



Model HSD-401 Industrial Smoke Damper

Extruded Aluminum Smoke Control
UL555S Leakage Class I



Application and Design

Model HSD-401 is a heavy duty, **flanged** frame style with extruded airfoil blades, industrial smoke damper. The HSD-401 has been qualified to 3000 fpm (15.2 m/s) and 6 in. wg (1.5 kPa) for operational closure in engineered smoke control situations. HSD-401 may be installed horizontally or vertically (with blades running horizontally) and is rated for airflow and leakage in either direction.

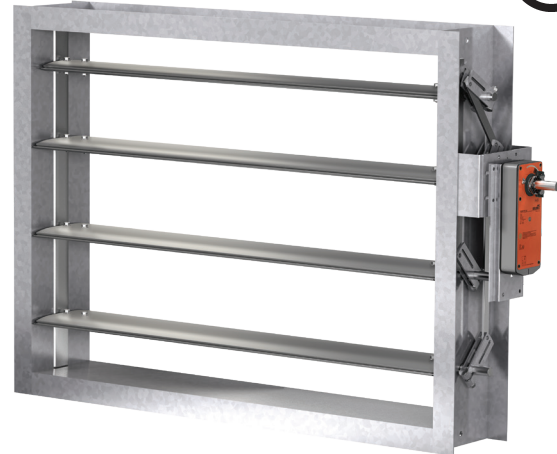
UL Ratings

Leakage: UL 555S leakage class I (to 6 in. wg [1.5 kPa]). Leakage rated in both directions

Pressure: Up to 6 in. wg (1.5 kPa) - differential pressure.

Velocity: Operational rated to 3000 fpm (15.2 m/s). Rating is for airflow in either direction through damper.

Temperature: 250°F (121°C) depending on the actuator



| Construction | Standard | Optional |
|--------------------------|-----------------------------|---------------------------------------|
| Frame Material | Galvanized steel | 304SS or 316SS |
| Frame Material Thickness | 12 ga. (2.7mm) | 10 ga. (3.5mm) |
| Frame Depth (C) | 8 in. (203mm) | 10 in. (254mm) |
| Frame Type | Flanged Channel | |
| Blade Action | Opposed | |
| Blade Material | Aluminum | |
| Blade Material Thickness | 0.080 in. (2mm) | - |
| Blade Seals | Silicone | |
| Blade Type | Extruded Airfoil | |
| Flange Width (D) | 2 in. (51mm) | 1 1/2 in. or 2 1/2 in. (38mm or 64mm) |
| Linkage | Plated Steel | 304SS or 316SS |
| Axle Bearings | Stainless steel sleeve | - |
| Axle Material | 3/4 in. (19mm) Plated steel | 303SS or 316SS |
| Jamb Seals | 301SS | 316SS |

* Actual Inside Dimension.

** The width dimension is ALWAYS parallel with the damper blade length.

Model HSD-401 meets the requirements for smoke dampers established by:

National Fire Protection Association
NFPA Standards 90A, 92, 101, & 105
IBC International Building Codes

"UL CLASSIFIED (see complete marking on product)"
"UL CLASSIFIED to Canadian safety standards (see complete marking on product)"
Standard 555S (Listing #R13317)

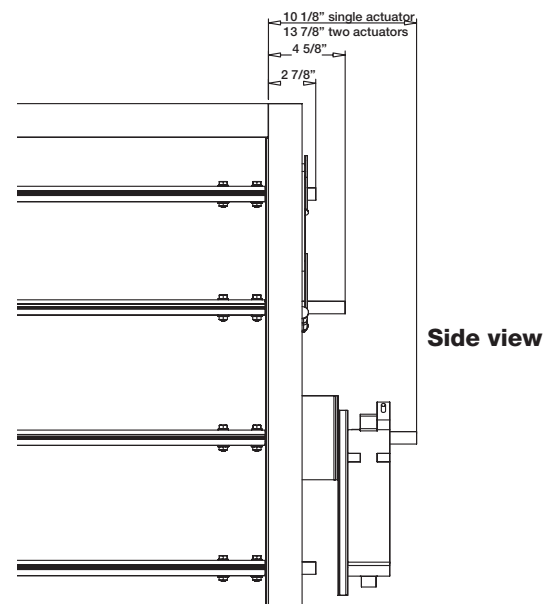
Size Limitations

| W x H | Minimum Size | Maximum Size | |
|--------|--------------|----------------|------------------|
| | | Single Section | Multiple Section |
| Inches | 6½ x 6¼ | 60 x 60 | 240 x 120 |
| mm | 165 x 159 | 1524 x 1524 | 6096 x 3048 |

Options

- Mounting holes in both flanges
- Actuators available in electric (120V, 24VAC, 230VAC) and pneumatic.

Installation instructions available at www.greenheck.com.



