604DD**: 4' (122) Deep, Dual Drainable Blade
- **1604Y**: 4' (122) Deep, Y Blade, Sightproof
- **1605W**: 5' (152) Deep, Wind-Driven Rain Resistant, Sightproof
- **1606J**: 6' (183) Deep, J Blade
- **1606JD**: 6' (183) Deep, J Blade, Drainable Head
- **1606KD**: 6' (183) Deep, K Blade, Drainable Head
- **1606D**: 6' (183) Deep, Drainable Blade
- **1606DD**: 6' (183) 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

- **ISA**: Aluminum
- **ISS**: 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
- **PC3S**: Fluoropolymer Powder Coat, Standard Color
- **PC5C**: Fluoropolymer Powder Coat, Custom Color

### Options & Accessories

**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. Shape

- **STD**: Rectangular or Square (default)
- **CA**: Circle (Round)
- **SB**: 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 isoceles
- **TB**: Arch gable
- **TC**: Triangle RA left
- **TD**: Triangle RA right
- **TE**: Quadrilateral left
- **TF**: Quadrilateral right
- **TG**: Diamond/Rhombus
- **TH**: Trapezoid
- **TA**: Triangle RA left
- **TL**: Right corner

### 11. Filter Rack

- **FR1**: 1" (25) Filter rack (default)
- **FR2**: 2" (51) Filter rack (default)

### 12a. Blank-off Panel

- **BG**: 20 Ga. galv. steel
- **BG1**: 20 Ga. galv. w/1" (25) insulation
- **BG2**: 20 Ga. galv. w/2" (51) insulation
- **BA**: 0.040" aluminum
- **BA1**: 0.040" alum. w/1" (25) insulation
- **BA12**: 0.040" alum. w/2" (51) insulation

### 12b. Sleeve Length

- **SL**: Specify
- **12" - 305 (standard) (default)
- **8" - 203 (default) [71]***

### 13. Sleeve

- **None (default)
- **SGLV**: Galvanized Steel
- **SALU**: Aluminum
- **S304**: Type 304 Stainless Steel

### Notes:

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

2. **Codes:**
- **LF00**: Color to follow, LFM01 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 Burgundy, LF15 Clay, LF16 Almond, LF17 Coastal White, LF18 Vista Green, LF19 Black, LF20 Gloss Black, LF21 Campus Green.

3. **Custom color powder coat paint finishes require a 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.**

4. **Notes:**
- **Specifications:**
  - LF00 Color to follow.
  - Physical dimensions of the louver are shown in the "Nailor Louver Finishes and Color Guide".
  - **SCUB**: Channel Subframe (default)
  - **CSSH**: Hinged Door w/staple plate
  - **SMCC**: Angles - aluminum continuous

5. **Special Corner Construction:**
- **SCBC**: Box Corner (default)
- **SMCC**: Mitered Corner

6. **Installation Angles:**
- **PACA**: Clips 1 1/2" x 1 1/2" x .125" (38 x 38 x 3), 3" (76) long alum.
- **SMCC**: Angles - aluminum continuous

7. **PACA Qty:** ___ (12" [305] max. o. c.)
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.
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.

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 shutoff 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.
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
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 shutoff 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.
PERFORMANCE DATA:
MODEL: 1604AD

FREE AREA in Square Feet and Square Meters

<table>
<thead>
<tr>
<th>Width in Inches</th>
<th>Height in Inches</th>
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<tr>
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<tr>
<td>0.30</td>
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<tr>
<td>9.55</td>
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</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Model</th>
<th>Free Area %</th>
<th>Free Area sq. ft. (sq. m.)</th>
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</thead>
<tbody>
<tr>
<td>1604AD</td>
<td>44%</td>
<td>7.10 (0.66)</td>
</tr>
</tbody>
</table>

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.)

Air Volume at Free Area Velocity shown

6766 cfm (3193 l/s)

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.

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.

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: 1606AD

FREE AREA in Square Feet and Square Meters

<table>
<thead>
<tr>
<th>Model</th>
<th>Width in Inches and Meters</th>
<th>FREQUENCY</th>
<th>12</th>
<th>18</th>
<th>24</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
<th>54</th>
<th>60</th>
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</thead>
<tbody>
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<td>0.61</td>
<td>0.76</td>
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<td>1.07</td>
<td>1.22</td>
<td>1.37</td>
<td>1.52</td>
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<td>0.07</td>
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<td>0.12</td>
<td>0.13</td>
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<tr>
<td>18</td>
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<td>0.10</td>
<td>0.13</td>
<td>0.16</td>
<td>0.19</td>
<td>0.22</td>
<td>0.25</td>
<td>0.28</td>
<td></td>
</tr>
</tbody>
</table>

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

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

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

NOTE: Tested to AMCA Fig. 5.5 – 6.5.

Air Flow 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: 1606CDAF

FREE AREA in Square Feet and Square Meters

<table>
<thead>
<tr>
<th>Width in Inches and Meters</th>
<th>12</th>
<th>18</th>
<th>24</th>
<th>30</th>
<th>36</th>
<th>42</th>
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<th>54</th>
<th>60</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>0.30</td>
<td>0.46</td>
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<td>0.76</td>
<td>0.91</td>
<td>1.07</td>
<td>1.22</td>
<td>1.37</td>
<td>1.52</td>
</tr>
</tbody>
</table>

SAFETY IN SIZES

To minimize water penetration when sizing intake louvers, select

12            18            24            30            36            42            48            54            60

Length in Inches and Meters

Example:

2.54 (100)

Height in Inches and Meters

Example:

1.27 (32)

Pressures shown are for (61) 9.50 g. at 15 min. test duration.

Leakage in CFM/ft² (L/s/㎡)

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

Air Flow and Water Penetration Data

for 48" x 48" (1219 x 1219) Louver Size

<table>
<thead>
<tr>
<th>Model</th>
<th>1606CDAF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Area %</td>
<td>46%</td>
</tr>
<tr>
<td>Free Area sq. ft. (sq. m.)</td>
<td>7.34 (0.68)</td>
</tr>
</tbody>
</table>

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.)

Air Volume at Free Area Velocity shown

8397 cfm (3963 L/s)

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.

Air Flow Rate

Pressure Drop (wired value)

Air Volume 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.
**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) under size (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 jamb 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) under size (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 jamb 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.
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) or Kynar 500/Hylar 5000 20% 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.
EXTRUDED ALUMINUM • ADJUSTABLE/COMBINATION

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)
   U25  Undersize 1/2" (12.7)

4. Frame
   CH  Channel (default)
   FL  Flanged

5. Blade Seals (1604AD/1606AD only)
   –  None (default)
   BPS  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

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  24 VAC
    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

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
    FL02  FSNF120  120 VAC
    FL04  FSAF120  24 VAC
    FL06  FSAF24  24 VAC
    FL12  FSLF120  120 VAC
    FL24  FSLF24  24 VAC

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

23a. Sleeve
    SGLV  Galvanized Steel
    SALU  Aluminum
    S304 Type 304 Stainless Steel

23b. Sleeve Length
    SL = Specify
    12"  (305) standard (default)

23c. Sleeve Gauge
    –  None (default)
    20G  20 Ga.
    18G  18 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".

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 Burgundy, 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.

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".

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. You may alternatively enter a unique code and description.
Model: 1612QS 12" (305) Deep

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.

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 FIELD NOISE REDUCTION for 48" x 48" (1219 x 1219) Louver Size

<table>
<thead>
<tr>
<th>Octave Band (Frequency) (Hz)</th>
<th>Free Field Noise Reduction (db)</th>
<th>Transmission Loss (db)</th>
<th>Sound Transmission Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 (125)</td>
<td>11</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>3 (250)</td>
<td>11</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>4 (500)</td>
<td>16</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>5 (1000)</td>
<td>25</td>
<td>19</td>
<td>13</td>
</tr>
<tr>
<td>6 (2000)</td>
<td>20</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>7 (4000)</td>
<td>19</td>
<td>13</td>
<td>13</td>
</tr>
</tbody>
</table>

NOTE: The Sound Transmission Class (STC) is a single number rating of the louver’s resistance to transfer airborne 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.

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

<table>
<thead>
<tr>
<th>Model</th>
<th>1612QS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Area %</td>
<td>30%</td>
</tr>
<tr>
<td>Free Area sq. ft. (sq. m.)</td>
<td>4.72 (0.44)</td>
</tr>
<tr>
<td>Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m)</td>
<td>826 fpm (252 m/min.)</td>
</tr>
<tr>
<td>Air Volume at Free Area Velocity shown</td>
<td>3899 cfm (1840 l/s)</td>
</tr>
<tr>
<td>Pressure Drop at Free Area Velocity shown</td>
<td>.10 in. w.g. (25 Pa)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Static Pressure Drop in Inches w.g. (Pa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>.10 (25)</td>
</tr>
<tr>
<td>.05 (12)</td>
</tr>
<tr>
<td>.03 (8)</td>
</tr>
<tr>
<td>.02 (5)</td>
</tr>
<tr>
<td>.01 (3)</td>
</tr>
</tbody>
</table>

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.
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 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.
FORMED STEEL • ARCHITECTURAL BLADE

- 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 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 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.
### PERFORMANCE DATA:
**MODEL: 1704J**

#### FREE AREA in Square Feet and Square Meters

<table>
<thead>
<tr>
<th>Width in Inches and Meters</th>
<th>12</th>
<th>18</th>
<th>24</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
<th>54</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Area %</td>
<td>53%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free Area sq. ft. (sq. m.)</td>
<td>8.53 (0.79)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Model</th>
<th>1704J</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Area %</td>
<td>53%</td>
</tr>
<tr>
<td>Free Area sq. ft. (sq. m.)</td>
<td>8.53 (0.79)</td>
</tr>
</tbody>
</table>

#### PRESSURE DROP

- **Free Area Velocily at Point of Beginning Water Penetration**
  - at .01 oz./sq. ft. (3 ml/sq. m)
  - (15 min. test duration)
  - 869 fpm (265 m/min.)

- **Air Volume at Free Area Velocity shown**
  - 7413 cfm (3498 l/s)

- **Pressure Drop at Free Area Velocity shown**
  - .13 in. w.g. (32 Pa)

---

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

---

**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

<table>
<thead>
<tr>
<th>Width in Inches and Meters</th>
<th>Height in Inches and Meters</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>0.30</td>
<td>1.06</td>
</tr>
<tr>
<td>0.46</td>
<td>1.87</td>
</tr>
<tr>
<td>0.71</td>
<td>2.87</td>
</tr>
<tr>
<td>0.81</td>
<td>3.40</td>
</tr>
<tr>
<td>0.92</td>
<td>3.89</td>
</tr>
</tbody>
</table>

Air Volume at Free Area Velocity shown 8001 cfm (3776 l/s)

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.
FORMED STEEL • ARCHITECTURAL BLADE LOUVERS

HOW TO SPECIFY

MODEL 1704J
FORMED STEEL ARCHITECTURAL BLADE LOUVERS

SUGGESTED SPECIFICATION:
Provide and install, as shown on plans and/or schedules, formed steel louver 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 louver 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 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 1706J.
FORMED STEEL • DRAINABLE HEAD

- DRAINABLE HEAD
- ARCHITECTURAL BLADE
- EXCELLENT WEATHER PROTECTION

Models:
- 1704JD  4" (102) Deep
- 1706JD  6" (152) Deep

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 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.
### PERFORMANCE DATA:
**MODEL: 1704JD**

#### FREE AREA in Square Feet and Square Meters

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

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<th>I N T A K E</th>
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<tr>
<td>Free Area %</td>
<td>52%</td>
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<tr>
<td>Free Area sq. ft. (sq. m.)</td>
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<td>Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)</td>
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<td>Air Volume at Free Area Velocity shown</td>
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<td>Pressure Drop at Free Area Velocity shown</td>
<td>.22 in. w.g. (55 Pa)</td>
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**PRESSURE DROP**

- **Air Flow 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

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

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

<table>
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<tr>
<th>Model</th>
<th>Free Area %</th>
<th>Free Area sq. ft. (sq. m.)</th>
<th>Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (381 m/min.)</th>
<th>Air Volume at Free Area Velocity shown (9813 cfm (4631 l/s))</th>
<th>Pressure Drop at Free Area Velocity shown (27 in. w.g. (67 Pa))</th>
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</thead>
<tbody>
<tr>
<td>1706JD</td>
<td>49%</td>
<td>7.85 (0.73)</td>
<td>1250 fpm</td>
<td>9813 cfm (4631 l/s)</td>
<td>27 in. w.g. (67 Pa)</td>
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</table>

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.
Models:
1704D  4" (102) Deep
1706D  6" (152) Deep

Model 1704D
Model 1704D combines excellent weather protection with superb air performance and pleasing aesthetics that complement 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 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.
## PERFORMANCE DATA:
### MODEL: 1704D

**FREE AREA in Square Feet and Square Meters**

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**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.)
- Air Volume at Free Area Velocity shown: 8237 cfm (3887 l/s)
- 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

**Static Pressure Drop in Inches w.g. (Pa)**

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<th>0.03 (8)</th>
<th>0.05 (12)</th>
<th>0.1 (20)</th>
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**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/ft².
Tested to AMCA Fig. 5.5 – 6.5.
PERFORMANCE DATA:
MODEL: 1706D

FREE AREA in Square Feet and Square Meters

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<th>Width in Inches and Meters</th>
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</table>

Air Volume at Free Area Velocity shown: 10,063 cfm (4749 l/s)
Pressure Drop at Free Area Velocity shown: .22 in. w.g. (55 Pa)

HEIGHT in Inches and Meters

<table>
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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 Volume at Free Area Velocity shown: 10,063 cfm (4749 l/s)
Pressure Drop at Free Area Velocity shown: .22 in. w.g. (55 Pa)

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.
FORMED STEEL • DRAINABLE BLADE LOUVERS

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.
**FORMED STEEL • DRAINABLE BLADE**

- **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 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 1706DHP

Model 1706DHP combines extraordinary air performance and excellent weather protection with smooth, clean lines that visually complement 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 airstream. 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 sections 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.
**FREE AREA in Square Feet and Square Meters**

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

**AIRFLOW/WATER PENETRATION DATA**

for 48" x 48" (1219 x 1219) Louver Size

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<th>Model</th>
<th>Free Area %</th>
<th>Free Area sq. ft. (sq. m.)</th>
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**PRESSURE DROP**

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**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**

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**AIRFLOW / WATER PENETRATION DATA**

**for 48" x 48" (1219 x 1219) Louver Size**

**Model**

<table>
<thead>
<tr>
<th>Free Area %</th>
<th>56%</th>
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<tbody>
<tr>
<td>Free Area sq. ft. (sq. m.)</td>
<td>9.05 (0.84)</td>
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</tbody>
</table>

**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.) |
| Air Volume at Free Area Velocity shown | 8941 cfm (4219 l/s) |
| 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**

<table>
<thead>
<tr>
<th>Static Pressure Drop in Inches w.g. (Pa)</th>
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</thead>
<tbody>
<tr>
<td>.01 (3)</td>
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<tr>
<td>200 (51)</td>
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</table>

**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.
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 3 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**

## OPTIONS & ACCESSORIES:

<table>
<thead>
<tr>
<th>Models</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1704J</td>
<td>4&quot; (102) Deep, J Blade</td>
</tr>
<tr>
<td>1704JD</td>
<td>4&quot; (102) Deep, J Blade, Drainable Head</td>
</tr>
<tr>
<td>1704D</td>
<td>4&quot; (102) Deep, Drainable Blade</td>
</tr>
<tr>
<td>1704DHP</td>
<td>4&quot; (102) Deep, Drainable Blade, High Performance</td>
</tr>
<tr>
<td>1706J</td>
<td>6&quot; (152) Deep, J Blade</td>
</tr>
<tr>
<td>1706JD</td>
<td>6&quot; (152) Deep, J Blade, Drainable Head</td>
</tr>
<tr>
<td>1706D</td>
<td>6&quot; (152) Deep, Drainable Blade</td>
</tr>
<tr>
<td>1706DHP</td>
<td>6&quot; (152) Deep, Drainable Blade, High Performance</td>
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</table>

## Nominal Width x Height

<table>
<thead>
<tr>
<th>Nominal Size (mm/s)</th>
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<tbody>
<tr>
<td>20GA 20 ga. galvanized steel (default)</td>
</tr>
<tr>
<td>18GA 18 ga. galvanized steel</td>
</tr>
<tr>
<td>16GA 16 ga. galvanized steel</td>
</tr>
<tr>
<td>304 Type 304 stainless steel</td>
</tr>
<tr>
<td>316 Type 316 stainless steel</td>
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### Construction

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<tr>
<td>20GA 20 ga. galvanized steel (default)</td>
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<tr>
<td>18GA 18 ga. galvanized steel</td>
</tr>
<tr>
<td>16GA 16 ga. galvanized steel</td>
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### Sizing

<table>
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<tr>
<td>U25    Unsersize 1/4&quot; (6.3) (default)</td>
</tr>
<tr>
<td>U00    Exact Size</td>
</tr>
<tr>
<td>U38    Unsersize 3/8&quot; (9.5)</td>
</tr>
<tr>
<td>U50    Unsersize 1/2&quot; (12.7)</td>
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### Frame

<table>
<thead>
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<tbody>
<tr>
<td>CH    Channel (default)</td>
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<tr>
<td>FL    Flanged</td>
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### Bird Screen

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<tbody>
<tr>
<td>BSG         Galvanized Steel (default)</td>
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<tr>
<td>BSA         Aluminum</td>
</tr>
<tr>
<td>BSSS        Type 304 Stainless Steel</td>
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<tr>
<td>BSN         None</td>
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### Insect Screen

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<tr>
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</tr>
<tr>
<td>ISSS          Type 304 Stainless Steel</td>
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### Finish

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<tr>
<td>PC3S   Powder Coat, Standard Color</td>
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<tr>
<td>PC3C   Powder Coat, Custom Color</td>
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<tr>
<td>PC4S   H. P. Powder Coat, Standard Color</td>
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<tr>
<td>PC4C   H. P. Powder Coat, Custom Color</td>
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<tr>
<td>PCSS   Fluoropolymer Powder Coat, Standard Color</td>
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<td>PCSC   Fluoropolymer Powder Coat, Custom Color</td>
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<td>PPC    Prime Coat</td>
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<td>WE                 Welded Construction</td>
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<td>ESI             Extended Sill</td>
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### Filter Rack

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<td>FR1         1&quot; (25) Filter rack</td>
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<tr>
<td>FR2         2&quot; (51) Filter rack</td>
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### Sleeve

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<td>BSLV     Galvanized Steel</td>
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<td>S304     Type 304 Stainless Steel</td>
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### Sleeve Length

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<td>SL            Specify</td>
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<tr>
<td>12&quot; (305) standard (default)</td>
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<tr>
<td>8&quot; – 28&quot; (203 – 711)</td>
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### Sleeve Gauge

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<td>20G          20 Ga.</td>
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<tr>
<td>18G          18 Ga.</td>
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<tr>
<td>16G          16 Ga.</td>
</tr>
<tr>
<td>14G          14 Ga.</td>
</tr>
<tr>
<td>10G          10 Ga.</td>
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### 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.
FORMED STEEL • ADJUSTABLE BLADE

- 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 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.
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

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.

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.
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.
PERFORMANCE DATA:
MODEL: 1704AD

FREE AREA in Square Feet and Square Meters

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<th>Width in Inches and Meters</th>
<th>12</th>
<th>18</th>
<th>24</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
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<td>.50</td>
<td>.56</td>
<td>.62</td>
<td>.69</td>
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</table>

Height in Inches and Meters

<table>
<thead>
<tr>
<th>Pressure Drop at Free Area Velocity shown</th>
<th>.50 (124)</th>
<th>.60 (149)</th>
<th>.70 (174)</th>
<th>1.0 (249)</th>
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<tbody>
<tr>
<td>12</td>
<td>9.91</td>
<td>10.73</td>
<td>11.54</td>
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<td>9.49</td>
<td>10.34</td>
<td>11.17</td>
<td>11.99</td>
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<tr>
<td>30</td>
<td>9.28</td>
<td>10.14</td>
<td>10.97</td>
<td>11.79</td>
</tr>
<tr>
<td>36</td>
<td>9.07</td>
<td>9.93</td>
<td>10.75</td>
<td>11.57</td>
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<tr>
<td>42</td>
<td>8.86</td>
<td>9.72</td>
<td>10.54</td>
<td>11.36</td>
</tr>
<tr>
<td>48</td>
<td>8.65</td>
<td>9.51</td>
<td>10.33</td>
<td>11.15</td>
</tr>
<tr>
<td>54</td>
<td>8.44</td>
<td>9.30</td>
<td>10.12</td>
<td>10.94</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Model</th>
<th>1704AD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Area %</td>
<td>50%</td>
</tr>
<tr>
<td>Free Area sq. ft. (sq. m.)</td>
<td>8.03 (0.75)</td>
</tr>
</tbody>
</table>

I N T A K E

<table>
<thead>
<tr>
<th>Free Area Velocity at Point of Beginning Water Penetration at .01 oz./sq. ft. (3 ml/sq. m) (15 min. test duration)</th>
<th>991 fpm (302 m/min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Volume at Free Area Velocity shown</td>
<td>7958 cfm (3755 l/s)</td>
</tr>
<tr>
<td>Pressure Drop at Free Area Velocity shown</td>
<td>.11 in. w.g. (27 Pa)</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Width in Inches and Meters</th>
<th>12</th>
<th>18</th>
<th>24</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
<th>54</th>
<th>60</th>
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<tr>
<td>12</td>
<td>0.30</td>
<td>0.53</td>
<td>0.76</td>
<td>0.99</td>
<td>1.23</td>
<td>1.46</td>
<td>1.69</td>
<td>1.93</td>
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<tr>
<td>18</td>
<td>0.30</td>
<td>0.55</td>
<td>0.77</td>
<td>1.01</td>
<td>1.30</td>
<td>1.63</td>
<td>2.03</td>
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<td>1.76</td>
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<td>2.84</td>
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<td>30</td>
<td>1.09</td>
<td>1.95</td>
<td>2.80</td>
<td>3.66</td>
<td>4.52</td>
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<td>6.23</td>
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<tr>
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<td>2.80</td>
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<td>6.23</td>
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<tr>
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<tr>
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<tr>
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<td>13.21</td>
<td>15.72</td>
<td>18.23</td>
<td>20.73</td>
<td>23.24</td>
</tr>
</tbody>
</table>

**FREE AREA %**

- 55%

**FREE AREA sq. ft. (sq. m.)**

- 8.80 (0.82)

**FREE AREA Velocity at Point of Beginning Water Penetration**

- 977 fpm (298 m/min.)

**Air Volume at Free Area Velocity shown**

- 8598 cfm (4057 l/s)

**Pressure Drop at Free Area Velocity shown**

- 0.10 in. w.g. (25 Pa)

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

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**A86**
FORMED STEEL ADJUSTABLE BLADE LOUVERS

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 (specifier to select: flanged type), 1/4" (6.3) undersize (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 (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 (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 (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 (specifier to select: electric actuator or pneumatic actuator). Factory assembled louver components to be mechanically fastened (specifier to select: weld 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 (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 (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 (specifier to select: flanged type), 1/4" (6.3) undersize (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 (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 (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 (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 (specifier to select: electric actuator or pneumatic actuator). Factory assembled louver components to be mechanically fastened (specifier to select: weld 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 (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 (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)
   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

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   250 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   FS12F10  120 VAC
    F24   FS12F24  24 VAC
    FA12  FS12F10  120 VAC
    FA24  FS12F24  24 VAC
    FL12  FS12F10  120 VAC
    FL24  FS12F24  24 VAC

24. 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.
ALUMINUM BRICK VENTS

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

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 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]).

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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]).

---

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

<table>
<thead>
<tr>
<th>Width x Height</th>
<th>Model 16BVE</th>
<th>Model 16BVF</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 1/8&quot; x 2 3/8&quot; (206 x 60)</td>
<td>12&quot; x 7 3/4&quot; (305 x 197)</td>
<td>16 1/2&quot; x 2 3/8&quot; (419 x 60)</td>
</tr>
<tr>
<td>8 1/8&quot; x 4 3/4&quot; (206 x 121)</td>
<td>12&quot; x 11 3/4&quot; (305 x 298)</td>
<td>16 1/2&quot; x 4 3/4&quot; (419 x 121)</td>
</tr>
<tr>
<td>8 1/8&quot; x 7 3/4&quot; (206 x 197)</td>
<td>15 5/8&quot; x 7 3/4&quot; (397 x 197)</td>
<td>16 1/2&quot; x 7 3/4&quot; (419 x 197)</td>
</tr>
<tr>
<td>12&quot; x 4 3/4&quot; (305 x 121)</td>
<td>15 5/8&quot; x 15 3/4&quot; (397 x 400)</td>
<td>16 1/2&quot; x 15 3/4&quot; (419 x 400)</td>
</tr>
</tbody>
</table>
Options and Accessories

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.

FRAME OPTIONS:

OPTION CODE CH
STANDARD CHANNEL FRAME

OPTION CODE FL
FLANGED FRAME

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

VISIBLE 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.

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:

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

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

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.

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

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
BLANK-OFF PANELS:

- **OPTION CODE BA**
  - .040" ALUMINUM
- **OPTION CODE BA1**
  - .040" ALUMINUM W/1" (25) INSUL.
- **OPTION CODE BA2**
  - .040" ALUMINUM W/2" (51) INSUL.
- **OPTION CODE BG**
  - 20 GA. GALVANIZED STEEL
- **OPTION CODE BG1**
  - 20 GA. GALVANIZED STEEL WITH 1" (25) INSULATION
- **OPTION CODE BG2**
  - 20 GA. GALVANIZED STEEL WITH 2" (51) INSULATION

Certain louver applications may require the airflow to 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 job site 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.
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.

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<th>Description</th>
<th>Application</th>
<th>Standard Factory Mounted Position</th>
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<td>HLLQ</td>
<td>Hand Locking Louver Quadrant</td>
<td>Manual Shut-off/ Balancing</td>
<td>External, Right hand, Out of air stream</td>
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<tr>
<td>HRCO</td>
<td>Hand Rotary Crank Operator</td>
<td>Manual Shut-off/ Balancing</td>
<td>Internal, Right hand, In air stream</td>
</tr>
<tr>
<td>PCOI</td>
<td>Pull Chain Operator</td>
<td>Inaccessible Installation</td>
<td>Internal, Right Hand, Includes 6 ft. (1.8 m) chain drop below louver</td>
</tr>
<tr>
<td>ACT</td>
<td>Actuator</td>
<td>Electric or Pneumatic Operation</td>
<td>Internal, Left hand, In air stream</td>
</tr>
<tr>
<td>CACT</td>
<td>Concealed Actuator</td>
<td>Electric or Pneumatic Operation</td>
<td>Concealed in enclosed box below louver, Left hand, Out of air stream</td>
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<th>With Blade and/or Jamb Seals</th>
<th>Application</th>
<th>Code</th>
<th>Manufacturer and Model No.</th>
<th>Voltage and Description</th>
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<td>12 (1.11)</td>
<td>6 (0.56)</td>
<td>For LOW Torque Operations</td>
<td>411</td>
<td>Honeywell ML4115</td>
<td>120 VAC, FATPA</td>
</tr>
<tr>
<td>12 (1.11)</td>
<td>6 (0.56)</td>
<td>For MEDIUM Torque Operations</td>
<td>FL12</td>
<td>Belimo FSLF120</td>
<td>120 VAC</td>
</tr>
<tr>
<td>811</td>
<td>Honeywell ML8115</td>
<td>24 VAC, FATPA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 (1.11)</td>
<td>6 (0.56)</td>
<td>For HIGH Torque Operations</td>
<td>FL24</td>
<td>Belimo FSLF24</td>
<td>24 VAC</td>
</tr>
<tr>
<td>10 (0.93)</td>
<td>Belimo FSLF120</td>
<td>120 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 (1.11)</td>
<td>12 (1.11)</td>
<td>For MEDIUM Torque Operations</td>
<td>F24</td>
<td>Belimo FSNF24</td>
<td>24 VAC</td>
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<tr>
<td>12 (1.11)</td>
<td>12 (1.11)</td>
<td>For HIGH Torque Operations</td>
<td>MS4</td>
<td>Honeywell MS4X09</td>
<td>120 VAC, FATPA</td>
</tr>
<tr>
<td>FL12</td>
<td>Belimo FSNF120</td>
<td>120 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 (1.11)</td>
<td>12 (1.11)</td>
<td>For HIGH Torque Operations</td>
<td>MS8</td>
<td>Honeywell M8X09F</td>
<td>24 VAC, FATPA</td>
</tr>
<tr>
<td>10 (0.93)</td>
<td>Belimo FSLF24</td>
<td>24 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 (5.57)</td>
<td>40 (3.72)</td>
<td>For HIGH Torque Operations</td>
<td>FA12</td>
<td>Belimo FSAF120</td>
<td>120 VAC</td>
</tr>
<tr>
<td>60 (5.57)</td>
<td>40 (3.72)</td>
<td>For HIGH Torque Operations</td>
<td>FA24</td>
<td>Belimo FSAF24</td>
<td>24 VAC</td>
</tr>
<tr>
<td>412</td>
<td>Honeywell MS4120F10</td>
<td>120 VAC, FATPA</td>
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<td></td>
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</tr>
<tr>
<td>412</td>
<td>Honeywell MS8120F10</td>
<td>24 VAC, FATPA</td>
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</table>

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

<table>
<thead>
<tr>
<th>Without Blade and/or Jamb Seals</th>
<th>With Blade and/or Jamb Seals</th>
<th>Application</th>
<th>Code</th>
<th>Manufacturer and Model No.</th>
<th>Voltage and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 (1.11)</td>
<td>6 (0.56)</td>
<td>For LOW Torque Operations</td>
<td>411S</td>
<td>Honeywell ML4115</td>
<td>120 VAC, FATPA</td>
</tr>
<tr>
<td>12 (1.11)</td>
<td>6 (0.56)</td>
<td>For MEDIUM Torque Operations</td>
<td>FL1S</td>
<td>Belimo FSLF120-S**</td>
<td>120 VAC with Auxiliary Switch</td>
</tr>
<tr>
<td>811</td>
<td>Honeywell ML8115</td>
<td>24 VAC, FATPA with MLS300H</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 (1.11)</td>
<td>6 (0.56)</td>
<td>For MEDIUM Torque Operations</td>
<td>FL2S</td>
<td>Belimo FSLF24-S</td>
<td>24 VAC with Auxiliary Switch</td>
</tr>
<tr>
<td>10 (0.93)</td>
<td>Belimo FSNF120</td>
<td>120 VAC with Auxiliary Switch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 (1.86)</td>
<td>10 (0.93)</td>
<td>For MEDIUM Torque Operations</td>
<td>F24S</td>
<td>Belimo FSNF24-S</td>
<td>24 VAC with Auxiliary Switch</td>
</tr>
<tr>
<td>12 (1.11)</td>
<td>12 (1.11)</td>
<td>For HIGH Torque Operations</td>
<td>MS4</td>
<td>Honeywell MS4X09F</td>
<td>120 VAC, FATPA with MLS300H</td>
</tr>
<tr>
<td>24 (2.23)</td>
<td>12 (1.11)</td>
<td>For HIGH Torque Operations</td>
<td>MS8</td>
<td>Honeywell M8X09F</td>
<td>24 VAC, FATPA with MLS300H</td>
</tr>
<tr>
<td>60 (5.57)</td>
<td>40 (3.72)</td>
<td>For HIGH Torque Operations</td>
<td>FA1S</td>
<td>Belimo FSAF120-S</td>
<td>120 VAC with Auxiliary Switch</td>
</tr>
<tr>
<td>60 (5.57)</td>
<td>40 (3.72)</td>
<td>For HIGH Torque Operations</td>
<td>FA2S</td>
<td>Belimo FSAF24-S</td>
<td>24 VAC with Auxiliary Switch</td>
</tr>
<tr>
<td>412</td>
<td>Honeywell MS4120F12</td>
<td>120 VAC with Auxiliary Switch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>812</td>
<td>Honeywell MS8120F12</td>
<td>24 VAC, FATPA with MLS300H</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Pneumatic - 2 Position Spring Return:

<table>
<thead>
<tr>
<th>Air Pressure</th>
<th>Maximum Damper ft² (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum PSI (kPa)</td>
<td>Maximum PSI (kPa)</td>
</tr>
<tr>
<td>20 (138)</td>
<td>30 (207)</td>
</tr>
<tr>
<td>20 (138)</td>
<td>30 (207)</td>
</tr>
<tr>
<td>20 (138)</td>
<td>30 (207)</td>
</tr>
<tr>
<td>50 (4.65)</td>
<td>25 (2.32)</td>
</tr>
<tr>
<td>84 (7.80)</td>
<td>42 (3.90)</td>
</tr>
</tbody>
</table>

### Note:

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

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.


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.

<table>
<thead>
<tr>
<th>FINISH TYPE:</th>
<th>DESCRIPTION:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fluoropolymer Powder Coat</strong>&lt;br&gt;AAMA 2605 - Superior Finish&lt;br&gt;(AKA: Powdura® 5000, Coraflon® Powder, Interpon® D3000-Fluoromax)</td>
<td>&quot;Ultimate&quot; - 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.</td>
</tr>
<tr>
<td><strong>High Performance Powder Coat</strong>&lt;br&gt;AAMA 2604 - High Performance Finish&lt;br&gt;(AKA: Powdura® 4000, Envirocron® Ultra Durable Powder, Dynadure™ 400, Interpon® D2000)</td>
<td>&quot;Better&quot; - A high performance polyester powder coating, based on &quot;super durable&quot; 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.</td>
</tr>
<tr>
<td><strong>Durable Powder Coat</strong>&lt;br&gt;AAMA 2603 - Pigmented Organic Coatings&lt;br&gt;(AKA: Powdura® 3000, Envirocron® Durable Powder, Dynadure™ 300, Interpon® D1000)</td>
<td>&quot;Good&quot; - 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.</td>
</tr>
<tr>
<td><strong>Clear Anodize 215-R1</strong>&lt;br&gt;AA-M10C22A41 (0.7 mil. min.)</td>
<td>Architectural Class I. Clear, colorless and hard oxide aluminum coating that resists weathering and chemical attack. Recommended for severely corrosive and abrasive atmospheric exposure.</td>
</tr>
<tr>
<td><strong>Clear Anodize 204-R1</strong>&lt;br&gt;AA-M10C22A31 (0.4 - 0.7 mil.)</td>
<td>Architectural Class II. Clear, colorless and hard oxide aluminum coating that resists weathering and chemical attack. Recommended for normal weather exposure.</td>
</tr>
<tr>
<td><strong>Color Anodize</strong>&lt;br&gt;AA-M10C22A44 (0.7 mil. min.)</td>
<td>Architectural Class I. &quot;Two-step&quot; 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.</td>
</tr>
<tr>
<td><strong>Prime Coat</strong></td>
<td>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.</td>
</tr>
</tbody>
</table>

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 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.
CONTROL & BACKDRAFT DAMPERS
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<td><strong>Jamb Seal Options</strong></td>
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</tr>
</tbody>
</table>
# Options and Accessories

## Blade Linkage Option
- LF • Face Linkage (In Airstream)

## Linkage Material Options
- SSL • Stainless Steel Linkage
- SSA • Stainless Steel Axles Only

## Drive Shaft Options
- DLO • Lock-On Drive Shaft
- DSR • Rigid Drive Shaft

## Blade Seal Options for 1012/1022
- BSP • Polyurethane Blades Seals

## Manual Locking Quadrants
- HLQ • Hand Locking Quadrant for 1/2" (13) Dia. Drives
- HL2 • Hand Locking Quadrant with 2" (51) Stand-Off
- HLQ • Hand Locking Quadrant for 1/4" (6) Dia. Square Drives
- SB • Hand Locking Quadrant with 2" (51) Stand-Off Bracket For Square Drives

## Manual Pull Chain Operators
- PCE • External Pull Chain Operator
- PCI • Internal Pull Chain Operator

## Jackshifting & Accessories
- JK5 • 1/2" (13) Dia. Jackshaft
- JK1 • 1" (25) Dia. Jackshaft
- Crankarms & Swivels

## Vertical Damper Sections Interconnection
- VCK • Vertical Interconnection Kit

## Sleeve Option
- SL • Sleeve

## Face & Bypass Mixing Dampers
- FBV • Vertical
- FBH • Horizontal
- FBR • Right Angle

# Take Control of Performance • Common Sleeve Louver/Control Damper

# Standard Multiple Section Control Damper Drive Arrangements

# Backdraft Dampers
- Model 1370 • Standard Performance • Light/Medium Duty
- Model 1380 • High Performance • Heavy Duty

# Counterbalanced Backdraft Dampers
- Model 1370CB • Standard Performance • Light/Medium Duty
- Model 1380CB • High Performance • Heavy Duty
- Model 1390CB • Steel Frame • High Performance • Heavy Duty
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/m² @ 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 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.
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. (.24) 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 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.

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.

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 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 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 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.
- 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.
- Each axle is fastened to blade end with double thru-bolts providing superior no-slip axle connections. Choice of bearings to suit application.
- 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/ft³ (1.2 kg/m³) 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. (m³/s per m²) 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.
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):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>Single Blade 6&quot; x 4&quot; (152 x 102)</td>
<td>Two Blades (parallel or opposed) 8&quot; x 10&quot; (203 x 254)</td>
</tr>
<tr>
<td>48&quot; x 72&quot; (1219 x 1829)</td>
<td></td>
</tr>
</tbody>
</table>

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.
PERFORMANCE DATA:
MODELS: 1010 AND 1020

PRESSURE DROP (damper fully open):

![Graph showing pressure drop vs. air velocity]

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

LEAKAGE (damper fully closed):

![Graph showing leakage vs. static pressure drop]

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

DYNAMIC LIMITATIONS/LEAKAGE

<table>
<thead>
<tr>
<th>Damper Width</th>
<th>Maximum System Pressure</th>
<th>Maximum System Velocity</th>
<th>Leakage * Cfm/Sq. Ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>48&quot; (1219)</td>
<td>2.5&quot; w.g.</td>
<td>2000 fpm</td>
<td>.18</td>
</tr>
<tr>
<td>36&quot; (914)</td>
<td>3.0&quot; w.g.</td>
<td>2000 fpm</td>
<td>.20</td>
</tr>
<tr>
<td>24&quot; (610)</td>
<td>4.0&quot; w.g.</td>
<td>2000 fpm</td>
<td>.23</td>
</tr>
<tr>
<td>12&quot; (305)</td>
<td>5.0&quot; w.g.</td>
<td>2000 fpm</td>
<td>.33</td>
</tr>
</tbody>
</table>

* 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

<table>
<thead>
<tr>
<th>SUGGESTED SPECIFICATION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>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 (<em>specifier to select</em>) Model 1010 parallel blade or Model 1020 opposed blade control damper.</td>
</tr>
</tbody>
</table>
Models:
1012  Parallel Blade
1022  Opposed Blade

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®.
Axes:  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):

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>Single Blade</td>
<td>6&quot; x 4&quot; (152 x 102)</td>
<td>Two Blades (parallel or opposed)</td>
</tr>
<tr>
<td>8&quot; x 10&quot;</td>
<td>(203 x 254)</td>
<td>(129 x 210)</td>
</tr>
</tbody>
</table>

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.
PERFORMANCE DATA:
MODELS: 1012 AND 1022

PRESSURE DROP (damper fully open):

LEAKAGE (damper fully closed w/o seals):

DYNAMIC LIMITATIONS / LEAKAGE

<table>
<thead>
<tr>
<th>Damper Width</th>
<th>Maximum System Pressure</th>
<th>Maximum System Velocity</th>
<th>Leakage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>W/O Seals</td>
<td>W/Seals</td>
<td>W/O Seals</td>
</tr>
<tr>
<td>48&quot; (1219)</td>
<td>2.5&quot; w.g.</td>
<td>2000 fpm</td>
<td>1.90</td>
</tr>
<tr>
<td>36&quot; (914)</td>
<td>3.0&quot; w.g.</td>
<td>2000 fpm</td>
<td>2.15</td>
</tr>
<tr>
<td>24&quot; (610)</td>
<td>4.0&quot; w.g.</td>
<td>2000 fpm</td>
<td>2.35</td>
</tr>
<tr>
<td>12&quot; (305)</td>
<td>5.0&quot; w.g.</td>
<td>2000 fpm</td>
<td>3.10</td>
</tr>
</tbody>
</table>

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

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


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
    FMO 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

<table>
<thead>
<tr>
<th>Type</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTO Least Cost (Auto-select)</td>
<td>Auto</td>
</tr>
<tr>
<td>BEL Belimo</td>
<td>Belimo</td>
</tr>
<tr>
<td>HON Honeywell</td>
<td>Honeywell</td>
</tr>
<tr>
<td>MAN Manually Select</td>
<td>Manually</td>
</tr>
<tr>
<td>N/A Not Applicable</td>
<td>N/A</td>
</tr>
<tr>
<td>SIE Siemens</td>
<td>Siemens</td>
</tr>
</tbody>
</table>

#### 24. Power Requirement

<table>
<thead>
<tr>
<th>Volts</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>120 VAC</td>
</tr>
<tr>
<td>230</td>
<td>230 VAC</td>
</tr>
<tr>
<td>24</td>
<td>24 V AC</td>
</tr>
<tr>
<td>PNU</td>
<td>Pneumatic</td>
</tr>
</tbody>
</table>

#### 25. Spring Return

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSPR Non-Spring Return</td>
<td>Non-Spring Return</td>
</tr>
<tr>
<td>SPR</td>
<td>Spring Return</td>
</tr>
</tbody>
</table>

#### 26. Control Type

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2POS Two Position</td>
<td>Two Position</td>
</tr>
<tr>
<td>FL Floating</td>
<td>Floating</td>
</tr>
<tr>
<td>MOD Modulating</td>
<td>Modulating</td>
</tr>
<tr>
<td>MODF Modulating and Floating</td>
<td>Modulating and Floating</td>
</tr>
<tr>
<td>FMZS Modulating and Floating, Adj., 0/Span</td>
<td>Modulating and Floating, Adj., 0/Span</td>
</tr>
</tbody>
</table>

#### 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:**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>411</td>
<td>ML4115</td>
<td>120 VAC</td>
</tr>
<tr>
<td>411S</td>
<td>ML4115</td>
<td>120 VAC w/MLS-300H</td>
</tr>
<tr>
<td>412</td>
<td>MS4120F10</td>
<td>120 VAC</td>
</tr>
<tr>
<td>412S</td>
<td>MS4120F12</td>
<td>120 VAC w/Aux. Sw.</td>
</tr>
<tr>
<td>462</td>
<td>MS4620F10</td>
<td>230 VAC</td>
</tr>
<tr>
<td>4X02</td>
<td>ML4X02</td>
<td>120 VAC</td>
</tr>
<tr>
<td>4X0S</td>
<td>ML4X02</td>
<td>120 VAC w/MLS-300H</td>
</tr>
<tr>
<td>4Y02</td>
<td>ML4Y02</td>
<td>230 VAC</td>
</tr>
<tr>
<td>4Y0S</td>
<td>ML4Y02</td>
<td>230 VAC w/MLS-300H</td>
</tr>
<tr>
<td>4Y1S</td>
<td>MS4Y09F</td>
<td>230 VAC w/MLS-300H</td>
</tr>
<tr>
<td>4YO</td>
<td>MS4Y09F</td>
<td>230 VAC</td>
</tr>
<tr>
<td>811</td>
<td>ML8115</td>
<td>24 VAC</td>
</tr>
<tr>
<td>811S</td>
<td>ML8115</td>
<td>24 VAC w/MLS-300H</td>
</tr>
<tr>
<td>812</td>
<td>MS8120F10</td>
<td>24 VAC</td>
</tr>
<tr>
<td>812S</td>
<td>MS8120F12</td>
<td>24 VAC w/Aux. Sw.</td>
</tr>
<tr>
<td>8X02</td>
<td>ML8X02</td>
<td>120 VAC</td>
</tr>
<tr>
<td>8X0S</td>
<td>ML8X02</td>
<td>120 VAC w/MLS-300H</td>
</tr>
<tr>
<td>AFC</td>
<td>Actuator from customer</td>
<td></td>
</tr>
</tbody>
</table>

**Spring Return:**

- None
- SMP Side Mounting Plate

**Note:**

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

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>4” (102) dia.</td>
<td>24” (610) dia.</td>
</tr>
</tbody>
</table>

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.
PERFORMANCE DATA:
MODEL: 1090

PRESSURE DROP (damper fully open):

MAXIMUM SYSTEM PRESSURE

<table>
<thead>
<tr>
<th>Diameter</th>
<th>System Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>24&quot; (610)</td>
<td>6&quot; w.g. (1.5 kPa)</td>
</tr>
<tr>
<td>18&quot; (457)</td>
<td>6&quot; w.g. (1.5 kPa)</td>
</tr>
<tr>
<td>12&quot; (305)</td>
<td>8&quot; w.g. (2 kPa)</td>
</tr>
<tr>
<td>6&quot; (152)</td>
<td>10&quot; w.g. (2.5 kPa)</td>
</tr>
</tbody>
</table>

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

LEAKAGE: CLASS I

Less than 4 cfm/sq. ft. @ 1" w.g. (0.02 m³/s/m² @ 250 kPa).
Less than 8 cfm/sq. ft. @ 4" w.g. (0.04 m³/s/m² @ 1 kPa).

