DESIGN / APPLICATION

Model H-420 (Opposed Blade Operation) and H-421 (Parallel Blade Operation) are Industrial Air Control Damper with a 3V blade design. These models consist of a heavy duty flanged frames designed for direct attachment to the ductwork or equipment. H-420/H-421 models are ideal for balancing and/or shut off HVAC applications in the industrial systems with many options to meet your needs.

STANDARD CONSTRUCTION

- **Frame:** 8" [203mm] x 2" [51mm] x 14 ga. Galvanized steel channel
- **Blades:** 14 ga. Galvanized steel, symmetrical design
- **Bearing:** Bronze Sleeve 185°F [85°C] max
- **Linkage:** Heavy Duty jamb linkage
- **Axles:** Ø1/2" [13mm] plated steel
- **Finish:** Mill galvanized with high temperature paint touch up.

SIZE LIMITATIONS

- **Minimum Size:** 6"W x 5"H [152mm x 127mm] (single blade)
- **Maximum Size:** 48"W x 96"H [1219mm x 2428mm] (single section)

RATINGS

- **Velocity:** 2000 - 4000 fpm
- **Pressure:** 3-10 in. w.g. - differential pressure
- **Temperature:**
  - Bronze Brg. -40° ~ 185°F [4° ~ 85°C] (Standard)
  - Stainless Brg. 185°F ~ 1,000°F [85°C ~ 538°C] (Optional)
  - Temperatures over 250°F [121°C] require special blade and clearance. For higher temperatures, consult United EnerTech.

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Max. Temp. (°F)</th>
<th>&quot;W&quot; Width</th>
<th>&quot;H&quot; Height</th>
<th>Frame Depth &quot;D&quot; (&quot;D&quot; [203mm Std.])</th>
<th>Flange Width &quot;Y&quot; (&quot;Y&quot; [51mm Std.])</th>
<th>Bolt Hole Information (See page 9)</th>
<th>Remarks</th>
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**NOTE:** Damper blades always run horizontal and are always the first dimension (W) when ordering (example: always order W" x H").

*Inside Dimensions are Actual Size (not undersized)

Job Name: □ MODEL H-420 (opposed blades)

□ MODEL H-421 (parallel blades)

Architect:

Engineer:

Contractor:

**DRAWN BY:** CLJ **DATE:** 7-3-06 **REV. DATE:** 11-18-14

**REV. NO.:** 39 **APPROVED BY:** BGT **DWG. NO.:** C-1
**MODEL H-420 PERFORMANCE DATA**

**Options**

**Temperature Limitations**
- Blade seals: EPDM -40° to +250°F
- Silicone Rubber -40° to +400°F
- Jamb seals: Flexible stainless steel -40° to +400°F

For higher temperatures consult United Enertech

**Velocity Limitations**

The graph below represents a conservative size to velocity limitation.

![Velocity Limitation Graph](image)

**Pressure Drop Data**

The pressure drop on this damper (shown below) was performed per AMCA Standard 500-D, Fig. 5.3 (straight ductwork upstream and down). Other figures and system configurations can vary the pressure drop from that shown. Any variations to entering and exiting ductwork or additional objects in the ductwork should be considered when estimating the pressure drop.

![Pressure Drop Graph](image)

**Pressure Limitations**

Below is a graph which depicts a conservative pressure limitation based on a maximum W/360 blade deflection.

![Pressure Limitation Graph](image)

**Leakage Data**

The leakage data below (with seals) is based on the damper having the options of both blade and jamb seals and with the damper blades in their fully closed position. Models H-420/421 standard construction is with no seals and its leakage is shown (Without Seals).