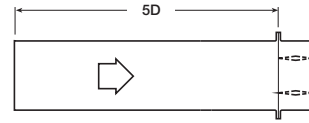
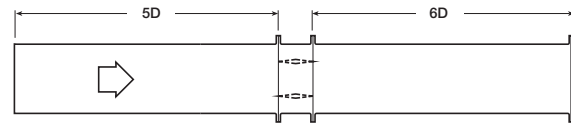
Performance Data

HSD-401

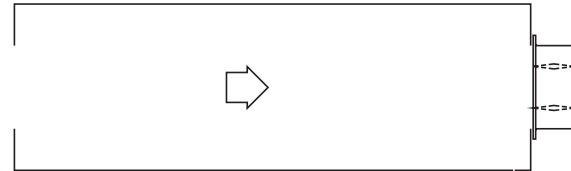
Pressure Drop Data

This pressure drop data was conducted in accordance with AMCA Standard 500-D using the three configurations shown. All data has been corrected to represent standard air at a density of 0.075 lb/ft³ (1.20 kg/m³).

Actual pressure drop found in 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.



$$D = \sqrt{\frac{4(W)(H)}{3.14}}$$



AMCA Test Figures

Figure 5.3 Illustrates a fully ducted damper. This configuration has the lowest pressure drop of the three test configurations because entrance and exit losses are minimized by straight duct runs upstream and downstream of the damper.

Figure 5.2 Illustrates a ducted damper exhausting air into an open area. This configuration has a lower pressure drop than Figure 5.5 because the entrance losses are minimized by a straight duct run upstream of the damper.

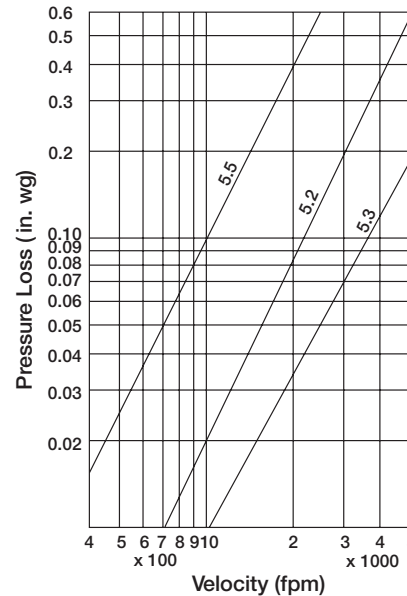
Figure 5.5 Illustrates a plenum mounted damper. This configuration has the highest pressure drop because of the high entrance and exit losses due to the sudden changes of area in the system.

Actuator Options

Actuator selection is limited to those models qualified to the specified pressures, temperatures, and velocities per UL555S. The actuators listed below have been qualified for Model HSD-401 as **fail closed** only.

| Maximum Size in. (mm) | No. of Sections | Honeywell MS4120, 4620, & 8120 |
|---|-----------------|-----------------------------------|
| Up to 3000 fpm and 6 in. wg (15.2m/s and 1.5 kPa) | | |
| 48 x 36 (1219 x 914) | 1 wide x 1 high | 1 |
| 48 x 60 (1219 x 1524) | 1 wide x 1 high | 2 |
| 48 x 120 (1219 x 3048) | 1 wide x 2 high | 4 |
| 60 x 60 (1524 x 1524) | 1 wide x 1 high | 2 |
| 96 x 60 (2438 x 1524) | 2 wide x 1 high | 2 |
| 120 x 60 (3048 x 1524) | 2 wide x 1 high | 4 |
| Up to 2000 fpm and 6 in. wg (10.2 m/s and 1.5 kPa) | | |
| 120 x 120 (3048 x 3048) | 2 wide x 2 high | 8 |
| 240 x 120 (6096 x 3048) | 4 wide x 2 high | 16 |

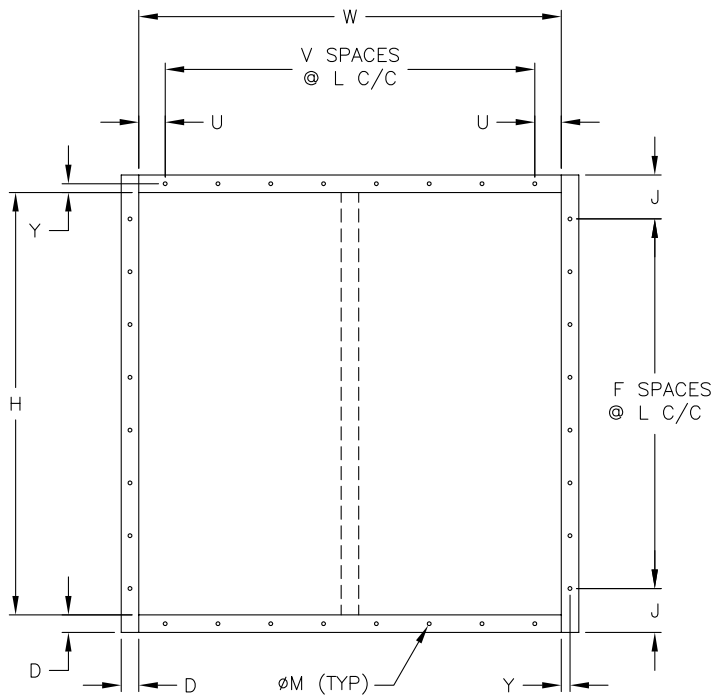
**Pressure Drop
36 in. x 36 in. (914mm x 914mm) Damper**