AIR LEAKAGE (damper fully closed):

Tested per AMCA standard 500-D, Fig. 5.5.
### HOW TO ORDER OR TO SPECIFY

**MODEL: 1090**

**LOW LEAKAGE ROUND CONTROL DAMPERS**

**EXAMPLE: 1090 - 12 - GLV - BC - 411**

<table>
<thead>
<tr>
<th>1. Model</th>
<th>5. Actuator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1090 Steel, Single Blade, Round</td>
<td>– None (default)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Duct Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter - inches (mm's)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLV Galvanized Steel (default)</td>
</tr>
<tr>
<td>304 Type 304 Stainless Steel</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Bearings</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC Celcon (default)</td>
</tr>
<tr>
<td>BO Oilite Bronze</td>
</tr>
<tr>
<td>BS Stainless Steel</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. Hand-Locking Quadrant</th>
</tr>
</thead>
<tbody>
<tr>
<td>HL2 Quadrant with 2&quot; (51) Bracket</td>
</tr>
<tr>
<td>HLQ Hand-Locking Quadrant</td>
</tr>
</tbody>
</table>

**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 m³/s/m² @ 1 kPa). Standard of acceptance shall be Nailor Industries Model 1090.
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):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Section</td>
<td>Multiple Section</td>
</tr>
<tr>
<td>Single Blade 6” x 6” (152 x 152)</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Two Blades (parallel or opposed) 6” x 10” (152 x 254)</td>
<td>48” x 72” (1219 x 1829)</td>
</tr>
</tbody>
</table>

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

**PERFORMANCE DATA:**
**MODELS: 1110 AND 1120**

**DYNAMIC LIMITATIONS:** 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.

<table>
<thead>
<tr>
<th>Damper Width</th>
<th>Maximum System Pressure</th>
<th>Maximum System Velocity</th>
</tr>
</thead>
<tbody>
<tr>
<td>in.</td>
<td>mm</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>1219</td>
<td>8.0&quot;) w.g. 4000 fpm</td>
</tr>
<tr>
<td>36</td>
<td>914</td>
<td>10.0&quot;) w.g. 4500 fpm</td>
</tr>
<tr>
<td>24</td>
<td>610</td>
<td>12.0&quot;) w.g. 5000 fpm</td>
</tr>
<tr>
<td>12</td>
<td>305</td>
<td>14.0&quot;) w.g. 6000 fpm</td>
</tr>
</tbody>
</table>

**LEAKAGE CLASS:**

<table>
<thead>
<tr>
<th>Damper Width</th>
<th>@ 1&quot; w.g. (0.25 kPa)</th>
<th>@ 4&quot; w.g. (1.0 kPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&quot; (305)</td>
<td>1A</td>
<td>1</td>
</tr>
<tr>
<td>24&quot; (610)</td>
<td>1A</td>
<td>1</td>
</tr>
<tr>
<td>36&quot; (914)</td>
<td>1A</td>
<td>1</td>
</tr>
<tr>
<td>48&quot; (1219)</td>
<td>1A</td>
<td>1</td>
</tr>
</tbody>
</table>

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):**

```
Air Velocity in feet per minute (m/s)
300 500 700 1000 2000 3000 6000 7000
(9)  (15)  (21) (30)  (60)  (90)  (120) (150)

Static Pressure Drop in inches w.g. (Pa)
1.0 (25)  .8 (20)  .6 (15)  .5 (10)  .4 (5)  .3 (2.5)  .1 (1)  .01 (0.25)

Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft³.
```
**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/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 (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 - 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**
    - None (default)
    - BT Thrust Bearings

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

15b. **Sleeve Length**
    - SL = Specify
    - 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
    - HLO 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
   - 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
   - 811 ML8115 24 VAC
   - 811S ML8115 24 VAC w/MLS-300H
   - 812 MS8120F10 24 VAC
   - 812S MS8120F12 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.
CONTROL DAMPERS • HIGH PERFORMANCE • AIRFOIL

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

Models:
2010   Parallel Blade
2020   Opposed Blade

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/ft² @ 1" w.g. (15.2 L/s/m² @ 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):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Section</td>
<td>Multiple Section</td>
</tr>
<tr>
<td>Single Blade 8&quot; x 8&quot; (203 x 203)</td>
<td>Two Blades 8&quot; x 12&quot; (203 x 305) 60&quot; x 72&quot; (1524 x 1829) Unlimited</td>
</tr>
</tbody>
</table>

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

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.

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B24
PERFORMANCE DATA:
MODELS: 2010 AND 2020

DYNAMIC LIMITATIONS:
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.

<table>
<thead>
<tr>
<th>Damper Width (in. mm)</th>
<th>Maximum System Pressure (w.g.)</th>
<th>Maximum System Velocity (fpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 1524</td>
<td>5.0”</td>
<td>3000</td>
</tr>
<tr>
<td>48 1219</td>
<td>8.0”</td>
<td>4000</td>
</tr>
<tr>
<td>36 914</td>
<td>10.0”</td>
<td>4500</td>
</tr>
<tr>
<td>24 610</td>
<td>12.0”</td>
<td>5000</td>
</tr>
<tr>
<td>12 305</td>
<td>14.0”</td>
<td>6000</td>
</tr>
</tbody>
</table>

LEAKAGE CLASS:

<table>
<thead>
<tr>
<th>Damper Width</th>
<th>@ 1” w.g. (0.25 kPa)</th>
<th>@ 4” w.g. (1.0 kPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12” (305)</td>
<td>1A</td>
<td>1</td>
</tr>
<tr>
<td>24” (610)</td>
<td>1A</td>
<td>1</td>
</tr>
<tr>
<td>36” (914)</td>
<td>1A</td>
<td>1</td>
</tr>
<tr>
<td>48” (1219)</td>
<td>1A</td>
<td>1</td>
</tr>
<tr>
<td>60” (1524)</td>
<td>1A</td>
<td>1</td>
</tr>
</tbody>
</table>

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./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.
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/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 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.
Models:
2010-EAF  Parallel Blade
2020-EAF  Opposed Blade

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/ft² @ 1” w.g. (15.2 L/s/m² @ 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):

<table>
<thead>
<tr>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Section</td>
</tr>
<tr>
<td>Single Blade 8&quot; x 8&quot; (203 x 203)</td>
</tr>
</tbody>
</table>

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

COMMON OPTIONS:
- Face and bypass configurations.
- Factory installed pneumatic and electric actuators.
PERFORMANCE DATA:
MODELS: 2010-EAF AND 2020-EAF

DYNAMIC LIMITATIONS:
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.

<table>
<thead>
<tr>
<th>Damper Width</th>
<th>Maximum System Pressure</th>
<th>Maximum System Velocity</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 (1524)</td>
<td>5.0&quot; w.g.</td>
<td>3000 fpm</td>
</tr>
<tr>
<td>48 (1219)</td>
<td>8.0&quot; w.g.</td>
<td>4000 fpm</td>
</tr>
<tr>
<td>36 (914)</td>
<td>10.0&quot; w.g.</td>
<td>4500 fpm</td>
</tr>
<tr>
<td>24 (610)</td>
<td>12.0&quot; w.g.</td>
<td>5000 fpm</td>
</tr>
<tr>
<td>12 (305)</td>
<td>14.0&quot; w.g.</td>
<td>6000 fpm</td>
</tr>
</tbody>
</table>

LEAKAGE CLASS:

<table>
<thead>
<tr>
<th>Damper Width</th>
<th>@ 1&quot; w.g. (0.25 kPa)</th>
<th>@ 4&quot; w.g. (1.0 kPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&quot; (305)</td>
<td>1A</td>
<td>1</td>
</tr>
<tr>
<td>24&quot; (610)</td>
<td>1A</td>
<td>1</td>
</tr>
<tr>
<td>36&quot; (914)</td>
<td>1A</td>
<td>1</td>
</tr>
<tr>
<td>48&quot; (1219)</td>
<td>1A</td>
<td>1</td>
</tr>
<tr>
<td>60&quot; (1524)</td>
<td>1A</td>
<td>1</td>
</tr>
</tbody>
</table>

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.
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/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-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.
Models:  
2010-IB/-IBF Parallel Blade  
2020-IB/-IBF Opposed Blade

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/m² @ 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.

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

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>Single Blade 8&quot; x 8&quot; (203 x 203)</td>
<td>60&quot; x 72&quot; (1524 x 1829)</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Two Blades (parallel or opposed) 8&quot; x 12&quot; (203 x 305)</td>
<td>(203 x 305)</td>
<td>(1524 x 305)</td>
</tr>
</tbody>
</table>

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

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:
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.

<table>
<thead>
<tr>
<th>Damper Width</th>
<th>Maximum System Pressure</th>
<th>Maximum System Velocity</th>
</tr>
</thead>
<tbody>
<tr>
<td>in. mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 1524</td>
<td>5.0” w.g.</td>
<td>3000 fpm</td>
</tr>
<tr>
<td>48 1219</td>
<td>8.0” w.g.</td>
<td>4000 fpm</td>
</tr>
<tr>
<td>36 914</td>
<td>10.0” w.g.</td>
<td>4500 fpm</td>
</tr>
<tr>
<td>24 610</td>
<td>12.0” w.g.</td>
<td>5000 fpm</td>
</tr>
<tr>
<td>12 305</td>
<td>14.0” w.g.</td>
<td>6000 fpm</td>
</tr>
</tbody>
</table>

LEAKAGE CLASS:
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.
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.

How to specify:

Models: 2010-IB/-IBF and 2020-IB/-IBF
High Performance, Insulated Control Dampers


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
   FMO Internal Supplied by Others
   FMIN Internal Supplied by Nailor
   FMO 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

10. Optional Linkage
    SSA Type 304 Stainless Steel Axles Only
    SSL Type 304 Stainless Steel

11. Thrust Bearings
    - None (default)
    BT Thrust Bushings

12. Side Mounting Plate
    - None
    SMP Side Mounting Plate

12a. Sleeve Length
    SL Specify
    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
   HLO   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  MS8120F12  24 VAC w/Aux. Sw.
    8X02  ML8X02  120 VAC
    8X0S  ML8X02  120 VAC w/MLS-300H
    AFC  Actuator from customer
    F12   FSFN120  120 VAC
    F12S  FSFN120-S  120 VAC w/Aux. Sw.
    F24   FSFN24  24 VAC
    F24S  FSFN24-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.

    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.
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 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.

For Models 1810 and 1820:

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>Single Blade</td>
<td>Two Blades</td>
</tr>
<tr>
<td>6&quot; x 4&quot;</td>
<td>(parallel or opposed)</td>
</tr>
<tr>
<td>(152 x 102)</td>
<td>8&quot; x 10&quot;</td>
</tr>
<tr>
<td>(203 x 254)</td>
<td></td>
</tr>
</tbody>
</table>

Temperature Range: -50°F to 250°F (-46°C to 121°C)

1810/1820 Series - Maximum Performance Ratings

<table>
<thead>
<tr>
<th>Maximum Velocity</th>
<th>2000 fpm (10 m/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Pressure</td>
<td>2.5 in. w.g. (625 Pa)</td>
</tr>
</tbody>
</table>

Common Options:

- Type 304 Stainless Steel construction.
- Round or oval duct transitions.
- Manual Hand Locking Quadrants with optional 2" (51) stand-off bracket.
MODELS: 1810 AND 1820
MANUAL BALANCING DAMPERS

PRESSURE DROP (damper fully open):

![Graph showing pressure drop vs. air velocity]

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 Oilit Bronze
   - BS Stainless Steel
7. Transition
   - None (default)
   - CR Round
   - CO Oval
8. Hand Locking Quadrant
   - None (default)
   - HL2 Quadrant with 2" (51) Bracket
   - HLQ Hand Locking Quadrant

OPTIONS & ACCESSORIES:

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.
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):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>4&quot; x 4&quot; (102 x 102)</td>
<td>36&quot; x 12&quot; (914 x 305)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Maximum Velocity</th>
<th>Maximum Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1500 fpm (7.6 m/s)</td>
<td>2 in. w.g. (500 Pa)</td>
</tr>
</tbody>
</table>
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):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>4” (102) dia.</td>
<td>20” (508) dia.</td>
</tr>
</tbody>
</table>

Temperature Range: -50°F to 250°F (-46°C to +121°C)

1890 Series - Maximum Performance Ratings

| Maximum Velocity | 2000 fpm (10 m/s) |
| Maxmimum 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

**OPTION CODE ALS**
ALUMINUM CONSTRUCTION WITH STAINLESS STEEL HARDWARE

**OPTION CODE EAF**
EXTRUDED ALUMINUM FRAME

**OPTION CODE SSF**
STAINLESS STEEL FRAME

BEARING OPTIONS:

**OPTION CODE BC**
CELCON® BEARINGS

**OPTION CODE BO**
OILITE® BRONZE BEARINGS

**OPTION CODE BS**
STAINLESS STEEL BEARINGS

**OPTION CODE BT**
THRUST BEARINGS

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.

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.

2000 Series
Rugged Type 6063-T5 extruded aluminum frame for premium performance. See Models 2010-EAF/2020-EAF for further details.

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.

Synthetic type Celcon® bearings provide long life and corrosion free operation. Standard bearing for all 1000 and 1800 series dampers.

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.

304 grade stainless steel bearings provide corrosion resistance in a wide variety of corrosive media. In higher heat applications, provides good oxidation resistance.

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.
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

OPTION CODE JSS
STAINLESS STEEL JAMB SEALS

Round/Oval Transitions:

OPTION CODE CR
TRANSITION ENCLOSURE FOR ROUND DUCT.

OPTION CODE CO
TRANSITION ENCLOSURE FOR OVAL DUCT

Standard compression type metallic jamb seal used for reducing air leakage between blade ends and frame. Standard jamb seals on Models 1010 and 1020.

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.

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.
**CONTROL DAMPER OPTIONS**

**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.

**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.
**CONTROL DAMPER OPTIONS**

**BLADE SEAL OPTION:**

**OPTION CODE BSP**
POLYURETHANE FOAM BLADE SEAL

**MANUAL LOCKING QUADRANTS:**

**OPTION CODE HLQ**
HAND LOCKING QUADRANT FOR 1/2" (13) DIA. DRIVES

FOR MODELS 1012 AND 1022 ONLY

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.

**FOR USE WITH 1/2" (13) DIA. DRIVE SHAFT**

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.

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:

OPTION CODE HLQ
HAND LOCKING QUADRANT FOR 1/4" (6) SQUARE DRIVES

FOR USE WITH 1/4" (6) SQUARE DRIVE SHAFT

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.

MANUAL PULL-CHAIN OPERATORS:

OPTION CODE PCE
EXTERNAL 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 CODE PCI
INTERNAL CHAIN OPERATOR

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 jackshafts 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).

MODEL 2020 SHOWN WITH OPTIONAL JK1 JACKSHAFT AND 1" (25) DIA. CRANK ARM

TYPICAL JACKSHAFT

OPTIONAL CRANK ARM DETAILS:

1/2" (13) DIA. CRANK ARM PART NO. CD005

1" (25) DIA. CRANK ARM PART NO. CD010

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.
CONTROL DAMPER OPTIONS

SLEEVE OPTIONS:

OPTION CODE SL
SLEEVE

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).

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.
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.
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.

Consult Nailor for specific applications and performance requirements for a custom solution today!
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:
   
   \[
   \text{Area} = \left(\frac{\text{W in. wide } \times \text{H in. high}}{144}\right) = \text{____ sq. ft.}
   \]

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.

\[
\text{Area} = \left(\frac{96 \times 96}{144}\right) = 64 \text{ sq. ft.}
\]

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.
<table>
<thead>
<tr>
<th>Dimension &quot;H&quot; Height in inches (mm)</th>
<th>All Model Series</th>
<th>1000 and 1100 Series Only</th>
<th>2000 Series Only</th>
<th>All Model Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>48&quot; (1219) and under</td>
<td>Over 48&quot; (1219)</td>
<td>Over 48&quot; (1219)</td>
<td>Over 60&quot; (1524)</td>
<td>Over 192&quot; (4877)</td>
</tr>
<tr>
<td></td>
<td>Thru 96&quot; (2438)</td>
<td>Thru 60&quot; (1524)</td>
<td>Thru 96&quot; (2438)</td>
<td>Thru 240&quot; (6069)</td>
</tr>
<tr>
<td>72&quot; (1829) and under</td>
<td>–</td>
<td>Detail 21 S or D</td>
<td>–</td>
<td>Detail 51 S or D</td>
</tr>
<tr>
<td>Over 72&quot; (1829) Thru 144&quot; (3658)</td>
<td>Detail 12 S or D</td>
<td>Detail 22 S, D or Q</td>
<td>Detail 22 S, D or Q</td>
<td>Detail 12 S or D</td>
</tr>
</tbody>
</table>

**NOTE:** INDICATES LOCATION OF JACKSHAFT COUPLING.
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):**

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>6&quot; x 6&quot; (152 x 152)</td>
<td>40&quot; x 48&quot; (1016 x 1219)</td>
</tr>
<tr>
<td>Multiple Section</td>
<td>Unlimited</td>
</tr>
</tbody>
</table>

**1370 Series - Maximum Performance Ratings**

<table>
<thead>
<tr>
<th>Maximum System Velocity</th>
<th>1500 fpm (7.6 m/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Spot Velocity</td>
<td>2500 fpm (12.7 m/s)</td>
</tr>
<tr>
<td>Maximum Back Pressure</td>
<td>6 in. w.g. (1.5 kPa)</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>200°F (93°C)</td>
</tr>
</tbody>
</table>

**COMMON OPTIONS:**

- Vertical or Horizontal mount.
- Front or rear flange frame (with or without bolt holes).
- Rear mounted bird and insect screens.
PERFORMANCE DATA:
MODEL: 1370

<table>
<thead>
<tr>
<th>Damper Width</th>
<th>Maximum Back Pressure</th>
<th>Maximum System Velocity</th>
<th>Operational Data</th>
<th>Leakage*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Blades Begin Opening</td>
<td>Blades Fully Open</td>
</tr>
<tr>
<td>40” (1016)</td>
<td>3.0” w.g.</td>
<td>1500 fpm</td>
<td>.05” w.g. (12 Pa)</td>
<td>.20” w.g. (50 Pa)</td>
</tr>
<tr>
<td>36” (914)</td>
<td>4.0” w.g.</td>
<td>1500 fpm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24” (610)</td>
<td>5.0” w.g.</td>
<td>1500 fpm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12” (305)</td>
<td>6.0” w.g.</td>
<td>1500 fpm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.
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):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>6&quot; x 6&quot; (152 x 152)</td>
<td>40&quot; x 52&quot; (1016 x 1321)</td>
</tr>
<tr>
<td></td>
<td>Multiple Section</td>
</tr>
<tr>
<td></td>
<td>Unlimited</td>
</tr>
</tbody>
</table>

### 1380 Series - Maximum Performance Ratings

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum System Velocity</td>
<td>2500 fpm (12.7 m/s)</td>
</tr>
<tr>
<td>Maximum Spot Velocity</td>
<td>3500 fpm (17.8 m/s)</td>
</tr>
<tr>
<td>Maximum Back Pressure</td>
<td>16 in. w.g. (4 kPa)</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>200°F (93°C)</td>
</tr>
</tbody>
</table>

### COMMON OPTIONS:

- Vertical or Horizontal mount.
- Front or rear flange frame (with or without bolt holes).
- Rear mounted bird and insect screens.
PERFORMANCE DATA:
MODEL: 1380

<table>
<thead>
<tr>
<th>Damper Width</th>
<th>Maximum Back Pressure</th>
<th>Maximum System Velocity</th>
<th>Operational Data</th>
<th>Leakage*</th>
</tr>
</thead>
<tbody>
<tr>
<td>48&quot; (1219)</td>
<td>4.0&quot; w.g.</td>
<td>2500 fpm</td>
<td>.08&quot; w.g.</td>
<td>0.60</td>
</tr>
<tr>
<td>36&quot; (914)</td>
<td>8.0&quot; w.g.</td>
<td>2500 fpm</td>
<td>.30&quot; w.g. (20 Pa)</td>
<td>0.60</td>
</tr>
<tr>
<td>24&quot; (610)</td>
<td>12.0&quot; w.g.</td>
<td>2500 fpm</td>
<td>0.72</td>
<td>0.72</td>
</tr>
<tr>
<td>12&quot; (305)</td>
<td>16.0&quot; w.g.</td>
<td>2500 fpm</td>
<td>1.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

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:

Tested per AMCA Standard 500-D, Figure 5.5.
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):**

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>6&quot; x 7&quot; (152 x 178)</td>
<td>40&quot; x 48&quot; (1016 x 1219)</td>
</tr>
</tbody>
</table>

**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)

**COMMON OPTIONS:**
- Vertical or Horizontal mount.
- Front or rear flange frame (with or without bolt holes).
FRAMES OPTIONS:

Channel Frame
(Duct Mount)
(Standard CF)

Front Flange
(on discharge side)
(Option FF)

Rear Flange
(on intake side)
(Option FR)

PERFORMANCE DATA:
MODEL: 1370CB

<table>
<thead>
<tr>
<th>Damper Width</th>
<th>Maximum Back Pressure</th>
<th>Maximum System Velocity</th>
<th>Operational Data</th>
<th>Leakage*</th>
</tr>
</thead>
<tbody>
<tr>
<td>40&quot; (1016)</td>
<td>3.0&quot; w.g.</td>
<td>1500 fpm</td>
<td>.01&quot; w.g.</td>
<td>.01&quot; w.g.</td>
</tr>
<tr>
<td>36&quot; (914)</td>
<td>4.0&quot; w.g.</td>
<td>1500 fpm</td>
<td>.10&quot; w.g.</td>
<td>.10&quot; w.g.</td>
</tr>
<tr>
<td>24&quot; (610)</td>
<td>5.0&quot; w.g.</td>
<td>1500 fpm</td>
<td>(2 Pa)</td>
<td>(25 Pa)</td>
</tr>
<tr>
<td>12&quot; (305)</td>
<td>6.0&quot; w.g.</td>
<td>1500 fpm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.
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):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Section</td>
<td>Multiple Section</td>
</tr>
<tr>
<td>6&quot; x 10&quot; (152 x 254)</td>
<td>Unlimited</td>
</tr>
<tr>
<td>48&quot; x 52&quot; (1219 x 1321)</td>
<td></td>
</tr>
</tbody>
</table>

1380CB Series - Maximum Performance Ratings

<table>
<thead>
<tr>
<th>Maximum System Velocity</th>
<th>2500 fpm (12.7 m/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Spot Velocity</td>
<td>3500 fpm (17.8 m/s)</td>
</tr>
<tr>
<td>Maximum Back Pressure</td>
<td>16 in. w.g. (4 kPa)</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>200°F (93°C)</td>
</tr>
</tbody>
</table>

COMMON OPTIONS:
- Vertical or Horizontal mount.
- Front or rear flange frame (with or without bolt holes).
PERFORMANCE DATA:
MODEL: 1380CB

<table>
<thead>
<tr>
<th>Damper Width</th>
<th>Maximum Back Pressure</th>
<th>Maximum System Velocity</th>
<th>Operational Data</th>
<th>Leakage*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Blades Begin Opening</td>
<td>Blades Fully Open</td>
</tr>
<tr>
<td>48&quot; (1219)</td>
<td>4.0&quot; w.g.</td>
<td>2500 fpm</td>
<td>.01&quot; w.g.</td>
<td>.05&quot; w.g. (2 Pa)</td>
</tr>
<tr>
<td>36&quot; (914)</td>
<td>8.0&quot; w.g.</td>
<td>2500 fpm</td>
<td>0.60</td>
<td>0.60</td>
</tr>
<tr>
<td>24&quot; (610)</td>
<td>12.0&quot; w.g.</td>
<td>2500 fpm</td>
<td>0.72</td>
<td>0.72</td>
</tr>
<tr>
<td>12&quot; (305)</td>
<td>16.0&quot; w.g.</td>
<td>2500 fpm</td>
<td>1.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

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.
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.

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.

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.

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.
Model 1390CB Counterbalanced Backdraft Damper

Model 1390CB Counterbalanced Backdraft Damper is engineered 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 Sizes (Duct W x H):**

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>6&quot; x 10&quot; (152 x 254)</td>
<td>48&quot; x 60&quot; (1219 x 1524)</td>
</tr>
</tbody>
</table>

**1390CB Series - Maximum Performance Ratings**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum System Velocity</td>
<td>2500 fpm (12.7 m/s)</td>
</tr>
<tr>
<td>Maximum Spot Velocity</td>
<td>3500 fpm (17.8 m/s)</td>
</tr>
<tr>
<td>Maximum Back Pressure</td>
<td>16 in. w.g. (4 kPa)</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>200°F (93°C)</td>
</tr>
</tbody>
</table>

**COMMON OPTIONS:**
- Extruded Aluminum frame construction.
- Vertical or Horizontal mount.
- Front or rear flange frame (with or without bolt holes).
PERFORMANCE DATA:
MODEL: 1390CB

<table>
<thead>
<tr>
<th>Damper Width</th>
<th>Maximum Back Pressure</th>
<th>Maximum System Velocity</th>
<th>Operational Data</th>
<th>Leakage</th>
</tr>
</thead>
<tbody>
<tr>
<td>48&quot; (1219)</td>
<td>4.0&quot; w.g.</td>
<td>2500 fpm</td>
<td>.01° w.g.</td>
<td>1.48%</td>
</tr>
<tr>
<td>36&quot; (914)</td>
<td>8.0&quot; w.g.</td>
<td>2500 fpm</td>
<td>.06° w.g. (2 Pa)</td>
<td>1.68%</td>
</tr>
<tr>
<td>24&quot; (610)</td>
<td>12.0&quot; w.g.</td>
<td>2500 fpm</td>
<td></td>
<td>2.04%</td>
</tr>
<tr>
<td>12&quot; (305)</td>
<td>16.0&quot; w.g.</td>
<td>2500 fpm</td>
<td></td>
<td>3.36%</td>
</tr>
</tbody>
</table>

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)
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.
INTRODUCTION TO LIFE SAFETY DAMPERS
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<th>Page</th>
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<td>UL 555 Safety Standard for Fire Dampers</td>
<td>C3</td>
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<td>UL 555S Safety Standard for Smoke Dampers</td>
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<td>Quick Select Guide for Fire, Smoke and Fire/Smoke Dampers</td>
<td>C16</td>
</tr>
<tr>
<td>Quick Select Guide for Ceiling Dampers</td>
<td>C18</td>
</tr>
</tbody>
</table>
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:

<table>
<thead>
<tr>
<th>Test</th>
<th>Static Fire Dampers</th>
<th>Dynamic Fire Dampers</th>
<th>Combination Fire/Smoke</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fire Endurance and Hose Stream</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>2. Cycling</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>3. Salt-Spray Exposure</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>4. Spring Closing Force</td>
<td>✔</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>5. Dynamic Closure</td>
<td>N/A</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>6. Operation (UL 555S)</td>
<td>N/A</td>
<td>N/A</td>
<td>✔</td>
</tr>
<tr>
<td>7. Leakage (UL 555S)</td>
<td>N/A</td>
<td>N/A</td>
<td>✔</td>
</tr>
</tbody>
</table>

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.
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 airflow 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.

<table>
<thead>
<tr>
<th>Rated Airflow and Pressure</th>
<th>Minimum Test Airflow and Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airflow, fpm (m/s)</td>
<td>Pressure, in. w.g. (kPa)</td>
</tr>
<tr>
<td>2000 (10)</td>
<td>4 (1.0)</td>
</tr>
<tr>
<td>3000 (15)</td>
<td>4 (1.0)</td>
</tr>
<tr>
<td>4000 (20)</td>
<td>4 (1.0)</td>
</tr>
<tr>
<td>2000 (10)</td>
<td>6 (1.5)</td>
</tr>
<tr>
<td>3000 (15)</td>
<td>6 (1.5)</td>
</tr>
<tr>
<td>4000 (20)</td>
<td>6 (1.5)</td>
</tr>
<tr>
<td>2000 (10)</td>
<td>8 (2.0)</td>
</tr>
<tr>
<td>3000 (15)</td>
<td>8 (2.0)</td>
</tr>
<tr>
<td>4000 (20)</td>
<td>8 (2.0)</td>
</tr>
</tbody>
</table>

- **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 airflow 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:

<table>
<thead>
<tr>
<th>Leakage Class</th>
<th>@ 4 in. w.g. (1.0 kPa)</th>
<th>@ 6 in. w.g. (1.5 kPa)</th>
<th>@ 8 in. w.g. (2.0 kPa)</th>
<th>@ 10 in. w.g. (2.5 kPa)</th>
<th>@ 12 in. w.g. (3.0 kPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>1 (0.020)</td>
<td>9.5 (0.048)</td>
<td>11 (0.056)</td>
<td>12.5 (0.064)</td>
<td>14 (0.071)</td>
</tr>
<tr>
<td>II</td>
<td>20 (0.102)</td>
<td>24 (0.123)</td>
<td>28 (0.143)</td>
<td>31.5 (0.160)</td>
<td>35 (0.179)</td>
</tr>
<tr>
<td>III</td>
<td>80 (0.408)</td>
<td>96 (0.489)</td>
<td>112 (0.571)</td>
<td>125 (0.640)</td>
<td>140 (0.714)</td>
</tr>
</tbody>
</table>

- **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/ft² of damper area (FPM), with the minimum being 2000 cfm/ft². 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 listings rated 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

<table>
<thead>
<tr>
<th>Code</th>
<th>Imperial</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>2000 fpm @ 4 in. w.g.</td>
<td>10 m/s @ 1 kPa</td>
</tr>
<tr>
<td>34</td>
<td>3000 fpm @ 4 in. w.g.</td>
<td>15 m/s @ 1 kPa</td>
</tr>
<tr>
<td>36</td>
<td>3000 fpm @ 6 in. w.g.</td>
<td>15 m/s @ 1.5 kPa</td>
</tr>
<tr>
<td>46</td>
<td>4000 fpm @ 6 in. w.g.</td>
<td>20 m/s @ 1.5 kPa</td>
</tr>
<tr>
<td>48</td>
<td>4000 fpm @ 8 in. w.g.</td>
<td>20 m/s @ 2 kPa</td>
</tr>
</tbody>
</table>

**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.
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.

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.

Fig. 1.0 - Time Temperature Curve

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).
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.

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.

BXUV.L550 Wood Truss Ceiling Assembly - 1 Hour UL 263 Fire Resistance Rating

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 up on 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.

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.

<table>
<thead>
<tr>
<th>Actuator Type/Model</th>
<th>S Dimension</th>
<th>E Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electric</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ML4X02  120 VAC Honeywell</td>
<td>5 3/4&quot; (146)</td>
<td>1 9/16&quot; (40)</td>
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<tr>
<td>ML8X02  24 VAC Honeywell</td>
<td>5 3/4&quot; (146)</td>
<td>1 9/16&quot; (40)</td>
</tr>
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<td>ML4Y02  230 VAC Honeywell</td>
<td>5 3/4&quot; (146)</td>
<td>5/8&quot; (16)</td>
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<td>FSLF120  120 VAC Belimo</td>
<td>5 3/4&quot; (146)</td>
<td>5/8&quot; (16)</td>
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<td>FSLF24  24 VAC Belimo</td>
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<td>5/8&quot; (16)</td>
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<tr>
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<td>5 3/4&quot; (146)</td>
<td>1 9/16&quot; (40)</td>
</tr>
<tr>
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<td>1 9/16&quot; (40)</td>
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<td>1 9/16&quot; (40)</td>
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<td>MS8X09F  120 VAC Honeywell</td>
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<td>1 9/16&quot; (40)</td>
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<td>1 9/16&quot; (40)</td>
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<td>MS4120F  120 VAC Honeywell</td>
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<tr>
<td>331-2961 Siemens #4</td>
<td>7&quot; (178)</td>
<td>11 1/2&quot; (292)</td>
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<tr>
<td>331-3060 Siemens #6</td>
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<td>15 1/2&quot; (394)</td>
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<tr>
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<td>7&quot; (178)</td>
<td>11 1/2&quot; (292)</td>
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</table>
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:

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<thead>
<tr>
<th>Actuator Type</th>
<th>Minimum Damper Size</th>
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<tbody>
<tr>
<td></td>
<td>Without accessories</td>
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<tr>
<td>Electric</td>
<td>10&quot; W x 8&quot; H (254 x 203)</td>
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<tr>
<td>Pneumatic</td>
<td>10&quot; W x 10&quot; H (254 x 254)</td>
</tr>
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</table>

FACTOR MOUNTED DUCT SMOKE DETECTOR MINIMUM SIZE REQUIREMENTS

Factory Mounted Duct Smoke Detector Minimum Size Requirements

<table>
<thead>
<tr>
<th>Duct Smoke Detector Type</th>
<th>Actuator Type</th>
<th>Actuator Mounting</th>
<th>Min. Sleeve Length (SL)</th>
<th>Min. Damper Position (L)</th>
<th>Minimum Damper Size</th>
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<tbody>
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</tr>
<tr>
<td>DSD-LF Low Flow</td>
<td>Electric</td>
<td>External</td>
<td>23&quot; (584)</td>
<td>9&quot; (229)</td>
<td>6&quot; W x 6&quot; H (152 x 152)</td>
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<tr>
<td></td>
<td>Pneumatic</td>
<td></td>
<td></td>
<td></td>
<td>10&quot; W x 6&quot; H (152 x 152)</td>
</tr>
<tr>
<td>DSD-LF Low Flow</td>
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<td>Internal</td>
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<td>–</td>
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<td></td>
<td>Pneumatic</td>
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<tr>
<td>DSD-NF No Flow</td>
<td>Electric</td>
<td>External</td>
<td>17&quot; (432)</td>
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<td></td>
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<td>Internal</td>
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<td>Pneumatic</td>
<td></td>
<td></td>
<td></td>
<td>–</td>
</tr>
</tbody>
</table>

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.
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 repairment 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.
## 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.

### 2 Position: Power Open/Fail Closed (Damper Normally Closed [NC])

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage/ Air Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ELECTRIC</strong></td>
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</tr>
<tr>
<td>ML4X02 Honeywell</td>
<td>120 VAC</td>
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<tr>
<td>ML8X02 Honeywell</td>
<td>24 VAC</td>
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<tr>
<td>ML4Y02 Honeywell</td>
<td>230 VAC</td>
</tr>
<tr>
<td>ML4115 Honeywell</td>
<td>120 VAC</td>
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<tr>
<td>ML8115 Honeywell</td>
<td>24 VAC</td>
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<tr>
<td><strong>PNEUMATIC</strong></td>
<td></td>
</tr>
<tr>
<td>MS4X09F Honeywell</td>
<td>120 VAC</td>
</tr>
<tr>
<td>MS8X09F Honeywell</td>
<td>24 VAC</td>
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<tr>
<td>MS4Y09F Honeywell</td>
<td>230 VAC</td>
</tr>
<tr>
<td>FSNF120 F Belimo</td>
<td>120 VAC</td>
</tr>
<tr>
<td>FSNF24 F Belimo</td>
<td>24 VAC</td>
</tr>
</tbody>
</table>

### For Low Torque Operations

- **ELECTRIC**
  - ML4X02 Honeywell: 120 VAC
  - ML8X02 Honeywell: 24 VAC
  - ML4Y02 Honeywell: 230 VAC
  - ML4115 Honeywell: 120 VAC
  - ML8115 Honeywell: 24 VAC
- **PNEUMATIC**
  - MS4X09F Honeywell: 120 VAC
  - MS8X09F Honeywell: 24 VAC
  - MS4Y09F Honeywell: 230 VAC
  - FSNF120 F Belimo: 120 VAC
  - FSNF24 F Belimo: 24 VAC

### For Medium Torque Operations

- **ELECTRIC**
  - MS4120F Honeywell: 120 VAC
  - MS8120F Honeywell: 24 VAC
  - MLS4620F Honeywell: 230 VAC
  - GGD121 Siemens: 24 VAC
  - GGD221 Siemens: 120 VAC
- **PNEUMATIC**
  - 331-2961 Siemens #4: 25 psi
  - 331-3060 Siemens #6: 25 psi

### For High Torque Operations

- **ELECTRIC**
  - MS7510A Honeywell: 24 VAC
  - FSAF24-SR Belimo: 24 VAC/VDC
- **PNEUMATIC**
  - 331-2961PR Siemens #4 w/ Pos. Relay: 25 psi

### Modulating: Fail Closed (Damper Normally Closed [NC])

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage/ Air Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ELECTRIC</strong></td>
<td></td>
</tr>
<tr>
<td>MS7510A Honeywell</td>
<td>24 VAC</td>
</tr>
<tr>
<td>FSAF24-SR Belimo</td>
<td>24 VAC/VDC</td>
</tr>
</tbody>
</table>

### Smoke Dampers Only: 2 Position: Power Closed/Fail Open (Damper Normally Open [NO])

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage/ Air Pressure</th>
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<tbody>
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<td><strong>ELECTRIC</strong></td>
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<tr>
<td>MS4120F Honeywell</td>
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<tr>
<td>MS8120F Honeywell</td>
<td>24 VAC</td>
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<tr>
<td>MLS4620F Honeywell</td>
<td>230 VAC</td>
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### Balancing: Fail Closed (Damper Normally Closed [NC])

<table>
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<th>Model</th>
<th>Voltage/ Air Pressure</th>
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<tr>
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<td></td>
</tr>
<tr>
<td>FSAF24-BAL Belimo</td>
<td>24 VAC/VDC</td>
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</tbody>
</table>

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.
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.

### Dynamic Fire Dampers - For Use in Dynamic or Static Systems

<table>
<thead>
<tr>
<th>Model Series</th>
<th>Damper Type</th>
<th>UL Classification</th>
<th>UL File #</th>
<th>City of New York MEA or BSA #</th>
<th>California State Fire Marshall Listing #</th>
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<tbody>
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<td>D0100</td>
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<tr>
<td>D0114</td>
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<td>1 1/2 hour label for walls &amp; floors</td>
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<td>460-88-SA</td>
<td>3225-0935:0101</td>
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<tr>
<td>D0500</td>
<td>Curtain Type, Steel</td>
<td>3 hour label for walls &amp; floors</td>
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</tr>
<tr>
<td>D0100G</td>
<td>Curtain Type, Steel with Integral Grille Mounting Tabs and Sleeve</td>
<td>1 1/2 hour label for walls &amp; floors</td>
<td>R9492</td>
<td>460-88-SA</td>
<td>3225-0935:0113</td>
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<tr>
<td>D0110GOW</td>
<td>Curtain Type, Steel, Out of Wall, with Integral Grille Mounting Flanges and Sleeve</td>
<td>1 1/2 hour label for walls &amp; floors</td>
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<td>460-88-SA</td>
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<tr>
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<td>3225-0935:0101</td>
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<td>1290F</td>
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### Static Fire Dampers - For Use in Static Systems Only

<table>
<thead>
<tr>
<th>Model Series</th>
<th>Damper Type</th>
<th>UL Classification</th>
<th>UL File #</th>
<th>City of New York MEA or BSA #</th>
<th>California State Fire Marshall Listing #</th>
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<tbody>
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<td>0130GC</td>
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<tr>
<td>1200SS</td>
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<td>3225-0935:0101</td>
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<td>Damper Type</td>
<td>UL Classification</td>
<td>UL File #</td>
<td>City of New York MEA or BSA #</td>
<td>California State Fire Marshall Listing #</td>
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<td>1210S</td>
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<td>Leakage Class I or II @ 250°F</td>
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<td>True Round, Stainless Steel</td>
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### Combination Fire & Smoke Dampers

<table>
<thead>
<tr>
<th>Model Series</th>
<th>Damper Type</th>
<th>UL Classification</th>
<th>UL File #</th>
<th>City of New York MEA or BSA #</th>
<th>California State Fire Marshall Listing #</th>
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</thead>
<tbody>
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<tr>
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<tr>
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<td>1220M</td>
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# QUICK SELECT GUIDE FOR CEILING 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 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.
CURTAIN FIRE DAMPERS

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 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 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.
CURTAIN FIRE DAMPERS

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.