<table>
<thead>
<tr>
<th>Imperial Units (Forward Flow)</th>
<th>1&quot; w.g. (cfm/sq. ft.)</th>
<th>2&quot; w.g. (cfm/sq. ft.)</th>
<th>3&quot; w.g. (cfm/sq. ft.)</th>
<th>4&quot; w.g. (cfm/sq. ft.)</th>
<th>6&quot; w.g. (cfm/sq. ft.)</th>
<th>8&quot; w.g. (cfm/sq. ft.)</th>
<th>*Torque (per sq. ft.)</th>
</tr>
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<tbody>
<tr>
<td>36&quot; x 36&quot;</td>
<td>0.89</td>
<td>1.73</td>
<td>3.08</td>
<td>4.39</td>
<td>6.98</td>
<td>8.36</td>
<td>13.3 lbs-in</td>
</tr>
</tbody>
</table>

*Torque applied to hold damper in closed position.
CONSTRUCTION SPECIFICATIONS

Frame: 14 ga. Galvanized steel

Blades: 14 ga. Galvanized steel

Axles: 1/2" dia. plated steel (Std.)
Optional: 3/4" dia. plated steel

FRAME & BOLT HOLE CONSTRUCTION OPTIONS

Flange (F Dim): Standard - 2"
Optional - 1-1/2" to 4"

Web Depth (D Dim): Standard - 8"
Optional - 8" to 12"

Bolt holes: (Standard construction is no bolt holes)
Optional - United Enertech recommended standard pattern.
Dim. "M": 7/16" dia. hole
Dim. "L": 6" Center to Center

Note: Customer must be within Min. or Max limits on table below.

<table>
<thead>
<tr>
<th>Dim.</th>
<th>Min or Max</th>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>min. 3/4&quot;</td>
<td></td>
<td>First/Last Space in Head/Sill</td>
</tr>
<tr>
<td>N1</td>
<td>min. 1.0&quot;</td>
<td></td>
<td>No. of holes in Head/Sill</td>
</tr>
<tr>
<td>K</td>
<td>min. F/2&quot;</td>
<td></td>
<td>First/Last Space in Jamb</td>
</tr>
<tr>
<td>N2</td>
<td>min. 1.0&quot;</td>
<td></td>
<td>No. of holes in Jamb</td>
</tr>
<tr>
<td>C</td>
<td>.75*D&quot; to 3/4&quot;</td>
<td>F/(2*M)&quot;</td>
<td>Centerline of bolt hole from inside edge of frame</td>
</tr>
<tr>
<td>L</td>
<td>2&quot; to 12&quot;</td>
<td>6.0&quot;</td>
<td>Hole Spacing</td>
</tr>
<tr>
<td>M</td>
<td>1/4&quot; to 11/16&quot;</td>
<td>7/16&quot;</td>
<td>Mounting hole Diameter</td>
</tr>
</tbody>
</table>

BLADE AND JAMB SEAL OPTIONS

Flexible Stainless Steel Jamb Seal (Optional)

Blade Seal EPDM (250°F Max.)
Trimlok X1543BT (UE1392)

Permatex Silicone

Blade Seal Silicone (400°F Max.)
Note: Adhesive w/Permatex RTV Silicone #28C
Model H-420/421 has available many operators shown below that can be factory mounted by United Enertech. Consult factory for other operators not shown.

### Suggested Specifications

Industrial Grade Rectangular Dampers meeting the following specifications shall be furnished and installed where shown on drawings and described in the schedule. The damper frame shall consist of heavy 14 gauge steel with a 2" minimum depth flange/web. The damper blade shall be of a single thickness, heavy 14 gauge steel crimped design. The axle shall be 1/2" dia. plated steel. Bearings shall be of the bronze oilite sleeve type to minimize wear. Also submitted with submittal package is the damper performance data such as pressure drop, leakage, and temperature ratings. The damper shall be suitable for velocities up to 4000 fpm at a pressure differential of 10" wg depending on width. Damper shall be United Enertech Model H-420/421 or equivalent.

**ADDITIONAL INFORMATION THAT MAY BE ADDED TO SPECIFICATIONS:**

- Damper shall be factory supplied with Blade Seals for low leakage. Blade Seals shall be PVC (180°F), EPDM (250°F), or Silicone (450°F) (Specifier to choose one). Damper shall also have flexible stainless steel jamb seals for low leakage. Frame and blades shall be 10 or 12 gauge galvanized or 304 Stainless Steel (Specifier to choose one).
- Dampers shall be shipped with factory installed bolt hole patterns as shown on drawings.