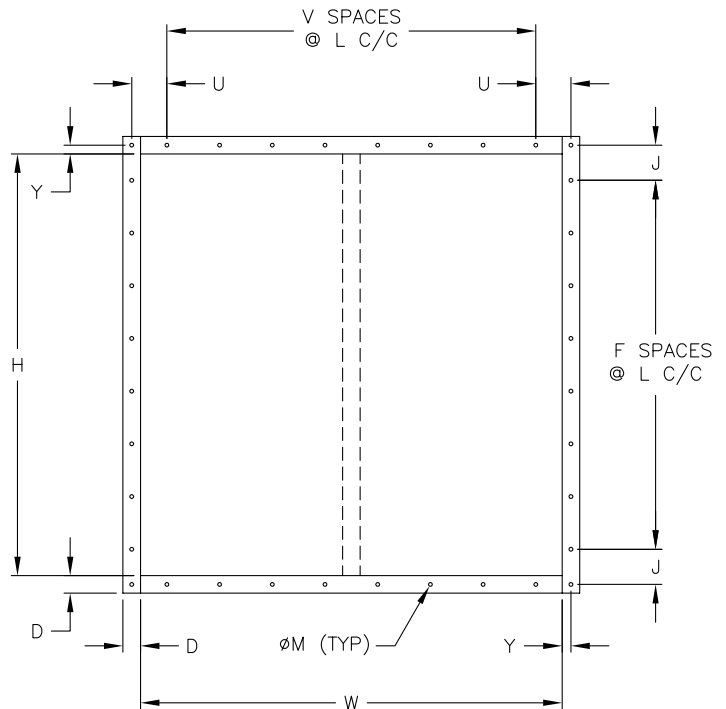
| Maximum Size in. (mm) | No. of Sections | Siemens 331-2856 |
|--|-----------------|------------------|
| Up to 3000 fpm and 6 in. wg (15.2 m/s and 1.5 kPa) | | |
| 36 x 60 (914 x 1524) | 1 wide x 1 high | 1 |
| 48 x 48 (1219 x 1219) | 1 wide x 1 high | 1 |
| 72 x 60 (1829 x 1524) | 2 wide x 1 high | 2 |
| 96 x 48 (2438 x 1219) | 2 wide x 1 high | 2 |

Mounting Holes & Specifications

Bolt holes are available as an option. Greenheck's standard pattern is 7/16 in. (11mm) diameter holes (M dimension) spaced 6 in. (152mm) on center (L dimension). Custom bolt hole patterns are available. Contact Greenheck for the limitations.



Standard Mounting Hole Pattern
Typical for single or double wide panel



Standard Mounting Hole Pattern with Corner Holes
Typical for single or double wide panel

Specifications

Industrial grade smoke control dampers meeting the following specifications shall be furnished and installed where shown on plans and/or as described in schedules. Dampers shall meet the requirements of NFPA 92 & 105 and further shall be tested, rated, and labeled in accordance with the latest edition of UL standard 555S. Smoke dampers shall be of low leakage design qualified to UL555S leakage class I.

Dampers shall consist of: a 12 ga. (2.7mm) galvanized steel channel frame with 8 in. (203mm) minimum depth and 2 in. (51mm) flanges; airfoil shaped, 6063-T5 extruded aluminum blades (0.080 in. [2mm] thick) with metal blade to blade overlap (seal to seal only contact is not acceptable); blades shall be symmetrical relative to their axle pivot point, presenting identical resistance to airflow and operation in either direction through the damper (blades that are non-symmetrical relative to their axle pivot

point are unacceptable); 3/4 in. (19mm) dia. plated steel axles turning in stainless steel sleeve bearings; and external (out of the airstream) blade-to-blade linkage.

Dampers shall be equipped with silicone rubber blade seals for low leakage performance up to 250°F (121°C) maximum. Dampers shall be equipped with flexible stainless steel jamb seals for low leakage performance.

Damper manufacturer's printed application and performance data shall include maximum pressure, velocity and temperature as qualified per UL555S, 4th edition for the maximum section and assembly size.

Damper air performance data shall be developed in accordance with the latest edition of AMCA Standard 500-D for Test Figures 5.2, 5.3 and 5.5. Basis of design is Greenheck model HSD-401.