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 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.
CURTAIN FIRE DAMPERS

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 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 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.
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

<table>
<thead>
<tr>
<th>Model/ Series</th>
<th>Type</th>
<th>Velocity/ Pressure Rating</th>
<th>Single Section</th>
<th>Multiple Section Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Minimum Size (W x H)</td>
<td>Maximum Size (W x H)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Installation</td>
<td>Installation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
</tr>
<tr>
<td>D0110</td>
<td>A</td>
<td>2000 fps @ 4” w.g. (10 m/s @ 1 kPa)</td>
<td>6” x 6” (152 x 152)</td>
<td>6” x 6” (152 x 152)</td>
</tr>
<tr>
<td>D0110</td>
<td>A</td>
<td>3000 fps @ 4” w.g. (15 m/s @ 1 kPa)</td>
<td>6” x 6” (152 x 152)</td>
<td>—</td>
</tr>
<tr>
<td>D0110</td>
<td>A</td>
<td>4000 fps @ 4” w.g. (20 m/s @ 1 kPa)</td>
<td>6” x 6” (152 x 152)</td>
<td>—</td>
</tr>
<tr>
<td>D0120</td>
<td>B</td>
<td>2000 fps @ 4” w.g. (10 m/s @ 1 kPa)</td>
<td>6” x 4” (152 x 102)</td>
<td>6” x 4” (152 x 102)</td>
</tr>
<tr>
<td>D0120</td>
<td>B</td>
<td>3000 fps @ 4” w.g. (15 m/s @ 1 kPa)</td>
<td>6” x 4” (152 x 102)</td>
<td>—</td>
</tr>
<tr>
<td>D0120</td>
<td>B</td>
<td>4000 fps @ 4” w.g. (20 m/s @ 1 kPa)</td>
<td>6” x 4” (152 x 102)</td>
<td>—</td>
</tr>
<tr>
<td>D0130</td>
<td>CR, Round</td>
<td>2000 fps @ 4” w.g. (10 m/s @ 1 kPa)</td>
<td>4” (102) dia.</td>
<td>4” (102) dia.</td>
</tr>
<tr>
<td>D0130</td>
<td>CR, Round</td>
<td>3000 fps @ 4” w.g. (15 m/s @ 1 kPa)</td>
<td>4” (102) dia.</td>
<td>—</td>
</tr>
<tr>
<td>D0130</td>
<td>CR, Round</td>
<td>4000 fps @ 4” w.g. (20 m/s @ 1 kPa)</td>
<td>4” (102) dia.</td>
<td>—</td>
</tr>
<tr>
<td>D0130</td>
<td>CO, Oval</td>
<td>2000 fps @ 4” w.g. (10 m/s @ 1 kPa)</td>
<td>5” x 4” (127 x 102)</td>
<td>5” x 4” (127 x 102)</td>
</tr>
<tr>
<td>D0130</td>
<td>CO, Oval</td>
<td>3000 fps @ 4” w.g. (15 m/s @ 1 kPa)</td>
<td>5” x 4” (127 x 102)</td>
<td>—</td>
</tr>
<tr>
<td>D0130</td>
<td>CO, Oval</td>
<td>4000 fps @ 4” w.g. (20 m/s @ 1 kPa)</td>
<td>5” x 4” (127 x 102)</td>
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</tr>
<tr>
<td>D0140</td>
<td>CSR, Sq./Rect.</td>
<td>2000 fps @ 4” w.g. (10 m/s @ 1 kPa)</td>
<td>4” x 4” (102 x 102)</td>
<td>4” x 4” (102 x 102)</td>
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<tr>
<td>D0140</td>
<td>CSR, Sq./Rect.</td>
<td>3000 fps @ 4” w.g. (15 m/s @ 1 kPa)</td>
<td>4” x 4” (102 x 102)</td>
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<tr>
<td>D0140</td>
<td>CSR, Sq./Rect.</td>
<td>4000 fps @ 4” w.g. (20 m/s @ 1 kPa)</td>
<td>4” x 4” (102 x 102)</td>
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</tr>
<tr>
<td>D0114HY</td>
<td>A</td>
<td>2000 fps @ 4” w.g. (10 m/s @ 1 kPa)</td>
<td>8” x 25” (203 x 635)</td>
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</tr>
<tr>
<td>D0124HY</td>
<td>B</td>
<td>2000 fps @ 4” w.g. (10 m/s @ 1 kPa)</td>
<td>8” x 22” (203 x 559)</td>
<td>—</td>
</tr>
<tr>
<td>D0134HY</td>
<td>CR, Round</td>
<td>2000 fps @ 4” w.g. (10 m/s @ 1 kPa)</td>
<td>22” (559) dia.</td>
<td>—</td>
</tr>
<tr>
<td>D0134HY</td>
<td>CO, Oval</td>
<td>2000 fps @ 4” w.g. (10 m/s @ 1 kPa)</td>
<td>6” x 22” (152 x 559)</td>
<td>—</td>
</tr>
<tr>
<td>D0114-12/14/16</td>
<td>A</td>
<td>2000 fps @ 4” w.g. (10 m/s @ 1 kPa)</td>
<td>6” x 6” (152 x 152)</td>
<td>6” x 6” (152 x 152)</td>
</tr>
<tr>
<td>D0114-12/14/16</td>
<td>A</td>
<td>3000 fps @ 4” w.g. (15 m/s @ 1 kPa)</td>
<td>6” x 6” (152 x 152)</td>
<td>—</td>
</tr>
<tr>
<td>D0114-12/14/16</td>
<td>A</td>
<td>4000 fps @ 4” w.g. (20 m/s @ 1 kPa)</td>
<td>6” x 6” (152 x 152)</td>
<td>—</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Model/ Series</th>
<th>Type</th>
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<tr>
<td></td>
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<td></td>
<td>Minimum Size (W x H)</td>
<td>Maximum Size (W x H)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
</tr>
<tr>
<td>D0124-12/14/16</td>
<td>B</td>
<td>2000 fpm @ 4” w.g. (10 m/s @ 1 kPa)</td>
<td>6” x 4” (152 x 102)</td>
<td>6” x 4” (152 x 102)</td>
</tr>
<tr>
<td>D0124-12/14/16</td>
<td>B</td>
<td>3000 fpm @ 4” w.g. (15 m/s @ 1 kPa)</td>
<td>6” x 4” (152 x 102)</td>
<td>—</td>
</tr>
<tr>
<td>D0124-12/14/16</td>
<td>B</td>
<td>4000 fpm @ 4” w.g. (20 m/s @ 1 kPa)</td>
<td>6” x 4” (152 x 102)</td>
<td>—</td>
</tr>
<tr>
<td>D0134-12/14/16 CR, Round</td>
<td></td>
<td>2000 fpm @ 4” w.g. (10 m/s @ 1 kPa)</td>
<td>4” (102) dia.</td>
<td>4” (102) dia.</td>
</tr>
<tr>
<td>D0134-12/14/16 CR, Round</td>
<td></td>
<td>3000 fpm @ 4” w.g. (15 m/s @ 1 kPa)</td>
<td>4” (102) dia.</td>
<td>—</td>
</tr>
<tr>
<td>D0134-12/14/16 CR, Round</td>
<td></td>
<td>4000 fpm @ 4” w.g. (20 m/s @ 1 kPa)</td>
<td>4” (102) dia.</td>
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<td>D0110G A</td>
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<td>2000 fpm @ 4” w.g. (10 m/s @ 1 kPa)</td>
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<tr>
<td>D0110G A</td>
<td></td>
<td>3000 fpm @ 4” w.g. (15 m/s @ 1 kPa)</td>
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<tr>
<td>D0110G A</td>
<td></td>
<td>4000 fpm @ 4” w.g. (20 m/s @ 1 kPa)</td>
<td>6” x 6” (152 x 152)</td>
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<tr>
<td>D0120G B</td>
<td></td>
<td>2000 fpm @ 4” w.g. (10 m/s @ 1 kPa)</td>
<td>6” x 4” (152 x 102)</td>
<td>6” x 4” (152 x 102)</td>
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<tr>
<td>D0120G B</td>
<td></td>
<td>3000 fpm @ 4” w.g. (15 m/s @ 1 kPa)</td>
<td>6” x 4” (152 x 102)</td>
<td>—</td>
</tr>
<tr>
<td>D0120G B</td>
<td></td>
<td>4000 fpm @ 4” w.g. (20 m/s @ 1 kPa)</td>
<td>6” x 4” (152 x 102)</td>
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<tr>
<td>D0130G CR, Round</td>
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<td>2000 fpm @ 4” w.g. (10 m/s @ 1 kPa)</td>
<td>4” (102) dia.</td>
<td>4” (102) dia.</td>
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<tr>
<td>D0130G CR, Round</td>
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<td>3000 fpm @ 4” w.g. (15 m/s @ 1 kPa)</td>
<td>4” (102) dia.</td>
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<tr>
<td>D0130G CR, Round</td>
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<td>4000 fpm @ 4” w.g. (20 m/s @ 1 kPa)</td>
<td>4” (102) dia.</td>
<td>—</td>
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<tr>
<td>D0110GOW A</td>
<td></td>
<td>2000 fpm @ 4” w.g. (10 m/s @ 1 kPa)</td>
<td>6” x 6” (152 x 152)</td>
<td>6” x 6” (152 x 152)</td>
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<tr>
<td>D0110GOW A</td>
<td></td>
<td>3000 fpm @ 4” w.g. (15 m/s @ 1 kPa)</td>
<td>6” x 6” (152 x 152)</td>
<td>—</td>
</tr>
<tr>
<td>D0110GOW A</td>
<td></td>
<td>4000 fpm @ 4” w.g. (20 m/s @ 1 kPa)</td>
<td>6” x 6” (152 x 152)</td>
<td>—</td>
</tr>
<tr>
<td>D0510 A</td>
<td></td>
<td>2000 fpm @ 4” w.g. (10 m/s @ 1 kPa)</td>
<td>6” x 6” (152 x 152)</td>
<td>6” x 6” (152 x 152)</td>
</tr>
<tr>
<td>D0510 A</td>
<td></td>
<td>3000 fpm @ 4” w.g. (15 m/s @ 1 kPa)</td>
<td>6” x 6” (152 x 152)</td>
<td>—</td>
</tr>
<tr>
<td>D0510 A</td>
<td></td>
<td>4000 fpm @ 4” w.g. (20 m/s @ 1 kPa)</td>
<td>6” x 6” (152 x 152)</td>
<td>—</td>
</tr>
<tr>
<td>D0520 B</td>
<td></td>
<td>2000 fpm @ 4” w.g. (10 m/s @ 1 kPa)</td>
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<td>D0520 B</td>
<td></td>
<td>3000 fpm @ 4” w.g. (15 m/s @ 1 kPa)</td>
<td>6” x 4” (152 x 102)</td>
<td>—</td>
</tr>
<tr>
<td>D0520 B</td>
<td></td>
<td>4000 fpm @ 4” w.g. (20 m/s @ 1 kPa)</td>
<td>6” x 4” (152 x 102)</td>
<td>—</td>
</tr>
</tbody>
</table>

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.)

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<tr>
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<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>D0530</td>
<td>CR, Round</td>
<td>2000 fpm @ 4’ w.g. (10 m/s @ 1 kPa)</td>
<td>4’ (102) dia.</td>
<td>31’ (787) dia.</td>
</tr>
<tr>
<td>D0530</td>
<td>CR, Round</td>
<td>3000 fpm @ 4’ w.g. (15 m/s @ 1 kPa)</td>
<td>4’ (102) dia.</td>
<td>—</td>
</tr>
<tr>
<td>D0530</td>
<td>CR, Round</td>
<td>4000 fpm @ 4’ w.g. (20 m/s @ 1 kPa)</td>
<td>4’ (102) dia.</td>
<td>—</td>
</tr>
<tr>
<td>D0530</td>
<td>CO, Oval</td>
<td>2000 fpm @ 4’ w.g. (10 m/s @ 1 kPa)</td>
<td>5’ x 4” (127 x 102)</td>
<td>5’ x 4” (127 x 102)</td>
</tr>
<tr>
<td>D0530</td>
<td>CO, Oval</td>
<td>3000 fpm @ 4’ w.g. (15 m/s @ 1 kPa)</td>
<td>5’ x 4” (127 x 102)</td>
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<tr>
<td>D0530</td>
<td>CO, Oval</td>
<td>4000 fpm @ 4’ w.g. (20 m/s @ 1 kPa)</td>
<td>5’ x 4” (127 x 102)</td>
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</tr>
<tr>
<td>D0530</td>
<td>CSR, Sq./Rect.</td>
<td>2000 fpm @ 4’ w.g. (10 m/s @ 1 kPa)</td>
<td>4’ x 4’ (102 x 102)</td>
<td>4’ x 4’ (102 x 102)</td>
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<tr>
<td>D0530</td>
<td>CSR, Sq./Rect.</td>
<td>3000 fpm @ 4’ w.g. (15 m/s @ 1 kPa)</td>
<td>4’ x 4’ (102 x 102)</td>
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</tr>
<tr>
<td>D0530</td>
<td>CSR, Sq./Rect.</td>
<td>4000 fpm @ 4’ w.g. (20 m/s @ 1 kPa)</td>
<td>4’ x 4’ (102 x 102)</td>
<td>—</td>
</tr>
</tbody>
</table>

⚠️ 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

<table>
<thead>
<tr>
<th>Model/Series</th>
<th>Type</th>
<th>Minimum Size (W x H)</th>
<th>Maximum Size (W x H)</th>
<th>Multiple Section Assembly</th>
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</thead>
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<td></td>
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<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>Installation</td>
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<tr>
<td>0110</td>
<td>A</td>
<td>4&quot; x 4&quot; (102 x 102)</td>
<td>60&quot; x 60&quot; (1524 x 1524)</td>
<td>120&quot; x 120&quot; (3048 x 3048)</td>
</tr>
<tr>
<td>0120</td>
<td>B</td>
<td>4&quot; x 3&quot; (102 x 76)</td>
<td>60&quot; x 54&quot; (1524 x 1372)</td>
<td>120&quot; x 114&quot; (3048 x 2896)</td>
</tr>
<tr>
<td>0130</td>
<td>CR, Round</td>
<td>3&quot; (76) dia.</td>
<td>53&quot; (1346) dia.</td>
<td>53&quot; (1346) dia.</td>
</tr>
<tr>
<td>0130</td>
<td>CO, Oval</td>
<td>4&quot; x 3&quot; (102 x 76)</td>
<td>58&quot; x 53&quot; (1473 x 1346)</td>
<td>118&quot; x 112&quot; (2997 x 2845)</td>
</tr>
<tr>
<td>0140</td>
<td>CSR, Sq./Rect.</td>
<td>3&quot; x 3&quot; (76 x 76)</td>
<td>58&quot; x 53&quot; (1473 x 1346)</td>
<td>118&quot; x 112&quot; (2997 x 2845)</td>
</tr>
<tr>
<td>0114-12/14/16</td>
<td>A</td>
<td>4&quot; x 4&quot; (102 x 102)</td>
<td>48&quot; x 48&quot; (1219 x 1219)</td>
<td>48&quot; x 48&quot; (1219 x 1219)</td>
</tr>
<tr>
<td>0124-12/14/16</td>
<td>B</td>
<td>4&quot; x 3&quot; (102 x 76)</td>
<td>48&quot; x 43&quot; (1219 x 1092)</td>
<td>48&quot; x 43&quot; (1219 x 1092)</td>
</tr>
<tr>
<td>0134-12/14/16</td>
<td>CR, Round</td>
<td>3&quot; (76) dia.</td>
<td>42&quot; (1067) dia.</td>
<td>42&quot; (1067) dia.</td>
</tr>
<tr>
<td>0100G</td>
<td>A, B, CR</td>
<td>4&quot; x 4&quot; (102 x 102)</td>
<td>24&quot; x 24&quot; (610 x 610)</td>
<td>24&quot; x 24&quot; (610 x 610)</td>
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<tr>
<td>0200G</td>
<td>A, B, CR</td>
<td>4&quot; x 4&quot; (102 x 102)</td>
<td>36&quot; x 24&quot; (914 x 610)</td>
<td>36&quot; x 24&quot; (914 x 610)</td>
</tr>
<tr>
<td>0110GOW</td>
<td>A</td>
<td>4&quot; x 4&quot; (102 x 102)</td>
<td>39&quot; x 29&quot; (991 x 737)</td>
<td>39&quot; x 29&quot; (991 x 737)</td>
</tr>
<tr>
<td>0210</td>
<td>A</td>
<td>4&quot; x 4&quot; (102 x 102)</td>
<td>41&quot; x 36&quot; or 36&quot; x 60&quot; (1041 x 914 or 1041 x 1524)</td>
<td>41&quot; x 36&quot; (1041 x 914)</td>
</tr>
<tr>
<td>0220</td>
<td>B</td>
<td>4&quot; x 3&quot; (102 x 76)</td>
<td>41&quot; x 30&quot; or 36&quot; x 50&quot; (1041 x 762 or 914 x 1270)</td>
<td>41&quot; x 30&quot; (1041 x 762)</td>
</tr>
<tr>
<td>0230</td>
<td>CR, Round</td>
<td>3&quot; (76) dia.</td>
<td>34&quot; (864) dia.</td>
<td>34&quot; (864) dia.</td>
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<tr>
<td>0230</td>
<td>CO, Oval</td>
<td>4&quot; x 3&quot; (102 x 76)</td>
<td>39&quot; x 29&quot; (991 x 737)</td>
<td>39&quot; x 29&quot; (991 x 737)</td>
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<tr>
<td>0240</td>
<td>CSR, Sq./Rect.</td>
<td>3&quot; x 3&quot; (76 x 76)</td>
<td>39&quot; x 29&quot; or 34&quot; x 49&quot; (991 x 737 or 864 x 1245)</td>
<td>39&quot; x 29&quot; (991 x 737)</td>
</tr>
<tr>
<td>0310</td>
<td>A</td>
<td>4&quot; x 4&quot; (102 x 102)</td>
<td>60&quot; x 48&quot; or 24&quot; x 60&quot; (1524 x 1219 or 610 x 1524)</td>
<td>48&quot; x 48&quot; (1219 x 1219)</td>
</tr>
<tr>
<td>0510</td>
<td>A</td>
<td>4&quot; x 4&quot; (102 x 102)</td>
<td>48&quot; x 48&quot; (1219 x 1219)</td>
<td>36&quot; x 36&quot; (914 x 914)</td>
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<tr>
<td>0520</td>
<td>B</td>
<td>4&quot; x 3&quot; (102 x 76)</td>
<td>48&quot; x 43&quot; (1219 x 1092)</td>
<td>36&quot; x 32&quot; (914 x 813)</td>
</tr>
<tr>
<td>0530</td>
<td>CR, Round</td>
<td>3&quot; (76) dia.</td>
<td>42&quot; (1067) dia.</td>
<td>31&quot; (767) dia.</td>
</tr>
<tr>
<td>0530</td>
<td>CO, Oval</td>
<td>4&quot; x 3&quot; (102 x 76)</td>
<td>46&quot; x 42&quot; (1168 x 1067)</td>
<td>34&quot; x 31&quot; (864 x 787)</td>
</tr>
<tr>
<td>0530</td>
<td>CSR, Sq./Rect.</td>
<td>3&quot; x 3&quot; (76 x 76)</td>
<td>46&quot; x 42&quot; (1168 x 1067)</td>
<td>34&quot; x 31&quot; (864 x 787)</td>
</tr>
<tr>
<td>0540</td>
<td>A</td>
<td>4&quot; x 4&quot; (102 x 102)</td>
<td>60&quot; x 48&quot; or 24&quot; x 60&quot; (1524 x 1219 or 610 x 1524)</td>
<td>—</td>
</tr>
<tr>
<td>0570</td>
<td>A</td>
<td>4&quot; x 4&quot; (102 x 102)</td>
<td>36&quot; x 60&quot; (914 x 1524)</td>
<td>—</td>
</tr>
<tr>
<td>0580</td>
<td>B</td>
<td>4&quot; x 3&quot; (102 x 76)</td>
<td>36&quot; x 50&quot; (914 x 1270)</td>
<td>—</td>
</tr>
<tr>
<td>0590</td>
<td>CR, Round</td>
<td>3&quot; (76) dia.</td>
<td>34&quot; (864) dia.</td>
<td>—</td>
</tr>
<tr>
<td>0590</td>
<td>CO, Oval</td>
<td>4&quot; x 3&quot; (102 x 76)</td>
<td>34&quot; x 49&quot; (864 x 1245)</td>
<td>—</td>
</tr>
<tr>
<td>0590</td>
<td>CSR, Sq./Rect.</td>
<td>3&quot; x 3&quot; (76 x 76)</td>
<td>34&quot; x 49&quot; (864 x 1245)</td>
<td>—</td>
</tr>
</tbody>
</table>

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).
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).

STANDARD CONSTRUCTION:

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D0110</td>
<td>Type A</td>
</tr>
<tr>
<td>D0120</td>
<td>Type B</td>
</tr>
<tr>
<td>D0130</td>
<td>Type CR/CO, Round/Oval</td>
</tr>
<tr>
<td>D0140</td>
<td>Type CSR, Square/Rectangular</td>
</tr>
</tbody>
</table>

For MIN./MAX. UL SIZES see chart on page D8.
Type C Damper Free Area – sq. ft.

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.

<table>
<thead>
<tr>
<th>Duct Width in inches (mm)</th>
<th>6' (152)</th>
<th>12' (305)</th>
<th>18' (457)</th>
<th>24' (610)</th>
<th>30' (762)</th>
<th>36' (914)</th>
<th>42' (1067)</th>
<th>48' (1219)</th>
<th>54' (1372)</th>
<th>60' (1524)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6' (152)</td>
<td>1.14</td>
<td>3.33</td>
<td>5.22</td>
<td>7.02</td>
<td>8.91</td>
<td>11.1</td>
<td>1.35</td>
<td>1.55</td>
<td>1.75</td>
<td>1.88</td>
</tr>
<tr>
<td>12' (305)</td>
<td>2.31</td>
<td>7.42</td>
<td>11.1</td>
<td>15.2</td>
<td>19.3</td>
<td>24.4</td>
<td>3.02</td>
<td>3.63</td>
<td>4.24</td>
<td>4.85</td>
</tr>
<tr>
<td>18' (457)</td>
<td>3.48</td>
<td>11.1</td>
<td>17.3</td>
<td>24.4</td>
<td>32.6</td>
<td>42.8</td>
<td>4.99</td>
<td>6.01</td>
<td>7.03</td>
<td>8.06</td>
</tr>
<tr>
<td>24' (610)</td>
<td>4.65</td>
<td>15.2</td>
<td>24.4</td>
<td>36.6</td>
<td>50.8</td>
<td>67.0</td>
<td>6.81</td>
<td>8.49</td>
<td>10.1</td>
<td>11.7</td>
</tr>
<tr>
<td>30' (762)</td>
<td>5.82</td>
<td>19.3</td>
<td>32.6</td>
<td>50.8</td>
<td>70.0</td>
<td>93.3</td>
<td>8.34</td>
<td>10.4</td>
<td>12.5</td>
<td>14.6</td>
</tr>
<tr>
<td>36' (914)</td>
<td>6.99</td>
<td>23.5</td>
<td>36.9</td>
<td>55.2</td>
<td>75.5</td>
<td>100.8</td>
<td>9.87</td>
<td>12.3</td>
<td>14.8</td>
<td>17.3</td>
</tr>
<tr>
<td>42' (1067)</td>
<td>8.14</td>
<td>27.7</td>
<td>41.9</td>
<td>63.2</td>
<td>91.5</td>
<td>122.8</td>
<td>11.4</td>
<td>14.5</td>
<td>17.6</td>
<td>20.3</td>
</tr>
<tr>
<td>48' (1219)</td>
<td>9.30</td>
<td>31.9</td>
<td>46.1</td>
<td>68.4</td>
<td>98.7</td>
<td>134.0</td>
<td>13.0</td>
<td>16.8</td>
<td>20.5</td>
<td>24.2</td>
</tr>
<tr>
<td>54' (1372)</td>
<td>10.46</td>
<td>36.1</td>
<td>50.3</td>
<td>72.6</td>
<td>102.9</td>
<td>143.2</td>
<td>14.6</td>
<td>19.1</td>
<td>22.9</td>
<td>26.7</td>
</tr>
<tr>
<td>60' (1524)</td>
<td>11.62</td>
<td>40.3</td>
<td>54.5</td>
<td>76.8</td>
<td>107.1</td>
<td>147.5</td>
<td>16.2</td>
<td>21.5</td>
<td>25.6</td>
<td>29.5</td>
</tr>
</tbody>
</table>

### Type B Damper Free Area – sq. ft.

<table>
<thead>
<tr>
<th>Duct Width in inches (mm)</th>
<th>6' (152)</th>
<th>12' (305)</th>
<th>18' (457)</th>
<th>24' (610)</th>
<th>30' (762)</th>
<th>36' (914)</th>
<th>42' (1067)</th>
<th>48' (1219)</th>
<th>54' (1372)</th>
<th>60' (1524)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6' (152)</td>
<td>1.17</td>
<td>3.39</td>
<td>5.62</td>
<td>8.44</td>
<td>11.1</td>
<td>13.8</td>
<td>1.65</td>
<td>1.95</td>
<td>2.25</td>
<td>2.56</td>
</tr>
<tr>
<td>12' (305)</td>
<td>2.36</td>
<td>6.78</td>
<td>10.8</td>
<td>15.4</td>
<td>20.5</td>
<td>26.6</td>
<td>3.22</td>
<td>3.82</td>
<td>4.42</td>
<td>5.02</td>
</tr>
<tr>
<td>18' (457)</td>
<td>3.54</td>
<td>10.1</td>
<td>15.3</td>
<td>22.0</td>
<td>30.7</td>
<td>40.9</td>
<td>4.89</td>
<td>5.89</td>
<td>7.09</td>
<td>8.39</td>
</tr>
<tr>
<td>24' (610)</td>
<td>4.73</td>
<td>13.5</td>
<td>21.7</td>
<td>31.4</td>
<td>43.5</td>
<td>57.7</td>
<td>6.66</td>
<td>8.06</td>
<td>9.66</td>
<td>11.4</td>
</tr>
<tr>
<td>30' (762)</td>
<td>5.92</td>
<td>16.9</td>
<td>26.1</td>
<td>38.2</td>
<td>53.3</td>
<td>71.5</td>
<td>8.43</td>
<td>10.1</td>
<td>12.1</td>
<td>14.1</td>
</tr>
<tr>
<td>36' (914)</td>
<td>7.11</td>
<td>20.3</td>
<td>30.5</td>
<td>42.7</td>
<td>59.7</td>
<td>80.9</td>
<td>10.2</td>
<td>12.4</td>
<td>15.2</td>
<td>17.8</td>
</tr>
<tr>
<td>42' (1067)</td>
<td>8.29</td>
<td>23.7</td>
<td>34.9</td>
<td>50.0</td>
<td>68.8</td>
<td>93.1</td>
<td>12.0</td>
<td>15.0</td>
<td>18.6</td>
<td>21.9</td>
</tr>
<tr>
<td>48' (1219)</td>
<td>9.48</td>
<td>27.1</td>
<td>39.2</td>
<td>55.3</td>
<td>76.0</td>
<td>103.4</td>
<td>13.9</td>
<td>17.7</td>
<td>22.3</td>
<td>25.9</td>
</tr>
<tr>
<td>54' (1372)</td>
<td>10.66</td>
<td>30.5</td>
<td>41.4</td>
<td>58.6</td>
<td>80.7</td>
<td>111.8</td>
<td>16.8</td>
<td>21.6</td>
<td>27.3</td>
<td>31.1</td>
</tr>
<tr>
<td>60' (1524)</td>
<td>11.85</td>
<td>34.0</td>
<td>44.9</td>
<td>65.8</td>
<td>90.8</td>
<td>127.0</td>
<td>19.7</td>
<td>25.4</td>
<td>32.0</td>
<td>36.9</td>
</tr>
</tbody>
</table>

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

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)

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

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

\[ \text{S.P.} = \text{Static pressure in inches water gauge} \]

\[ \text{FAV} = \text{Free Area Velocity} \]

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. w.g. by .2486 for kilopascals

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

To calculate Free Area of round duct: Diameter² 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)
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: 22 ga. (0.85) roll-formed G60 galvanized steel.
SLEEVE/F RAME:
- D01 X 4 - 12 Length 12” (305)
- D01 X 4 - 14 Length 14” (356)
- D01 X 4 - 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.

DIMENSIONAL DATA:

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Blades and frame in the airstream.</th>
<th>Minimum size</th>
<th>Maximum size</th>
</tr>
</thead>
<tbody>
<tr>
<td>D0114-1X</td>
<td>A</td>
<td>6” x 6” (152 x 152)</td>
<td>36” x 36” (914 x 914)</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Blades out of airstream.</th>
<th>Minimum size</th>
<th>Maximum size</th>
</tr>
</thead>
<tbody>
<tr>
<td>D0124-1X</td>
<td>B</td>
<td>6” x 4” (152 x 102)</td>
<td>36” x 32” (914 x 813)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Round transition collars.</th>
<th>Minimum size</th>
<th>Maximum size</th>
</tr>
</thead>
<tbody>
<tr>
<td>D0134-1X</td>
<td>CR</td>
<td>4” dia. (102)</td>
<td>31” dia. (787)</td>
<td></td>
</tr>
</tbody>
</table>

**D01X4-1X Series - Maximum Performance Ratings**

<table>
<thead>
<tr>
<th>UL 555 Fire Resistance Rating</th>
<th>1 1/2 Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Velocity</td>
<td>4000 fpm (20 m/s)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>4 in. w.g. (1 kPa)</td>
</tr>
</tbody>
</table>
OPTIONS & ACCESSORIES:

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT</td>
<td>Pull Tab Release for Simple Testing and Maintenance</td>
</tr>
<tr>
<td>QS1/QS2</td>
<td>Single set or Pair of &quot;Quick-Set&quot; Retaining Angles</td>
</tr>
<tr>
<td>HM1/HM2</td>
<td>One or Both Sleeve Ends Hemmed for Slip and Drive Connection</td>
</tr>
<tr>
<td>TDF1/TDF2</td>
<td>One or Both Sleeve Ends Flanged for Breakaway Connection</td>
</tr>
<tr>
<td>MS</td>
<td>24V Microswitch</td>
</tr>
<tr>
<td>MSE</td>
<td>120/24V Microswitch with Enclosure</td>
</tr>
</tbody>
</table>

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.
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).

STANDARD CONSTRUCTION:

<table>
<thead>
<tr>
<th></th>
<th>D0114HY (Type A)</th>
<th>D0124HY (Type B)</th>
<th>D0134HY (Type C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame</td>
<td>5’ (127) deep max., roll-formed galvanized steel</td>
<td>5’ (127) deep max., roll-formed galvanized steel</td>
<td>5’ (127) deep max., roll-formed galvanized steel</td>
</tr>
<tr>
<td>Blades</td>
<td>Min. 22 ga. (0.85) roll-formed galvanized steel</td>
<td>Min. 22 ga. (0.85) roll-formed galvanized steel</td>
<td>Min. 22 ga. (0.85) roll-formed galvanized steel</td>
</tr>
<tr>
<td>Sleeve/Enclosure</td>
<td>12’ (305) long x 20 ga. (1.0) std. 14&quot; (356) or 16&quot; (406) long available</td>
<td>12’ (305) long x 20 ga. (1.0) std. 14&quot; (356) or 16&quot; (406) long available</td>
<td>12’ (305) long x 20 ga. (1.0) std. 14&quot; (356) or 16&quot; (406) long available</td>
</tr>
<tr>
<td>Fusible Link</td>
<td>165°F (74°C) standard 212°F (100°C) available</td>
<td>165°F (74°C) standard 212°F (100°C) available</td>
<td>165°F (74°C) standard 212°F (100°C) available</td>
</tr>
<tr>
<td>Mounting</td>
<td>Vertical mount only</td>
<td>Vertical mount only</td>
<td>Vertical mount only</td>
</tr>
</tbody>
</table>

For MIN./MAX. UL SIZES see chart on page D8.
**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.
Models:
D0510  Type A
D0520  Type B
D0530  Type CR/CO/CSR, Round/Oval/Square/Rectangular

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:

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

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

**MODEL D0520:**
*Type B*

**MODEL D0530:**
*Type CR*

**MODEL D0530:**
*Type CO*

**MODEL D0530:**
*Type CSR (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.**

<table>
<thead>
<tr>
<th>Duct Width in inches (mm)</th>
<th>6&quot; (152)</th>
<th>12&quot; (305)</th>
<th>18&quot; (457)</th>
<th>24&quot; (610)</th>
<th>30&quot; (762)</th>
<th>36&quot; (914)</th>
<th>42&quot; (1067)</th>
<th>48&quot; (1219)</th>
<th>54&quot; (1372)</th>
<th>60&quot; (1524)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; (152)</td>
<td>.14</td>
<td>.33</td>
<td>.52</td>
<td>.70</td>
<td>.89</td>
<td>1.1</td>
<td>1.3</td>
<td>1.5</td>
<td>1.7</td>
<td>1.8</td>
</tr>
<tr>
<td>12&quot; (305)</td>
<td>.31</td>
<td>.72</td>
<td>1.1</td>
<td>1.5</td>
<td>1.9</td>
<td>2.4</td>
<td>3.8</td>
<td>4.2</td>
<td>5.8</td>
<td>6.2</td>
</tr>
<tr>
<td>18&quot; (457)</td>
<td>.48</td>
<td>1.1</td>
<td>1.7</td>
<td>2.4</td>
<td>3.0</td>
<td>3.7</td>
<td>4.3</td>
<td>4.9</td>
<td>5.6</td>
<td>6.2</td>
</tr>
<tr>
<td>24&quot; (610)</td>
<td>.65</td>
<td>1.5</td>
<td>2.4</td>
<td>3.2</td>
<td>4.1</td>
<td>5.0</td>
<td>5.8</td>
<td>6.7</td>
<td>7.5</td>
<td>8.4</td>
</tr>
<tr>
<td>30&quot; (762)</td>
<td>.82</td>
<td>1.9</td>
<td>3.0</td>
<td>4.1</td>
<td>5.2</td>
<td>6.3</td>
<td>7.3</td>
<td>8.4</td>
<td>9.5</td>
<td>10.6</td>
</tr>
<tr>
<td>36&quot; (914)</td>
<td>.99</td>
<td>2.3</td>
<td>3.6</td>
<td>4.9</td>
<td>6.3</td>
<td>7.6</td>
<td>8.9</td>
<td>10.2</td>
<td>11.5</td>
<td>12.8</td>
</tr>
<tr>
<td>42&quot; (1067)</td>
<td>1.2</td>
<td>2.7</td>
<td>4.2</td>
<td>5.8</td>
<td>7.3</td>
<td>8.8</td>
<td>10.4</td>
<td>11.9</td>
<td>13.4</td>
<td>15.0</td>
</tr>
<tr>
<td>48&quot; (1219)</td>
<td>1.3</td>
<td>3.1</td>
<td>4.9</td>
<td>6.6</td>
<td>8.4</td>
<td>10.2</td>
<td>11.9</td>
<td>13.7</td>
<td>15.5</td>
<td>17.2</td>
</tr>
<tr>
<td>54&quot; (1372)</td>
<td>1.5</td>
<td>3.5</td>
<td>5.5</td>
<td>7.5</td>
<td>9.5</td>
<td>11.5</td>
<td>13.5</td>
<td>15.5</td>
<td>17.5</td>
<td>19.4</td>
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<tr>
<td>60&quot; (1524)</td>
<td>1.7</td>
<td>3.9</td>
<td>6.1</td>
<td>8.3</td>
<td>10.6</td>
<td>12.8</td>
<td>15.0</td>
<td>17.2</td>
<td>19.4</td>
<td>21.7</td>
</tr>
</tbody>
</table>

**Type B Damper Free Area – sq. ft.**

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

**Type C Damper Free Area have Area equal to Nominal Duct Area.**

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) = cfm / Free Area
- **Example:**
  - 1 – 36" x 24" Damper required for 8,500 cfm. (Type A)
  - FAV = Free Area
  - 1700 fpm located on the 'A' curve shows a pressure drop of .07 in. wg.

**Type B Damper Free Area – sq. ft.**

To calculate Free Area of round duct: Diameter² x .00545 = Free Area (sq ft.)

To convert to SI (metric) system:
- Multiply sq. ft. by .0929 for square meters
- Multiply in. wg. by .2486 for kilopascals
- Multiply fpm by .00508 for meters per second
- Multiply cfm by .4719 for liters per second

**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)
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.

OPTIONS & ACCESSORIES:

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT</td>
<td>Pull Tab Release for Simple Testing and Maintenance</td>
</tr>
<tr>
<td>QS1/QS2</td>
<td>Single set or Pair of &quot;Quick-Set&quot; Retaining Angles</td>
</tr>
<tr>
<td>HM1/HM2</td>
<td>One or Both Sleeve Ends Hemmed for Slip and Drive Connection</td>
</tr>
<tr>
<td>TDF1/TDF2</td>
<td>One or Both Sleeve Ends Flanged for Breakaway Connection</td>
</tr>
<tr>
<td>MS</td>
<td>24V Microswitch</td>
</tr>
<tr>
<td>MSE</td>
<td>120/24V Microswitch with Enclosure</td>
</tr>
</tbody>
</table>
Models:
D0110G Type A
D0120G Type B
D0130G Type CR, Round

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:

<table>
<thead>
<tr>
<th>Model</th>
<th>Frame:</th>
<th>Blades:</th>
<th>Standard Sleeve:</th>
<th>Fusible Link: (UL Listed)</th>
<th>Blade Closure:</th>
<th>Mounting:</th>
<th>Optional Grille:</th>
</tr>
</thead>
<tbody>
<tr>
<td>D0110G</td>
<td>4 1/4&quot; (108) wide, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>12&quot; (305) long x 22 ga. (0.85) steel with 3/4&quot; (19) wide grille mounting flanges</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>Stainless steel closure springs and galvanized steel locking ramps</td>
<td>Vertical or Horiz.</td>
<td>Steel grille with correctly located countersunk screw holes; Select model from Nailor Air Distribution Catalog</td>
</tr>
<tr>
<td>D0120G</td>
<td>4 1/4&quot; (108) wide, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Out of airstream, Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>12&quot; (305) long x 22 ga. (0.85) steel with 3/4&quot; (19) wide grille mounting flanges; Type B duct connection on one end</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>Stainless steel closure springs and galvanized steel locking ramps</td>
<td>Vertical or Horiz.</td>
<td>Steel grille with correctly located countersunk screw holes; Select model from Nailor Air Distribution Catalog</td>
</tr>
<tr>
<td>D0130G</td>
<td>4 1/4&quot; (108) wide, 22 ga. (0.85) roll-formed galv. steel; out of airstream</td>
<td>Out of airstream, Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>12&quot; (305) long x 22 ga. (0.85) steel with 3/4&quot; (19) wide grille mounting flanges; Type C duct connection on one end</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>Stainless steel closure springs and galvanized steel locking ramps</td>
<td>Vertical or Horiz.</td>
<td>Steel grille with correctly located countersunk screw holes; Select model from Nailor Air Distribution Catalog</td>
</tr>
</tbody>
</table>
DIMENSIONAL DETAILS:

<table>
<thead>
<tr>
<th>Duct Height (H)</th>
<th>Dim. ‘A’</th>
</tr>
</thead>
<tbody>
<tr>
<td>4” – 17” (102 – 432)</td>
<td>2” (51)</td>
</tr>
<tr>
<td>18” – 24” (457 – 610)</td>
<td>3” (76)</td>
</tr>
<tr>
<td>25” – 32” (635 – 813)</td>
<td>4” (102)</td>
</tr>
</tbody>
</table>

**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:**

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>QS1</td>
<td>Single set of “Quick-Set” Retaining Angles for Rear Side</td>
</tr>
<tr>
<td>HM1</td>
<td>Sleeve End Hemmed for Slip and Drive Connection for Rear Side</td>
</tr>
<tr>
<td>TDF1</td>
<td>Sleeve End Flanged for Breakaway Connection for Rear Side</td>
</tr>
<tr>
<td>MS</td>
<td>24V Microswitch</td>
</tr>
<tr>
<td>MSE</td>
<td>120/24V Microswitch with Enclosure</td>
</tr>
</tbody>
</table>

**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.
Model: D0110GOW  Type A

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 offset 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:

<table>
<thead>
<tr>
<th></th>
<th>D0110GOW (Type A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame:</td>
<td>4 1/4&quot; (108) wide, 22 ga. (0.85) roll-formed galv. steel</td>
</tr>
<tr>
<td>Blades:</td>
<td>Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
</tr>
<tr>
<td>Standard Sleeve:</td>
<td>10&quot; (254) long x 16 ga. (1.6) galvanized steel with 3/4&quot; (19) wide grille mounting flanges; intumescent thermal insulation on all four sides</td>
</tr>
<tr>
<td>Fusible Link: (UL Listed)</td>
<td>165°F (74°C) std. 212°F (100°C) avail.</td>
</tr>
<tr>
<td>Blade Closure:</td>
<td>Stainless steel closure springs and galvanized steel locking ramps</td>
</tr>
<tr>
<td>Mounting:</td>
<td>Vertical or Horizontal</td>
</tr>
<tr>
<td>Optional Grille:</td>
<td>Steel or aluminum grille or register; Select model from Nailor Air Distribution Catalog</td>
</tr>
</tbody>
</table>
DIMENSIONAL DATA:

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.
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**

   - **SL**: Specify

   - **8” - 28” (203 - 700)

8a. **Sleeve Gauge**

   - **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**

   - **PT**: Pull Tab Release

10. **Micro Switch**

    - **MS**: 24 VAC Micro-Switch
    - **MSE**: 24/120 VAC Micro-Switch w/Enc.

11. **Retaining Angles**

    - **QS1**: One Side
    - **QS2**: Two Sides (pair)

12. **Sleeve Accessory**

    - **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.*
Series 0100/V 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 0100/V 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:

<table>
<thead>
<tr>
<th>Models</th>
<th>Frame:</th>
<th>Blades:</th>
<th>Enclosure:</th>
<th>Fusible Link: (UL Listed)</th>
<th>Blade Closure:</th>
<th>Mounting:</th>
<th>Integral Sleeve:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0110/V/H Type A</td>
<td>4 1/4&quot; (108) wide, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>n/a</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps</td>
<td>Vertical or Horiz.</td>
<td>See Model 114-12, 114-14, 114-16, 124-12, 124-14, 124-16</td>
</tr>
<tr>
<td>0120/V/H Type B</td>
<td>4 1/4&quot; (108) wide, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Out of airstream, Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Type B 22 ga. (0.85) galvanized steel</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps</td>
<td>Vertical or Horiz.</td>
<td>22 ga. (0.85) x 12” (305) long, 22 ga. (0.85) x 14” (356) long, 22 ga. (0.85) x 16’ (406) long</td>
</tr>
<tr>
<td>0130/V/H Type CR/CO</td>
<td>4 1/4&quot; (108) wide, 22 ga. (0.85) roll-formed galv. steel; out of airstream</td>
<td>Out of airstream, Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Type C Round or Oval 22 ga. (0.85) galvanized steel</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps</td>
<td>Vertical or Horiz.</td>
<td>22 ga. (0.85) x 12” (305) long, 22 ga. (0.85) x 14” (356) long, 22 ga. (0.85) x 16’ (406) long</td>
</tr>
<tr>
<td>0140/V/H Type CSR</td>
<td>4 1/4&quot; (108) wide, 22 ga. (0.85) roll-formed galv. steel; out of airstream</td>
<td>Out of airstream, Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Type C Square or Rect. 22 ga. (0.85) galvanized steel</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps</td>
<td>Vertical or Horiz.</td>
<td>22 ga. (0.85) x 12” (305) long, 22 ga. (0.85) x 14” (356) long, 22 ga. (0.85) x 16’ (406) long</td>
</tr>
</tbody>
</table>

For MIN./MAX. UL SIZES see chart on page D11.
**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.**

<table>
<thead>
<tr>
<th>Duct Width in inches (mm)</th>
<th>6' (152)</th>
<th>12' (305)</th>
<th>18' (457)</th>
<th>24' (610)</th>
<th>30' (762)</th>
<th>36' (914)</th>
<th>42' (1067)</th>
<th>48' (1219)</th>
<th>54' (1372)</th>
<th>60' (1524)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6' (152)</td>
<td>14</td>
<td>33</td>
<td>52</td>
<td>70</td>
<td>89</td>
<td>1.1</td>
<td>1.3</td>
<td>1.5</td>
<td>1.7</td>
<td>1.8</td>
</tr>
<tr>
<td>12' (305)</td>
<td>31</td>
<td>72</td>
<td>1.1</td>
<td>1.5</td>
<td>1.9</td>
<td>2.4</td>
<td>2.8</td>
<td>3.2</td>
<td>3.6</td>
<td>4.0</td>
</tr>
<tr>
<td>18' (457)</td>
<td>48</td>
<td>1.1</td>
<td>1.7</td>
<td>2.4</td>
<td>3.0</td>
<td>3.7</td>
<td>4.3</td>
<td>4.9</td>
<td>5.6</td>
<td>6.2</td>
</tr>
<tr>
<td>24' (610)</td>
<td>65</td>
<td>2.3</td>
<td>4.2</td>
<td>6.6</td>
<td>9.0</td>
<td>12.0</td>
<td>15.0</td>
<td>18.0</td>
<td>21.0</td>
<td>24.0</td>
</tr>
<tr>
<td>30' (762)</td>
<td>82</td>
<td>3.6</td>
<td>6.3</td>
<td>9.3</td>
<td>12.3</td>
<td>15.3</td>
<td>18.3</td>
<td>21.3</td>
<td>24.3</td>
<td>27.3</td>
</tr>
<tr>
<td>36' (914)</td>
<td>99</td>
<td>6.3</td>
<td>9.5</td>
<td>12.7</td>
<td>15.9</td>
<td>19.1</td>
<td>22.3</td>
<td>25.5</td>
<td>28.7</td>
<td>32.0</td>
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<tr>
<td>42' (1067)</td>
<td>1.2</td>
<td>10.5</td>
<td>14.6</td>
<td>18.7</td>
<td>22.8</td>
<td>26.9</td>
<td>31.0</td>
<td>35.1</td>
<td>39.2</td>
<td>43.3</td>
</tr>
<tr>
<td>48' (1219)</td>
<td>1.3</td>
<td>13.8</td>
<td>18.0</td>
<td>22.1</td>
<td>26.2</td>
<td>30.3</td>
<td>34.4</td>
<td>38.5</td>
<td>42.6</td>
<td>46.7</td>
</tr>
<tr>
<td>54' (1372)</td>
<td>1.5</td>
<td>17.0</td>
<td>21.2</td>
<td>25.3</td>
<td>29.4</td>
<td>33.5</td>
<td>37.6</td>
<td>41.7</td>
<td>45.8</td>
<td>49.9</td>
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<tr>
<td>60' (1524)</td>
<td>1.7</td>
<td>19.2</td>
<td>23.4</td>
<td>27.5</td>
<td>31.6</td>
<td>35.7</td>
<td>39.8</td>
<td>43.9</td>
<td>48.0</td>
<td>52.1</td>
</tr>
</tbody>
</table>

**Type B Damper Free Area – sq. ft.**

<table>
<thead>
<tr>
<th>Duct Width in inches (mm)</th>
<th>6' (152)</th>
<th>12' (305)</th>
<th>18' (457)</th>
<th>24' (610)</th>
<th>30' (762)</th>
<th>36' (914)</th>
<th>42' (1067)</th>
<th>48' (1219)</th>
<th>54' (1372)</th>
<th>60' (1524)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6' (152)</td>
<td>17</td>
<td>39</td>
<td>62</td>
<td>84</td>
<td>101</td>
<td>1.3</td>
<td>1.5</td>
<td>1.7</td>
<td>2.0</td>
<td>2.2</td>
</tr>
<tr>
<td>12' (305)</td>
<td>36</td>
<td>63</td>
<td>1.3</td>
<td>1.8</td>
<td>2.3</td>
<td>2.7</td>
<td>3.2</td>
<td>3.7</td>
<td>4.1</td>
<td>4.6</td>
</tr>
<tr>
<td>18' (457)</td>
<td>54</td>
<td>1.3</td>
<td>2.3</td>
<td>3.4</td>
<td>4.2</td>
<td>4.9</td>
<td>5.6</td>
<td>6.3</td>
<td>7.1</td>
<td>7.9</td>
</tr>
<tr>
<td>24' (610)</td>
<td>73</td>
<td>2.7</td>
<td>4.6</td>
<td>6.6</td>
<td>8.6</td>
<td>10.6</td>
<td>12.6</td>
<td>14.6</td>
<td>16.6</td>
<td>18.6</td>
</tr>
<tr>
<td>30' (762)</td>
<td>92</td>
<td>4.6</td>
<td>7.0</td>
<td>9.3</td>
<td>11.6</td>
<td>13.9</td>
<td>16.2</td>
<td>18.5</td>
<td>20.8</td>
<td>23.1</td>
</tr>
<tr>
<td>36' (914)</td>
<td>111</td>
<td>6.1</td>
<td>9.5</td>
<td>12.9</td>
<td>16.3</td>
<td>19.7</td>
<td>23.1</td>
<td>26.5</td>
<td>29.9</td>
<td>33.3</td>
</tr>
<tr>
<td>42' (1067)</td>
<td>1.3</td>
<td>8.5</td>
<td>12.0</td>
<td>15.5</td>
<td>19.0</td>
<td>22.5</td>
<td>26.0</td>
<td>29.5</td>
<td>33.0</td>
<td>36.5</td>
</tr>
<tr>
<td>48' (1219)</td>
<td>1.5</td>
<td>10.9</td>
<td>14.5</td>
<td>18.1</td>
<td>21.7</td>
<td>25.3</td>
<td>28.9</td>
<td>32.5</td>
<td>36.1</td>
<td>39.7</td>
</tr>
<tr>
<td>54' (1372)</td>
<td>1.7</td>
<td>13.4</td>
<td>17.0</td>
<td>20.6</td>
<td>24.2</td>
<td>27.8</td>
<td>31.4</td>
<td>35.0</td>
<td>38.6</td>
<td>42.2</td>
</tr>
<tr>
<td>60' (1524)</td>
<td>1.9</td>
<td>15.9</td>
<td>20.5</td>
<td>24.1</td>
<td>27.7</td>
<td>31.3</td>
<td>34.9</td>
<td>38.5</td>
<td>42.1</td>
<td>45.7</td>
</tr>
</tbody>
</table>

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

To calculate Free Area of round duct: Diameter² x 0.00545 = Free Area (sq ft.)

**FREE AREA VELOCITY (FAV):**

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 (fps) = \( \frac{\text{cfm}}{\text{Duct Size} - \frac{1}{4}'' (6)} \)

Example:

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

FAV = \( \frac{8500}{30} = 283.3 \) fps

1700 fps located on the ‘A’ curve shows a pressure drop of .07 in. wg.

CFM = cubic feet per minute

fps = 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 .01086 for liters per second

Multiply fps by .04719 for meters per second

Multiply in. wg. by .2486 for kilopascals

Multiply sq. ft. by .0929 for square meters.
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. (.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: 22 ga. (0.85) roll-formed G60 galvanized steel.

SLEEVE/FRAME:
- 01 X 4 X - 12 Length 12” (305)
- 01 X 4 X - 14 Length 14” (356)
- 01 X 4 X - 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)
**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. Data 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: 01X4/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.
### Models:
- **0210 V/H** Type A
- **0220 V/H** Type B
- **0230 V/H** Type CR/CO, Round/Oval
- **0240 V/H** Type CSR, Square/Rectangular

Series 0200 V/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 0200 V/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:

<table>
<thead>
<tr>
<th>Model</th>
<th>Frame:</th>
<th>Blades:</th>
<th>Enclosure:</th>
<th>Fusible Link: (UL Listed)</th>
<th>Blade Closure:</th>
<th>Mounting:</th>
<th>Available Sleeve:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0210 V/H</td>
<td>2” (51) wide, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>n/a</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps</td>
<td>Vertical or Horiz.</td>
<td>Galvanized steel; Specify SL option</td>
</tr>
<tr>
<td>0220 V/H</td>
<td>2” (51) wide, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Out of airstream, curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Type B 22 ga. (0.85) galvanized steel</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps</td>
<td>Vertical or Horiz.</td>
<td>Galvanized steel; Specify SL option</td>
</tr>
<tr>
<td>0230 V/H</td>
<td>2” (51) wide, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Out of airstream, curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Type C Round or Oval 22 ga. (0.85) galvanized steel</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps</td>
<td>Vertical or Horiz.</td>
<td>Galvanized steel; Specify SL option</td>
</tr>
<tr>
<td>0240 V/H</td>
<td>2” (51) wide, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Out of airstream, curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Type C Square or Rect. 22 ga. (0.85) galvanized steel</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps</td>
<td>Vertical or Horiz.</td>
<td>Galvanized steel; Specify SL option</td>
</tr>
</tbody>
</table>

For MIN./MAX. UL SIZES see chart on page D11.
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.

<table>
<thead>
<tr>
<th>Duct Width in inches (mm)</th>
<th>6&quot; (152)</th>
<th>12&quot; (305)</th>
<th>18&quot; (457)</th>
<th>24&quot; (610)</th>
<th>30&quot; (762)</th>
<th>36&quot; (914)</th>
<th>40&quot; (1016)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; (152)</td>
<td>12</td>
<td>27</td>
<td>.44</td>
<td>.59</td>
<td>.75</td>
<td>.94</td>
<td>1.02</td>
</tr>
<tr>
<td>12&quot; (305)</td>
<td>27</td>
<td>61</td>
<td>.93</td>
<td>1.36</td>
<td>1.7</td>
<td>2.1</td>
<td>2.4</td>
</tr>
<tr>
<td>18&quot; (457)</td>
<td>42</td>
<td>94</td>
<td>1.5</td>
<td>2.2</td>
<td>2.7</td>
<td>3.4</td>
<td>3.7</td>
</tr>
<tr>
<td>24&quot; (610)</td>
<td>55</td>
<td>1.29</td>
<td>2.1</td>
<td>3.0</td>
<td>3.7</td>
<td>4.5</td>
<td>4.9</td>
</tr>
<tr>
<td>30&quot; (762)</td>
<td>71</td>
<td>1.65</td>
<td>2.6</td>
<td>3.8</td>
<td>4.3</td>
<td>5.7</td>
<td>6.3</td>
</tr>
<tr>
<td>36&quot; (914)</td>
<td>85</td>
<td>2.1</td>
<td>3.2</td>
<td>4.6</td>
<td>5.7</td>
<td>7.0</td>
<td>7.7</td>
</tr>
<tr>
<td>42&quot; (1067)</td>
<td>93</td>
<td>2.3</td>
<td>3.5</td>
<td>5.1</td>
<td>6.3</td>
<td>7.6</td>
<td>8.8</td>
</tr>
<tr>
<td>48&quot; (1219)</td>
<td>1.14</td>
<td>2.7</td>
<td>4.3</td>
<td>6.0</td>
<td>7.7</td>
<td>9.4</td>
<td>n/a</td>
</tr>
<tr>
<td>54&quot; (1372)</td>
<td>1.32</td>
<td>3.1</td>
<td>4.9</td>
<td>6.2</td>
<td>8.8</td>
<td>10.7</td>
<td>n/a</td>
</tr>
<tr>
<td>60&quot; (1524)</td>
<td>1.51</td>
<td>3.5</td>
<td>5.5</td>
<td>7.7</td>
<td>9.9</td>
<td>11.8</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Type B Thinline Damper Free Area – sq. ft.

<table>
<thead>
<tr>
<th>Duct Width in inches (mm)</th>
<th>6&quot; (152)</th>
<th>12&quot; (305)</th>
<th>18&quot; (457)</th>
<th>24&quot; (610)</th>
<th>30&quot; (762)</th>
<th>36&quot; (914)</th>
<th>40&quot; (1016)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; (152)</td>
<td>.15</td>
<td>.32</td>
<td>.52</td>
<td>.69</td>
<td>.88</td>
<td>1.09</td>
<td>1.17</td>
</tr>
<tr>
<td>12&quot; (305)</td>
<td>.31</td>
<td>.70</td>
<td>1.07</td>
<td>1.55</td>
<td>1.95</td>
<td>2.4</td>
<td>2.7</td>
</tr>
<tr>
<td>18&quot; (457)</td>
<td>.47</td>
<td>1.05</td>
<td>1.7</td>
<td>2.5</td>
<td>3.05</td>
<td>3.8</td>
<td>4.2</td>
</tr>
<tr>
<td>24&quot; (610)</td>
<td>.62</td>
<td>1.44</td>
<td>2.3</td>
<td>3.4</td>
<td>4.2</td>
<td>5.1</td>
<td>5.6</td>
</tr>
<tr>
<td>30&quot; (762)</td>
<td>.80</td>
<td>1.84</td>
<td>2.9</td>
<td>4.3</td>
<td>4.9</td>
<td>6.5</td>
<td>7.2</td>
</tr>
<tr>
<td>36&quot; (914)</td>
<td>.95</td>
<td>2.33</td>
<td>3.6</td>
<td>5.1</td>
<td>6.4</td>
<td>7.8</td>
<td>n/a</td>
</tr>
<tr>
<td>42&quot; (1067)</td>
<td>1.0</td>
<td>2.5</td>
<td>3.8</td>
<td>5.6</td>
<td>7.0</td>
<td>8.5</td>
<td>n/a</td>
</tr>
<tr>
<td>48&quot; (1219)</td>
<td>1.1</td>
<td>3.1</td>
<td>4.8</td>
<td>6.8</td>
<td>8.6</td>
<td>10.4</td>
<td>n/a</td>
</tr>
</tbody>
</table>

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

To calculate Free Area of round duct: Diameter² 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)

Free Area = 14,000

\( \frac{7 \text{ sq. ft.}}{2000 \text{ fpm}} \)

2000 fpm located on the 'A' curve shows a pressure drop of .12 in. wg.

S.P. = static pressure in inches water gauge

F.V = 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 Chart

Static Pressure Drop in inches w.g. (Pa)

<table>
<thead>
<tr>
<th>Free Air Velocity in feet per minute (m/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
</tr>
<tr>
<td>1000</td>
</tr>
<tr>
<td>2000</td>
</tr>
<tr>
<td>3000</td>
</tr>
<tr>
<td>6000</td>
</tr>
</tbody>
</table>

D32
**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.

**OPTIONS & ACCESSORIES:**

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT</td>
<td>Pull Tab Release for Simple Testing and Maintenance</td>
</tr>
<tr>
<td>QS1/QS2</td>
<td>Single set or Pair of &quot;Quick-Set&quot; Retaining Angles</td>
</tr>
<tr>
<td>HM1/HM2</td>
<td>One or Both Sleeve Ends Hemmed for Slip and Drive Connection</td>
</tr>
<tr>
<td>TDF1/TDF2</td>
<td>One or Both Sleeve Ends Flanged for Breakaway Connection</td>
</tr>
<tr>
<td>MS</td>
<td>24V Microswitch</td>
</tr>
<tr>
<td>MSE</td>
<td>120/24V Microswitch with Enclosure</td>
</tr>
</tbody>
</table>

**MODEL SERIES: 0200V/H - 1 1/2 HOUR LABEL**

**THINLINE STATIC CURTAIN FIRE DAMPERS**
**STATIC CURTAIN FIRE DAMPERS • WIDE FRAME**

- **WIDE FRAME**
- **1 1/2 HOUR RATING**
- **FOR USE IN STATIC SYSTEMS**
- **UL 555 CLASSIFIED**

**Model:**

0310 V/H  Type A

Model 0310 V/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 0310 V/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:**

| Model          | 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:  | 165°F (74°C) std.  
| (UL Listed)    | 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      | Galvanized steel;  
| Sleeve:        | Specify SL option |

For MIN./MAX. UL SIZES see chart on page D11.

See Sizing Chart on page D55 for blade pack depth.
OPTIONS & ACCESSORIES:

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT</td>
<td>Pull Tab Release for Simple Testing and Maintenance</td>
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<tr>
<td>QS1/QS2</td>
<td>Single set or Pair of “Quick-Set” Retaining Angles</td>
</tr>
<tr>
<td>HM1/HM2</td>
<td>One or Both Sleeve Ends Hemmed for Slip and Drive Connection</td>
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<td>TDF1/TDF2</td>
<td>One or Both Sleeve Ends Flanged for Breakaway Connection</td>
</tr>
<tr>
<td>MS</td>
<td>24V Microswitch</td>
</tr>
<tr>
<td>MSE</td>
<td>120/24V Microswitch with Enclosure</td>
</tr>
</tbody>
</table>

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.
Models:
0510 V Type A
0520 V Type B
0530 V Type CR/CO, Round/Oval
0530 V Type CSR, Square/Rectangular

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:

<table>
<thead>
<tr>
<th></th>
<th>0510V (Type A)</th>
<th>0520V (Type B)</th>
<th>0530V (Type CR/CO)</th>
<th>0530V (Type CSR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame:</td>
<td>4 1/4” (108) wide, 22 ga. (0.85) roll-formed galv. steel</td>
<td>4 1/4” (108) wide, 22 ga. (0.85) roll-formed galv. steel</td>
<td>4 1/4” (108) wide, 22 ga. (0.85) roll-formed galv. steel; out of airstream</td>
<td>4 1/4” (108) wide, 22 ga. (0.85) roll-formed galv. steel; out of airstream</td>
</tr>
<tr>
<td>Blades:</td>
<td>Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Out of airstream, curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Out of airstream, curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Out of airstream, curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
</tr>
<tr>
<td>Enclosure:</td>
<td>n/a</td>
<td>Type B 22 ga. (0.85) galvanized steel</td>
<td>Type C Round or Oval 22 ga. (0.85) galvanized steel</td>
<td>Type C Square or Rect. 22 ga. (0.85) galvanized steel</td>
</tr>
<tr>
<td>Fusible Link: (UL Listed)</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
</tr>
<tr>
<td>Blade Closure:</td>
<td>Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps</td>
<td>Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps</td>
<td>Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps</td>
<td>Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps</td>
</tr>
<tr>
<td>Mounting:</td>
<td>Vertical or Horiz.</td>
<td>Vertical or Horiz.</td>
<td>Vertical or Horiz.</td>
<td>Vertical or Horiz.</td>
</tr>
<tr>
<td>Available Sleeve:</td>
<td>Galvanized steel; Specify SL option</td>
<td>Galvanized steel; Specify SL option</td>
<td>Galvanized steel; Specify SL option</td>
<td>Galvanized steel; Specify SL option</td>
</tr>
</tbody>
</table>

For MIN./MAX. UL SIZES see chart on page D11.
### DIMENSIONAL DATA:

![Model 0520: Type B](image1)

MODEL 0520:
- **Type B**

![Model 0530: Type CR](image2)

MODEL 0530:
- **Type CR**

![Model 0530: Type CO](image3)

MODEL 0530:
- **Type CO**

![Model 0530: CSR with collar](image4)

MODEL 0530:
- **Type CSR with collar (standard)**

![Model 0530: CSR without collar](image5)

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.

<table>
<thead>
<tr>
<th>Duct Width in inches (mm)</th>
<th>6&quot; (152)</th>
<th>12&quot; (305)</th>
<th>18&quot; (457)</th>
<th>24&quot; (610)</th>
<th>30&quot; (762)</th>
<th>36&quot; (914)</th>
<th>42&quot; (1067)</th>
<th>48&quot; (1219)</th>
<th>54&quot; (1372)</th>
<th>60&quot; (1524)</th>
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<tbody>
<tr>
<td>6&quot; (152)</td>
<td>.14</td>
<td>.33</td>
<td>.52</td>
<td>.70</td>
<td>.89</td>
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<td>1.3</td>
<td>1.5</td>
<td>1.7</td>
<td>1.8</td>
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<tr>
<td>12&quot; (305)</td>
<td>.31</td>
<td>.72</td>
<td>1.1</td>
<td>1.5</td>
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<td>2.4</td>
<td>2.8</td>
<td>3.2</td>
<td>3.6</td>
<td>4.0</td>
</tr>
<tr>
<td>18&quot; (457)</td>
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<td>1.1</td>
<td>1.7</td>
<td>2.4</td>
<td>3.0</td>
<td>3.7</td>
<td>4.3</td>
<td>4.9</td>
<td>5.6</td>
<td>6.2</td>
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<tr>
<td>24&quot; (610)</td>
<td>.65</td>
<td>1.5</td>
<td>2.4</td>
<td>3.2</td>
<td>4.1</td>
<td>5.0</td>
<td>5.8</td>
<td>6.7</td>
<td>7.5</td>
<td>8.4</td>
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<td>30&quot; (762)</td>
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<td>5.2</td>
<td>6.3</td>
<td>7.3</td>
<td>8.4</td>
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<td>10.6</td>
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<tr>
<td>36&quot; (914)</td>
<td>.99</td>
<td>2.3</td>
<td>3.6</td>
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<td>6.3</td>
<td>7.6</td>
<td>8.9</td>
<td>10.2</td>
<td>11.5</td>
<td>12.8</td>
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<td>42&quot; (1067)</td>
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<tr>
<td>48&quot; (1219)</td>
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<td>11.9</td>
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<td>15.5</td>
<td>17.2</td>
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<td>5.5</td>
<td>7.5</td>
<td>9.5</td>
<td>11.5</td>
<td>13.5</td>
<td>15.5</td>
<td>17.5</td>
<td>19.4</td>
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<tr>
<td>60&quot; (1524)</td>
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<td>3.9</td>
<td>6.1</td>
<td>8.3</td>
<td>10.6</td>
<td>12.8</td>
<td>15.0</td>
<td>17.2</td>
<td>19.4</td>
<td>21.7</td>
</tr>
</tbody>
</table>

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 Air Velocity (fpm) = \( \frac{\text{CFM}}{\text{Free Area}} \)**

Example:

- 1 – 36" x 24" Damper required for 8,500 cfm. (Type A)
  
  \[ \text{FAV} = \frac{8500}{5} = 1700 \text{ fpm} \]

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

**CFM = cubic feet per minute**

**fpm = feet per minute velocity**

**S.P. = static pressure in inches water gauge**

**FAV = Free Area Velocity**

**Imperial System Shown**

To convert to SI (metric) system:

- Multiply cfm by .4719 for liters per second
- Multiply fpm by .00508 for meters per second
- Multiply in. wg. by .2486 for kilopascals
- Multiply sq. ft. by .0929 for square meters.

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

<table>
<thead>
<tr>
<th>Duct Width in inches (mm)</th>
<th>6&quot; (152)</th>
<th>12&quot; (305)</th>
<th>18&quot; (457)</th>
<th>24&quot; (610)</th>
<th>30&quot; (762)</th>
<th>36&quot; (914)</th>
<th>42&quot; (1067)</th>
<th>48&quot; (1219)</th>
<th>54&quot; (1372)</th>
<th>60&quot; (1524)</th>
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</thead>
<tbody>
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<td>.62</td>
<td>.84</td>
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<td>12&quot; (305)</td>
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<td>.83</td>
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<td>1.8</td>
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<td>2.7</td>
<td>3.2</td>
<td>3.7</td>
<td>4.1</td>
<td>4.6</td>
</tr>
<tr>
<td>18&quot; (457)</td>
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<td>2.0</td>
<td>2.7</td>
<td>3.4</td>
<td>4.2</td>
<td>4.9</td>
<td>5.6</td>
<td>6.3</td>
<td>7.1</td>
</tr>
<tr>
<td>24&quot; (610)</td>
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<td>7.5</td>
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<td>9.5</td>
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<tr>
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<tr>
<td>36&quot; (914)</td>
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<td>2.6</td>
<td>4.1</td>
<td>5.5</td>
<td>7.0</td>
<td>8.5</td>
<td>9.9</td>
<td>11.6</td>
<td>13.4</td>
<td>14.4</td>
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<td>8.2</td>
<td>9.9</td>
<td>11.6</td>
<td>13.4</td>
<td>15.1</td>
<td>16.8</td>
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<tr>
<td>48&quot; (1219)</td>
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<td>3.5</td>
<td>5.4</td>
<td>7.4</td>
<td>9.4</td>
<td>11.4</td>
<td>13.3</td>
<td>15.3</td>
<td>17.3</td>
<td>19.2</td>
</tr>
<tr>
<td>54&quot; (1372)</td>
<td>1.7</td>
<td>3.9</td>
<td>6.1</td>
<td>8.3</td>
<td>10.6</td>
<td>12.8</td>
<td>15.0</td>
<td>17.2</td>
<td>19.5</td>
<td>21.7</td>
</tr>
</tbody>
</table>

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

To calculate Free Air of round duct: Diameter\(^2 \times .00545 = \text{Free Area (sq ft.)}\)
### How to Specify

**Models: 0510V, 0520V, 0530V - 3 Hour Label**

**Static Curtain Fire Dampers**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>PT</td>
<td>Pull Tab Release for Simple Testing and Maintenance</td>
</tr>
<tr>
<td>QS1/QS2</td>
<td>Single set or Pair of &quot;Quick-Set&quot; Retaining Angles</td>
</tr>
<tr>
<td>HM1/HM2</td>
<td>One or Both Sleeve Ends Hemmed for Slip and Drive Connection</td>
</tr>
<tr>
<td>TDF1/TDF2</td>
<td>One or Both Sleeve Ends Flanged for Breakaway Connection</td>
</tr>
<tr>
<td>MS</td>
<td>24V Microswitch</td>
</tr>
<tr>
<td>MSE</td>
<td>120/24V Microswitch with Enclosure</td>
</tr>
</tbody>
</table>

**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.
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:

<table>
<thead>
<tr>
<th></th>
<th>0570V (Type A)</th>
<th>0580V (Type B)</th>
<th>0590V (Type CR/CO)</th>
<th>0590V (Type CSR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame</td>
<td>2&quot; (51) wide, 22 ga. (0.85) roll-formed galv. steel</td>
<td>2&quot; (51) wide, 22 ga. (0.85) roll-formed galv. steel</td>
<td>2&quot; (51) wide, 22 ga. (0.85) roll-formed galv. steel, out of airstream</td>
<td>2&quot; (51) wide, 22 ga. (0.85) roll-formed galv. steel, out of airstream</td>
</tr>
<tr>
<td>Blades</td>
<td>Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Out of airstream, curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Out of airstream, curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Out of airstream, curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
</tr>
<tr>
<td>Enclosure</td>
<td>n/a</td>
<td>Type B 22 ga. (0.85) galvanized steel</td>
<td>Type C Round or Oval 22 ga. (0.85) galvanized steel</td>
<td>Type C Square or Rect. 22 ga. (0.85) galvanized steel</td>
</tr>
<tr>
<td>Fusible Link: UL Listed</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
</tr>
<tr>
<td>Blade Closure:</td>
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<td>Gravity</td>
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<tr>
<td>Sleeve:</td>
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For MIN./MAX. UL SIZES see chart on page D11.
DIMENSIONAL DATA:

For overall damper dimensions see sizing chart on page D54.

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.

<table>
<thead>
<tr>
<th>Duct Width</th>
<th>6&quot; (152)</th>
<th>12&quot; (305)</th>
<th>18&quot; (457)</th>
<th>24&quot; (610)</th>
<th>30&quot; (762)</th>
<th>36&quot; (914)</th>
<th>40&quot; (1016)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; (152)</td>
<td>.12</td>
<td>.27</td>
<td>.93</td>
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<td>2.1</td>
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</tr>
<tr>
<td>12&quot; (305)</td>
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<td>.93</td>
<td>1.36</td>
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<td>18&quot; (457)</td>
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<td>36&quot; (914)</td>
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</table>

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

<table>
<thead>
<tr>
<th>Duct Width</th>
<th>6&quot; (152)</th>
<th>12&quot; (305)</th>
<th>18&quot; (457)</th>
<th>24&quot; (610)</th>
<th>30&quot; (762)</th>
<th>36&quot; (914)</th>
<th>40&quot; (1016)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; (152)</td>
<td>.15</td>
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<td>.52</td>
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<td>.88</td>
<td>1.09</td>
<td>1.17</td>
</tr>
<tr>
<td>12&quot; (305)</td>
<td>.31</td>
<td>.70</td>
<td>1.07</td>
<td>1.55</td>
<td>1.95</td>
<td>2.4</td>
<td>2.7</td>
</tr>
<tr>
<td>18&quot; (457)</td>
<td>.47</td>
<td>1.05</td>
<td>1.7</td>
<td>2.5</td>
<td>3.0</td>
<td>3.8</td>
<td>4.2</td>
</tr>
<tr>
<td>24&quot; (610)</td>
<td>.62</td>
<td>1.44</td>
<td>2.3</td>
<td>3.4</td>
<td>4.2</td>
<td>5.1</td>
<td>5.6</td>
</tr>
<tr>
<td>30&quot; (762)</td>
<td>.80</td>
<td>1.84</td>
<td>2.9</td>
<td>4.3</td>
<td>4.9</td>
<td>6.5</td>
<td>7.2</td>
</tr>
<tr>
<td>36&quot; (914)</td>
<td>.95</td>
<td>2.33</td>
<td>3.6</td>
<td>5.1</td>
<td>6.4</td>
<td>7.8</td>
<td>n/a</td>
</tr>
<tr>
<td>42&quot; (1067)</td>
<td>1.0</td>
<td>2.5</td>
<td>3.8</td>
<td>5.6</td>
<td>7.0</td>
<td>8.5</td>
<td>n/a</td>
</tr>
<tr>
<td>48&quot; (1219)</td>
<td>1.3</td>
<td>3.1</td>
<td>4.8</td>
<td>6.8</td>
<td>8.6</td>
<td>10.4</td>
<td>n/a</td>
</tr>
</tbody>
</table>

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

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)

\[ \frac{14,000}{7 \text{ sq. ft.}} = 2000 \text{ fpm} \]

2000 fpm located on the ‘A’ curve shows a pressure drop of .12 in. wg.

\( \text{S.P.} = \text{pressure drop in inches water gauge} \)

\( \text{FAV} = \text{Free Area Velocity} \)

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.

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

Pressure Drop

Static Pressure Drop in inches w.g. (Pa)

To calculate Free Area of round duct: Diameter\(^2\) x .00545 = Free Area (sq. ft.)

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.
OPTIONS & ACCESSORIES:

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT</td>
<td>Pull Tab Release for Simple Testing and Maintenance</td>
</tr>
<tr>
<td>QS1/QS2</td>
<td>Single set or Pair of &quot;Quick-Set&quot; Retaining Angles</td>
</tr>
<tr>
<td>HM1/HM2</td>
<td>One or Both Sleeve Ends Hemmed for Slip and Drive Connection</td>
</tr>
<tr>
<td>TDF1/TDF2</td>
<td>One or Both Sleeve Ends Flanged for Breakaway Connection</td>
</tr>
<tr>
<td>MS</td>
<td>24V Microswitch</td>
</tr>
<tr>
<td>MSE</td>
<td>120/24V Microswitch with Enclosure</td>
</tr>
</tbody>
</table>

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.
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:

<table>
<thead>
<tr>
<th>0540V (Type A)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frame:</strong></td>
<td>6’ (152) wide, 22 ga. (0.85) roll-formed galv. steel</td>
</tr>
<tr>
<td><strong>Blades:</strong></td>
<td>Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
</tr>
<tr>
<td><strong>Fusible Link:</strong> (UL Listed)</td>
<td>165°F (74°C) std. 212°F (100°C) avail.</td>
</tr>
<tr>
<td><strong>Blade Closure:</strong></td>
<td>Gravity</td>
</tr>
<tr>
<td><strong>Mounting:</strong></td>
<td>Vertical only</td>
</tr>
<tr>
<td><strong>Available Sleeve:</strong></td>
<td>Galvanized steel; Specify SL option</td>
</tr>
</tbody>
</table>

For MIN./MAX. UL SIZES see chart on page D11.

See Sizing Chart on page D55 for blade pack depth.
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.
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 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. 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:

<table>
<thead>
<tr>
<th></th>
<th>0110G</th>
<th>0120G</th>
<th>0130G</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frame</strong></td>
<td>4 1/4” (108) wide, 22 ga. (0.85) roll-formed galv. steel</td>
<td>4 1/4” (108) wide, 22 ga. (0.85) roll-formed galv. steel</td>
<td>4 1/4” (108) wide, 22 ga. (0.85) roll-formed galv. steel; out of airstream</td>
</tr>
<tr>
<td><strong>Blades</strong></td>
<td>Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Out of airstream, Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
<td>Out of airstream, Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
</tr>
<tr>
<td><strong>Standard Sleeve</strong></td>
<td>12” (305) long x 22 ga. (0.85) galv. steel with 3/4” (19) wide grille mounting flanges</td>
<td>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</td>
<td>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</td>
</tr>
<tr>
<td><strong>Fusible Link</strong></td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
<td>165°F (74°C) std. 212°F (100°C) available</td>
</tr>
<tr>
<td><strong>Blade Closure</strong></td>
<td>Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps</td>
<td>Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps</td>
<td>Vert. mount; gravity Horizontal mount; stainless steel closure springs with galvanized steel locking ramps</td>
</tr>
<tr>
<td><strong>Mounting</strong></td>
<td>Vertical or Horiz.</td>
<td>Vertical or Horiz.</td>
<td>Vertical or Horiz.</td>
</tr>
<tr>
<td><strong>Optional Grille</strong></td>
<td>Steel grille with correctly located countersunk screw holes; Select model from Nailor Air Distribution Catalog</td>
<td>Steel grille with correctly located countersunk screw holes; Select model from Nailor Air Distribution Catalog</td>
<td>Steel grille with correctly located countersunk screw holes; Select model from Nailor Air Distribution Catalog</td>
</tr>
</tbody>
</table>

For MIN./MAX. UL SIZES see chart on page D11.
DIMENSIONAL DATA:

<table>
<thead>
<tr>
<th>Duct Height (H)</th>
<th>Dim. ‘A’</th>
</tr>
</thead>
<tbody>
<tr>
<td>6” – 17” (152 – 432)</td>
<td>2” (51)</td>
</tr>
<tr>
<td>18” – 21” (457 – 533)</td>
<td>3” (76)</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>QS1</td>
<td>QUICK-SET ANGLE</td>
</tr>
<tr>
<td>HM1</td>
<td>HEMMED SLEEVE</td>
</tr>
<tr>
<td>TDF1</td>
<td>FLANGED SLEEVE</td>
</tr>
<tr>
<td>MS</td>
<td>MICROSWITCH</td>
</tr>
<tr>
<td>MSE</td>
<td></td>
</tr>
</tbody>
</table>

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°C (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.
系列产品0200G Thinline Frame Integral Sleeve Curtain Fire Dampers是设计用于与钢制百叶窗配合使用，当风管在火隔墙/分隔处终止时。0200G Thinline系列具有1/2小时UL标志，适用于2小时火隔断或更少，并且在静音“风扇关闭”系统中被分类，当HVAC系统在火灾发生时关闭。

此独特产品利用特殊百叶窗安装垫片，可以消除不美观的支撑角，该支撑角通常在百叶窗后面突出。钢制百叶窗完全覆盖了安装垫片，以实现清洁、美观的外观。

2"（51）深的thinline百叶窗在百叶窗中偏移，以适应单个或双个偏转百叶窗或百叶窗。钉螺栓在百叶窗框架上 countersunk孔将匹配到安装垫片，当与百叶窗装配一起订购时。设计特征包括耐用的防锈卷边钢框架、叶片和管路，以及选择过渡样式和配件，使得安装简单快速。

<table>
<thead>
<tr>
<th>QUALIFICATIONS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• UL 555 &amp; CAN/ULC-S112 CLASSIFIED FIRE DAMPER. 1 1/2 hr. label (File # R9492).</td>
</tr>
<tr>
<td>• 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.</td>
</tr>
<tr>
<td>• City of New York Board of Standards and Appeals. Cal. No. 460-88-SA.</td>
</tr>
<tr>
<td>• California State Fire Marshal: Fire Damper Listing No. 3225-0935:0100.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STANDARD CONSTRUCTION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0210G (Type A)</td>
</tr>
<tr>
<td>Frame: 2&quot; (51) wide, 22 ga. (0.85) roll-formed galv. steel</td>
</tr>
<tr>
<td>Blades: Curtain type, interlocking blades, 22 ga. (0.85) roll-formed galv. steel</td>
</tr>
<tr>
<td>Standard Sleeve: 12&quot; (305) long x 22 ga. (0.85) galv. steel with 3/4&quot; (19) wide grille mounting flanges</td>
</tr>
<tr>
<td>Fusible Link: (UL Listed)</td>
</tr>
<tr>
<td>Blade Closure: Gravity</td>
</tr>
<tr>
<td>Mounting: For Vertical mounting</td>
</tr>
<tr>
<td>Optional Grille: Steel grille with correctly located countersunk screw holes; Select model from Nailor Air Distribution Catalog</td>
</tr>
</tbody>
</table>

For MIN./MAX. UL SIZES see chart on page D11.
DIMENSIONAL DATA:

<table>
<thead>
<tr>
<th>Duct Height (H)</th>
<th>Dim. ‘A’</th>
</tr>
</thead>
<tbody>
<tr>
<td>6” – 9” (152 – 229)</td>
<td>2” (51)</td>
</tr>
<tr>
<td>10” – 15” (254 – 381)</td>
<td>3” (76)</td>
</tr>
<tr>
<td>16” – 19” (406 – 483)</td>
<td>4” (102)</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>QS1</td>
<td>Single set of &quot;Quick-Set&quot; Retaining Angles for Rear Side</td>
</tr>
<tr>
<td>HM1</td>
<td>Sleeve End Hemmed for Slip and Drive Connection for Rear Side</td>
</tr>
<tr>
<td>TDF1</td>
<td>One Sleeve End Flanged for Breakaway Connection for Rear Side</td>
</tr>
<tr>
<td>MS</td>
<td>24V Microswitch</td>
</tr>
<tr>
<td>MSE</td>
<td>120/24V Microswitch with Enclosure</td>
</tr>
</tbody>
</table>

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.
Model: 0110GOW Out of Wall Curtain Fire Damper

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:

<table>
<thead>
<tr>
<th>Model: 0110GOW (Type A)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Frame:</strong></td>
</tr>
<tr>
<td>4 1/4&quot; (108) wide,</td>
</tr>
<tr>
<td>22 ga. (0.85) roll-</td>
</tr>
<tr>
<td>formed galv. steel</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Blades:</strong></td>
</tr>
<tr>
<td>Curtain type,</td>
</tr>
<tr>
<td>interlocking blades,</td>
</tr>
<tr>
<td>22 ga. (0.85) roll-</td>
</tr>
<tr>
<td>formed galv. steel</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Standard Sleeve:</strong></td>
</tr>
<tr>
<td>10&quot; (254) long x 16 ga.</td>
</tr>
<tr>
<td>(1.6) galvanized steel</td>
</tr>
<tr>
<td>with 3/4&quot; (19) wide</td>
</tr>
<tr>
<td>grille mounting flanges;</td>
</tr>
<tr>
<td>intumescent thermal</td>
</tr>
<tr>
<td>insulation on all</td>
</tr>
<tr>
<td>four sides</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Fusible Link:</strong></td>
</tr>
<tr>
<td>(UL Listed)</td>
</tr>
<tr>
<td>165°F (74°C) std.</td>
</tr>
<tr>
<td>212°F (100°C) avail.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Blade Closure:</strong></td>
</tr>
<tr>
<td>Vert. mount; gravity</td>
</tr>
<tr>
<td>Horizontal mount;</td>
</tr>
<tr>
<td>stainless steel closure</td>
</tr>
<tr>
<td>springs with galvanized</td>
</tr>
<tr>
<td>steel locking ramps</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Mounting:</strong></td>
</tr>
<tr>
<td>Vertical or Horizontal</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Optional Grille:</strong></td>
</tr>
<tr>
<td>Steel or aluminum</td>
</tr>
<tr>
<td>grille or register;</td>
</tr>
<tr>
<td>Select model from Nailor</td>
</tr>
<tr>
<td>Air Distribution Catalog</td>
</tr>
</tbody>
</table>

For MIN./MAX. UL SIZES see chart on page D11.
DIMENSIONAL DATA:
MODEL: 0110GOW

OPTIONS & ACCESSORIES:

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>QS1</td>
<td>Single set of &quot;Quick-Set&quot; Retaining Angles for Rear Side</td>
</tr>
<tr>
<td>HM1</td>
<td>Sleeve End Hemmed for Slip and Drive Connection for Rear Side</td>
</tr>
<tr>
<td>TDF1</td>
<td>Sleeve End Flanged for Breakaway Connection for Rear Side</td>
</tr>
<tr>
<td>MS</td>
<td>24V Microswitch</td>
</tr>
<tr>
<td>MSE</td>
<td>120/24V Microswitch with Enclosure</td>
</tr>
</tbody>
</table>

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.
Model 0130GC Garbage Chute Fire Dampers

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:

<table>
<thead>
<tr>
<th>Model 0130GC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frame:</strong></td>
</tr>
<tr>
<td><strong>Blades:</strong></td>
</tr>
<tr>
<td><strong>Mounting Collar:</strong></td>
</tr>
<tr>
<td><strong>Fusible Link:</strong> (UL Listed)</td>
</tr>
<tr>
<td><strong>Blade Closure:</strong></td>
</tr>
<tr>
<td><strong>Mounting:</strong></td>
</tr>
<tr>
<td><strong>Standard Sizes:</strong></td>
</tr>
</tbody>
</table>
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

1. 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 Thinline, Horizontal, Type A, 1 1/2 Hr. Label
   0140V Thinline, Vertical, Type A, 1 1/2 Hr. Label
   0210H Thinline, Horizontal, Type B, 1 1/2 Hr. Label
   0210V Thinline, Vertical, Type B, 1 1/2 Hr. Label
   0220H Thinline, Horizontal, Type C, Round/Oval, 1 1/2 Hr. Label
   0220V Thinline, Vertical, Type C, Round/Oval, 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, Horizontal, Type C, Sq./Rect., 1 1/2 Hr. Label
   0240V Thinline, 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

   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
(01X4 Series only)

   Add Suffix to Model Number
   - 12H 12" (305) Horiz. Mount 12" x 22 GA.
   - 14H 14" (356) Horiz. 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°F (74°C) (default)
   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:

<table>
<thead>
<tr>
<th>Duct Opening Height</th>
<th>Overall Height</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type A</strong></td>
<td></td>
</tr>
<tr>
<td>Imperial</td>
<td>Metric</td>
</tr>
<tr>
<td>4&quot; → 60&quot;</td>
<td>102 mm → 1524 mm</td>
</tr>
<tr>
<td>Note: Type A Damper Overall Width = Duct Opening – 1/4&quot; (6 mm)</td>
<td></td>
</tr>
<tr>
<td>3&quot; → 17&quot;</td>
<td>76 → 432 mm</td>
</tr>
<tr>
<td>18&quot; → 27&quot;</td>
<td>457 → 656 mm</td>
</tr>
<tr>
<td>28&quot; → 36&quot;</td>
<td>711 → 914 mm</td>
</tr>
<tr>
<td>37&quot; → 45&quot;</td>
<td>940 → 1143 mm</td>
</tr>
<tr>
<td>46&quot; → 54&quot;</td>
<td>1168 → 1372 mm</td>
</tr>
<tr>
<td>Note: Type B Damper Overall Width = Duct Opening – 1/4&quot; (6 mm)</td>
<td></td>
</tr>
<tr>
<td><strong>Type B</strong></td>
<td></td>
</tr>
<tr>
<td>Imperial</td>
<td>Metric</td>
</tr>
<tr>
<td>3&quot; → 17&quot;</td>
<td>76 → 432 mm</td>
</tr>
<tr>
<td>18&quot; → 27&quot;</td>
<td>457 → 656 mm</td>
</tr>
<tr>
<td>28&quot; → 36&quot;</td>
<td>711 → 914 mm</td>
</tr>
<tr>
<td>37&quot; → 45&quot;</td>
<td>940 → 1143 mm</td>
</tr>
<tr>
<td>46&quot; → 53&quot;</td>
<td>1168 → 1346 mm</td>
</tr>
<tr>
<td>Note: Type C Damper Overall Width = Duct Opening + 1 3/4&quot; (44 mm)</td>
<td></td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Duct Opening Height</th>
<th>Overall Height</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Imperial</strong></td>
<td><strong>Metric</strong></td>
</tr>
<tr>
<td>Type A</td>
<td>Duct Height – 1/4&quot;</td>
</tr>
<tr>
<td>4&quot; → 60&quot;</td>
<td>102 mm → 1524 mm</td>
</tr>
</tbody>
</table>

**Note:** Type A Damper Overall Width = Duct Opening – 1/4" (6 mm)

<table>
<thead>
<tr>
<th>Type B</th>
<th>Duct Height + 2 1/8&quot;</th>
<th>Duct Height + 54 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>3&quot; → 9&quot;</td>
<td>76 → 229 mm</td>
<td>&quot; + 3 1/8&quot;</td>
</tr>
<tr>
<td>10&quot; → 15&quot;</td>
<td>254 → 381 mm</td>
<td>&quot; + 4 1/8&quot;</td>
</tr>
<tr>
<td>16&quot; → 19&quot;</td>
<td>406 → 483 mm</td>
<td>&quot; + 5 1/8&quot;</td>
</tr>
<tr>
<td>20&quot; → 25&quot;</td>
<td>508 → 635 mm</td>
<td>&quot; + 6 1/8&quot;</td>
</tr>
<tr>
<td>26&quot; → 31&quot;</td>
<td>660 → 787 mm</td>
<td>&quot; + 7 1/8&quot;</td>
</tr>
<tr>
<td>32&quot; → 34&quot;</td>
<td>813 → 864 mm</td>
<td>&quot; + 8 1/8&quot;</td>
</tr>
<tr>
<td>35&quot; → 40&quot;</td>
<td>889 → 1016 mm</td>
<td>&quot; + 9 1/8&quot;</td>
</tr>
<tr>
<td>41&quot; → 46&quot;</td>
<td>1041 → 1168 mm</td>
<td>&quot; + 10 1/8&quot;</td>
</tr>
<tr>
<td>47&quot; → 50&quot;</td>
<td>1194 → 1245 mm</td>
<td>&quot; + 11 1/8&quot;</td>
</tr>
</tbody>
</table>

**Note:** Type B Damper Overall Width = Duct Opening – 1/4" (6 mm)

<table>
<thead>
<tr>
<th>Type C</th>
<th>Duct Height + 2 3/4&quot;</th>
<th>Duct Height + 70 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>3&quot; → 9&quot;</td>
<td>76 → 229 mm</td>
<td>&quot; + 3 3/4&quot;</td>
</tr>
<tr>
<td>10&quot; → 15&quot;</td>
<td>254 → 381 mm</td>
<td>&quot; + 4 3/4&quot;</td>
</tr>
<tr>
<td>16&quot; → 19&quot;</td>
<td>406 → 483 mm</td>
<td>&quot; + 5 3/4&quot;</td>
</tr>
<tr>
<td>20&quot; → 25&quot;</td>
<td>508 → 635 mm</td>
<td>&quot; + 6 3/4&quot;</td>
</tr>
<tr>
<td>26&quot; → 31&quot;</td>
<td>660 → 787 mm</td>
<td>&quot; + 7 3/4&quot;</td>
</tr>
<tr>
<td>32&quot; → 34&quot;</td>
<td>813 → 864 mm</td>
<td>&quot; + 8 3/4&quot;</td>
</tr>
<tr>
<td>35&quot; → 40&quot;</td>
<td>889 → 1016 mm</td>
<td>&quot; + 9 3/4&quot;</td>
</tr>
<tr>
<td>41&quot; → 46&quot;</td>
<td>1041 → 1168 mm</td>
<td>&quot; + 10 3/4&quot;</td>
</tr>
<tr>
<td>47&quot; → 49&quot;</td>
<td>1194 → 1245 mm</td>
<td>&quot; + 11 3/4&quot;</td>
</tr>
</tbody>
</table>

**Note:** Type C Damper Overall Width = Duct Opening + 1 3/4" (44 mm)
<table>
<thead>
<tr>
<th>Duct Opening Height (inches)</th>
<th>Type &quot;A&quot; Overall Height (inches)</th>
<th>Blade Pack Depth (inches)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>3/4</td>
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<td>3 4/5</td>
</tr>
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<td>50 3/4</td>
<td>3 7/8</td>
</tr>
<tr>
<td>52</td>
<td>51 3/4</td>
<td>3 7/8</td>
</tr>
<tr>
<td>53</td>
<td>52 3/4</td>
<td>3 7/8</td>
</tr>
<tr>
<td>54</td>
<td>53 3/4</td>
<td>4 1/8</td>
</tr>
<tr>
<td>55</td>
<td>54 3/4</td>
<td>4 1/8</td>
</tr>
<tr>
<td>56</td>
<td>55 3/4</td>
<td>4 1/8</td>
</tr>
<tr>
<td>57</td>
<td>56 3/4</td>
<td>4 1/8</td>
</tr>
<tr>
<td>58</td>
<td>57 3/4</td>
<td>4 1/8</td>
</tr>
<tr>
<td>59</td>
<td>58 3/4</td>
<td>4 1/8</td>
</tr>
<tr>
<td>60</td>
<td>59 3/4</td>
<td>4 1/8</td>
</tr>
</tbody>
</table>

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: D0120 TYPE B (2000 fpm @ 4" w.g. [10 m/s @ 1 kPa])

VERTICAL INSTALLATION:

HORIZONTAL INSTALLATION:

<table>
<thead>
<tr>
<th>Type</th>
<th>H Dimension Nominal Duct Height</th>
<th>X Dimension High Hat</th>
<th>O Dimension Overall Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>4” – 17” (102 – 432)</td>
<td>2’ (51)</td>
<td>H + 2 1/8” (54)</td>
</tr>
<tr>
<td>High</td>
<td>18” – 27” (457 – 656)</td>
<td>3’ (76)</td>
<td>H + 3 1/8” (79)</td>
</tr>
<tr>
<td>Assemblies</td>
<td>28” – 32” (711 – 813)</td>
<td>4” (102)</td>
<td>H + 4 1/8” (105)</td>
</tr>
<tr>
<td>Double</td>
<td>33” – 38” (838 – 965)</td>
<td>2’ (51)</td>
<td>H + 2 1/8” (54)</td>
</tr>
<tr>
<td>High</td>
<td>39” – 45” (991 – 1143)</td>
<td>3’ (76)</td>
<td>H + 3 1/8” (79)</td>
</tr>
<tr>
<td>Assemblies</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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: D0130 TYPE CR (2000 fpm @ 4" w.g. [10 m/s @ 1 kPa])

VERTICAL INSTALLATION:

HORIZONTAL INSTALLATION:

<table>
<thead>
<tr>
<th>Type CR</th>
<th>D Dimension Nom. Duct Diameter</th>
<th>X Dimension High Hat</th>
<th>O Dimension Overall Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single High Assemblies</td>
<td>4&quot; – 17&quot; (102 – 432)</td>
<td>2&quot; (51)</td>
<td>D + 2 3/4&quot; (70)</td>
</tr>
<tr>
<td></td>
<td>18&quot; – 27&quot; (457 – 686)</td>
<td>3&quot; (76)</td>
<td>D + 3 3/4&quot; (95)</td>
</tr>
<tr>
<td></td>
<td>28&quot; – 31&quot; (711 – 787)</td>
<td>4&quot; (102)</td>
<td>D + 4 3/4&quot; (121)</td>
</tr>
<tr>
<td>Double High Assemblies</td>
<td>32&quot; – 34&quot; (813 – 864)</td>
<td>2&quot; (51)</td>
<td>D + 2 3/4&quot; (70)</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Types CO/CSR</th>
<th>H Dimension Nominal Duct Height</th>
<th>X Dimension High Hat</th>
<th>O Dimension Overall Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single High Assemblies</td>
<td>4” – 17” (102 – 432)</td>
<td>2’ (51)</td>
<td>H + 2 3/4” (70)</td>
</tr>
<tr>
<td></td>
<td>18” – 27” (457 – 686)</td>
<td>3’ (76)</td>
<td>H + 3 3/4” (95)</td>
</tr>
<tr>
<td></td>
<td>28” – 31” (711 – 787)</td>
<td>4’ (102)</td>
<td>H + 4 3/4” (121)</td>
</tr>
</tbody>
</table>

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: 0110 TYPE A

VERTICAL INSTALLATION:

![Vertical Diagrams]

HORIZONTAL INSTALLATION:

![Horizontal Diagrams]

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: 0120 TYPE B

VERTICAL INSTALLATION:

HORIZONTAL INSTALLATION:

<table>
<thead>
<tr>
<th>Type B</th>
<th>H Dimension Nominal Duct Height</th>
<th>X Dimension High Hat</th>
<th>O Dimension Overall Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single High Assemblies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3’ – 17’ (76 – 432)</td>
<td>2’ (51)</td>
<td>H + 2 1/8’ (54)</td>
<td></td>
</tr>
<tr>
<td>18’ – 27’ (457 – 668)</td>
<td>3’ (76)</td>
<td>H + 3 1/8’ (79)</td>
<td></td>
</tr>
<tr>
<td>28’ – 36’ (711 – 914)</td>
<td>4’ (102)</td>
<td>H + 4 1/8’ (105)</td>
<td></td>
</tr>
<tr>
<td>37’ – 45’ (940 – 1143)</td>
<td>5’ (127)</td>
<td>H + 5 1/8’ (130)</td>
<td></td>
</tr>
<tr>
<td>46’ – 54’ (1168 – 1372)</td>
<td>6’ (152)</td>
<td>H + 6 1/8’ (156)</td>
<td></td>
</tr>
<tr>
<td>Double High Assemblies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55’ – 76’ (1397 – 1930)</td>
<td>4’ (102)</td>
<td>H + 4 1/8’ (105)</td>
<td></td>
</tr>
<tr>
<td>77’ – 95’ (1956 – 2413)</td>
<td>5’ (127)</td>
<td>H + 5 1/8’ (130)</td>
<td></td>
</tr>
<tr>
<td>96’ – 114’ (2438 – 2896)</td>
<td>6’ (152)</td>
<td>H + 6 1/8’ (156)</td>
<td></td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Type CR</th>
<th>D Dimension Nom. Duct Diameter</th>
<th>X Dimension High Hat</th>
<th>O Dimension Overall Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single High Assemblies</td>
<td>3’ – 17’ (76 – 432)</td>
<td>2’ (51)</td>
<td>D + 2 3/4’ (70)</td>
</tr>
<tr>
<td></td>
<td>18’ – 27’ (457 – 686)</td>
<td>3’ (76)</td>
<td>D + 3 3/4’ (95)</td>
</tr>
<tr>
<td></td>
<td>28’ – 36’ (711 – 914)</td>
<td>4’ (102)</td>
<td>D + 4 3/4’ (121)</td>
</tr>
<tr>
<td></td>
<td>37’ – 45’ (940 – 1143)</td>
<td>5’ (127)</td>
<td>D + 5 3/4’ (146)</td>
</tr>
<tr>
<td></td>
<td>46’ – 53’ (1168 – 1346)</td>
<td>6’ (152)</td>
<td>D + 6 3/4’ (171)</td>
</tr>
<tr>
<td>Double High Assemblies</td>
<td>54’ – 75’ (1372 – 1905)</td>
<td>4’ (102)</td>
<td>D + 4 3/4’ (121)</td>
</tr>
<tr>
<td></td>
<td>76’ – 94’ (1930 – 2388)</td>
<td>5’ (127)</td>
<td>D + 5 3/4’ (146)</td>
</tr>
<tr>
<td></td>
<td>95’ – 112’ (2413 – 2845)</td>
<td>6’ (152)</td>
<td>D + 6 3/4’ (171)</td>
</tr>
</tbody>
</table>

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.
### VERTICAL INSTALLATION:

![Diagram of vertical installation](image)

### HORIZONTAL INSTALLATION:

![Diagram of horizontal installation](image)

### 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.

### Table: Dimensions

<table>
<thead>
<tr>
<th>Types CO/CSR</th>
<th>H Dimension Nominal Duct Height</th>
<th>X Dimension High Hat</th>
<th>O Dimension Overall Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single High Assemblies</td>
<td>3&quot; – 17&quot; (76 – 432)</td>
<td>2&quot; (51)</td>
<td>H + 2 3/4&quot; (70)</td>
</tr>
<tr>
<td></td>
<td>18&quot; – 27&quot; (457 – 686)</td>
<td>3&quot; (76)</td>
<td>H + 3 3/4&quot; (95)</td>
</tr>
<tr>
<td></td>
<td>28&quot; – 36&quot; (711 – 914)</td>
<td>4&quot; (102)</td>
<td>H + 4 3/4&quot; (121)</td>
</tr>
<tr>
<td></td>
<td>37&quot; – 45&quot; (940 – 1143)</td>
<td>5&quot; (127)</td>
<td>H + 5 3/4&quot; (146)</td>
</tr>
<tr>
<td></td>
<td>46&quot; – 53&quot; (1168 – 1346)</td>
<td>6&quot; (152)</td>
<td>H + 6 3/4&quot; (171)</td>
</tr>
<tr>
<td>Double High Assemblies</td>
<td>54&quot; – 75&quot; (1372 – 1905)</td>
<td>4&quot; (102)</td>
<td>H + 4 3/4&quot; (121)</td>
</tr>
<tr>
<td></td>
<td>76&quot; – 94&quot; (1930 – 2388)</td>
<td>5&quot; (127)</td>
<td>H + 5 3/4&quot; (146)</td>
</tr>
<tr>
<td></td>
<td>95&quot; – 112&quot; (2413 – 2845)</td>
<td>6&quot; (152)</td>
<td>H + 6 3/4&quot; (171)</td>
</tr>
</tbody>
</table>

### Notes on Installation:

1. **Vertical Installation:**
   - **W** Width = Nominal Duct Size + 1 3/4" (44)
   - **H + 1"** (25) = Overall Damper Height

2. **Horizontal Installation:**
   - **W** Width = Nominal Duct Size + 1 3/4" (44)
   - **H + 1"** (25) = Overall Damper Height

### Model Options:

- **0130 TYPE CO OVAL**
- **0140 TYPE CSR RECTANGULAR**

**OVERALL WIDTH = DUCT SIZE + 1 3/4" (44)**
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.

Options and Accessories

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:

OPTION CODE SL
SLEEVE LENGTH

CUSTOM SLEEVES FOR NON-INTEGRAL SLEEVE MODELS

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).

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.

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.

Sleeve with Option Code HM2 shown.
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 misplaced 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.
CURTAIN FIRE DAMPER OPTIONS

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).
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.
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 its 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.
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.

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.
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.

<table>
<thead>
<tr>
<th>Maximum TDF1/TDF2 Sleeve Size Allowed:</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Curtain Type Fire Damper: 60&quot; wide x 60&quot; high (1524 x 1524).</td>
</tr>
<tr>
<td>For Multi-Blade Type Fire Damper: 36&quot; wide x 48&quot; high (914 x 1219).</td>
</tr>
</tbody>
</table>
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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 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 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-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 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 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 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).
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):

<table>
<thead>
<tr>
<th>Model</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Velocity/Pressure Rating</td>
<td>Single Sect.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vert./Horiz.</td>
</tr>
<tr>
<td>Model D1200</td>
<td>24</td>
<td>8' x 8&quot;</td>
</tr>
<tr>
<td>34, 44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model D1200-3</td>
<td>24</td>
<td>8' x 8&quot;</td>
</tr>
<tr>
<td>34, 44</td>
<td></td>
<td></td>
</tr>
</tbody>
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MODELS D1202 AND D1202-3: TYPE B SLEEVE ENCLOSURE

Models D1202 and D1202-3 Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Model</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Velocity/Pressure Rating</td>
<td>Single Sect.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vert./Horiz.</td>
</tr>
<tr>
<td>Model D1202</td>
<td>24</td>
<td>8' x 4&quot;</td>
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<tr>
<td>34, 44</td>
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<td></td>
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<tr>
<td>Model D1202-3</td>
<td>24</td>
<td>8' x 4&quot;</td>
</tr>
<tr>
<td>34, 44</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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).

MODELS D1200, D1200-3, D1201 AND D1201-3: TYPE A SLEEVE

Examples of Models D1200, D1200-3, D1201, and D1201-3:

- Models D1200 and D1200-3: 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).

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).
### Models D1203 and D1203-3: Type C Sleeve Enclosures

#### Style CR: For Round Ducts

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<th>Velocity/Pressure Rating</th>
<th>Minimum</th>
<th>Maximum</th>
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</thead>
<tbody>
<tr>
<td>D1203</td>
<td>24</td>
<td>4&quot; (102) dia.</td>
<td>70&quot; (1778) dia.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>34&quot; x 864 dia.</td>
<td>30&quot; x 762 dia.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>34&quot; (864) dia.</td>
<td>30&quot; (762) dia.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>34&quot; (864) dia.</td>
<td>30&quot; (762) dia.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>34&quot; (864) dia.</td>
<td>30&quot; (762) dia.</td>
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</tbody>
</table>

#### Style CO: For Oval Ducts

<table>
<thead>
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<th>Velocity/Pressure Rating</th>
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<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1203</td>
<td>24</td>
<td>4&quot; (102) dia.</td>
<td>62&quot; (1575) dia.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>34&quot; x 864 dia.</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>34&quot; (864) dia.</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>34&quot; (864) dia.</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>34&quot; (864) dia.</td>
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#### Style CSR: For Square or Rectangular Ducts

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<th>Velocity/Pressure Rating</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1203</td>
<td>24</td>
<td>4&quot; (102) dia.</td>
<td>56&quot; (1473) dia.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>34&quot; x 864 dia.</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>34&quot; (864) dia.</td>
<td>n/a</td>
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<tr>
<td></td>
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<td>34&quot; (864) dia.</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>34&quot; (864) dia.</td>
<td>n/a</td>
</tr>
</tbody>
</table>

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 - Round Duct Connection Sizes (Duct Dia.): (See Min. Duct size)

<table>
<thead>
<tr>
<th>Model</th>
<th>Duct Size</th>
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<th>Vertical</th>
<th>Horizontal</th>
<th>Vertical</th>
<th>Horizontal</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1203</td>
<td>4&quot; (102)</td>
<td>4&quot; x 4&quot; (102 x 102)</td>
<td>34&quot; x 46&quot; (864 x 1168)</td>
<td>30&quot; x 46&quot; (762 x 1168)</td>
<td>70&quot; x 94&quot; (1778 x 2388) or 142&quot; x 46&quot; (3607 x 1168)</td>
<td>62&quot; x 94&quot; (1575 x 2388) or 126&quot; x 46&quot; (3200 x 1168)</td>
</tr>
<tr>
<td>D1203-3</td>
<td>4&quot; (102)</td>
<td>4&quot; x 4&quot; (102 x 102)</td>
<td>34&quot; x 46&quot; (864 x 1168)</td>
<td>30&quot; x 46&quot; (762 x 1168)</td>
<td>58&quot; x 94&quot; (1473 x 2388) duct size (individual sections not to exceed 28&quot; x 46&quot; [711 x 1168] duct size).</td>
<td>n/a</td>
</tr>
</tbody>
</table>

#### Models D1203 and D1203-3 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H): (See Min. Duct size)

<table>
<thead>
<tr>
<th>Model</th>
<th>Duct Size</th>
<th>Vertical/Horizontal</th>
<th>Vertical</th>
<th>Horizontal</th>
<th>Vertical</th>
<th>Horizontal</th>
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<tr>
<td>D1203</td>
<td>4&quot; (102)</td>
<td>4&quot; x 4&quot; (102 x 102)</td>
<td>34&quot; x 46&quot; (864 x 1168)</td>
<td>30&quot; x 46&quot; (762 x 1168)</td>
<td>70&quot; x 94&quot; (1778 x 2388) or 142&quot; x 46&quot; (3607 x 1168)</td>
<td>62&quot; x 94&quot; (1575 x 2388) or 126&quot; x 46&quot; (3200 x 1168)</td>
</tr>
<tr>
<td>D1203-3</td>
<td>4&quot; (102)</td>
<td>4&quot; x 4&quot; (102 x 102)</td>
<td>34&quot; x 46&quot; (864 x 1168)</td>
<td>30&quot; x 46&quot; (762 x 1168)</td>
<td>58&quot; x 94&quot; (1473 x 2388) duct size (individual sections not to exceed 28&quot; x 46&quot; [711 x 1168] duct size).</td>
<td>n/a</td>
</tr>
</tbody>
</table>

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.

### Additional Information

- **Wall Thickness**: Min. Sleeve Length
  - 4 (102): 16 (406)
  - 8 (203): 20 (508)
  - 12 (305): 24 (610)
  - 16 (406): 28 (711)

- 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).
PERFORMANCE DATA:
MODEL SERIES: D1200 - 1 1/2 HOUR LABEL AND D1200-3 - 3 HOUR LABEL

PRESSURE DROP:

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### D1200 Series Maximum Performance Ratings

<table>
<thead>
<tr>
<th>UL 555 Fire Rating</th>
<th>1 1/2 Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Velocity</td>
<td>4000 fpm (20 m/s)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>4 in. w.g. (1 kPa)</td>
</tr>
</tbody>
</table>

### D1200-3 Series Maximum Performance Ratings

<table>
<thead>
<tr>
<th>UL 555 Fire Rating</th>
<th>3 Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Velocity</td>
<td>4000 fpm (20 m/s)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>4 in. w.g. (1 kPa)</td>
</tr>
</tbody>
</table>

---

**HOW TO SPECIFY**

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).
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 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.
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

<table>
<thead>
<tr>
<th>Model</th>
<th>Minimum Single Sect.</th>
<th>Maximum Single Section</th>
<th>Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>Vert./Horiz.</td>
<td>Vertical</td>
<td>Horizontal</td>
</tr>
<tr>
<td>Model 1200</td>
<td></td>
<td>8&quot; x 8&quot; (203 x 203)</td>
<td>36&quot; x 48&quot; (914 x 1219)</td>
</tr>
<tr>
<td>Model 1200-3</td>
<td></td>
<td>8&quot; x 8&quot; (203 x 203)</td>
<td>36&quot; x 48&quot; (914 x 1219)</td>
</tr>
</tbody>
</table>

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).

MODELS 1202 AND 1202-3: TYPE B SLEEVE ENCLOSURE

Models 1202 and 1202-3 Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Model</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>Single Sect.</td>
<td>Single Section</td>
</tr>
<tr>
<td>Model 1202</td>
<td>Vert./Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>Model</td>
<td></td>
<td>Horizontal</td>
</tr>
<tr>
<td>Model 1202</td>
<td>8&quot; x 4&quot; (203 x 102)</td>
<td>36&quot; x 7 1/2&quot; (914 x 191)</td>
</tr>
<tr>
<td>Model 1202-3</td>
<td>8&quot; x 4&quot; (203 x 102)</td>
<td>36&quot; x 7 1/2&quot; (914 x 191)</td>
</tr>
</tbody>
</table>

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).
Models 1203 and 1203-3 - Round Duct Connection Sizes (Duct Dia.):

<table>
<thead>
<tr>
<th>Model</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Single Sect.</strong></td>
<td><strong>Single Section</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Vertical/Horizontal</strong></td>
<td><strong>Vertical</strong></td>
</tr>
<tr>
<td>Model 1203</td>
<td>4&quot; (102) dia. Overall damper size is 8&quot; x 8&quot; (203 x 203) min.</td>
<td>34&quot; (864) dia.</td>
</tr>
<tr>
<td>Model 1203-3</td>
<td>4&quot; (102) dia. Overall damper size is 8&quot; x 8&quot; (203 x 203) min.</td>
<td>34&quot; (864) dia.</td>
</tr>
</tbody>
</table>

Models 1203 and 1203-3 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Model</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Single Sect.</strong></td>
<td><strong>Single Section</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Vertical/Horizontal</strong></td>
<td><strong>Vertical</strong></td>
</tr>
<tr>
<td>Model 1203</td>
<td>4&quot; x 4&quot; (102 x 102) Overall damper size is 8&quot; x 8&quot; (203 x 203) min.</td>
<td>34&quot; x 46&quot; (864 x 1168)</td>
</tr>
<tr>
<td>Model 1203-3</td>
<td>4&quot; x 4&quot; (102 x 102) Overall damper size is 8&quot; x 8&quot; (203 x 203) min.</td>
<td>34&quot; x 46&quot; (864 x 1168)</td>
</tr>
</tbody>
</table>

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).

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Min. Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>
**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).
MULTI-BLADE FIRE DAMPERS • VEE BLADE • DYNAMIC

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 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)

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.

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

![Diagram of Type B Sleeve Enclosure]

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):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical/Horizontal</td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>Vertical</td>
<td>Horizontal</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>8” x 4” (203 x 102)</td>
<td>36” x 7 1/2” (914 x 191)</td>
</tr>
<tr>
<td>34, 44</td>
<td>Overall damper height is 8” (203).</td>
<td></td>
</tr>
</tbody>
</table>

Model D1253 - Round Duct Connection Sizes (Duct Dia.):

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Minimum Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

Model D1253 - Square or Rectangular Duct Connection Sizes (Duct Dia.):

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Minimum Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

Model D1253 - Oval Duct Connection Sizes (Duct Dia.):

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Minimum Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

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).
PERFORMANCE DATA:
MODEL SERIES: D1250 - 1 1/2 HOUR LABEL

PRESSURE DROP:

D1250 Series Maximum Performance Ratings

<table>
<thead>
<tr>
<th>UL 555 Fire Rating</th>
<th>1 1/2 Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Velocity</td>
<td>4000 fpm (20 m/s)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>4 in. w.g. (1 kPa)</td>
</tr>
</tbody>
</table>

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

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.
MULTI-BLADE FIRE DAMPERS • OUT-OF-WALL

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 axes 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.

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):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>Vertical/Horizontal</td>
<td>Vertical</td>
<td>Horizontal</td>
</tr>
<tr>
<td>24, 34, 44</td>
<td>8’ x 8” (203 x 203)</td>
<td>36’ x 48” (914 x 1219)</td>
</tr>
</tbody>
</table>

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.

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 Graph]

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

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.

D1201-DOW Series Maximum Performance Ratings

<table>
<thead>
<tr>
<th>UL 555 Fire Rating</th>
<th>1 1/2 Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Velocity</td>
<td>4000 fpm (20 m/s)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>4 in. w.g. (1 kPa)</td>
</tr>
</tbody>
</table>
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.

**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

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.

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.
MULTI-BLADE FIRE DAMPERS • OUT-OF-WALL

PERFORMANCE DATA:
MODEL: D1201-OW - 1 1/2 HOUR LABEL

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.

HOW TO SPECIFY

D1201-OW Series Maximum Performance Ratings

<table>
<thead>
<tr>
<th>UL 555 Fire Rating</th>
<th>1 1/2 Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Velocity</td>
<td>4000 fpm (20 m/s)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>4 in. w.g. (1 kPa)</td>
</tr>
</tbody>
</table>

Performance Data:
MODEL: D1201-OW - 1 1/2 HOUR LABEL

Pressure drop tested per AMCA Standard 500-D, Figure 5.2.
Data corrected to standard air density of 0.075 lbs/ft.³.

Static Pressure Drop in inches w.g. (Pa)
Air Velocity in feet per minute (m/s)

<table>
<thead>
<tr>
<th>300</th>
<th>500</th>
<th>700</th>
<th>1000</th>
<th>2000</th>
<th>3000</th>
<th>4000</th>
<th>5000</th>
<th>6000</th>
</tr>
</thead>
<tbody>
<tr>
<td>.01</td>
<td>.02</td>
<td>.03</td>
<td>.04</td>
<td>.05</td>
<td>.06</td>
<td>.07</td>
<td>.08</td>
<td>.09</td>
</tr>
<tr>
<td>.10</td>
<td>.15</td>
<td>.25</td>
<td>.30</td>
<td>.37</td>
<td>.45</td>
<td>.50</td>
<td>.60</td>
<td>.75</td>
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<tr>
<td>.80</td>
<td>.90</td>
<td>1.00</td>
<td>1.20</td>
<td>1.50</td>
<td>2.00</td>
<td>2.50</td>
<td>3.00</td>
<td>4.00</td>
</tr>
<tr>
<td>500</td>
<td>700</td>
<td>1000</td>
<td>1500</td>
<td>2000</td>
<td>2500</td>
<td>3000</td>
<td>4000</td>
<td>6000</td>
</tr>
</tbody>
</table>

1.0 (250)
0.8 (200)
0.6 (150)
0.5 (125)
0.4 (100)
0.3 (75)
0.2 (50)
0.1 (25)
0.05 (10)
0.025 (5)
0.0125 (2.5)
0.00625 (1.25)
0.003125 (0.625)
0.0015625 (0.3125)

E22
Multi-Blade Fire Dampers • Stainless Steel

- Harsh Environment
- Type 304 or 316 Stainless Steel
- High Performance Airfoil Blade
- UL 555 Classified Dynamic Fire Damper

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.

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):

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/Pressure Rating</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Single Sect.</td>
<td>Multiple Section</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical</td>
<td>Vertical</td>
</tr>
<tr>
<td>Model</td>
<td></td>
<td>Vertical</td>
<td>Vertical</td>
</tr>
<tr>
<td>D1200SS</td>
<td>24</td>
<td>8&quot; x 8&quot; (203 x 203)</td>
<td>36&quot; x 48&quot; (914 x 1219)</td>
</tr>
<tr>
<td>D1200SS-3</td>
<td>24</td>
<td>8&quot; x 8&quot; (203 x 203)</td>
<td>36&quot; x 48&quot; (914 x 1219)</td>
</tr>
</tbody>
</table>

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).

**MODELS D1202SS AND D1202SS-3: TYPE B SLEEVE ENCLOSURE**

Models D1202SS and D1202SS-3 Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/Pressure Rating</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Single Sect.</td>
<td>Multiple Section</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical</td>
<td>Vertical</td>
</tr>
<tr>
<td>Model</td>
<td></td>
<td>Vertical</td>
<td>Vertical</td>
</tr>
<tr>
<td>D1202SS</td>
<td>24</td>
<td>8&quot; x 4&quot; (203 x 102). Overall damper height is 8&quot; (203).</td>
<td>36&quot; x 7 1/2&quot; (914 x 191)</td>
</tr>
<tr>
<td>D1202SS-3</td>
<td>24</td>
<td>8&quot; x 4&quot; (203 x 102). Overall damper height is 8&quot; (203).</td>
<td>36&quot; x 7 1/2&quot; (914 x 191)</td>
</tr>
</tbody>
</table>

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).
MODELS D1203SS AND D1203SS-3: TYPE C SLEEVE ENCLOSURES

**Models D1203SS and D1203SS-3 - Round Duct Connection Sizes (Duct Dia.):**

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/Pressure Rating</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Single Sect.</td>
<td>Single Section</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical</td>
<td>Vertical</td>
</tr>
<tr>
<td>Model D1203SS</td>
<td>24</td>
<td>4&quot; (102) dia.</td>
<td>34&quot; (864) dia.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n/a</td>
<td>70&quot; (1778) dia.</td>
</tr>
<tr>
<td>Model D1203SS-3</td>
<td>24</td>
<td>4&quot; (102) dia.</td>
<td>34&quot; (864) dia.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n/a</td>
<td>58&quot; (1473) dia.(Individual sections not to exceed 28&quot; [711] dia. duct size).</td>
</tr>
</tbody>
</table>

**Models D1203SS and D1203SS-3 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):**

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/Pressure Rating</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Single Sect.</td>
<td>Single Section</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical</td>
<td>Vertical</td>
</tr>
<tr>
<td>Model D1203SS</td>
<td>24</td>
<td>4&quot; x 4&quot; (102 x 102). Overall damper size is 8&quot; x 8&quot; (203 x 203) min.</td>
<td>34&quot; x 46&quot; (864 x 1168)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n/a</td>
<td>70&quot; x 94&quot; (1778 x 2388) or 142&quot; x 46&quot; (3607 x 1168)</td>
</tr>
<tr>
<td>Model D1203SS-3</td>
<td>24</td>
<td>4&quot; x 4&quot; (102 x 102). Overall damper size is 8&quot; x 8&quot; (203 x 203) min.</td>
<td>34&quot; x 46&quot; (864 x 1168)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n/a</td>
<td>58&quot; x 94&quot; (1473 x 2388) duct size (Individual sections not to exceed 28&quot; x 46&quot; [711 x 1168] duct size).</td>
</tr>
</tbody>
</table>
PERFORMANCE DATA:
MODEL SERIES: D1200SS - 1 1/2 HOUR LABEL AND D1200SS-3 - 3 HOUR LABEL

PRESSURE DROP:

<table>
<thead>
<tr>
<th>Air Velocity in feet per minute (m/s)</th>
<th>Static Pressure Drop in inches w.g. (Pa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>300 (0)</td>
<td>0.01 (3)</td>
</tr>
<tr>
<td>500 (2)</td>
<td>0.02 (6)</td>
</tr>
<tr>
<td>700 (4)</td>
<td>0.03 (9)</td>
</tr>
<tr>
<td>1000 (5)</td>
<td>0.04 (12)</td>
</tr>
<tr>
<td>1500 (8)</td>
<td>0.06 (15)</td>
</tr>
<tr>
<td>2000 (10)</td>
<td>0.08 (20)</td>
</tr>
<tr>
<td>3000 (15)</td>
<td>0.1 (24)</td>
</tr>
<tr>
<td>4000 (20)</td>
<td>0.15 (40)</td>
</tr>
<tr>
<td>5000 (25)</td>
<td>0.2 (50)</td>
</tr>
<tr>
<td>6000 (30)</td>
<td>0.25 (75)</td>
</tr>
<tr>
<td>7000 (35)</td>
<td>0.3 (100)</td>
</tr>
</tbody>
</table>

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).
MULTI-BLADE FIRE DAMPERS • STAINLESS STEEL

**HARSH ENVIRONMENT**
*TYPE 304 OR 316 STAINLESS STEEL*
*HIGH PERFORMANCE AIRFOIL BLADE*
*UL 555 CLASSIFIED STATIC FIRE DAMPER*

**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.
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 (Duct W x H):

<table>
<thead>
<tr>
<th>Model</th>
<th>Minimum</th>
<th>Maximum</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single Sect.</td>
<td>Single Section</td>
<td>Multiple Section</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>Model 120SS</td>
<td>8&quot; x 8&quot; (203 x 203)</td>
<td>36&quot; x 48&quot; (914 x 1219)</td>
<td>n/a</td>
</tr>
<tr>
<td>Model 1200SS-3</td>
<td>8&quot; x 8&quot; (203 x 203)</td>
<td>36&quot; x 48&quot; (914 x 1219)</td>
<td>n/a</td>
</tr>
</tbody>
</table>

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).

MODELS 1202SS AND 1202SS-3: TYPE B SLEEVE ENCLOSURE

Models 1202SS and 1202SS-3 (Duct W x H):

<table>
<thead>
<tr>
<th>Model</th>
<th>Minimum</th>
<th>Maximum</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single Sect.</td>
<td>Single Section</td>
<td>Multiple Section</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>Model 1202SS</td>
<td>8&quot; x 4&quot; (203 x 102). Overall damper height is 8&quot; (203).</td>
<td>36&quot; x 7 1/2&quot; (914 x 191)</td>
<td>n/a</td>
</tr>
<tr>
<td>Model 1202SS-3</td>
<td>8&quot; x 4&quot; (203 x 102). Overall damper height is 8&quot; (203).</td>
<td>36&quot; x 7 1/2&quot; (914 x 191)</td>
<td>n/a</td>
</tr>
</tbody>
</table>

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).
MODELS 1203SS AND 1203SS-3: TYPE C SLEEVE ENCLOSURES

<table>
<thead>
<tr>
<th>Model</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single Sect.</td>
<td>Single Section</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>Vertical</td>
</tr>
<tr>
<td>Model 1203SS</td>
<td>4&quot; (102) dia.</td>
<td>34&quot; (864) dia.</td>
</tr>
<tr>
<td>Model 1203SS-3</td>
<td>4&quot; (102) dia.</td>
<td>34&quot; (864) dia.</td>
</tr>
</tbody>
</table>

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).

### Models 1203SS and 1203SS-3 - Round Duct Connection Sizes (Duct Dia.):

<table>
<thead>
<tr>
<th>Model</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single Sect.</td>
<td>Single Section</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>Vertical</td>
</tr>
<tr>
<td>Model 1203SS</td>
<td>4&quot; x 4&quot; (102 x 102), Overall damper size is 8&quot; x 8&quot; (203 x 203) min.</td>
<td>34&quot; x 46&quot; (864 x 1168)</td>
</tr>
<tr>
<td>Model 1203SS-3</td>
<td>4&quot; x 4&quot; (102 x 102), Overall damper size is 8&quot; x 8&quot; (203 x 203) min.</td>
<td>34&quot; x 46&quot; (864 x 1168)</td>
</tr>
</tbody>
</table>

### Models 1203SS and 1203SS-3 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Model</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single Sect.</td>
<td>Single Section</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>Vertical</td>
</tr>
<tr>
<td>Model 1203SS</td>
<td>4&quot; x 4&quot; (102 x 102), Overall damper size is 8&quot; x 8&quot; (203 x 203) min.</td>
<td>34&quot; x 46&quot; (864 x 1168)</td>
</tr>
<tr>
<td>Model 1203SS-3</td>
<td>4&quot; x 4&quot; (102 x 102), Overall damper size is 8&quot; x 8&quot; (203 x 203) min.</td>
<td>34&quot; x 46&quot; (864 x 1168)</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Min. Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>
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 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).

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.):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>6” (152) dia.</td>
<td>24” (610) dia.</td>
</tr>
</tbody>
</table>

Note: Dampers available in 1” (25) increments. Vertical or horizontal installation.

COMMON OPTIONS:
• MLS-300 Position Indicator Switch Pack.
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).

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.):

<table>
<thead>
<tr>
<th>Minimum Dia.</th>
<th>Maximum Dia.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6” (152)</td>
<td>24” (610)</td>
</tr>
</tbody>
</table>

Note: Dampers available in 1” (25) increments. Vertical or horizontal installation.

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**

![Graph showing pressure drop vs air volume in CFM (through face area).](image)

<table>
<thead>
<tr>
<th>Static Pressure Drop in inches w.g.</th>
<th>Air Volume in CFM (through face area)</th>
</tr>
</thead>
<tbody>
<tr>
<td>.01</td>
<td>100 (41)</td>
</tr>
<tr>
<td>.02</td>
<td>200 (96)</td>
</tr>
<tr>
<td>.03</td>
<td>300 (142)</td>
</tr>
<tr>
<td>.04</td>
<td>400 (188)</td>
</tr>
<tr>
<td>.05</td>
<td>500 (234)</td>
</tr>
<tr>
<td>.06</td>
<td>600 (280)</td>
</tr>
<tr>
<td>.07</td>
<td>700 (326)</td>
</tr>
<tr>
<td>.08</td>
<td>800 (372)</td>
</tr>
<tr>
<td>.09</td>
<td>900 (418)</td>
</tr>
<tr>
<td>.1</td>
<td>1000 (464)</td>
</tr>
<tr>
<td>.15</td>
<td>1500 (630)</td>
</tr>
<tr>
<td>.2</td>
<td>2000 (836)</td>
</tr>
<tr>
<td>.25</td>
<td>2500 (1042)</td>
</tr>
<tr>
<td>.3</td>
<td>3000 (1248)</td>
</tr>
<tr>
<td>.35</td>
<td>3500 (1454)</td>
</tr>
<tr>
<td>.4</td>
<td>4000 (1660)</td>
</tr>
<tr>
<td>.45</td>
<td>4500 (1866)</td>
</tr>
<tr>
<td>.5</td>
<td>5000 (2072)</td>
</tr>
<tr>
<td>.55</td>
<td>5500 (2278)</td>
</tr>
<tr>
<td>.6</td>
<td>6000 (2484)</td>
</tr>
<tr>
<td>.65</td>
<td>6500 (2690)</td>
</tr>
<tr>
<td>.7</td>
<td>7000 (2896)</td>
</tr>
</tbody>
</table>

**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)

Pressure Drop tested per AMCA Standard 500-D, Fig. 5.5.
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

### 1. 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)

- **JSM** = Flexible metal
- **JSS** = Stainless steel

### 10. Blade Seals

(Not applicable to all models)

- **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) |

### ACCESSORIES:

#### 15. Retaining Angles

- **QS1** = Single set (Not available on Model D1201-DOW)
- **QS2** = Pair (Not available on Model D1201-OW)

#### 16. Position Indicator

- **300** = MLS-300 (4-wire)

#### 17. TDF Flange

(Stainless Steel models only)

- **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.
MULTI-BLADE FIRE DAMPERS • MARINE

- 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

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).

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):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Section</td>
<td>Single Section</td>
<td>Multiple Section</td>
</tr>
<tr>
<td>Vertical/Horizontal</td>
<td>Vertical</td>
<td>Horizontal</td>
</tr>
<tr>
<td>8&quot; x 8&quot; (203 x 203)</td>
<td>36&quot; x 36&quot; (914 x 914)</td>
<td>32&quot; x 48&quot; (813 x 1219)</td>
</tr>
</tbody>
</table>

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:

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 ollite 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

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<thead>
<tr>
<th>Models</th>
<th>1201-MDG</th>
<th>Galvanized Steel, Airfoil Blade</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1201-MDS</td>
<td>Stainless Steel, Airfoil Blade</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duct Size</th>
<th>Width x Height or Diameter (inches [mm's])</th>
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<tbody>
<tr>
<td>V</td>
<td>Vertical (default)</td>
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<tr>
<td>H</td>
<td>Horizontal</td>
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<table>
<thead>
<tr>
<th>Stainless Steel Construction</th>
<th>(Model 1201-MDS only)</th>
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</thead>
<tbody>
<tr>
<td>Type 304</td>
<td>Stainless Steel</td>
</tr>
<tr>
<td>Type 316</td>
<td>Stainless Steel</td>
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<table>
<thead>
<tr>
<th>Closure Device</th>
<th>FL</th>
<th>Fusible Link (default)</th>
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<tr>
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<th>165°F (74°C) (default)</th>
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<tr>
<td>212°F (100°C)</td>
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<table>
<thead>
<tr>
<th>Bearings</th>
<th>BO</th>
<th>Oillte Bronze (default on Model 1201-MDG)</th>
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<tr>
<td></td>
<td>BS</td>
<td>Stainless Steel (default on Model 1201-MDS)</td>
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<th>Sleeve Length</th>
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<tr>
<td>12</td>
<td>12&quot; (305) standard (default)</td>
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<tr>
<td>10</td>
<td>10&quot; (254)</td>
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<tr>
<td>14</td>
<td>14&quot; (356)</td>
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<tr>
<td>16</td>
<td>16&quot; (406)</td>
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<tr>
<td>18</td>
<td>18&quot; (457)</td>
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<tr>
<td>20</td>
<td>20&quot; (508)</td>
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<td>24</td>
<td>24&quot; (610)</td>
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<tr>
<td></td>
<td>14G</td>
<td>14 ga.</td>
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<tr>
<td></td>
<td>10G</td>
<td>10 ga.</td>
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<th>Sleeve Flange</th>
<th>FD20</th>
<th>2&quot; (51) standard (default)</th>
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<td></td>
<td>FD10</td>
<td>1&quot; (25)</td>
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<tr>
<td></td>
<td>FD15</td>
<td>1 1/2&quot; (38)</td>
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<tr>
<td></td>
<td>FD25</td>
<td>2 1/2&quot; (64)</td>
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<tr>
<td></td>
<td>FD30</td>
<td>3&quot; (76)</td>
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<thead>
<tr>
<th>Bolt Holes</th>
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<tr>
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<td>BH1 In One Flange</td>
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<tr>
<td></td>
<td>BH2 In Both Flanges</td>
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<tr>
<th>Actuator Selected by</th>
<th>AUTO Least Cost (Auto-Select) (default)</th>
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<tr>
<td>MAN</td>
<td>Manually Select</td>
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<th>Power Requirement</th>
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<tr>
<td>230 VAC</td>
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<tr>
<td>24 VAC</td>
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<td>25 psi Pneumatic</td>
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<th>Actuator Mounting</th>
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<td>RH Right-Hand (default)</td>
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<th>Actuator Models</th>
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<tr>
<td>MS4</td>
<td>MS4X09F 120 VAC</td>
</tr>
<tr>
<td>MS8</td>
<td>MS8X09F 24 VAC</td>
</tr>
<tr>
<td>4Y0</td>
<td>MS4Y09F 230 VAC</td>
</tr>
<tr>
<td>412</td>
<td>MS4120F 120 VAC</td>
</tr>
<tr>
<td>812</td>
<td>MS8120F 24 VAC</td>
</tr>
<tr>
<td>462</td>
<td>MS4620F 230 VAC</td>
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<td>Pneumatic:</td>
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<tr>
<td>296</td>
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<tr>
<td>306</td>
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<td>312</td>
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<table>
<thead>
<tr>
<th>Position Indicator</th>
<th>None (default)</th>
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<tbody>
<tr>
<td>300 MLS-300 - 4 wire</td>
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<table>
<thead>
<tr>
<th>E. P. Switch</th>
<th>EP1 2651008 120 V</th>
</tr>
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<tr>
<td>EP2 2651007 24 V</td>
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<table>
<thead>
<tr>
<th>Explosive Proof Motor</th>
<th>None (default)</th>
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</thead>
<tbody>
<tr>
<td>EPH</td>
<td>Explosive-Proof Motor</td>
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<thead>
<tr>
<th>Outdoor Motor Housing</th>
<th>None (default)</th>
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<tr>
<td>OMH4 Type 304 Stainless Steel (NEMA 4X)</td>
<td></td>
</tr>
<tr>
<td>OMH6 Type 316 Stainless Steel (NEMA 4X)</td>
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</table>

<table>
<thead>
<tr>
<th>Continuous Weld Sleeve</th>
<th>None (default)</th>
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</thead>
<tbody>
<tr>
<td>CWS Continuous Weld Sleeve</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Notes:</th>
<th>1. Standard sleeve is 12&quot; (305 long x 16 ga. (1.6) with a 2&quot; (51) flange at both ends.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Refer to actuator price sheet for selection availability. Contact factory for availability of other actuators.</td>
</tr>
<tr>
<td></td>
<td>3. One MLS-300 required per damper assembly.</td>
</tr>
<tr>
<td></td>
<td>4. EP (electric-pneumatic) switch optional accessory is applicable only to pneumatic actuators and is shipped loose.</td>
</tr>
</tbody>
</table>

**OPTIONS & ACCESSORIES:**

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<thead>
<tr>
<th>Option</th>
<th>Description</th>
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</thead>
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<td>Position Indicator</td>
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<tr>
<td>19</td>
<td>E. P. Switch</td>
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<tr>
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<td>Continuous Weld Sleeve</td>
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<tr>
<td>18</td>
<td>Position Indicator</td>
</tr>
<tr>
<td>19</td>
<td>E. P. Switch</td>
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<tr>
<td>20</td>
<td>Explosive Proof Motor</td>
</tr>
<tr>
<td>22</td>
<td>Continuous Weld Sleeve</td>
</tr>
</tbody>
</table>
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.
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.
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:

<table>
<thead>
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<th>Standard Model #</th>
<th>With Type A Sleeve</th>
</tr>
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<tbody>
<tr>
<td>(D)1200</td>
<td>Model (D)1201</td>
</tr>
<tr>
<td>D1250</td>
<td>Model D1251</td>
</tr>
</tbody>
</table>

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.
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:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>For Curtain Type Fire Damper:</td>
<td>60&quot; wide x 60&quot; high (1524 x 1524).</td>
</tr>
<tr>
<td>For Multi-Blade Type Fire Damper:</td>
<td>36&quot; wide x 48&quot; high (914 x 1219).</td>
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Note: Reference IOM-FDTDCFINST for more details.
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  - Model Series 1260 • Steel
- **Balancing Airfoil Blade Smoke Dampers**
  - Model Series 1210BAL • Balancing • Steel
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- **Vertical Airfoil Blade Smoke Dampers**
  - Model Series 1210VB • Vertical Blade • Steel
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  - SMP Side Mounting Plate
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- **Duct Smoke Detectors**
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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 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 fps @ 4" w.g. (10 m/s @ 1 kPa), UL tested for extended ratings up to 4000 fps @ 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 55S 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 SERIES 1210BAL
AIRFOIL BLADE • BALANCING ACTUATOR
Model Series 1210BAL Balancing Smoke Dampers are ideal for applications requiring smoke management during hazardous conditions as well as duct balancing during normal operation. Using a 3 position actuator with a built-in potentiometer, the damper blades can be positioned without the need for an input control signal. When energized in normal operation, the damper goes to the set position to balance the airflow or a fully open/closed position during smoke conditions, depending on system design, as part of a static or dynamic smoke management system.
Model Series 1210BAL smoke dampers have been designed and tested to provide premium performance. Airfoil blade design and elimination of blade sills, top and bottom, provide an exceptionally low pressure drop design. Unique, inter-locking double skin blade design provides flame and smoke seal under fire conditions, maintaining leakage class at temperatures up to 2000°F (1093°C).

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 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 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-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.
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):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
</tr>
<tr>
<td>24</td>
<td>250/350</td>
<td>8&quot; x 8&quot; (203 x 203)</td>
<td>36&quot; x 48&quot; (914 x 1219)</td>
</tr>
</tbody>
</table>

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.
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

Model 1282 Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Minimum Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

Minimum:
- Single Section: 8" x 4" (203 x 102)
- Single Section: Overall damper height is 8" (203)
- Multiple Section: 288" x 7 1/2" (7315 x 191)

Maximum:
- Single Section: 36" x 7 1/2" (914 x 191)

Model 1283 - Round Duct Connection Sizes (Duct Dia.):

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Minimum Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

Minimum:
- Single Section: 4" (102) dia.
- Overall damper size is 8" x 8" (203 x 203) min.
- Maximum:
  - Single Section: 34" (864) dia.
  - Multiple Section: 94" (2388) dia.

Model 1283 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Minimum Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

Minimum:
- Single Section: 4" x 4" (102 x 102)
- Overall damper size is 8" x 8" (203 x 203) min.
- Maximum:
  - Single Section: 34" x 46" (864 x 1168)
  - Multiple Section: 142" x 94" (3607 x 2388),
    286" x 46" (7264 x 1168) or
    70" x 142" (1778 x 3607).

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).
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).

PRESSURE DROP:

<table>
<thead>
<tr>
<th>Air Velocity in Feet Per Minute (m/s)</th>
<th>Static Pressure Drop in inches w.g. (Pa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 (94)</td>
<td>.001 (.3)</td>
</tr>
<tr>
<td>300 (142)</td>
<td>.002 (.5)</td>
</tr>
<tr>
<td>400 (189)</td>
<td>.003 (.6)</td>
</tr>
<tr>
<td>500 (236)</td>
<td>.004 (.8)</td>
</tr>
<tr>
<td>600 (284)</td>
<td>.005 (1.0)</td>
</tr>
<tr>
<td>700 (330)</td>
<td>.006 (1.2)</td>
</tr>
<tr>
<td>800 (378)</td>
<td>.007 (1.4)</td>
</tr>
<tr>
<td>900 (425)</td>
<td>.008 (1.6)</td>
</tr>
<tr>
<td>1000 (472)</td>
<td>.01 (1.9)</td>
</tr>
<tr>
<td>1100 (519)</td>
<td>.015 (2.5)</td>
</tr>
<tr>
<td>1200 (566)</td>
<td>.017 (3.0)</td>
</tr>
<tr>
<td>1300 (613)</td>
<td>.02 (3.5)</td>
</tr>
<tr>
<td>1400 (660)</td>
<td>.025 (4.0)</td>
</tr>
<tr>
<td>1500 (707)</td>
<td>.03 (4.5)</td>
</tr>
<tr>
<td>1600 (754)</td>
<td>.035 (5.0)</td>
</tr>
<tr>
<td>1700 (801)</td>
<td>.04 (5.5)</td>
</tr>
<tr>
<td>1800 (848)</td>
<td>.045 (6.0)</td>
</tr>
<tr>
<td>1900 (895)</td>
<td>.05 (6.5)</td>
</tr>
<tr>
<td>2000 (944)</td>
<td>.055 (7.0)</td>
</tr>
</tbody>
</table>

Pressure drop tested per AMCA Standard 500-D, Figure 5.3.
Data corrected to standard air density of 0.075 lbs/ft.³.
**EXTRUDED ALUMINUM AIRFOIL BLADE SMOKE DAMPERS**

**MODEL SERIES: 1280**


1. **Models**
   - 1280 Aluminum, Airfoil Blade
2. **Sleeve/Enclosure Style**
   - (4th Digit)
   - 0 = No Sleeve
   - 1 = Type A Sleeve
   - 2 = Type B Sleeve Enclosure
   - 3 = Type C Sleeve Enclosure
3. **Duct Size**
   - Width x Height
   - inches (mm’s)
4. **Mounting**
   - H/V Horizontal/Vertical (default)
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)
   - II Class II
8. **Max. Velocity / Pressure Rating**
   - 24 2000 fpm @ 4’’ w.g. (default)
9. **Elevated Temperature**
   - 250 250°F (default)
   - 350 350°F
10. **Bearings**
    - BO Oilite Bronze (default)
    - BS Stainless Steel
11. **Duct Smoke Detector**
    - — None (default)
    - DSDL Low-Flow, factory mounted
    - DSDN No-Flow, factory mounted
12. **Side Mounting Plate**
    - (No Sleeve models only)
    - SMP Side Mounting Plate
13. **Sleeve Length**
    - SL = Specify
    - 16’’ (406) standard (default)
    - 12’’ – 28’’ (305 – 711)
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 Fail Position**
    - CL Close (default)
18. **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
19. **Extruded Aluminum Frame**
    - — None (default)
    - EAF Extruded Aluminum Frame
20. **Options & Accessories:**
    - **Position Indicator**
      - — None (default)
      - 300 MLS-300 (4-wire)
    - **EP Switch**
      - — None (default)
      - EP1 120 VAC
      - EP2 24 VAC
    - **TDF Flange**
      - — None (default)
      - TDF1 One End
      - TDF2 Both Ends
    - **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.
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 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):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
</tr>
<tr>
<td>24, 34, 36, 46</td>
<td>250/350</td>
<td>8&quot; x 8&quot; (203 x 203), 6&quot; x 6&quot; (152 x 152) with low profile frame (maximum size is 18&quot; x 6&quot; [457 x 152].)</td>
<td>36&quot; x 48&quot; (914 x 1219) or 28&quot; x 48&quot; (721 x 1219)</td>
</tr>
<tr>
<td>48</td>
<td>250</td>
<td>36&quot; x 48&quot; (914 x 1219)</td>
<td>144&quot; x 96&quot; (3658 x 2438) or 288&quot; x 48&quot; (721 x 1219)</td>
</tr>
<tr>
<td>48</td>
<td>350</td>
<td>36&quot; x 24&quot; (914 x 610)</td>
<td>144&quot; x 48&quot; (3658 x 1219) or 288&quot; x 24&quot; (721 x 1219)</td>
</tr>
</tbody>
</table>

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.
- D SDL/DSDN Duct Smoke Detectors.
- MLS-300 Position Indicator Switch Pack.
- Factory fitted sleeves in custom lengths, gauges and transition styles.

MODEL 1211: TYPE A SLEEVE
Standard factory sleeve (cataled 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).

MODEL 1213 TYPE C SLEEVE ENCLOSURES:

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).

MODEL 1213 TYPE C SLEEVE ENCLOSURES:

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).
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).

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**


1. **Models**
   - 1210 Steel, Airfoil Blade

2. **Sleeve/Enclosure Style**
   - (4th Digit)
   - 0 = No Sleeve
   - 1 = Type A Sleeve
   - 2 = Type B Sleeve Enclosure
   - 3 = Type C Sleeve Enclosure

3. **Duct Size**
   - Width x Height
   - inches (mm's)

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)
   - 34 = 3000 fpm @ 4" w.g.
   - 36 = 3000 fpm @ 6" w.g.
   - 46 = 4000 fpm @ 6" w.g.
   - 48 = 4000 fpm @ 8" w.g.

9. **Elevated Temperature**
   - 250 = 250°F (default)
   - 350 = 350°F

10. **Bearings**
    - BO Oilite Bronze (default)
    - BS Stainless Steel

11. **Duct Smoke Detector**
    - None (default)
    - DSDL Low-Flow, factory mounted
    - DSDN No-Flow, factory mounted

12. **Actuator Location**
    - RH Right hand (default)
    - LH Left hand
    - MH Multi-hand

13. **Actuator Fail Position**
    - CL Close (default)
    - OP Open

14. **Actuator Models**
    - **Electric:**
      - 4X02 ML4X02 120 VAC
      - 8X02 ML8X02 24 VAC
      - 4Y02 ML4Y02 230 VAC
      - 411 ML4115 120 VAC
      - 811 ML8115 24 VAC
      - MS4 MS4X09F 120 VAC
      - MS8 MS8X09F 24 VAC
      - 4Y0 MS4Y09F 230 VAC
      - 412 MS4120F 120 VAC
      - 812 MS8120F 24 VAC
      - 462 MS4620F 230 VAC
      - 4D2 GGD221 120 VAC
      - 4D1 GGD121 24 VAC
      - 4D3 GGD321 230 VAC
      - FL12 FSLF120 120 VAC
      - FL23 FSLF230 230 VAC
      - FL24 FSLF24 24 VAC
      - F12 FSNF120 120 VAC
      - F23 FSNF230 230 VAC
      - F24 FSNF24 24 VAC
    - **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 select) 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.
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):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum Single Section</th>
<th>Minimum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24</td>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
</tr>
<tr>
<td></td>
<td>250/350</td>
<td>8’ x 8” (203 x 203)</td>
<td>36” x 48” (914 x 1219)</td>
<td>144” x 48” (3658 x 1219) or 36” x 96” (914 x 2438)</td>
</tr>
</tbody>
</table>

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.

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).

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Minimum Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

**MODEL 1263 TYPE C SLEEVE ENCLOSURES:**

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).

**Model 1262 Sizes (Duct W x H):**

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Single Section</th>
<th>Single Section</th>
<th>Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical/Horizontal</td>
<td></td>
<td></td>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>250/350</td>
<td>8” x 4” (203 x 102)</td>
<td>36” x 7 1/2” (914 x 191)</td>
<td>144” x 7 1/2” (3658 x 191)</td>
<td></td>
</tr>
</tbody>
</table>

**Model 1263 - Round Duct Connection Sizes (Duct Dia.):**

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical/Horizontal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>250/350</td>
<td>4” (102) dia.</td>
<td>34” (864) dia.</td>
</tr>
</tbody>
</table>

**Model 1263 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):**

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical/Horizontal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>250/350</td>
<td>4” x 4” (102 x 102)</td>
<td>142” x 46” (3607 x 1168)</td>
</tr>
</tbody>
</table>
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).

<table>
<thead>
<tr>
<th>Maximum Performance Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL 555S Leakage Rating</td>
</tr>
<tr>
<td>Maximum Velocity</td>
</tr>
<tr>
<td>Maximum Pressure</td>
</tr>
<tr>
<td>Maximum Temperature</td>
</tr>
<tr>
<td>Class I</td>
</tr>
<tr>
<td>2000 fpm (10 m/s)</td>
</tr>
<tr>
<td>4 in. w.g. (1 kPa)</td>
</tr>
<tr>
<td>350°F (177°C)</td>
</tr>
</tbody>
</table>

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.
VEE GROOVE BLADE SMOKE DAMPERS
MODEL SERIES: 1260


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
H/V Horiz/Vert (default)

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
250 250°F (default)
350 350°F

8. Elevated Temperature
2000 fpm @ 4” w.g. (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:
4X02 ML4X02 120 VAC
8X02 ML8X02 24 VAC
4Y02 ML4Y02 230 VAC
411 ML4115 120 VAC
811 ML8115 24 VAC
MS4 MS4X09 120 VAC
MS8 MS8X09 120 VAC
4Y0 MS4Y09 230 VAC

18. Damper Location
L8 8” (203) From sleeve end (default)
LX Other (specify)

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. Blades 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.
Models:  
- 1210BAL No Sleeve  
- 1211BAL Type A Sleeve  
- 1212BAL Type B Sleeve Enclosure  
- 1213BAL Type C Sleeve Enclosure

Model Series 1210BAL Balancing Airfoil Blade Smoke Dampers are ideal for applications requiring fire containment and smoke management during hazardous conditions as well as duct balancing during normal operation. Using a 24 VAC, 3 position actuator with a built-in potentiometer, the damper blades can be positioned without the need for an input control signal. When energized in normal operation, the damper goes to the set position to balance the airflow, or a fully open/closed position in fire/smoke conditions, depending on system design.

The 1210BAL Model Series dampers 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 vertical or horizontal mounting. Airfoil blade design and elimination of blade sills, top and bottom, provide an exceptionally low pressure drop design. Unique, inter-locking double skin blade design provides flame and smoke seal under fire conditions, maintaining leakage class at temperatures up to 2000°F (1093°C).

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.  
Axes: 1/2" (13) dia. plated steel double bolted to blades.  
Jackshaft: 1/2" (13) dia. cadmium plated steel.  
Jamb Seals: Cambered stainless steel.

Models 1210BAL and 1211BAL Sizes (Duct W x H):  

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24 250</td>
<td>6&quot; x 6&quot; (152 x 152) with low profile frame (maximum size is 18&quot; x 6&quot; [457 x 152]),</td>
<td>36&quot; x 48&quot; (914 x 1219)</td>
</tr>
</tbody>
</table>

Note: Dampers with duct heights less than 6" (152) 8" (203) if width is over 18" [457]) require a Type 'B' sleeve enclosure (Model 1212BAL). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1213BAL). 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.

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 1210BAL dampers with duct heights less than 6" (152) (8" [203] if width is over 18" [457]) require a Type ‘B’ sleeve enclosure (Model 1212BAL). Duct sizes less than 8" (203) in width require a Type ‘C’ enclosure (Model 1213BAL).

MODEL 1212BAL 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).

MODEL 1213BAL TYPE C SLEEVE ENCLOSURES:

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).

Model 1212BAL Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Minimum Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

Note: Multiple section assemblies are not permitted.

Model 1213BAL - Round Duct Connection Sizes (Duct Dia.):

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Minimum Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

Note: Multiple section assemblies are not permitted.

Model 1213BAL - Sq., Rect. or Oval Duct Connection Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Minimum Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

Note: Multiple section assemblies are not permitted.
PERFORMANCE DATA:
MODEL SERIES: 1210BAL

LEAKAGE CLASS:
The 1210BAL Series Balancing 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

<table>
<thead>
<tr>
<th>UL 555S Leakage Rating</th>
<th>Class I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Velocity</td>
<td>2000 fpm (10 m/s)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>4 in. w.g. (1 kPa)</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>250°F (121°C)</td>
</tr>
</tbody>
</table>

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 or to Specify

## Balancing Airfoil Blade Smoke Dampers

**Model Series: 1210BAL**

**Example:** 1211BAL - 24 x 24 - H/V - AUTO - 24 - I - 24 - 250 - BO - SL = 16 - 20G - EXT - RH - CL - FAB - L8

### 1. Models
- 1210BAL Balancing, 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)

### 5. Power Requirement
- 24 - 24 VAC (default)

### 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**

### 12. Sleeve Gauge
- 20G - 20 Ga. standard (default)
- 18G - 18 Ga.
- 16G - 16 Ga.
- 14G - 14 Ga.
- 10G - 10 Ga.

### 13. Transition
- **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:**
  - **FAB** FSAF4-BAL 24 VAC/DC

### 18. Damper Location
- **L8** 8" (203) From sleeve end (default)
- **LX** Other (specify)

### 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.
2. One MLS-300 required per damper assembly.

---

**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: 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 Class I Smoke Damper under UL 555S at an elevated temperature of 250°F (121°C) and each damper shall bear a UL label verifying same for use in dynamic or static Smoke Control Systems. 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 Model Series 1210BAL.
Models 1210M and 1211M Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
</tr>
<tr>
<td>24</td>
<td>250</td>
<td>8” x 8” (203 x 203)</td>
<td>36” x 48” (914 x 1219)</td>
</tr>
</tbody>
</table>

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 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.
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).

MODEL 1213M TYPE C SLEEVE ENCLOSURES:

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).

**Model 1212M Sizes (Duct W x H):**

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Minimum Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>250</td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
<td></td>
</tr>
<tr>
<td>6” x 4” (203 x 102)</td>
<td>36” x 7 1/2” (914 x 191)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Model 1213M - Round Duct Connection Sizes (Duct Dia.):**

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Minimum Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>250</td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
<td></td>
</tr>
<tr>
<td>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.)</td>
<td>34” (864) dia.</td>
<td>94” (2388) dia.</td>
<td></td>
</tr>
</tbody>
</table>

**Model 1213M - Sq., Rect. or Oval Duct Connection Sizes (Duct W x H):**

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>250</td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
<td></td>
</tr>
<tr>
<td>4” x 4” (203 x 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.)</td>
<td>34” x 46” (864 x 1168)</td>
<td>142” x 94” (3607 x 2388) or 286” x 46” (7264 x 1168)</td>
<td></td>
</tr>
</tbody>
</table>
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).

<table>
<thead>
<tr>
<th>Maximum Performance Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL 555S Leakage Rating</td>
</tr>
<tr>
<td>Maximum Velocity</td>
</tr>
<tr>
<td>Maximum Pressure</td>
</tr>
<tr>
<td>Maximum Temperature</td>
</tr>
</tbody>
</table>

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.
MODULATING AIRFOIL BLADE SMOKE DAMPERS
MODEL SERIES: 1210M

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:
    MS7 MS7510 24VAC
    FAM FSAF-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.
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):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical</td>
<td>Single Section</td>
<td>Single Section</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>250</td>
<td>8&quot; x 8&quot; (203 x 203)</td>
<td>48&quot; x 36&quot; (1219 x 914)</td>
</tr>
</tbody>
</table>

Note: Dampers with duct heights less than 8" (203) require a Type ‘B’ sleeve enclosure (Model 1212VB). Duct sizes less than 6" (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).
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).

Model 1212VB Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical</td>
<td></td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>24</td>
<td>250</td>
<td>8” x 4” (203 x 102)</td>
<td>48” x 7 1/2” (1219 x 191)</td>
</tr>
<tr>
<td>Vertical</td>
<td></td>
<td>Vertical</td>
<td>Vertical</td>
</tr>
</tbody>
</table>

Note: Multiple section assemblies are not permitted.

MODEL 1213VB TYPE C SLEEVE ENCLOSURES:

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).

Model 1213VB - Round Duct Connection Sizes (Duct Dia.):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical</td>
<td></td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>24</td>
<td>250</td>
<td>4” (102) dia. (overall damper size is 8” x 8” [203 x 203])</td>
<td>34” (864) dia.</td>
</tr>
</tbody>
</table>

Note: Multiple section assemblies are not permitted.

Model 1213VB - Sq., Rect. or Oval Duct Conn. Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical</td>
<td></td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>24</td>
<td>250</td>
<td>4” x 4” (102 x 102) (overall damper size is 8” x 8” [203 x 203]) min.</td>
<td>46” x 34” (1168 x 864)</td>
</tr>
</tbody>
</table>

Note: Multiple section assemblies are not permitted.
VERTICAL AIRFOIL BLADE SMOKE DAMPERS

MODEL SERIES: 1210VB


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 Oiltite 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:
    MS4 MS4X09F 120 VAC
    MS8 MS8X09F 24 VAC
    4Y0 MS4Y09F 230 VAC
    412 MS4120F 120 VAC
    812 MS8120F 24 VAC
    462 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” (1 40) 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 oiltite 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.
SMOKE DAMPERS • AIRFOIL • 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.

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):

<table>
<thead>
<tr>
<th>Model</th>
<th>Diameter</th>
<th>Vertical/Horizontal</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1210SS</td>
<td>12&quot; (305)</td>
<td>5&quot; (127)</td>
<td>5&quot; (127)</td>
</tr>
<tr>
<td>1211SS</td>
<td>14&quot; (356)</td>
<td>5&quot; (127)</td>
<td>5&quot; (127)</td>
</tr>
<tr>
<td>1212SS</td>
<td>16&quot; (406)</td>
<td>5&quot; (127)</td>
<td>5&quot; (127)</td>
</tr>
<tr>
<td>1213SS</td>
<td>18&quot; (457)</td>
<td>5&quot; (127)</td>
<td>5&quot; (127)</td>
</tr>
</tbody>
</table>

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.

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).

**MODEL 1213SS TYPE C SLEEVE ENCLOSURES:**

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).

---

Model 1212SS Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Minimum Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

Model 1213SS - Round Duct Connection Sizes (Duct Dia.):

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Minimum Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

Model 1213SS - Sq., Rect. or Oval Duct Connection Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>250</td>
<td>4&quot; (102) dia.</td>
<td>34&quot; (864) dia.</td>
</tr>
</tbody>
</table>

---
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).

PRESSURE DROP:

Maximum Performance Ratings

<table>
<thead>
<tr>
<th>UL 555S Leakage Rating</th>
<th>Class I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Velocity</td>
<td>2000 fpm (10 m/s)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>4 in. w.g. (1 kPa)</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>250°F (121°C)</td>
</tr>
</tbody>
</table>

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

### AIRFOIL BLADE SMOKE DAMPERS

**MODEL SERIES: 1210SS**


1. **Models**
   - 1210SS Stainless Steel, Airfoil Blade

2. **Sleeve/Enclosure Style**
   - (4th Digit)
   - 0 = No Sleeve
   - 1 = Type A Sleeve
   - 2 = Type B Sleeve Enclosure
   - 3 = Type C Sleeve Enclosure

3. **Duct Size**
   - Width x Height inches (mm's)

4. **Construction**
   - 304 Type 304 Stainless Steel (default)
   - 316 Type 316 Stainless Steel

5. **Mounting**
   - H/V Horizontal/Vertical (default)

6. **Actuator Selected By**
   - AUTO Least Cost (Auto-Select) (default)
   - BEL Belimo
   - HON Honeywell
   - SIE Siemens

7. **Power Requirement**
   - 120 120 VAC (default)
   - 230 230 VAC
   - 24 24 VAC
   - 25 25 psi Pneumatic

8. **Leakage Rating**
   - I Class I (default)
   - II Class II

9. **Max. Velocity / Pressure Rating**
   - 24 2000 fpm @ 4" w.g. (default)

10. **Elevated Temperature**
    - 250 250°F (default)

11. **Bearings**
    - BS Stainless Steel (default)

12. **Duct Smoke Detector**
    - None (default)
    - DSDL Low-Flow, factory mounted
    - DSDN No-Flow, factory mounted

13. **Side Mounting Plate**
    - (No Sleeve models only)
    - SMP Side Mounting Plate

14. **Actuator Models**
    - **Electric:**
      - 4X02 ML4X02 120 VAC
      - 8X02 ML8X02 24 VAC
      - 4Y02 ML4Y02 230 VAC
      - 411 ML4116 120 VAC
      - 811 ML8116 24 VAC
      - MS4 MS4X09F 120 VAC
      - MS8 MS8X09F 24 VAC
      - 4Y0 MS4Y09F 230 VAC
      - 412 MS4120F 120 VAC
      - 812 MS8120F 24 VAC
      - 462 MS4620F 230 VAC
      - GD2 GGD221 120 VAC
      - GD1 GGD121 24 VAC
      - GD3 GGD321 230 VAC
      - FL12 FSLF120 120 VAC
      - FL23 FSLF230 230 VAC
      - FL24 FSLF24 24 VAC
      - F12 FSMF120 120 VAC
      - F23 FSMF230 230 VAC
      - F24 FSMF24 24 VAC
    - **Pneumatic:**
      - 296 331-2961
      - 306 331-3060

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 Test Switch**
    - None (default)
    - DTS Damper Test Switch

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. **Damp 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 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.
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.):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>6” (152) dia.</td>
<td>24” (610) dia.</td>
</tr>
</tbody>
</table>

Note: Dampers available in 2” (51) increments.

COMMON OPTIONS:
- DTS Damper Test Switch for cycle testing.
- MLS-300 Position Indicator Switch Pack.
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.):**

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; (152) dia.</td>
<td>24&quot; (610) dia.</td>
</tr>
</tbody>
</table>

**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.
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).

PRESSURE DROP

<table>
<thead>
<tr>
<th>Static Pressure Drop in inches w.g.</th>
<th>0.01</th>
<th>0.02</th>
<th>0.03</th>
<th>0.04</th>
<th>0.05</th>
<th>0.06</th>
<th>0.07</th>
<th>0.08</th>
<th>0.09</th>
<th>0.1</th>
<th>0.15</th>
<th>0.2</th>
<th>0.25</th>
<th>0.3</th>
<th>0.4</th>
<th>0.5</th>
<th>0.6</th>
<th>0.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Volume in CFM (through face area)</td>
<td>(47)</td>
<td>(94)</td>
<td>(142)</td>
<td>(189)</td>
<td>(236)</td>
<td>(330)</td>
<td>(472)</td>
<td>(944)</td>
<td>(1416)</td>
<td>(1888)</td>
<td>(2360)</td>
<td>(3303)</td>
<td>(4720)</td>
<td>(174)</td>
<td>(120)</td>
<td>(66)</td>
<td>(64)</td>
<td>(50)</td>
</tr>
</tbody>
</table>

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 - MS4**

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:**
    
    4X02 ML4X02 120 VAC
    
    8X02 ML8X02 24 VAC
    
    4Y02 ML4Y02 230 VAC
    
    MS4 MS4X09F 120 VAC
    
    MS8 MS8X09F 24 VAC
    
    4Y0 MS4Y09F 230 VAC
    
    **Pneumatic:**
    
    296 331-2961
    
    482 331-4826

**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.
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.

**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:

<table>
<thead>
<tr>
<th>Standard Model #</th>
<th>With Type A Sleeve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1210</td>
<td>Model 1211</td>
</tr>
<tr>
<td>1260</td>
<td>Model 1261</td>
</tr>
<tr>
<td>1280</td>
<td>Model 1281</td>
</tr>
</tbody>
</table>
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 ML4115/ML8115 and MS4X09/MS8X09 actuators are examples.

Some actuator models have variants with position indicator switches built right into 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.
**SMOKE DAMPER OPTIONS**

**POSITION INDICATORS:**

**MLS-300N (NAILOR) SWITCH DETAILS**

**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.
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.

Figure 1. 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
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.
DUCT SMOKE DETECTORS:

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.
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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 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 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 SERIES 1270 (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 1220BAL (1 1/2 HR.) AND 1220BAL-3 (3 HR.)
AIRFOIL BLADE • BALANCING
Model Series 1220BAL and 1220BAL-3 Balancing Fire/Smoke Dampers are ideal for applications requiring fire containment and smoke management during hazardous conditions as well as duct balancing during normal operation. Using a 3 position actuator with a built-in potentiometer, the damper blades can be positioned without the need for an input control signal. When energized in normal operation, the damper goes to the set position to balance the airflow, or a fully open/closed position in fire/smoke conditions, depending on system design.

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 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-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 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 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 is available for more severe environment applications.
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 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.
Model Series:
1220  1 1/2 Hour Label
1220-3  3 Hour Label

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).

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) (6" [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):

<table>
<thead>
<tr>
<th>Model</th>
<th>Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Single Section</td>
<td>Multiple Section</td>
</tr>
<tr>
<td>Model 1220</td>
<td>24, 34, 48</td>
<td>250/350</td>
<td>8&quot; x 8&quot; (203 x 203); 6&quot; x 6&quot; (152 x 152) with low profile frame (maximum size is 18&quot; x 6&quot; [457 x 152]).</td>
<td>120&quot; x 96&quot; (3048 x 2438) (maximum each section is 30&quot; x 48&quot; [762 x 1219]).</td>
</tr>
<tr>
<td>Model 1221</td>
<td>48</td>
<td>250/350</td>
<td>36&quot; x 48&quot; (914 x 1219)</td>
<td>144&quot; x 96&quot; (3658 x 2438)</td>
</tr>
<tr>
<td>Model 1220-3</td>
<td>48</td>
<td>250/350</td>
<td>36&quot; x 48&quot; (914 x 1219)</td>
<td>144&quot; x 96&quot; (3658 x 2438)</td>
</tr>
<tr>
<td>Model 1221-3</td>
<td>48</td>
<td>250/350</td>
<td>36&quot; x 24&quot; (914 x 610)</td>
<td>144&quot; x 96&quot; (3658 x 2438)</td>
</tr>
</tbody>
</table>

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 |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

MODELS 1222 AND 1222-3: TYPE B SLEEVE ENCLOSURE

Models 1222 and 1222-3 Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Model</th>
<th>Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Single Section</td>
<td>Multiple Section</td>
</tr>
<tr>
<td>Model 1222</td>
<td>24, 34, 48</td>
<td>250/350</td>
<td>8&quot; x 4&quot; (203 x 102) Overall damper height is 8&quot; (203); 6&quot; (152) on duct sizes 18 x 5 1/2&quot; (457 x 140) and under.</td>
<td>120&quot; x 7 1/2&quot; (3048 x 191) (max. each section is 30&quot; x 7 1/2&quot; [762 x 191]).</td>
</tr>
<tr>
<td>Model 1222-3</td>
<td>24, 34, 48</td>
<td>250/350</td>
<td>36&quot; x 7 1/2&quot; (914 x 191)</td>
<td>144&quot; x 7 1/2&quot; (3658 x 191)</td>
</tr>
<tr>
<td>Model 1222-3</td>
<td>24, 34, 48</td>
<td>250/350</td>
<td>32&quot; x 7 1/2&quot; (813 x 191)</td>
<td>144&quot; x 7 1/2&quot; (3658 x 191)</td>
</tr>
</tbody>
</table>

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 |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
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<td>20 (508)</td>
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<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>
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

MODELS 1223 AND 1223-3 - Round Duct Connection Sizes (Duct Dia.):

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Single Section</th>
<th>Single Section</th>
<th>Maximum</th>
<th>Vertical/Horizontal</th>
<th>Vertical/Horizontal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
</tr>
<tr>
<td>Model 1223</td>
<td>24, 34, 36, 46</td>
<td>250/350</td>
<td>4&quot; (102) dia.</td>
<td>34&quot; (864) dia.</td>
<td>30° (762) dia.</td>
<td>94°</td>
<td>142° (2997 x 2388)</td>
<td>126&quot; x 94° (3200 x 2388)</td>
</tr>
<tr>
<td></td>
<td>48</td>
<td>250</td>
<td>22° (559) dia.</td>
<td>22° (559) dia.</td>
<td>46°</td>
<td>116° (2388 dia.)</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Model 1223-3</td>
<td>24, 34, 36, 46</td>
<td>250/350</td>
<td>4&quot; (102) dia.</td>
<td>34&quot; (864) dia.</td>
<td>30° (762) dia.</td>
<td>94°</td>
<td>142° (2997 x 2388)</td>
<td>126&quot; x 94° (3200 x 2388)</td>
</tr>
<tr>
<td></td>
<td>48</td>
<td>250</td>
<td>22° (559) dia.</td>
<td>22° (559) dia.</td>
<td>46°</td>
<td>116° (2388 dia.)</td>
<td>n/a</td>
<td></td>
</tr>
</tbody>
</table>

MODELS 1223 AND 1223-3 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Single Section</th>
<th>Single Section</th>
<th>Maximum</th>
<th>Vertical/Horizontal</th>
<th>Vertical/Horizontal</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
</tr>
<tr>
<td>Model 1223</td>
<td>24, 34, 36, 46</td>
<td>250/350</td>
<td>4&quot; x 4&quot; (102 x 102). Overall damper size is 8&quot; x 8&quot; (203 x 203). Min. for duct sizes over 16&quot; x 4&quot; (406 x 102).</td>
<td>34&quot;x4&quot; (864 x 1168)</td>
<td>30&quot;x4&quot; (762 x 1168)</td>
<td>142&quot;x4&quot; (2997 x 2388)</td>
<td>126&quot;x94&quot; (3200 x 2388)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>48</td>
<td>250</td>
<td>34&quot;x4&quot; (864 x 1168)</td>
<td>30&quot;x4&quot; (762 x 1168)</td>
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<td>126&quot;x94&quot; (3200 x 2388)</td>
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<td>126&quot;x94&quot; (3200 x 2388)</td>
</tr>
<tr>
<td>Model 1223-3</td>
<td>24, 34, 36, 46</td>
<td>250/350</td>
<td>4&quot; x 4&quot; (102 x 102). Overall damper size is 8&quot; x 8&quot; (203 x 203). Min. for duct sizes over 16&quot; x 4&quot; (406 x 102).</td>
<td>34&quot;x4&quot; (864 x 1168)</td>
<td>30&quot;x4&quot; (762 x 1168)</td>
<td>116&quot;x94&quot; (2997 x 2388)</td>
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</tr>
</tbody>
</table>

Wall Thickness Min. Sleeve Length

<table>
<thead>
<tr>
<th>Wall Thickness</th>
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</tr>
</thead>
<tbody>
<tr>
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<td>16 (406)</td>
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<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

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).
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.

PRESSURE DROP:

<table>
<thead>
<tr>
<th>Air Velocity in feet per minute (m/s)</th>
<th>Static Pressure Drop in inches w.g. (Pa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01 (3)</td>
<td>0.03</td>
</tr>
<tr>
<td>0.02 (6)</td>
<td>0.06</td>
</tr>
<tr>
<td>0.03 (9)</td>
<td>0.09</td>
</tr>
<tr>
<td>0.04 (12)</td>
<td>0.12</td>
</tr>
<tr>
<td>0.05 (15)</td>
<td>0.15</td>
</tr>
<tr>
<td>0.06 (18)</td>
<td>0.18</td>
</tr>
<tr>
<td>0.07 (21)</td>
<td>0.21</td>
</tr>
<tr>
<td>0.08 (24)</td>
<td>0.24</td>
</tr>
<tr>
<td>0.09 (27)</td>
<td>0.27</td>
</tr>
<tr>
<td>0.1 (30)</td>
<td>0.30</td>
</tr>
<tr>
<td>0.11 (33)</td>
<td>0.33</td>
</tr>
<tr>
<td>0.12 (36)</td>
<td>0.36</td>
</tr>
<tr>
<td>0.13 (39)</td>
<td>0.39</td>
</tr>
<tr>
<td>0.14 (42)</td>
<td>0.42</td>
</tr>
<tr>
<td>0.15 (45)</td>
<td>0.45</td>
</tr>
<tr>
<td>0.16 (48)</td>
<td>0.48</td>
</tr>
<tr>
<td>0.17 (51)</td>
<td>0.51</td>
</tr>
<tr>
<td>0.18 (54)</td>
<td>0.54</td>
</tr>
<tr>
<td>0.19 (57)</td>
<td>0.57</td>
</tr>
<tr>
<td>0.2 (60)</td>
<td>0.60</td>
</tr>
<tr>
<td>0.21 (63)</td>
<td>0.63</td>
</tr>
<tr>
<td>0.22 (66)</td>
<td>0.66</td>
</tr>
<tr>
<td>0.23 (69)</td>
<td>0.69</td>
</tr>
<tr>
<td>0.24 (72)</td>
<td>0.72</td>
</tr>
<tr>
<td>0.25 (75)</td>
<td>0.75</td>
</tr>
<tr>
<td>0.26 (78)</td>
<td>0.78</td>
</tr>
<tr>
<td>0.27 (81)</td>
<td>0.81</td>
</tr>
<tr>
<td>0.28 (84)</td>
<td>0.84</td>
</tr>
<tr>
<td>0.29 (87)</td>
<td>0.87</td>
</tr>
<tr>
<td>0.3 (90)</td>
<td>0.90</td>
</tr>
</tbody>
</table>

Data corrected to standard air density of 0.075 lbs/ft.³.
## HOW TO ORDER

### MODEL SERIES: 1220 - 1 1/2 HOUR LABEL AND 1220-3 - 3 HOUR LABEL

#### COMBINATION FIRE/SMOKE DAMPERS


### 1a. Models

- **Dyna**mic or Stat**ic** Applications
- 1220 Airfoil Blade, **1 1/2 Hour Label**
- 1220-3 Airfoil Blade, **3 Hour Label**

### 1b. Sleeve/Enclosure Style

- (4**th** 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

<table>
<thead>
<tr>
<th>ERL/PRL</th>
<th>165 165°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>212 212°F (PRL)</td>
<td></td>
</tr>
<tr>
<td>250 250°F (ERL only) (default)</td>
<td></td>
</tr>
<tr>
<td>280 280°F (PRL only)</td>
<td></td>
</tr>
<tr>
<td>350 350°F (ERL only)</td>
<td></td>
</tr>
</tbody>
</table>
- DTO Dual Temperature Override Sensor (MLS-400)
  - HL 250/165°F
  - HIL 350/165°F

### 11. Bearings

- BO Oiltite Bronze (default)
- BS Stainless Steel

### 12. Duct Smoke Detector

- None (default)
- DSDL Low-Flow, factory mounted
- DSN 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:

- 4X02 ML4X02 120 VAC
- 8X02 ML8X02 24 VAC
- 4Y02 ML4Y02 230 VAC
- 8Y02 ML8Y02 24 VAC
- 4L02 ML4L02 120 VAC
- 8L02 ML8L02 24 VAC
- 4S02 ML4S02 120 VAC
- 8S02 ML8S02 24 VAC
- 4G02 ML4G02 120 VAC
- 8G02 ML8G02 24 VAC
- 4D02 ML4D02 120 VAC
- 8D02 ML8D02 24 VAC
- 4F02 ML4F02 120 VAC
- 8F02 ML8F02 24 VAC
- 4T02 ML4T02 120 VAC
- 8T02 ML8T02 24 VAC

#### Pneumatic:

- 296 331-2961
- 306 331-3060

### 20. Damper Location

- L8 8” (203) from sleeve end (default)
- LX Other (specify)

### 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.
3. PRL closure device 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 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 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 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.

G14
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 555 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):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevated Temp. °F</td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>Vertical/Horizontal</td>
<td>Vert./Horiz.</td>
<td></td>
</tr>
<tr>
<td>Vertical/Horizontal</td>
<td>Vert./Horiz.</td>
<td></td>
</tr>
</tbody>
</table>

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.
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).

PRESSURE DROP:

<table>
<thead>
<tr>
<th>Air Velocity in feet per minute (m/s)</th>
<th>Static Pressure Drop in inches w.g. (Pa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>0.01 (3)</td>
</tr>
<tr>
<td>500</td>
<td>0.02 (5)</td>
</tr>
<tr>
<td>700</td>
<td>0.03 (8)</td>
</tr>
<tr>
<td>1000</td>
<td>0.04 (10)</td>
</tr>
<tr>
<td>1500</td>
<td>0.05 (13)</td>
</tr>
<tr>
<td>2000</td>
<td>0.06 (15)</td>
</tr>
<tr>
<td>3000</td>
<td>0.08 (20)</td>
</tr>
<tr>
<td>4000</td>
<td>0.10 (25)</td>
</tr>
<tr>
<td>6000</td>
<td>1.00 (250)</td>
</tr>
</tbody>
</table>

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**


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 \times 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)
- DTO = Dual Temperature Override Sensor (MLS-400)
  - 280 = 280°F (PRL only)
  - 350 = 350°F (ERL only)

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:**
  - 4X02 ML4X02 120 VAC
  - 8X02 ML8X02 24 VAC
  - 4Y02 ML4Y02 230 VAC
  - 411 ML4115 120 VAC
  - 811 ML8115 24 VAC
  - MS4 MS4X09F 120 VAC
  - MS8 MS8X09F 24 VAC
  - 4Y0 ML4Y09F 230 VAC
  - 412 MS4120F 120 VAC
  - 812 MS8120F 24 VAC
  - 462 MS4620F 230 VAC
  - GD2 GGD221 120 VAC
  - GD1 GGD121 24 VAC
  - GD3 GGD321 230 VAC
  - FL12 FSLF120 120 VAC
  - FL23 FSLF230 24 VAC
  - FL24 FSLF24 24 VAC
  - F12 FSNF120 120 VAC
  - F23 FSNF230 24 VAC
  - F24 FSNF24 24 VAC
- **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.
3. An ERL or DTO (MLS-400) may be ordered on dampers with pneumatic actuators, but in addition, an EP switch (factory mounted) is required.
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.
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.
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)
- 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):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum Single Section Vertical</th>
<th>Maximum Single Section Vertical</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>250</td>
<td>8&quot; x 8&quot; (203 x 203)</td>
<td>48&quot; x 36&quot; (1219 x 914)</td>
</tr>
</tbody>
</table>

Notes:
1. Dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1222VB).
2. Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Model 1223VB).
3. 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: 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 2 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).

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Min. Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

Model 1222VB Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical</td>
<td>Single Section</td>
<td>Single Section</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>250</td>
<td>8&quot; x 4&quot; (203 x 102)</td>
<td>48&quot; x 7 1/2&quot; (1219 x 191)</td>
</tr>
</tbody>
</table>

Note: Multiple section assemblies are not permitted.

MODEL 1223VB: TYPE C SLEEVE ENCLOSURES

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).

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Min. Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

Model 1223VB Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical</td>
<td>Single Section</td>
<td>Single Section</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>250</td>
<td>8&quot; x 4&quot; (203 x 102)</td>
<td>48&quot; x 7 1/2&quot; (1219 x 191)</td>
</tr>
</tbody>
</table>

Note: Multiple section assemblies are not permitted.

Model 1223VB - Round Duct Connection Sizes (Duct Dia.):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical</td>
<td>Single Section</td>
<td>Single Section</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>250</td>
<td>4&quot; (102) dia. (overall damper height is 8&quot; [203 x 203]).</td>
<td>34&quot; (864) dia.</td>
</tr>
</tbody>
</table>

Note: Multiple section assemblies are not permitted.

Model 1223VB - Sq., Rec. or Oval Duct Connection Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical</td>
<td>Single Section</td>
<td>Single Section</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>250</td>
<td>4&quot; x 4&quot; (102 x 102) (overall damper size is 8&quot; x 8&quot; [203 x 203] min.),</td>
<td>46&quot; x 34&quot; (1168 x 864)</td>
</tr>
</tbody>
</table>

Note: Multiple section assemblies are not permitted.
MODEL SERIES: 1221VB - 1 1/2 HOUR LABEL

VERTICAL BLADE COMBINATION FIRE/SMOKE DAMPERS


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)

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

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:
412 MS4120F 120 VAC
812 MS8120F 24 VAC
462 MS4620F 230 VAC

20. Damper Location
L8 8” (203) from sleeve end
LX Other (specify)

21. Position Indicator
— None (default)
300 MLS-300 (4-wire)

22. Retaining Angles
— None (default)
QSI One side
Q32 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.
COMBINATION FIRE/SMOKE DAMPER • VEE BLADE

• 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

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):

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.
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).

Model 1272 Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Minimum Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Single Section</th>
<th>Single Section</th>
<th>Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical/Horizontal</td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
<td>Horizontal</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>250/350</td>
<td>8&quot; x 4&quot; (203 x 102) Overall damper height is 8&quot; (203), 36&quot; x 7 1/2&quot; (914 x 191), 30&quot; x 7 1/2&quot; (762 x 191), 72&quot; x 7 1/2&quot; (1823 x 191), 60&quot; x 7 1/2&quot; (1524 x 191)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MODEL 1273: TYPE C SLEEVE ENCLOSURES

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).

Model 1273 - Round Duct Connection Sizes (Duct Dia.):

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Minimum Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (610)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Single Section</th>
<th>Single Section</th>
<th>Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical/Horiz.</td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
<td>Horizontal</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>250/350</td>
<td>4&quot; (102) dia. Overall damper size is 8&quot; x 8&quot; (203 x 203) min.</td>
<td>34&quot; (864) dia.</td>
<td>28&quot; (711) dia.</td>
<td>46&quot; (1168) dia.</td>
</tr>
</tbody>
</table>

Model 1273 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Single Section</th>
<th>Single Section</th>
<th>Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical/Horiz.</td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
<td>Horizontal</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>250/350</td>
<td>4&quot; x 4&quot; (102 x 102) Overall damper size is 8&quot; x 8&quot; (203 x 203), 34&quot; x 46&quot; (864 x 1168), 28&quot; x 38&quot; (711 x 965), 72&quot; x 46&quot; (1176 x 1168) or 34&quot; x 94&quot; (864 x 2388), 58&quot; x 38&quot; (1473 x 965) or 28&quot; x 78&quot; (711 x 1981)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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).

<table>
<thead>
<tr>
<th>1270 Series - Maximum Performance Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL 555 Fire Rating</td>
</tr>
<tr>
<td>UL 555S Leakage Rating</td>
</tr>
<tr>
<td>Maximum Velocity</td>
</tr>
<tr>
<td>Maximum Pressure</td>
</tr>
<tr>
<td>Maximum Temperature</td>
</tr>
</tbody>
</table>

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


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:
    4X02 ML4X02 120 VAC
    8X02 ML8X02 24 VAC
    4Y02 ML4Y02 230 VAC
    411 ML4115 120 VAC
    811 ML8115 24 VAC
    MS4 MS4X09F 120 VAC
    MS8 MS8X09F 24 VAC
    4Y0 MS4Y09F 230 VAC
    412 MS4120F 120 VAC
    812 MS8120F 24 VAC
    462 MS4620F 230 VAC
    GD2 GDG221 120 VAC
    GD1 GDG121 24 VAC
    GD3 GDG321 230 VAC
    F12 FSNF120 120 VAC
    F24 FSNF24 24 VAC
    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.
3. An ERL or DTO (MLS-400) may be ordered on dampers with pneumatic actuators, but in addition, an EP switch (factory mounted) is required.
4. EP (electric-pneumatic) switch accessory is applicable only to pneumatic actuators and is optional (shipped loose) when PRL closure device is selected.
5. One DTO (MLS-400) or MLS-300 required per damper assembly. DTO (MLS-400) includes MLS-300 position indicator.
6. Maximum Closure Temperature allowed is equal to Damper Elevated Temperature.
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.
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):

<table>
<thead>
<tr>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
</tr>
<tr>
<td>24</td>
<td>250/350</td>
<td>8” x 8” (203 x 203)</td>
<td>24’ x 24” (610 x 610)</td>
</tr>
</tbody>
</table>

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.
## HOW TO ORDER

### MODEL: 1271G - 1 1/2 HOUR LABEL

**COMBINATION FIRE/SMOKE DAMPER FOR GRILLES**


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:  
4X02  ML4X02  120 VAC  
8X02  ML8X02  24 VAC  
4Y02  ML4Y02  230 VAC  
411  ML4115  120 VAC  
811  ML8115  24 VAC  
MS4  MS4X09F  120 VAC  
MS8  MS8X09F  24 VAC  
4Y0  MS4Y09F  230 VAC  
412  MS4120F  120 VAC  
812  MS8120F  24 VAC  
462  MS4620F  230 VAC  
GD2  GGD221  120 VAC  
GD1  GGD121  24 VAC  
GD3  GGD321  230 VAC  
F12  FSNF120  120 VAC  
F24  FSNF24  24 VAC  

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.
Model Series:
1220BAL  1 1/2 Hour Label
1220BAL-3  3 Hour Label

The 1220BAL and 1220BAL-3 Model Series Balancing Fire/Smoke Dampers are ideal for applications requiring fire containment and smoke management during hazardous conditions as well as duct balancing during normal operation. Using a 3 position actuator with a built-in potentiometer, the damper blades can be positioned without the need for an input control signal. When energized in normal operation, the damper goes to the set position to balance the airflow, or a fully open/closed position in fire/smoke conditions, depending on system design.

The 1220BAL and 1220BAL-3 Model Series 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 an exceptionally low pressure drop design. Unique, inter-locking double skin blade design provides flame and smoke seal under fire conditions, maintaining leakage class at temperatures up to 2000°F (1093°C).

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.

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 1220BAL (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 1222BAL). Model Series 1220BAL-3 (3 Hr. Label) dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1222BAL-3). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Models 1223BAL and 1223BAL-3).

MODELS 1220BAL, 1220BAL-3, 1221BAL AND 1221BAL-3: TYPE A SLEEVE

Models 1220BAL (no sleeve), 1221BAL, 1220BAL-3 (no sleeve) & 1221BAL-3 Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 1220BAL</td>
<td>24</td>
<td>250</td>
<td>8&quot; x 8&quot; (203 x 203).</td>
<td>36&quot; x 48&quot; (914 x 1219)</td>
</tr>
<tr>
<td>Model 1221BAL</td>
<td>24</td>
<td>250</td>
<td>8&quot; x 8&quot; (203 x 203).</td>
<td>32&quot; x 48&quot; (813 x 1219)</td>
</tr>
</tbody>
</table>

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).

MODELS 1222BAL AND 1222BAL-3: TYPE B SLEEVE ENCLOSURE

Models 1222BAL and 1222BAL-3 Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical/Horizontal</td>
<td>Vertical/Horizontal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 1222BAL</td>
<td>24</td>
<td>250</td>
<td>8&quot; x 4&quot; (203 x 102)</td>
<td>36&quot; x 7 1/2&quot; (914 x 191)</td>
</tr>
<tr>
<td>Model 1222BAL-3</td>
<td>24</td>
<td>250</td>
<td>8&quot; x 4&quot; (203 x 102)</td>
<td>32&quot; x 7 1/2&quot; (813 x 191)</td>
</tr>
</tbody>
</table>

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).
DIMENSIONAL DATA:

Model Series 1220BAL (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 1222BAL). Model Series 1220BAL-3 (3 Hr. Label) dampers with duct heights less than 8" (203) require a Type 'B' sleeve enclosure (Model 1222BAL-3). Duct sizes less than 8" (203) in width require a Type 'C' enclosure (Models 1223BAL and 1223BAL-3).

MODELS 1223BAL AND 1223BAL-3: TYPE C SLEEVE ENCLOSURES

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum Single Section</th>
<th>Maximum Single Section</th>
<th>Vertical/Horizontal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1223BAL</td>
<td>24</td>
<td>250</td>
<td>4&quot; (102) dia.</td>
<td>Overall damper size is 8&quot; x 6&quot; (203 x 152); 8&quot; x 8&quot; (203 x 203) min. for duct sizes over 4&quot; (102) dia.</td>
<td>Vertical: 34&quot; (864) dia.</td>
</tr>
<tr>
<td>Model 1223BAL-3</td>
<td>24</td>
<td>250</td>
<td>4&quot; (102) dia.</td>
<td>Overall damper size is 8&quot; x 8&quot; (203 x 203) min.</td>
<td>Vertical: 34&quot; (864) dia.</td>
</tr>
</tbody>
</table>

Note: Multiple section assemblies are not permitted.

Models 1223BAL and 1223BAL-3 - Round Duct Connection Sizes (Duct Dia.):

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum Single Section</th>
<th>Maximum Single Section</th>
<th>Vertical/Horizontal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1223BAL</td>
<td>24</td>
<td>250</td>
<td>4&quot; x 4&quot; (102 x 102), Overall damper width is 8&quot; (203) min.; min. overall height is 6&quot; (152) (8&quot; [203] for duct sizes over 16&quot; x 4&quot; [406 x 102])</td>
<td>34&quot; x 46&quot; (864 x 1168)</td>
<td>Vertical: 30&quot; x 46&quot; (762 x 1168)</td>
</tr>
<tr>
<td>Model 1223BAL-3</td>
<td>24</td>
<td>250</td>
<td>4&quot; x 4&quot; (102 x 102), Overall damper size is 6&quot; x 6&quot; (203 x 203) min.</td>
<td>34&quot; x 46&quot; (864 x 1168)</td>
<td>Vertical: 30&quot; x 46&quot; (762 x 1168)</td>
</tr>
</tbody>
</table>

Note: Multiple section assemblies are not permitted.

Models 1223BAL and 1223BAL-3 - Sq., Rect. or Oval Duct Connection Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum Single Section</th>
<th>Maximum Single Section</th>
<th>Vertical/Horizontal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1223BAL</td>
<td>24</td>
<td>250</td>
<td>4&quot; x 4&quot; (102 x 102), Overall damper width is 8&quot; (203) min.; min. overall height is 6&quot; (152) (8&quot; [203] for duct sizes over 16&quot; x 4&quot; [406 x 102])</td>
<td>34&quot; x 46&quot; (864 x 1168)</td>
<td>Vertical: 30&quot; x 46&quot; (762 x 1168)</td>
</tr>
<tr>
<td>Model 1223BAL-3</td>
<td>24</td>
<td>250</td>
<td>4&quot; x 4&quot; (102 x 102), Overall damper size is 6&quot; x 6&quot; (203 x 203) min.</td>
<td>34&quot; x 46&quot; (864 x 1168)</td>
<td>Vertical: 30&quot; x 46&quot; (762 x 1168)</td>
</tr>
</tbody>
</table>

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).
PERFORMANCE DATA:

MODEL SERIES: 1220BAL - 1 1/2 HOUR LABEL AND 1220BAL-3 - 3 HOUR LABEL

LEAKAGE CLASS:

The 1220BAL Series Balancing 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 1220BAL-3 Series Balancing 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).

**1220BAL 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)

**1220BAL-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: 1220BAL - 1 1/2 HOUR LABEL AND 1220BAL-3 - 3 HOUR LABEL

**BALANCING COMBINATION FIRE / SMOKE DAMPERS**

**EXAMPLE:** 1221BAL - 24x24 - V - AUTO - 120 - I - 24 - 250 - ERL - 250 - BO - SL = 16 - 20G - EXT - RH - CL - FAB - L8

### 1. Models

| 1220BAL | Balancing, Airfoil Blade, 1 1/2 Hour Label |
| 1220BAL-3 | Balancing, Airfoil Blade, 3 Hour Label |

### 1a. Dynamic or Static Applications

| 1220BAL | Balancing, Airfoil Blade, 1 1/2 Hour Label |
| 1220BAL-3 | Balancing, Airfoil Blade, 3 Hour Label |

### 1b. Sleeve/Enclosure Style

- **Sleeve/Enclosure Style**
  - **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)

### 5. Power Requirement

- **24V** = 24 VAC (default)

### 6. Leakage Rating

- **I** = Class I (default)

### 7. Max. Velocity/Pressure Rating

- **2000 fpm @ 4" w.g.** (default)

### 8. Elevated Temperature

- **250°F** (default)

### 9. Closure Device

- **ERL** = ERL Electric Resettable Link (default)
- **DTO** = Dual Temperature Override Sensor (MLS-400)

### 10. Closure Temperature

- **ERL** = 165°F (default)
- **DTO** = Dual Temperature Override Sensor (MLS-400)

### 11. Bearings

- **BO** = Oilite Bronze (default)
- **BS** = Stainless Steel

### 12. Duct Smoke Detector

- **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

- **CSR** = Square/Rectangular

### 16. Actuator Mounting

- **EXT** = External (default)
- **INT** = Internal

### 17. Actuator Location

- **RH** = Right hand (default)
- **LH** = Left hand

### 18. Actuator Fail Position

- **CL** = Close (default)

### 19. Actuator Models

- **FAB** = FSF-BAL 24 VAC/DC

### 20. Damper Location

- **L8** = 8" (203) from sleeve end (default)
- **LX** = Other (specify)

### OPTIONS & ACCESSORIES:

<table>
<thead>
<tr>
<th>21. Position Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>300</strong> = MLS-300 (4-wire)</td>
</tr>
<tr>
<td>(Included with Dual Temperature Override Sensor [DTO])</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>22. Retaining Angles</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>QS1</strong> = One side</td>
</tr>
<tr>
<td><strong>QS2</strong> = Both sides (pair)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>23. TDF Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TDF1</strong> = One end</td>
</tr>
<tr>
<td><strong>TDF2</strong> = Both ends</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>24. Damper Test Switch</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DTS</strong> = Damper Test Switch</td>
</tr>
</tbody>
</table>

### 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.
HOW TO SPECIFY

MODEL SERIES: 1220BAL - 1 1/2 HOUR LABEL
BALANCING 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 Class I 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. 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 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 electric 3 position actuator with a built-in maximum position potentiometer 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 1220BAL.

MODEL SERIES: 1220BAL-3 - 3 HOUR LABEL
BALANCING 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 Class I 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. 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 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 electric 3 position actuator with a built-in maximum position potentiometer 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 1220BAL-3.
Model Series:
1220M  1 1/2 Hour Label
1220M-3  3 Hour Label

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, interlocking 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.
### 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

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1220M</td>
<td>24</td>
<td>250</td>
<td>8&quot; x 8&quot; (203 x 203), 6&quot; x 6&quot; (152 x 152) with low profile frame (maximum size is 16&quot; x 6&quot; [467 x 152]).</td>
<td>36&quot; x 48&quot; (914 x 1219)</td>
</tr>
<tr>
<td>1220M-3</td>
<td>24</td>
<td>250</td>
<td>8&quot; x 8&quot; (203 x 203).</td>
<td>120&quot; x 96&quot; (3048 x 2438)</td>
</tr>
</tbody>
</table>

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).

#### MODELS 1222M AND 1222M-3: TYPE B SLEEVE ENCLOSURE

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1222M</td>
<td>24</td>
<td>250</td>
<td>8&quot; x 4&quot; (203 x 102) (Overall damper height is 8&quot; [203], 6&quot; [152] on duct sizes 18 x 5 1/2&quot; [457 x 140] and under).</td>
<td>36&quot; x 7 1/2&quot; (914 x 191)</td>
</tr>
<tr>
<td>1222M-3</td>
<td>24</td>
<td>250</td>
<td>8&quot; x 4&quot; (203 x 102) Overall damper height is 8&quot; (203).</td>
<td>120&quot; x 7 1/2&quot; (3048 x 191) (max. each section is 30&quot; x 7 1/2&quot; [762 x 191]).</td>
</tr>
</tbody>
</table>

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 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

Models 1223M and 1223M-3 - Round Duct Connection Sizes (Duct Dia.):

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Single Section</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vertical/Horizontal</td>
<td></td>
</tr>
<tr>
<td>1223M</td>
<td>24</td>
<td>250</td>
<td>4&quot; (102) 4&quot; dia.</td>
<td>34° (864) dia.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall damper size is 8&quot; x 8&quot; (203 x 152); 8&quot; x 8&quot; (203 x 203) min. for duct sizes over 4&quot; (102).</td>
<td>30° (762) dia.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vertical</td>
<td>94° (2388) dia.</td>
</tr>
<tr>
<td>1223M-3</td>
<td>24</td>
<td>250</td>
<td>4&quot; (102) 4&quot; dia.</td>
<td>34° (864) dia.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall damper size is 8&quot; x 8&quot; (203 x 203) min.</td>
<td>30° (762) dia.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vertical</td>
<td>94° (2388) dia.</td>
</tr>
</tbody>
</table>

Models 1223M and 1223M-3 - Round Duct Connection Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Single Section</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vertical/Horizontal</td>
<td></td>
</tr>
<tr>
<td>1223M</td>
<td>24</td>
<td>250</td>
<td>4&quot; x 4&quot; (102 x 102), overall damper width is 8&quot; [203] min.; min. overall height is 6&quot; (152); 8&quot; x 203 for duct sizes over 16&quot; x 4&quot; (406 x 102).</td>
<td>34° x 46° (864 x 1168)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vertical</td>
<td>142° x 94° (3807 x 2388)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Horizontal</td>
<td>126° x 94° (3200 x 2388)</td>
</tr>
<tr>
<td>1223M-3</td>
<td>24</td>
<td>250</td>
<td>4&quot; x 4&quot; (102 x 102), overall damper size is 8&quot; x 8&quot; (203 x 203) min.</td>
<td>34° x 46° (864 x 1168)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vertical</td>
<td>118° x 94° (2997 x 2388)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Horizontal</td>
<td>n/a</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Min. Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (810)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>UL 555 Fire Rating</th>
<th>1 1/2 Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL 555S Leakage Rating</td>
<td>Class I</td>
</tr>
<tr>
<td>Maximum Velocity</td>
<td>2000 fpm (10 m/s)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>4 in. w.g. (1 kPa)</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>250°F (121°C)</td>
</tr>
</tbody>
</table>

### 1220M-3 Series - Maximum Performance Ratings

<table>
<thead>
<tr>
<th>UL 555 Fire Rating</th>
<th>3 Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL 555S Leakage Rating</td>
<td>Class I</td>
</tr>
<tr>
<td>Maximum Velocity</td>
<td>2000 fpm (10 m/s)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>4 in. w.g. (1 kPa)</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>250°F (121°C)</td>
</tr>
</tbody>
</table>

PRESSESURE DROP:

![Pressure Drop Graph](image)

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**


| 1a. Models | 13a. Side Mounting Plate |
| Dynamic or Static Applications | (No Sleeve models only) |
| 1220M Modulating, Airfoil Blade, 1 1/2 Hour Label | SMP Side Mounting Plate |
| 1220M-3 Modulating, Airfoil Blade, 3 Hour Label | |

| 1b. Sleeve/Enclosure Style (4th Digit) | 13b. Sleeve Length |
| 0 = No Sleeve | SL = Specify |
| 1 = Type A Sleeve | 16” (406) standard (default) |
| 2 = Type B Sleeve Enclosure | 16” – 36” (406 – 914) |
| 3 = Type C Sleeve Enclosure | |

| 2. Duct Size | 14. Sleeve Gauge |
| Width x Height inches (mm’s) | 20G 20 Ga. standard (default) |
| | 18G 18 Ga. |
| | 16G 16 Ga. |
| | 14G 14 Ga. |
| | 10G 10 Ga. |

| 3. Mounting | 15. Transition |
| V Vertical (wall) | (Sleeve Type C models only) |
| H Horizontal (floor) | CR Round |
| | CO Oval |
| | CSR Square/Rectangular |

| 4. Actuator Selected By | 16. Actuator Mounting |
| AUTO Least Cost (Auto-Select) (default) | EXT External (default) |
| BEL Belimo | INT Internal |
| HON Honeywell | |
| SIE Siemens | |

| 5. Power Requirement | 17. Actuator Location |
| 24 24 VAC (default) | RH Right hand (default) |
| 25 25 psi Pneumatic | LH Left hand |
| | MH Multi-hand |

| Class I (default) | CL Close (default) |

| 7. Max. Velocity/Pressure Rating | 19. Actuator Models |
| 24000 fpm @ 4" w.g. (default) | Electric: |
| 8. Elevated Temperature | MS7 MS7510 24 VAC |
| 250 250°F (default) | FAM FSAF-SR 24 VAC/DC |

| 9. Closure Device | 20. Damper Location |
| ERL ERL Electric Resettable Link (default) | L8 8" (203) from sleeve end (default) |
| PRL PRL Pneumatic Link | LX Other (specify) |
| DTO Dual Temperature Override Sensor (MLS-400) | 8” – 16” (203 – 406) |

| ERL/PRL | — None (default) |
| 165 165°F | 300 MLS-300 (4-wire) |
| 212 212°F (PRL) | (Included with Dual Temperature Override Sensor [DTO]) |
| 250 250°F (ERL only) (default) | |
| DTO Dual Temperature Override Sensor (MLS-400) | |
| HL 250/165°F | |

| BO Oilite Bronze (default) | — None (default) |
| BS Stainless Steel | EP1 120 VAC |
| | EP2 24 VAC |

| 12. Duct Smoke Detector | 23. Retaining Angles |
| — None (default) | — None (default) |
| DSDL Low-Flow, factory mounted | QS1 One side |
| DSDN No-Flow, factory mounted | QS2 Both sides (pair) |

| 24. TDF Flange | 25. Damper Test Switch |
| — None (default) | — None (default) |
| TDF1 One end | DTS Damper Test Switch |
| TDF2 Both ends | |

### OPTIONS & ACCESSORIES:

| 21. Position Indicator |
| — None (default) |

| 22. EP Switch |
| — None (default) |

| 23. Retaining Angles |
| — None (default) |

| 24. TDF Flange |
| — None (default) |

### 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.
3. An ERL or DTO (MLS-400) may be ordered on dampers with pneumatic actuators, but in addition, an EP switch (factory mounted) is required.
4. EP (electric-pneumatic) switch accessory is applicable only to pneumatic actuators and is optional (shipped loose) when PRL closure device is selected.
5. One DTO (MLS-400) or MLS-300 required per damper assembly. DTO (MLS-400) includes MLS-300 position indicator.
6. Maximum Closure Temperature allowed is equal to Damper Elevated Temperature.
**COMB. FIRE/SMOKE DAMPER • AIRFOIL • MODULATING**

**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). 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). 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.
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):

<table>
<thead>
<tr>
<th>Velocity/ Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Vertical/Horizonal</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Vertical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24, 34, 36, 48</td>
<td>250/350</td>
<td>8” x 8” (203 x 203)</td>
<td>8” x 8” (203 x 203)</td>
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<tr>
<td>48</td>
<td>250</td>
<td>36” x 48” (914 x 1219)</td>
<td>32” x 48” (813 x 1219)</td>
</tr>
<tr>
<td>48</td>
<td>350</td>
<td>36” x 24” (914 x 610)</td>
<td>32” x 24” (813 x 610)</td>
</tr>
</tbody>
</table>

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.
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.

**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.

**PRESSURE DROP:**

<table>
<thead>
<tr>
<th>Air Velocity in feet per minute (m/s)</th>
<th>Static Pressure Drop in inches w.g. (Pa)</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>0.2</td>
<td>0.2 (5)</td>
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<tr>
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<td>0.3 (7.5)</td>
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<tr>
<td>0.4</td>
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<tr>
<td>0.5</td>
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<tr>
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<td>0.6 (15)</td>
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<tr>
<td>0.7</td>
<td>0.7 (17.5)</td>
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<tr>
<td>0.8</td>
<td>0.8 (20)</td>
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<tr>
<td>1.2</td>
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<td>1.3 (32.5)</td>
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<td>1.4</td>
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<td>1.5</td>
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<tr>
<td>10.0</td>
<td>10.0 (250)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Velocity/ Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Vertical/Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>24, 34, 36, 48</td>
<td>250/350</td>
<td>12&quot; x 8&quot; (305 x 203) or 8&quot; x 12&quot; (203 x 305) with electric actuator, 8&quot; x 20&quot; (203 x 508) with pneumatic actuator.</td>
<td>36&quot; x 48&quot; (914 x 1219)</td>
</tr>
<tr>
<td>48</td>
<td>250</td>
<td>36&quot; x 48&quot; (914 x 1219)</td>
<td>32&quot; x 48&quot; (813 x 1219)</td>
</tr>
<tr>
<td>48</td>
<td>350</td>
<td>36&quot; x 48&quot; (914 x 1219)</td>
<td>32&quot; x 48&quot; (813 x 1219)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>36&quot; x 24&quot; (914 x 610)</td>
<td>32&quot; x 24&quot; (813 x 610)</td>
</tr>
</tbody>
</table>

**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**

![](image)

**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.

**PRESSURE DROP:**

![Pressure Drop Table]

<table>
<thead>
<tr>
<th>Air Velocity in feet per minute (m/s)</th>
<th>Static Pressure Drop in inches w.g. (Pa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>0.01</td>
</tr>
<tr>
<td>500</td>
<td>0.02</td>
</tr>
<tr>
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<td>3000</td>
<td>0.08</td>
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<td>0.12</td>
</tr>
<tr>
<td>6000</td>
<td>0.15</td>
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Pressure drop tested per AMCA Standard 500-D, Figure 5.2. Data corrected to standard air density of 0.075 lbs/ft.³.

**1221-OW Series - Maximum Performance Ratings**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Rating</th>
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<tbody>
<tr>
<td>UL 555 Fire Rating</td>
<td>1 1/2 Hour</td>
</tr>
<tr>
<td>UL 555S Leakage Rating</td>
<td>Class I</td>
</tr>
<tr>
<td>Maximum Velocity</td>
<td>4000 fpm (20 m/s)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>8 in. w.g. (2 kPa)</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>350°F (177°C)</td>
</tr>
</tbody>
</table>

*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.*
### 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


#### 1a. Models

<table>
<thead>
<tr>
<th>Dynamic or Static Applications</th>
<th>O/W Damper 1221-DOW, 1 1/2 Hour Label, Through Penetrations</th>
<th>O/W Damper 1221-OW, 1 1/2 Hour Label, Grille Mount</th>
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</thead>
</table>

#### 1b. Sleeve/Enclosure Style

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<td>Type A Sleeve</td>
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#### 2. Duct Size

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<th>Width x Height (inches (mm's))</th>
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</table>

#### 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

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<th>230 VAC</th>
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<tbody>
<tr>
<td>24 VAC</td>
<td>25 psi Pneumatic</td>
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#### 6. Leakage Rating

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#### 7. Max. Velocity / Pressure Rating

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#### 8. Elevated Temperature

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#### 9. Closure Device

<table>
<thead>
<tr>
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<th>ERL Electric Resettatable Link (default)</th>
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<tr>
<td>PRL</td>
<td>PRL Pneumatic Link</td>
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<td>DTO</td>
<td>Dual Temperature Override Sensor (MLS-400)</td>
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#### 10. Closure Temperature

<table>
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<th>165°F</th>
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<td>212°F PRL</td>
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<td>250</td>
<td>250°F (ERL only) (default)</td>
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<tr>
<td>280</td>
<td>280°F (PRL only)</td>
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<tr>
<td>350</td>
<td>350°F (ERL only)</td>
</tr>
<tr>
<td>DTO</td>
<td>Dual Temperature Override Sensor (MLS-400)</td>
</tr>
</tbody>
</table>

#### 11. Bearings

| BO | Oilite Bronze (default) |
| BS | Stainless Steel |

#### 12. Sleeve Length

<table>
<thead>
<tr>
<th>SL</th>
<th>Specify</th>
</tr>
</thead>
<tbody>
<tr>
<td>21&quot; (533) standard 1221-DOW</td>
<td></td>
</tr>
<tr>
<td>16&quot; (406) standard 1221-OW</td>
<td></td>
</tr>
<tr>
<td>20&quot; (508) standard 1221-OW</td>
<td></td>
</tr>
<tr>
<td>H &gt; 16&quot; (406)</td>
<td></td>
</tr>
</tbody>
</table>

#### 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:**

- 4X02 ML4X02 120 VAC
- 8X02 ML8X02 24 VAC
- 4Y02 ML4Y02 230 VAC
- 411 ML4115 120 VAC
- 811 ML8115 24 VAC
- MS4 MS4X09F 120 VAC
- MS8 MS8X09F 24 VAC
- 4Y0 MS4Y09F 230 VAC
- 412 MS4120F 120 VAC
- 812 MS8120F 24 VAC
- 462 MS4620F 230 VAC
- GD2 GD221 120 VAC
- GD1 GD121 24 VAC
- GD3 GD321 230 VAC
- FL12 FSLF120 120 VAC
- FL23 FSLF230 230 VAC
- FL24 FSLF24 24 VAC
- F12 FSNF120 120 VAC
- F23 FSNF230 230 VAC
- F24 FSNF24 24 VAC
- Pneumatic:

| 296 | 331-2961 |
| 306 | 331-3060 |

#### 18. Damper Location

| L8 | 8" (203) 1221-DOW |
| L9 | 9" (229) 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.
3. An ERL or DTO (MLS-400) may be ordered on dampers with pneumatic actuators, but in addition, an EP switch (factory mounted) is required.
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.
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 fps @ 4” w.g. (10 m/s @ 1 kPa) or 3000 fps @ 4” w.g. (15 m/s @ 1 kPa) or 4000 fps @ 4” w.g. (20 m/s @ 1 kPa). Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation. Frame shall be constructed of 16 ga. (1.6) equivalent galvanized steel formed double-skin airfoil design on 5 1/2” (140) centers. Blades 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 acceptability 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 fps @ 4” w.g. (10 m/s @ 1 kPa) or 3000 fps @ 4” w.g. (15 m/s @ 1 kPa) or 4000 fps @ 4” w.g. (20 m/s @ 1 kPa). Damper and actuator assembly shall be factory cycled a minimum of 3 times to ensure correct operation. 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. Blades 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 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 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 acceptability shall be Nailor Industries Model 1221-OW.
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.
Axes: 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.

DIMENSIONAL DATA:
Model 1221C-1 Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>8” x 8” (203 x 203)</td>
<td>24” x 24” (610 x 610)</td>
</tr>
</tbody>
</table>

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 # 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).
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.

DIMENSIONAL DATA:

Model 1221C-2 Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot; x 8&quot; (203 x 203)</td>
<td>24&quot; x 24&quot; (610 x 610)</td>
</tr>
</tbody>
</table>

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 # 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).
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 (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.

DIMENSIONAL DATA:
Model 1221C-3 Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot; x 8&quot; (203 x 203)</td>
<td>24&quot; x 24&quot; (610 x 610)</td>
</tr>
</tbody>
</table>

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 # 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).

MODEL 1221C-3
Model 1221C-3 Applications

**Corridor Damper for use with Steel Grille/Diffuser:**

- SLEEVE I.D. = NOMINAL SIZE
- 4" (102) STD.
- 16" (406) STD.
- 4 MOUNTING TABS
- UPPER RETAINING ANGLE
- LOWER RETAINING ANGLE
- VARES DEPENDING ON CEILING THICKNESS
- ACTUATOR (LOCATION MAY VARY)

**Corridor Damper for Ducted Installations:**

- SLEEVE I.D. = NOMINAL SIZE
- 8" (203)
- 16" (406) STD.
- VARES DEPENDING ON CEILING THICKNESS
- ACTUATOR (LOCATION MAY VARY)

**Combination Fire/Smoke Damper for Walls and Floors:**

- DAMPER
- ACTUATOR (LOCATION MAY VARY)
- SLEEVE I.D. = NOMINAL SIZE
- 8" (203)
- 5" (127)
- 16" (406) STANDARD
- 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).

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 1221C-1 and 1221C-2
Maximum Performance Ratings

<table>
<thead>
<tr>
<th>UL 555 Corridor Damper Fire Rating</th>
<th>1 Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL 555S Leakage Rating</td>
<td>Class I</td>
</tr>
<tr>
<td>Maximum Velocity</td>
<td>2000 fpm (10 m/s)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>4 in. w.g. (1 kPa)</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>350°F (177°C)</td>
</tr>
</tbody>
</table>

Model 1221C-3
Maximum Performance Ratings

<table>
<thead>
<tr>
<th>UL 555 Corridor Damper Fire Rating</th>
<th>1 Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL 555 Fire Damper Fire Rating</td>
<td>1 1/2 Hour</td>
</tr>
<tr>
<td>UL 555S Leakage Rating</td>
<td>Class I</td>
</tr>
<tr>
<td>Maximum Velocity</td>
<td>2000 fpm (10 m/s)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>4 in. w.g. (1 kPa)</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>350°F (177°C)</td>
</tr>
</tbody>
</table>
HOW TO ORDER

MODEL SERIES: 1221C
CORRIDOR DAMPERS


1. 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

2. Sleeve/Enclosure Style
   (4th Digit)
   1 = Type A Sleeve

3. Duct Size
   Width x Height or Diameter inches (mm's)

4. Mounting
   V Vertical (wall)
   H Horizontal (floor)

5. Actuator Selected By
   AUTO Least Cost (Auto-Select) (default)
   BEL Bellimo
   HON Honeywell
   SIE Siemens

6. Power Requirement
   120 120 VAC (default)
   230 230 VAC
   24 24 VAC
   25 25 VAC

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)

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:
    4X02 ML4X02 120 VAC
    8X02 ML8X02 24 VAC
    4Y02 ML4Y02 230 VAC
    411 ML4115 120 VAC
    811 ML8115 24 VAC
    MS4 MS4X09F 120 VAC
    MS8 MS8X09F 24 VAC
    4Y0 MS4Y09F 230 VAC
    412 MS4120F 120 VAC
    812 MS8120F 24 VAC
    462 MS4620F 230 VAC
    MS7 MS7510 24 VAC
    GD2 GGD221 120 VAC
    GD1 GGD121 24 VAC
    GD3 GGD321 230 VAC
    FAB FSAF-BAL 24 VAC/DC
    FAM FSAF-SR 24 VAC/DC
    FL12 FSLF120 120 VAC
    FL23 FSLF230 230 VAC
    FL24 FSLF24 24 VAC
    F12 FSNF120 120 VAC
    F23 FSNF230 230 VAC
    F24 FSNF24 24 VAC

    Pneumatic:
    296 331-2961
    296P 331-2961PR
    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.
3. An ERL or DTO (MLS-400) may be ordered on dampers with pneumatic actuators, but in addition, an EP switch (factory mounted) is required.
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.
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 \( (\text{specifier select temperature}) \) \( 250^\circ \text{F} \) \( (121^\circ \text{C}) \) or \( 350^\circ \text{F} \) \( (177^\circ \text{C}) \). Dampers shall be tested under UL 555 and UL 555S by UL to a minimum velocity/pressure rating of 2000 fpm @ 4" w.g. \( (10 \text{ m/s} \times 1 \text{ kPa}) \).

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 \( 2000^\circ \text{F} \) \( (1093^\circ \text{C}) \) 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 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" \( (1.25) \) x 1 1/2" \( (1.25) \) x 16 ga. \( (38 \times 38 x 1.6) \) galvanized steel.

Appropriate \( (\text{specifier select}) \) externally or internally mounted \( (\text{specifier select type}) \) 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.
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.

DIMENSIONAL DATA:
Model 1271C-1 Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot; x 8&quot;</td>
<td>24&quot; x 24&quot;</td>
</tr>
</tbody>
</table>

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:

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):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot; x 8&quot; (203 x 203)</td>
<td>24&quot; x 24&quot; (610 x 610)</td>
</tr>
</tbody>
</table>

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).

Isometric View of typical Model 1271C-2 in 1 hr. wood stud ceiling
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) galv. 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-3 Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot; x 8&quot; (203 x 203)</td>
<td>24&quot; x 24&quot; (610 x 610)</td>
</tr>
</tbody>
</table>

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 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: 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:

<table>
<thead>
<tr>
<th>Model 1271C-1 and 1271C-2</th>
<th>Maximum Performance Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL 555 Classified Corridor Damper Fire Resistance Rating</td>
<td>1 Hour</td>
</tr>
<tr>
<td>UL 555S Classified Smoke Damper Leakage Rating</td>
<td>Class I</td>
</tr>
<tr>
<td>Maximum Velocity</td>
<td>2000 fpm (10 m/s)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>4 in. w.g. (1 kPa)</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>350°F (177°C)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model 1271C-3</th>
<th>Maximum Performance Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL 555 Classified Corridor Damper Fire Resistance Rating</td>
<td>1 Hour</td>
</tr>
<tr>
<td>UL 555 Classified Fire Damper Fire Resistance Rating</td>
<td>1 1/2 Hour</td>
</tr>
<tr>
<td>UL 555S Classified Smoke Damper Leakage Rating</td>
<td>Class I</td>
</tr>
<tr>
<td>Maximum Velocity</td>
<td>2000 fpm (10 m/s)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>4 in. w.g. (1 kPa)</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>350°F (177°C)</td>
</tr>
</tbody>
</table>

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

MODEL SERIES: 1271C
TUNNEL CORRIDOR COMBINATION FIRE/SMOKE DAMPERS

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:
4X02 ML4X02 120 VAC
8X02 ML8X02 24 VAC
4Y02 ML4Y02 230 VAC
411 ML4115 120 VAC
811 ML8115 24 VAC
MS4 MS4X09F 120 VAC
MS8 MS8X09F 24 VAC
4Y0 MS4Y09F 230 VAC
412 MS4120F 120 VAC
812 MS8120F 24 VAC
462 MS4620F 230 VAC
GD2 GGD221 120 VAC
GD1 GGD121 24 VAC
GD3 GGD321 24 VAC
F12 FSNF120 120 VAC
F24 FSNF24 24 VAC

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
SRB Bottom Transition,
Model 1271C-2 only
SR2 Top and Bottom Transition,
Model 1271C-2 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.
3. An ERL or DTO (MLS-400) may be ordered on dampers with pneumatic actuators, but in addition, an EP switch (factory mounted) is required.
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.
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 (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).
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 lower 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.

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 (specifier select rating) 1 hour fire resistance rated Corridor Damper or 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).
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 upper 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.
Model Series:
1220SS  1 1/2 Hour Label
1220SS-3  3 Hour Label

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.
**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**

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td>Model 1220SS</td>
<td></td>
<td></td>
<td>Vertical</td>
<td>Vertical</td>
</tr>
<tr>
<td>Model 1221SS</td>
<td></td>
<td></td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>Model 1220SS-3</td>
<td></td>
<td></td>
<td>Vertical</td>
<td>Vertical</td>
</tr>
<tr>
<td>Model 1221SS-3</td>
<td></td>
<td></td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
</tbody>
</table>

**MODELS 1222SS AND 1222SS-3: 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).

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>Single Section</td>
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<tr>
<td>Model 1222SS</td>
<td></td>
<td></td>
<td>Vertical</td>
<td>Vertical</td>
</tr>
<tr>
<td>Model 1222SS-3</td>
<td></td>
<td></td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
</tbody>
</table>

**ACTUATOR (LOCATION MAY VARY)**

8" (203) OVERALL

W = NOM. DUCT SIZE

H = NOM. DUCT SIZE

Wall Thickness | Min. Sleeve Length
---|---
4 (102) | 16 (406)
8 (203) | 20 (508)
12 (305) | 24 (610)
16 (406) | 28 (711)

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 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**

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/ Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
</tr>
<tr>
<td>Model 1223SS</td>
<td>24</td>
<td>250</td>
<td>4” (102) dia. (overall damper size is 8” x 8” [203 x 203] min.).</td>
<td>28” (711) dia.</td>
</tr>
<tr>
<td>Model 1223SS-3</td>
<td>24</td>
<td>250</td>
<td>4” (102) dia. (overall damper size is 8” x 8” [203 x 203] min.).</td>
<td>28” (711) dia.</td>
</tr>
</tbody>
</table>

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).

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Min. Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (102)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>24 (615)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>28 (711)</td>
</tr>
</tbody>
</table>

**Models 1223SS and 1223SS-3 - Round Duct Connection Sizes (Duct Dia.):**

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/ Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
</tr>
<tr>
<td>Model 1223SS</td>
<td>24</td>
<td>250</td>
<td>4” x 4” (102 x 102) dia. (overall damper size is 8” x 8” [203 x 203] min.).</td>
<td>28” x 46” (711 x 1168)</td>
</tr>
<tr>
<td>Model 1223SS-3</td>
<td>24</td>
<td>250</td>
<td>4” x 4” (102 x 102) dia. (overall damper size is 8” x 8” [203 x 203] min.).</td>
<td>28” x 46” (711 x 1168)</td>
</tr>
</tbody>
</table>

**Models 1223SS & 1223SS-3 - Square, Rect. or Oval Duct Connection Sizes (Duct W x H):**

<table>
<thead>
<tr>
<th>Model</th>
<th>Velocity/ Pressure Rating</th>
<th>Elevated Temp. °F</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Single Section</td>
<td>Single Section</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
</tr>
<tr>
<td>Model 1223SS</td>
<td>24</td>
<td>250</td>
<td>4” x 4” (102 x 102) dia. (overall damper size is 8” x 8” [203 x 203] min.).</td>
<td>28” x 46” (711 x 1168)</td>
</tr>
<tr>
<td>Model 1223SS-3</td>
<td>24</td>
<td>250</td>
<td>4” x 4” (102 x 102) dia. (overall damper size is 8” x 8” [203 x 203] min.).</td>
<td>28” x 46” (711 x 1168)</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>UL 555 Fire Rating</th>
<th>1 1/2 Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL 555S Leakage Rating</td>
<td>Class I</td>
</tr>
<tr>
<td>Maximum Velocity</td>
<td>2000 fpm (10 m/s)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>4 in. w.g. (1 kPa)</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>250°F (121°C)</td>
</tr>
</tbody>
</table>

### 1220SS-3 Series - Maximum Performance Ratings

<table>
<thead>
<tr>
<th>UL 555 Fire Rating</th>
<th>3 Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL 555S Leakage Rating</td>
<td>Class I</td>
</tr>
<tr>
<td>Maximum Velocity</td>
<td>2000 fpm (10 m/s)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>4 in. w.g. (1 kPa)</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>250°F (121°C)</td>
</tr>
</tbody>
</table>

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.
STAINLESS STEEL COMBINATION FIRE/SMOKE DAMPERS

MODEL SERIES: 1220SS - 1 1/2 HOUR LABEL AND 1220SS-3 - 3 HOUR LABEL


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:
    4X02 ML4X02 120 VAC
    8X02 ML8X02 24 VAC
    4Y02 ML4Y02 230 VAC
    411 ML4115 120 VAC
    811 ML8115 24 VAC
    MS4 MS4X09F 120 VAC
    MS8 MS8X09F 120 VAC
    4Y0 MS4Y09F 230 VAC
    412 MS4120F 120 VAC
    812 MS8120F 24 VAC
    462 MS4620F 230 VAC
    GD2 GGD221 120 VAC
    GD1 GGD121 24 VAC
    GD3 GGD321 230 VAC
    FL12 FSLF120 120 VAC
    FL23 FSLF230 230 VAC
    FL24 FSLF24 24 VAC
    F12 FSNF120 120 VAC
    F23 FSNF230 230 VAC
    F24 FSNF24 24 VAC
    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.
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 Nai lor 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 Nai lor 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.
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.):

<table>
<thead>
<tr>
<th>Minimum Wall Thickness</th>
<th>Maximum Wall Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 to 8 (102 to 203)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>10 to 12 (254 to 305)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>14 to 16 (356 to 406)</td>
<td>24 (610)</td>
</tr>
</tbody>
</table>

Note: Dampers available in 2" (51) increments.

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.
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).

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.):

<table>
<thead>
<tr>
<th>Wall Thickness</th>
<th>Minimum Sleeve Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 to 8 (102 to 203)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>10 to 12 (254 to 305)</td>
<td>20 (508)</td>
</tr>
<tr>
<td>14 to 16 (356 to 406)</td>
<td>24 (610)</td>
</tr>
</tbody>
</table>

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).

PRESSURE DROP (damper fully open)

<table>
<thead>
<tr>
<th>Air Volume in CFM (through face area)</th>
<th>Static Pressure Drop in inches w.g.</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 (47)</td>
<td>0.01 (0.3)</td>
</tr>
<tr>
<td>200 (94)</td>
<td>0.02 (0.5)</td>
</tr>
<tr>
<td>300 (142)</td>
<td>0.03 (0.8)</td>
</tr>
<tr>
<td>400 (188)</td>
<td>0.04 (1.0)</td>
</tr>
<tr>
<td>500 (236)</td>
<td>0.05 (1.3)</td>
</tr>
<tr>
<td>600 (277)</td>
<td>0.06 (1.5)</td>
</tr>
<tr>
<td>700 (334)</td>
<td>0.07 (1.8)</td>
</tr>
<tr>
<td>800 (375)</td>
<td>0.08 (2.0)</td>
</tr>
<tr>
<td>900 (422)</td>
<td>0.09 (2.3)</td>
</tr>
<tr>
<td>1000 (470)</td>
<td>0.10 (2.5)</td>
</tr>
<tr>
<td>1200 (550)</td>
<td>0.12 (3.0)</td>
</tr>
<tr>
<td>1500 (694)</td>
<td>0.15 (3.7)</td>
</tr>
<tr>
<td>1800 (762)</td>
<td>0.18 (4.5)</td>
</tr>
<tr>
<td>2000 (840)</td>
<td>0.20 (5.0)</td>
</tr>
<tr>
<td>2400 (982)</td>
<td>0.25 (6.2)</td>
</tr>
<tr>
<td>3000 (1200)</td>
<td>0.30 (7.6)</td>
</tr>
<tr>
<td>3500 (1416)</td>
<td>0.35 (8.9)</td>
</tr>
<tr>
<td>4000 (1888)</td>
<td>0.40 (10.3)</td>
</tr>
<tr>
<td>5000 (2360)</td>
<td>0.50 (12.5)</td>
</tr>
<tr>
<td>6000 (2772)</td>
<td>0.60 (14.7)</td>
</tr>
<tr>
<td>7000 (3304)</td>
<td>0.70 (17.0)</td>
</tr>
</tbody>
</table>

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**


1. **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
     - 304   Type 304 Stainless Steel
     - 316   Type 316 Stainless Steel
   - (Stainless Steel Model 1290FS-SS only)

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 1290F4-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:
      - 4X02  ML4X02 120 VAC
      - 8X02  ML8X02 24 VAC
      - 4Y02  ML4Y02 230 VAC
      - MS4   MS4X09F 120 VAC
      - MS8   MS8X09F 24 VAC
      - 4Y0   MS4Y09F 230 VAC
    - Pneumatic:
      - 296   331-2961
      - 482   331-4826

19. **Options & Accessories:**
    - 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.
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.
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
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
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
DAMPER CONTROL PANELS

- 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
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
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 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 used to control up to a maximum of four pneumatic actuators.
3. Pneumatic actuators are to be field piped per local codes.
**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.
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 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
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.

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).

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.
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 ML4115/ML8115 and MS4X09/MS8X09 actuators are examples.

Some actuator models have variants with position indicator switches built right into 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 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.
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).
RETYRING 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.
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:

<table>
<thead>
<tr>
<th>STANDARD MODEL #</th>
<th>WITH TYPE A SLEEVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1220</td>
<td>MODEL 1221</td>
</tr>
<tr>
<td>1270</td>
<td>MODEL 1271</td>
</tr>
</tbody>
</table>

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.
**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:**

<table>
<thead>
<tr>
<th></th>
<th>60” wide x 60” high (1524 x 1524)</th>
<th>36” wide x 48” high (914 x 1219)</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Curtain Type Fire Damper</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For Multi-Blade Type Fire Damper</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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).

**OPTION CODE DTS**

**PUSH BUTTON TEST SWITCH**

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)
**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
DSDL LOW-FLOW
DUCT SMOKE DETECTOR

APPLICATION:
Nailor Model DSDL 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 DSDL 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 DSDL.

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 DSDL 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.

DSDL 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.
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<td>H31</td>
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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 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.

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, 0756(D) & 0757(D)
FOR WOOD TRUSS CEILING ASSEMBLIES
Models 0755, 0756(D) and 0757(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 Series 0756 features a factory sheet metal plenum for steel grille/diffuser mount or ducted applications with duct collar(s), Model 0756D. Model 0757 is designed for steel grille/diffuser mount applications or ducted applications, Model 0757D, with field installed steel or fiberglass plenums (by others).

MODEL 0763
FOR WOOD TRUSS CEILING ASSEMBLIES
Models 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 designs. Model 0763 ships complete with thermal blanket and top inlet round duct connection. Model 0763 is designed to mount inside a field supplied internally insulated steel plenum (by others) that accommodates a steel grille, register or diffuser, by Nailor or by others.

MODELS 0758, 0759, 0760, 0761 & 0762
FOR WOOD TRUSS CEILING ASSEMBLIES
Models 0758 thru 0762 register boxes with integral ceiling dampers have been specifically designed and tested to provide protection and simple installation in specific UL design wood truss ceiling assemblies. Model 0758 features a 90° side inlet (tapered); Model 0759 features a 90° side inlet and is insulated. Model 0760 is insulated with a 45° inlet; Model 0761 features a top inlet; Model 0762 is insulated with a top inlet.
**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](image-url)

- 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:

<table>
<thead>
<tr>
<th>RNS DIFFUSER</th>
<th>PERFORATED FACE</th>
<th>MODULAR CORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERIES 4000</td>
<td>SERIES 4000</td>
<td>SERIES 7500 FRD</td>
</tr>
<tr>
<td>PLENUM SLOT</td>
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</tr>
<tr>
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<tr>
<td></td>
<td>SERIES 4100</td>
<td>SERIES 4100</td>
</tr>
</tbody>
</table>

SEE THE NAILOR AIR DISTRIBUTION PRODUCTS CATALOG FOR A COMPLETE SELECTION OF FIRE-RATED PACKAGES.
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):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
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</thead>
<tbody>
<tr>
<td>6” x 3” (152 x 75)</td>
<td>24” x 24” (610 x 610)</td>
</tr>
</tbody>
</table>

**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):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
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<tbody>
<tr>
<td>12&quot; x 6&quot;</td>
<td>24&quot; x 24&quot;</td>
</tr>
<tr>
<td>(305 x 152)</td>
<td>(610 x 610)</td>
</tr>
</tbody>
</table>

COMMON OPTION:
- 165°F (74°C) UL Listed fusible link.

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):

<table>
<thead>
<tr>
<th>Minimum</th>
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<tbody>
<tr>
<td>4&quot; x 4&quot;</td>
<td>24&quot; x 24&quot;</td>
</tr>
<tr>
<td>(102 x 102)</td>
<td>(610 x 610)</td>
</tr>
</tbody>
</table>

COMMON OPTION:
- 165°F (74°C) UL Listed fusible link.
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.):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot; (102) dia.</td>
<td>24&quot; (610) dia.</td>
</tr>
</tbody>
</table>

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.):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot; (102) dia.</td>
<td>24&quot; (610) dia.</td>
</tr>
</tbody>
</table>

COMMON OPTION:
- 165°F (74°C) UL Listed fusible link.
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 to 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.
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.
6. Duct Drop: By others.

Model 0716A Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; x 3&quot; (152 x 76)</td>
<td>16&quot; x 16&quot; (406 x 406)</td>
</tr>
</tbody>
</table>

COMMON OPTION:
• 165°F (74°C) UL Listed fusible link.

U.S. Patent No. 4,936,287
Canadian Patent No. 2,014,587-1

Model 0722A & 0716A

Units manufactured with blade length on dimension (W) except where short dimension (H) is less than 6" (152). (See Detail 1 above).

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.
6. Duct Drop: By others.

Model 0716-4A Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&quot; x 6&quot;</td>
<td>24&quot; x 24&quot;</td>
</tr>
<tr>
<td>(305 x 152)</td>
<td>(610 x 610)</td>
</tr>
</tbody>
</table>

COMMON OPTION:
- 165°F (74°C) UL Listed fusible link.

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.
6. Duct Drop: By others.

Model 0722A Sizes (Duct Dia.):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>5&quot; (127) dia.</td>
<td>16&quot; (406) dia.</td>
</tr>
</tbody>
</table>

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.
6. Duct Drop: By others.

Models 0722A-SE and 0722A-LE Sizes (Duct Dia.):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>5&quot; (127) dia.</td>
<td>16&quot; (406) dia.</td>
</tr>
</tbody>
</table>

COMMON OPTION:
- 165°F (74°C) UL Listed fusible link.

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 to 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.
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.

Model 0720 Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; x 4&quot;</td>
<td>18&quot; x 18&quot;</td>
</tr>
<tr>
<td>(152 x 102)</td>
<td>(457 x 457)</td>
</tr>
</tbody>
</table>

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 to 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°F (100°C) (default)
   - 165°F (74°C)
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.

<table>
<thead>
<tr>
<th>Ceiling Diffuser Nominal Size (W x H)</th>
<th>Blanket Size (A x B)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Imperial Modules</strong></td>
<td><strong>Metric Modules</strong></td>
</tr>
<tr>
<td>inches</td>
<td>mm</td>
</tr>
<tr>
<td>12 x 12</td>
<td>305 x 305</td>
</tr>
<tr>
<td>24 x 12</td>
<td>610 x 305</td>
</tr>
<tr>
<td>24 x 24</td>
<td>610 x 610</td>
</tr>
</tbody>
</table>

**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.
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/M503 and roof/ceiling design numbers P531/P538/P545/P547/P552.
- 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.
7. Flange: Plaster flange.
8. Blanket: Ceramic fiber thermal blanket.
9. Steel Grille/ Diffuser: Optional or by others.

Models 0755 & 0755A Sizes (Duct W x H):

<table>
<thead>
<tr>
<th>Nominal Duct Size</th>
<th>Opened Height C</th>
</tr>
</thead>
<tbody>
<tr>
<td>4” (102)</td>
<td>6 1/2” (165)</td>
</tr>
<tr>
<td>5” (127)</td>
<td>7” (178)</td>
</tr>
<tr>
<td>6” (152)</td>
<td>7 1/2” (191)</td>
</tr>
<tr>
<td>7” (178)</td>
<td>8” (203)</td>
</tr>
<tr>
<td>8” (203)</td>
<td>8 1/2” (216)</td>
</tr>
</tbody>
</table>

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).

- 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 Fire Dampers shall be tested and manufactured in accordance with UL 555C Standard for Ceiling Dampers and UL 263 Standard for Fire Tests of Building Construction and Materials, and shall bear a UL label verifying the same.
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 to 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:

<table>
<thead>
<tr>
<th>Ceiling Opening Size</th>
<th>Round Neck Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; x 6&quot; (152 x 152)</td>
<td>4&quot;, 5&quot;, 6&quot; (102, 127, 152)</td>
</tr>
<tr>
<td>8&quot; x 6&quot; (203 x 152)</td>
<td></td>
</tr>
<tr>
<td>10&quot; x 6&quot; (254 x 152)</td>
<td></td>
</tr>
<tr>
<td>12&quot; x 6&quot; (305 x 152)</td>
<td></td>
</tr>
<tr>
<td>8&quot; x 8&quot; (203 x 203)</td>
<td>4&quot;, 5&quot;, 6&quot;, 7&quot;, 8&quot; (102, 127, 152, 178, 203)</td>
</tr>
<tr>
<td>10&quot; x 8&quot; (254 x 203)</td>
<td></td>
</tr>
<tr>
<td>12&quot; x 8&quot; (305 x 203)</td>
<td></td>
</tr>
<tr>
<td>10&quot; x 10&quot; (254 x 254)</td>
<td>4&quot;, 5&quot;, 6&quot;, 7&quot;, 8&quot; (102, 127, 152, 178, 203)</td>
</tr>
<tr>
<td>12&quot; x 10&quot; (305 x 253)</td>
<td></td>
</tr>
<tr>
<td>12&quot; x 12&quot; (305 x 305)</td>
<td>4&quot;, 5&quot;, 6&quot;, 7&quot;, 8&quot; (102, 127, 152, 178, 203)</td>
</tr>
</tbody>
</table>
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 RADIATION DAMPER.
  Category CABS. (File # R9660).
- 1 hour rated for use in UL floor/ceiling design numbers L550/L562/L574/L579/L585/M503 and roof/ceiling design numbers P531/P538/P545/P547/P552.
- 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 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.

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.
- Optional Damper Styles: 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 DUCTED

STANDARD CONSTRUCTION:

1. Fusible Link: UL Listed, 212°F (100°C), standard.
2. Blades: 22 ga. (0.85) roll-formed galvanized steel.
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):

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; x 4&quot;</td>
<td>18&quot; x 18&quot;</td>
</tr>
<tr>
<td>(152 x 102)</td>
<td>(457 x 457)</td>
</tr>
</tbody>
</table>

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.
- Optional Damper Styles: 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 0756 Note:
0716 style damper shown. 0714 Single Blade or 0720 Low Profile Curtain Damper also available.

Model 0756D Note:
0716 style damper shown. 0714 Single Blade or 0720 Low Profile Curtain Damper also available.
MODELS: 0756 AND 0756D
WOOD TRUSS CEILING FIRE DAMPERS 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 Fire Dampers shall be tested and manufactured in accordance with UL 555C Standard for Ceiling Dampers and UL 263 Standard for Fire Tests of Building Construction and Materials, and shall bear a UL label verifying the same.
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 to 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. A grille/diffuser of minimum 26 ga. (0.55) steel construction and of model specified shall be provided by Nailor Industries to ensure correct fit.
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

- UL 263 CLASSIFIED
- STEEL OR FIBERGLASS PLENUM BY OTHERS

Models:
- 0757  Grille/Diffuser Mount
- 0757D  Ducted

Model 0757 Ceiling Radiation Dampers have been designed and tested for simple installation in specific wood truss ceiling assemblies. They are UL Classified for use in 1 hour rated UL floor/ceiling design numbers L550/L562/L574/L579/L585/M503 and roof/ceiling design numbers P531/P538/P545/P547/P552. Available in grille/diffuser mount style Model 0757, or ducted style Model 0757D, both configurations are designed for use in a fiberglass ductboard or steel plenum (by others). Model 0757 is designed to accommodate a steel grille/diffuser in applications where the plenum terminates at the ceiling. Model 0757D can be used to provide a multi-outlet plenum to feed 0757 grille/diffuser assembly and has a damper sleeve that extends below the ceiling, suitable for ducted connection.

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/M503 and roof/ceiling design numbers P531/P538/P545/P547/P552.
- 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.
4. Damper Frame: 24 ga. (0.70) G60 galvanized steel.
5. Plaster flange 7/8" (22).

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.
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.
- Optional Damper Styles: 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 0757 Note:
0716 style damper shown. 0714 Single Blade or 0720 Low Profile Curtain Damper also available.

Model 0757D Note:
0716 style damper shown. 0714 Single Blade or 0720 Low Profile Curtain Damper also available.
Wood Truss Ceiling Damper Assembly

**DIMENSIONAL DETAILS:**
**MODEL: 0757 GRILLE/DIFFUSER MOUNT**

Steel Plenum (by OTHERS) (Type A shown)

Steel Plenum (by OTHERS) (Type A shown)

Fiberglass Plenum (by OTHERS)

<table>
<thead>
<tr>
<th>Plenum Construction</th>
<th>Plenum Type</th>
<th>Description/Installation</th>
<th>Min. Damper Size</th>
<th>Max. Damper Size</th>
<th>Max. No. of Collars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
<td>A</td>
<td>90° Side Inlet</td>
<td>6 x 4 (152 x 102)</td>
<td>16 x 12 (406 x 305)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>90° Side Inlet, Insulated</td>
<td>8 x 4 (203 x 102)</td>
<td>12 x 12 (305 x 305)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>90° Side Inlet, Tapered</td>
<td>8 x 4 (203 x 102)</td>
<td>14 x 8 (356 x 203)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>Tapered, Top Inlet</td>
<td>8 x 4 (203 x 102)</td>
<td>12 x 12 (305 x 305)</td>
<td>1</td>
</tr>
</tbody>
</table>

**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).
DIMENSIONAL DETAILS:
MODEL: 0757D DUCTED

Steel Plenum (by OTHERS) (Type A shown)

Fiberglass Plenum (by OTHERS)

<table>
<thead>
<tr>
<th>Plenum Construction</th>
<th>Plenum Type</th>
<th>Description/Installation</th>
<th>Min. Damper Size</th>
<th>Max. Damper Size</th>
<th>Max. Number of Collars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
<td>B</td>
<td>Ducted, 90° Side Inlet</td>
<td>6 x 4 (152 x 102)</td>
<td>18 x 18 (457 x 457)</td>
<td>3</td>
</tr>
<tr>
<td>Fiberglass</td>
<td>B</td>
<td>Ducted, 90° Side Inlet</td>
<td>6 x 4 (152 x 102)</td>
<td>21 x 18 (533 x 457)</td>
<td>3</td>
</tr>
</tbody>
</table>

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).
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 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/L562/L574/L579/L585/M503 and roof/ceiling design numbers P531/P538/P545/P547/P552.
- 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.
4. Damper Frame: 22 ga. (0.85) G60 galvanized steel.
5. Plenum Collar (by others).

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).
WOOD TRUSS CEILING DAMPERS

DIMENSIONAL DETAILS:
MODEL: 0763

45° Inlet, Insulated Type F Steel Plenum (by OTHERS)

Top Inlet, Insulated Type G Steel Plenum (by OTHERS)

PLAFON 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, (by Nailor or others). 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-CRD0763NST for Supplementary Installation Instructions for Field Fabrication of Steel Plenums (by others).

 DIMENSIONAL DETAILS:
MODEL: 0763

45° Inlet, Insulated Type F Steel Plenum (by OTHERS)

Top Inlet, Insulated Type G Steel Plenum (by OTHERS)

PLAFON 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, (by Nailor or others). 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-CRD0763NST for Supplementary Installation Instructions for Field Fabrication of Steel Plenums (by others).
HOW TO SPECIFY

MODELS: 0757 AND 0757D
GRILLE/DIFFUSER MOUNT OR DUCTED ASSEMBLY WITH STEEL OR FIBERGLASS PLENUM

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 Fire Dampers shall be tested and manufactured in accordance with UL 555C Standard for Ceiling Dampers and UL 263 Standard for Fire Tests of Building Construction and Materials, and shall bear a UL label verifying the same. 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 to 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. For Model 0757 a grille/diffuser of minimum 26 ga. (0.55) steel construction and of model specified shall be provided by Nailor Industries to ensure correct fit. (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
GRILLE/DIFFUSER MOUNT

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 Fire Dampers shall be tested and manufactured in accordance with UL 555C Standard for Ceiling Dampers and UL 263 Standard for Fire Tests of Building Construction and Materials, and shall bear a UL label verifying the same. 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 to manufacturer’s UL approved installation instructions. Information submitted for approval shall include same UL installation instructions. A grille/diffuser of minimum 26 ga. (0.55) steel construction and of model specified shall be provided by Nailor Industries to ensure correct fit. Standard of acceptance shall be Nailor Industries Model 0763.
MODELS: 0756, 0756D, 0757, 0757D & 0763
WOOD TRUSS CEILING RADIATION DAMPERS • UL 263

EXAMPLE: 0756 - 12" x 6" - 06 - 212

1. Models
   0756  Rectangular, Side Inlet,
   Steel Plenum, Grille Mount
   0756D Rectangular, Side Inlet,
   Steel Plenum, Ducted
   0757  Rectangular, Grille Mount,
   (Steel or Fiberglass Plenum
   by others)
   0757D Rectangular, Ducted,
   (Steel or Fiberglass Plenum
   by others)
   0763  Round, Rectangular, Ducted,
   (Steel Plenum by others)

2. Ceiling Opening Size
   Width x Height (inches [mm's])
   or Diameter (Model 0763) (inches [mm's])

3a. Round Connection Collar
   (Models 0756, 0756D only)
   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

3c. Plenum Construction
   (Models 0757, 0757D only)
   FBG  Fiberglass (by others)
   STL  Steel (by others)

3d. Plenum Type
   Model 0757:
   A  90° Side Inlet
   C  Insulated 90° Side Inlet
   D  Tapered 90° Side Inlet
   E  Top Inlet Tapered
   Model 0757D:
   B  90° Side Inlet
   Model 0763:
   F  Insulated 45° Inlet (by others)
   (8 x 4 to 14 x 6 Grille
   [203 x 102 to 356 x 152 Grille])
   G  Insulated Top Inlet (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
   (Model 0763 excluded)
   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)
   (Models 0760 and 0763 only)

6. Damper Styles
   0716  Two Blade (default)
   0714  Single Blade
   0720  Low Profile Curtain

Available Sizes:

<table>
<thead>
<tr>
<th>Model</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>0756</td>
<td>6&quot; x 4&quot; (152 x 102)</td>
<td>16&quot; x 12&quot; (406 x 305)</td>
</tr>
<tr>
<td>0756D</td>
<td>6&quot; x 4&quot; (152 x 102)</td>
<td>18&quot; x 12&quot; (457 x 305)</td>
</tr>
<tr>
<td>0763</td>
<td>4&quot; (102) Dia.</td>
<td>28&quot; x 28&quot; (711 x 711)</td>
</tr>
</tbody>
</table>

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

Available Sizes:

<table>
<thead>
<tr>
<th>Model</th>
<th>Plenum Construction</th>
<th>Plenum Type</th>
<th>Description</th>
<th>Ceiling Opening/Damper</th>
</tr>
</thead>
<tbody>
<tr>
<td>0756</td>
<td>Steel</td>
<td>A</td>
<td>90° Side Inlet</td>
<td>6&quot; x 4&quot; (152 x 102)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C</td>
<td>90° Side Inlet Insulated</td>
<td>8&quot; x 4&quot; (203 x 102)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D</td>
<td>90° Side Inlet Tapered</td>
<td>8&quot; x 4&quot; (203 x 102)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>E</td>
<td>Top Inlet Tapered</td>
<td>8&quot; x 4&quot; (203 x 102)</td>
</tr>
<tr>
<td>0757D</td>
<td>Steel</td>
<td>A</td>
<td>90° Side Inlet</td>
<td>6&quot; x 4&quot; (152 x 102)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>90° Side Inlet</td>
<td>6&quot; x 4&quot; (152 x 102)</td>
</tr>
<tr>
<td></td>
<td>Fiberglass</td>
<td>A</td>
<td>90° Side Inlet</td>
<td>6&quot; x 4&quot; (152 x 102)</td>
</tr>
<tr>
<td></td>
<td>Fiberglass</td>
<td>B</td>
<td>90° Side Inlet</td>
<td>6&quot; x 4&quot; (152 x 102)</td>
</tr>
</tbody>
</table>
Ceiling dampers are designed to function as a heat barrier in air handling openings penetrating fire resistance membrane ceilings. Model 0758, 0759, 0760, 0761, 0762 register boxes with integral ceiling dampers have specially designed and tested to provide protection and simple installation in specific UL design wood truss ceiling assemblies. The 0758 and 0759 design features a single blade damper out of the airstream to reduce pressure drop and noise generation, therefore maximizing performance. The 0760, 0761, 0762 design features a square or rectangular two blade damper. All models are designed to accommodate standard size common residential registers.

### MODEL: 0758 SIDE INLET

**STANDARD CONSTRUCTION:**

1. Fusible Link: UL Listed, 212°F (100°C), standard.
2. Blades: 22 ga. (0.85) roll-formed galv. steel.
4. Damper Frame: 22 ga. (0.85) galvanized steel.
5. Duct: UL Classified Class 0 or 1 flexible air duct connection by others.
7. 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.
- 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).

### 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.
- Meets NFPA 90A requirements.
MODEL: 0759 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.
4. Damper Frame: 22 ga. (0.85) galvanized steel.
5. Internal Insulation: 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.
9. 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.
• 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).

Dimensional Data (W x H):

<table>
<thead>
<tr>
<th>Available Sizes</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot; x 4&quot; (203 x 102)</td>
<td>4&quot;, 5&quot; (102, 127) dia.</td>
</tr>
<tr>
<td>10&quot; x 4&quot; (254 x 102)</td>
<td>4&quot;, 5&quot;, 6&quot; (102, 127, 152) dia.</td>
</tr>
<tr>
<td>12&quot; x 4&quot; (305 x 102)</td>
<td>6&quot;, 7&quot;, 8&quot; (152, 178, 203) dia.</td>
</tr>
<tr>
<td>8&quot; x 6&quot; (203 x 152)</td>
<td>6&quot; (152) dia.</td>
</tr>
<tr>
<td>10&quot; x 6&quot; (254 x 152)</td>
<td>5&quot;, 6&quot;, 7&quot; (127, 152, 178) dia.</td>
</tr>
<tr>
<td>12&quot; x 6&quot; (305 x 152)</td>
<td>6&quot;, 7&quot;, 8&quot;, 9&quot; (152, 178, 203, 229) dia.</td>
</tr>
<tr>
<td>8&quot; x 8&quot; (203 x 203)</td>
<td>5&quot;, 6&quot; (127, 152) dia.</td>
</tr>
<tr>
<td>10&quot; x 8&quot; (254 x 203)</td>
<td>7&quot;, 8&quot; (178, 203) dia.</td>
</tr>
<tr>
<td>12&quot; x 8&quot; (305 x 203)</td>
<td>7&quot;, 8&quot; (178, 203) dia.</td>
</tr>
<tr>
<td>10&quot; x 10&quot; (254 x 254)</td>
<td>7&quot;, 8&quot; (178, 203) dia.</td>
</tr>
<tr>
<td>12&quot; x 12&quot; (305 x 305)</td>
<td>8&quot; (203) dia.</td>
</tr>
</tbody>
</table>

W x H = Nominal Grille/Register Size

MODEL: 0760 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.
4. Damper Frame: 22 ga. (0.85) galvanized steel.
5. Internal Insulation: 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.
9. Steel Grille/ Register: By Nailor or others. Standard depth for grille clearance is 2" (51).

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).
• Installation Boot Rails. 26" (660) long:
  ISR 2 @ 1" x 24 ga. (25 x 0.70).

Dimensional Data (W x H):

<table>
<thead>
<tr>
<th>Available Sizes</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot; x 4&quot; (203 x 102)</td>
<td>4&quot;, 5&quot; (102, 127) dia.</td>
</tr>
<tr>
<td>10&quot; x 4&quot; (254 x 102)</td>
<td>4&quot;, 5&quot;, 6&quot; (102, 127, 152) dia.</td>
</tr>
<tr>
<td>12&quot; x 4&quot; (305 x 102)</td>
<td>6&quot;, 7&quot;, 8&quot; (152, 178, 203) dia.</td>
</tr>
<tr>
<td>14&quot; x 4&quot; (356 x 102)</td>
<td>7&quot; (178) dia.</td>
</tr>
<tr>
<td>16&quot; x 6&quot; (203 x 152)</td>
<td>6&quot; (152) dia.</td>
</tr>
<tr>
<td>14&quot; x 6&quot; (356 x 152)</td>
<td>6&quot;, 7&quot; (152, 178) dia.</td>
</tr>
</tbody>
</table>

W x H = Nominal Grille/Register Size
MODEL: 0761 TOP INLET

STANDARD CONSTRUCTION:
1. Fusible Link: UL Listed, 212°F (100°C), standard.
2. Blades: 22 ga. (0.85) roll-formed galv. steel.
4. Damper Frame: 22 ga. (0.85) galvanized steel.
5. Plenum: Steel. 26 ga. (0.055) 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).

Dimensional Data (W x H):

<table>
<thead>
<tr>
<th>Available Sizes</th>
<th>Nominal Duct Size D</th>
</tr>
</thead>
<tbody>
<tr>
<td>W x H</td>
<td></td>
</tr>
<tr>
<td>8&quot; x 4&quot; (203 x 102)</td>
<td>4&quot;, 5&quot; (102, 127)</td>
</tr>
<tr>
<td>10&quot; x 4&quot; (254 x 102)</td>
<td>4&quot;, 5&quot;, 6&quot; (102, 127, 152)</td>
</tr>
<tr>
<td>12&quot; x 4&quot; (305 x 102)</td>
<td>6&quot;, 7&quot;, 8&quot; (152, 178, 203)</td>
</tr>
<tr>
<td>8&quot; x 6&quot; (203 x 152)</td>
<td>6&quot; (152)</td>
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<tr>
<td>10&quot; x 6&quot; (254 x 152)</td>
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<td>6&quot;, 7&quot;, 8&quot;, 9&quot; (152, 178, 203, 229)</td>
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<tr>
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<td>5&quot;, 6&quot; (127, 152)</td>
</tr>
<tr>
<td>10&quot; x 8&quot; (254 x 203)</td>
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<td>9&quot; x 9&quot; (229 x 229)</td>
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<td>12&quot; x 12&quot; (305 x 305)</td>
<td>8&quot;, 9&quot;, 10&quot; (203, 229, 254)</td>
</tr>
</tbody>
</table>

W x H = Nominal Grille/Register Size

MODEL: 0762 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.
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.
9. Steel Grille/Reg.: By Nailor or others. Min. depth for grille clearance is 2" (51).

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).
• Installation Boot Rails. 26" (660) long:
  ISR 2 @ 1" x 24 ga. (25 x 0.70).

Dimensional Data (W x H):

<table>
<thead>
<tr>
<th>Available Sizes</th>
<th>Nominal Duct Size D</th>
</tr>
</thead>
<tbody>
<tr>
<td>W x H</td>
<td></td>
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<tr>
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</tr>
</tbody>
</table>

W x H = Nominal Grille/Register Size
DIMENSIONAL DETAILS:
MODELS: 0758, 0759, 0760, 0761, 0762

Model 0758
Model 0759
Model 0760
Model 0761
Model 0762
HOW TO ORDER

MODELS: 0758 TO 0762
WOOD TRUSS CEILING RADIATION DAMPERS REGISTER BOXES

EXAMPLE: 0758 - 14" x 6" - 06 - 212 - ISA

1. Models
   0758  Register Box, Tapered 90° Side Inlet
   0759  Register Box, 90° Side Inlet, Insulated
   0760  Register Box, 45° Side Inlet, Insulated
   0761  Register Box, Tapered Top Inlet
   0762  Register Box, Top Inlet, Insulated

2. Register Size
   Width x Height (inches [mm's])
   0606  6" x 6" (152 x 152)
   0808  8" x 8" (203 x 203)
   1004  10" x 4" (254 x 102)
   1006  10" x 6" (254 x 152)
   1008  10" x 8" (254 x 203)
   1204  12" x 4" (305 x 102)
   1208  12" x 8" (305 x 203)
   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])
   05  5" (127)
   06  6" (152)
   07  7" (178)
   08  8" (203)
   09  9" (229)
   10  10" (254)

4. Fusible Link Temperature
   212°F (100°C) (default)
   165°F (74°C)

5. 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)
   (Models 0760 and 0763 only)
   IBR Boot Rails
   2 @ 26" x 1" x 24 ga. (660 x 25 x ?)

Available Sizes:

<table>
<thead>
<tr>
<th>Nominal Register Size</th>
<th>Round Inlet (Duct) Size</th>
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<td>7&quot; (178)</td>
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<td>10&quot; x 6&quot; (254 x 152)</td>
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<tr>
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<td>6&quot;, 7&quot;, 8&quot; (152, 178, 203)</td>
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<tr>
<td>8&quot; x 8&quot; (203 x 203)</td>
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<tr>
<td>9&quot; x 9&quot; (229 x 229)</td>
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<td>10&quot; x 10&quot; (254 x 254)</td>
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<td>12&quot; x 12&quot; (305 x 305)</td>
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ACCESS DOORS
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<td>I8</td>
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<td>0800 Series • Oval Door • Style M2 Knock-Over Tabs</td>
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<td>0855-2 Series • Thermal Break Plenum Access Door • In-Swing Frame (Positive Pressure)</td>
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<td><strong>For Round Duct</strong></td>
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<td>0890 Series • For Low Pressure</td>
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<td>0895 Series • For Medium &amp; High Pressure</td>
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<td><strong>Fire Rated Access Doors</strong></td>
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<td><strong>Universal Access Doors</strong></td>
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<tr>
<td>0900-2 Series • For Drywall, Masonry, Plaster</td>
<td>I22</td>
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</tbody>
</table>
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 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 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.

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.
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.
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):

<table>
<thead>
<tr>
<th>Size</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
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<td>6 x 6</td>
<td>152 x 152</td>
</tr>
<tr>
<td>8 x 8</td>
<td>203 x 203</td>
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<tr>
<td>10 x 8</td>
<td>254 x 254</td>
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<tr>
<td>10 x 10</td>
<td>305 x 305</td>
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<td>12 x 10</td>
<td>356 x 356</td>
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<td>356 x 356</td>
</tr>
<tr>
<td>16 x 12</td>
<td>406 x 305</td>
</tr>
</tbody>
</table>

See note for fasteners.
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)

3. Options:
   High Pressure Gasketing
   HP  High Pressure.
   Adds second gasket on underside
   of 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.
**Ultra-Low Leakage Access Doors**

- **Premium Performance**
- **Flat Oval Design**
- **Ultra-Low Leakage**
- **Ergonomic Sizing**
- **Insulated**

**Model:**
0800 Flat Oval

**Mounting Types:**
M1 Double Flange
M2 Knock-over Tabs

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
  - Frame Style M1 – Exterior mounting with externally insulated ductwork

- **Flush**
  - Frame Style M1 – Flush mounting
  - Suitable for internally insulated ductwork

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

<table>
<thead>
<tr>
<th>Nominal Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>Viewport</th>
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<tr>
<td>8 x 5</td>
<td>8</td>
<td>5</td>
<td>9 1/2</td>
<td>6 1/2</td>
<td>1 1/8</td>
<td>n/a</td>
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<tr>
<td>(203 x 127)</td>
<td>(203)</td>
<td>(127)</td>
<td>(241)</td>
<td>(165)</td>
<td>(29)</td>
<td></td>
</tr>
<tr>
<td>(305 x 152)</td>
<td>(298)</td>
<td>(146)</td>
<td>(349)</td>
<td>(197)</td>
<td>(29)</td>
<td>(70)</td>
</tr>
<tr>
<td>18 x 10</td>
<td>17 3/4</td>
<td>9 3/4</td>
<td>19 3/4</td>
<td>11 3/4</td>
<td>1 1/8</td>
<td>5 1/2 dia.</td>
</tr>
<tr>
<td>(457 x 254)</td>
<td>(451)</td>
<td>(248)</td>
<td>(502)</td>
<td>(298)</td>
<td>(29)</td>
<td>(140)</td>
</tr>
<tr>
<td>(533 x 356)</td>
<td>(527)</td>
<td>(349)</td>
<td>(578)</td>
<td>(400)</td>
<td>(29)</td>
<td>(140)</td>
</tr>
<tr>
<td>(635 x 432)</td>
<td>(629)</td>
<td>(425)</td>
<td>(679)</td>
<td>(476)</td>
<td>(29)</td>
<td>(140)</td>
</tr>
</tbody>
</table>

Note: See Ergonomic Sizing Guide on page 17 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.
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.
11. Viewport: Viewport (not available on size 8" x 5" [203 x 127]).
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):

<table>
<thead>
<tr>
<th>Nominal Size</th>
<th>A (W)</th>
<th>B (H)</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>Viewport</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 x 5</td>
<td>8 (203)</td>
<td>5 (127)</td>
<td>9 1/2</td>
<td>6 1/2</td>
<td>1 1/8</td>
<td>n/a</td>
</tr>
<tr>
<td>(203 x 127)</td>
<td></td>
<td></td>
<td>(241)</td>
<td>(165)</td>
<td>(29)</td>
<td></td>
</tr>
<tr>
<td>(305 x 152)</td>
<td>(298)</td>
<td>(146)</td>
<td>(349)</td>
<td>(197)</td>
<td>(29)</td>
<td>(70)</td>
</tr>
<tr>
<td>18 x 10</td>
<td>17 3/4</td>
<td>9 3/4</td>
<td>19 3/4</td>
<td>11 3/4</td>
<td>1 1/8</td>
<td>5 1/2 dia.</td>
</tr>
<tr>
<td>(457 x 254)</td>
<td>(451)</td>
<td>(248)</td>
<td>(502)</td>
<td>(298)</td>
<td>(29)</td>
<td>(140)</td>
</tr>
</tbody>
</table>

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.
7. Template: Layout template included.
8. Opening: Oval shaped opening adaptable to all ducts 5” (127) or over.

COMMON OPTIONS:
10. Viewport: Viewport (not available on size 8” x 5” [203 x 127]).
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.
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.

**Dimensional Data (W x H):**

<table>
<thead>
<tr>
<th>Nominal Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 x 5</td>
<td>8</td>
<td>5</td>
<td>9 1/2</td>
<td>6 1/2</td>
<td>1 1/8</td>
</tr>
<tr>
<td>(203 x 127)</td>
<td>(203)</td>
<td>(127)</td>
<td>(241)</td>
<td>(165)</td>
<td>(29)</td>
</tr>
<tr>
<td>12 x 6</td>
<td>11 3/4</td>
<td>5 3/4</td>
<td>13 3/4</td>
<td>7 3/4</td>
<td>1 1/8</td>
</tr>
<tr>
<td>(305 x 152)</td>
<td>(298)</td>
<td>(146)</td>
<td>(349)</td>
<td>(197)</td>
<td>(29)</td>
</tr>
<tr>
<td>18 x 10</td>
<td>17 3/4</td>
<td>9 3/4</td>
<td>19 3/4</td>
<td>11 3/4</td>
<td>1 1/8</td>
</tr>
<tr>
<td>(457 x 254)</td>
<td>(451)</td>
<td>(248)</td>
<td>(502)</td>
<td>(298)</td>
<td>(29)</td>
</tr>
<tr>
<td>21 x 14</td>
<td>20 3/4</td>
<td>13 3/4</td>
<td>22 3/4</td>
<td>15 3/4</td>
<td>1 1/8</td>
</tr>
<tr>
<td>(533 x 356)</td>
<td>(527)</td>
<td>(349)</td>
<td>(578)</td>
<td>(400)</td>
<td>(29)</td>
</tr>
<tr>
<td>25 x 17</td>
<td>24 3/4</td>
<td>16 3/4</td>
<td>26 3/4</td>
<td>18 3/4</td>
<td>1 1/8</td>
</tr>
<tr>
<td>(635 x 432)</td>
<td>(629)</td>
<td>(425)</td>
<td>(679)</td>
<td>(476)</td>
<td>(29)</td>
</tr>
</tbody>
</table>

**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)

3. OPTIONS:
   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.
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.
5. Fasteners: Die-cast closure hatches.
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.)
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.
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.

### Models:
- 0850-2L  Left Hinge
- 0850-2R  Right Hinge

### Standard Sizes:

<table>
<thead>
<tr>
<th>Width x Height</th>
<th>Nominal Size</th>
<th>Access Opening</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 x 12</td>
<td>(305 x 305)</td>
<td>(762 x 1829)</td>
</tr>
<tr>
<td>18 x 18</td>
<td>(457 x 457)</td>
<td>(914 x 914)</td>
</tr>
<tr>
<td>18 x 24</td>
<td>(457 x 610)</td>
<td>(914 x 1219)</td>
</tr>
<tr>
<td>24 x 24</td>
<td>(610 x 610)</td>
<td>(914 x 1524)</td>
</tr>
<tr>
<td>24 x 36</td>
<td>(610 x 914)</td>
<td>(914 x 1829)</td>
</tr>
<tr>
<td>24 x 48</td>
<td>(610 x 1219)</td>
<td>(914 x 2134)</td>
</tr>
<tr>
<td>24 x 60</td>
<td>(610 x 1524)</td>
<td>(914 x 2134)</td>
</tr>
<tr>
<td>24 x 72</td>
<td>(610 x 1524)</td>
<td>(914 x 1524)</td>
</tr>
<tr>
<td>30 x 36</td>
<td>(762 x 914)</td>
<td>(1219 x 1829)</td>
</tr>
<tr>
<td>30 x 48</td>
<td>(762 x 1219)</td>
<td>(1219 x 2134)</td>
</tr>
<tr>
<td>30 x 60</td>
<td>(762 x 1524)</td>
<td>(1219 x 2438)</td>
</tr>
</tbody>
</table>

### Cross-Section A-A

- **Model 0850-2R**
- **Model 0850-2L**

**Optional Viewport**

- Inner and Outer Door Gaskets
- Thermal Breaks Separate Inside from Outside
- Cross-Section A-A

**Dimensions:**
- Height: 113/32" (36) on both Models
- Width: 113/32" (36) on both Models
- Access Opening: 2 1/4" (57) on 0850-2R
- Nominal Size: 3 1/2" (89) on both Models
- Access Opening = Nominal Size - 1 1/4" (6)
- Optional Viewport
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.

Models:
0855-2L Left Hinge
0855-2R Right Hinge

Standard Sizes:

<table>
<thead>
<tr>
<th>Width x Height</th>
<th>Nominal Width x Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 x 12</td>
<td>30 x 72</td>
</tr>
<tr>
<td>18 x 18</td>
<td>36 x 36</td>
</tr>
<tr>
<td>18 x 24</td>
<td>36 x 48</td>
</tr>
<tr>
<td>24 x 24</td>
<td>36 x 60</td>
</tr>
<tr>
<td>24 x 36</td>
<td>36 x 72</td>
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<tr>
<td>30 x 36</td>
<td>48 x 72</td>
</tr>
<tr>
<td>30 x 48</td>
<td>48 x 84</td>
</tr>
</tbody>
</table>

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.
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.
Model:
0890  Low Pressure Access Door

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

Dimensional Data (W x H):

<table>
<thead>
<tr>
<th>Duct Diameter</th>
<th>Door Size (A x B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 (127)</td>
<td>7 x 4 (178 x 102)</td>
</tr>
<tr>
<td>6 (152)</td>
<td>8 x 5 (203 x 127)</td>
</tr>
<tr>
<td>7 (178)</td>
<td>9 x 6 (229 x 152)</td>
</tr>
<tr>
<td>8 (203)</td>
<td>10 x 7 (254 x 178)</td>
</tr>
<tr>
<td>9 (229)</td>
<td>11 x 8 (279 x 203)</td>
</tr>
<tr>
<td>10 (254)</td>
<td>12 x 9 (305 x 229)</td>
</tr>
<tr>
<td>12 (305)</td>
<td>14 x 10 (356 x 254)</td>
</tr>
<tr>
<td>14 (356)</td>
<td>16 x 12 (406 x 305)</td>
</tr>
<tr>
<td>16 (406)</td>
<td>16 x 12 (406 x 305)</td>
</tr>
<tr>
<td>18 (457)</td>
<td>18 x 14 (457 x 356)</td>
</tr>
<tr>
<td>20 (508)</td>
<td>18 x 16 (457 x 406)</td>
</tr>
<tr>
<td>24 (610)</td>
<td>18 x 16 (457 x 406)</td>
</tr>
</tbody>
</table>

Additional sizes are available; contact factory.
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.

### Dimensional Data (W x H):

<table>
<thead>
<tr>
<th>Duct Diameter</th>
<th>Nominal Door Size</th>
<th>Turret Dimensions (A x B)</th>
<th>Optional Viewport</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 to 12 (152 to 305)</td>
<td>8 x 5 (203 x 127)</td>
<td>10 x 7 (254 x 178)</td>
<td>n/a</td>
</tr>
<tr>
<td>8 to 20 (203 to 508)</td>
<td>12 x 6 (305 x 152)</td>
<td>14 1/4 x 8 1/4 (362 x 209)</td>
<td>2 3/4 dia. (70)</td>
</tr>
<tr>
<td>12 to 24 (305 to 610)</td>
<td>18 x 10 (457 x 254)</td>
<td>20 1/4 x 12 1/4 (514 x 311)</td>
<td>5 1/2 dia. (140)</td>
</tr>
<tr>
<td>16 to 36 (406 to 914)</td>
<td>21 x 14 (533 x 356)</td>
<td>23 1/4 x 16 1/4 (590 x 413)</td>
<td>5 1/2 dia. (140)</td>
</tr>
<tr>
<td>24 to 60 (610 to 1524)</td>
<td>25 x 17 (635 x 432)</td>
<td>27 1/4 x 19 1/4 (692 x 489)</td>
<td>5 1/2 dia. (140)</td>
</tr>
</tbody>
</table>

**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.)
**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**
     - Code 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**
     - 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.
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):

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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):

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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.
ENGINEERING FORMULAE & INDEX
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<th>Topic</th>
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<td>J5</td>
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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:

\[
P_v = \left(\frac{V}{4005}\right)^2 \text{ or } V = 4005 \sqrt{P_v}
\]

Where:  
\( V \) = Air Velocity (FPM)  
\( P_v \) = 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.
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:

\[
\text{Velocity (fpm)} = 4005 \sqrt{\text{Velocity Pressure in inches of water}}
\]
### Equivalent Measures of Pressure

1 lb. per square inch = 
- 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 = 
- 14.696 lbs. per sq. ft. 

1 Atmosphere = 
- 144 lbs. per sq. ft. 
- 2.036 in. Mercury at 32°F. 
- 1.136 ft. Water at 70°F.

1 inch Water at 70°F = .03609 lb. per sq. in. 
1.733 in. Water at 70°F = .5774 oz. per sq. in. 
1 inch Mercury at 32°F = 5.196 lbs. per sq. ft.

1 foot Water at 70°F = .433 lbs. per sq. in. 
7.86 oz. per sq. in. = 1.136 ft. Water at 70°F.

1.163 in. Water at 70°F = .941 lbs. per sq. in.

### Sheet Metal Thickness (Inches) and Weight (Lbs./Sq. Ft.)

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† Steel – U.S. Standard (Revised) 
Galvanized – Galvanized Gauge No. 
Aluminum – American Gauge and Brown & Sharpe

### Round Duct Area and Circumference

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### Common Fractions Reduced to Decimals

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### 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.
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 ÷ 4005)²
ΔP = Differential Pressure
ΔPs = Static Differential Pressure
ΔPt = Total Differential Pressure

CFM = FPM x Ak
FPM = CFM ÷ Ak
VP = TP - SP
TP = SP + VP
SP = TP - VP
ΔPt = TP₁ - TP₂
ΔPs = SP₁ - SP₂

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 Guide Conversion Factors

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<th>Imperial Unit</th>
<th>Metric Unit</th>
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<th>From Metric To Imperial Multiply By:</th>
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