

Industrial Backdraft Damper

Application and Design

Model HB-230 is a heavy duty double flanged channel frame style backdraft damper with double thickness fabricated airfoil blades. It is designed to prevent backflow and to provide shut off in HVAC or industrial process systems. External heavy duty linkage, blade counterbalance, and ball bearings are standard.

Ratings (See page 2 for specific limitations)

Pressure: 6.0 - 13.5 in. wg (1.5 kPa - 3.4 kPa) - differential pressure

Velocity: 3900 - 5150 fpm (19.8 - 26.2 m/s)

Temperature: Minimum: -40°F (-40°C)
Maximum: 250°F (121°C)
Consult factory for temperature above 250°F (121°C)

Standard Construction (See page 3 for options)

Frame: 8 in. x 2 in. x 12 ga. (203mm x 51mm x 2.7mm) galvanized steel channel

Blades: Airfoil shaped, 18 ga. (1.3mm) galvanized steel double skin construction, edge pivoted, 7 in. (178mm) max. spacing.

Blade Seals: Silicone rubber.

Axles: Plated steel 3/4 in. (19mm) dia.

Linkage: External heavy duty type with galvanized steel clevis arms and plated steel tie bars & pivot pins with nylon pivot bearings.

Bearings: Galvanized steel ball press fit into frame.

Finish: Mill galvanized.

Size Limitations:

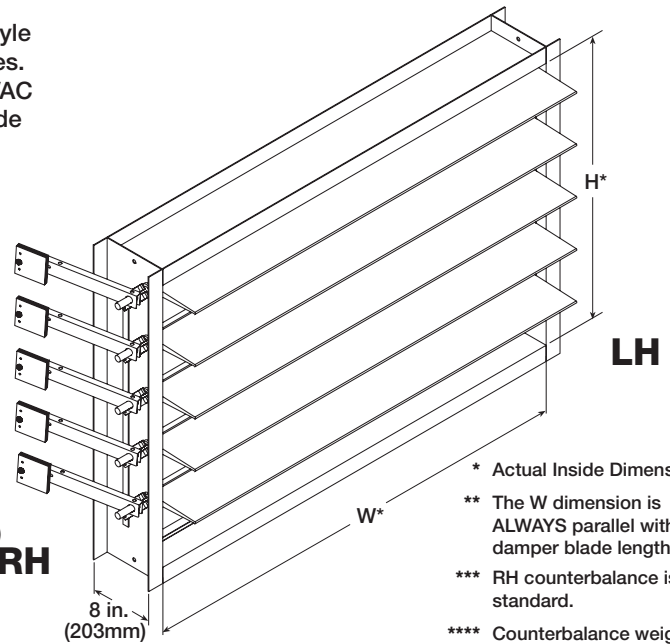
Minimum Size: Single blade 6 in. W x 6 in. H
(152mm x 152mm)

Maximum Single Section Size: 60 in. W x 96 in. H
(1524mm x 2438mm)

Maximum Double Section Size: 120 in. W x 96 in. H
(3048mm x 2438mm)

Options:

- 10 ga. (3.5mm) galvanized steel frame
- 10 ga. (3.5mm) and 12 ga. (2.7mm) 304 stainless steel frame
- 304 stainless steel blades
- 304 stainless steel axles
- Relubricable ball bearings
- Mounting holes in both flanges
- Flanges - 2 in. (51mm) standard; 1 1/2 in. - 4 in. (38mm - 102mm) optional
- 304 stainless steel linkage



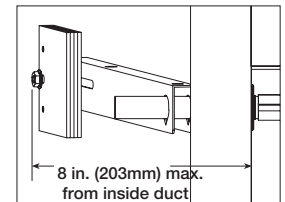
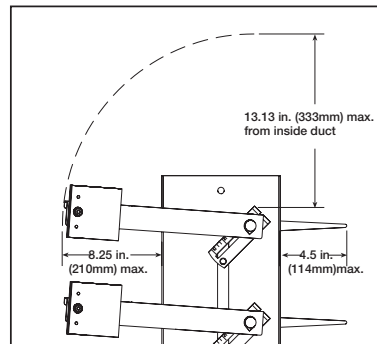
* Actual Inside Dimension.

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

*** RH counterbalance is standard.

**** Counterbalance weights extend beyond inlet flange in the open position.

Counterbalance Weight Dimensions



Front View

Side View

Advise flow direction & counterbalance weight location when ordering

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 (1.2 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.

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.

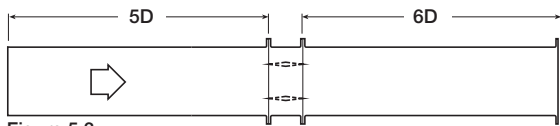


Figure 5.3

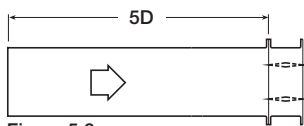


Figure 5.2

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

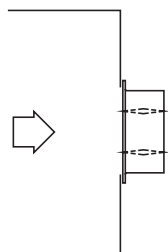
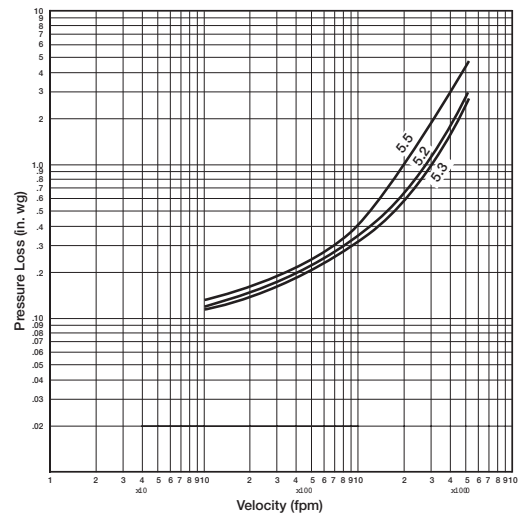


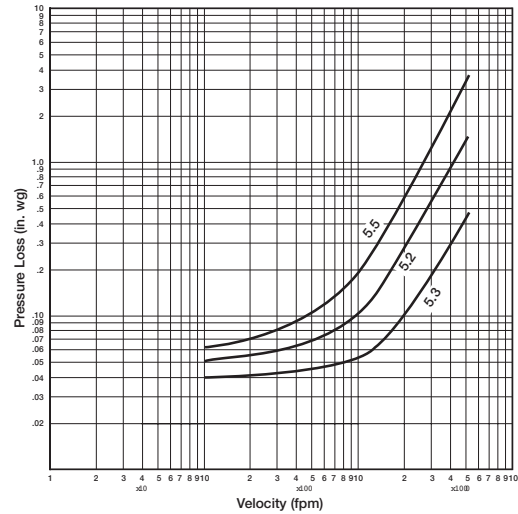
Figure 5.5

AMCA Test Figures

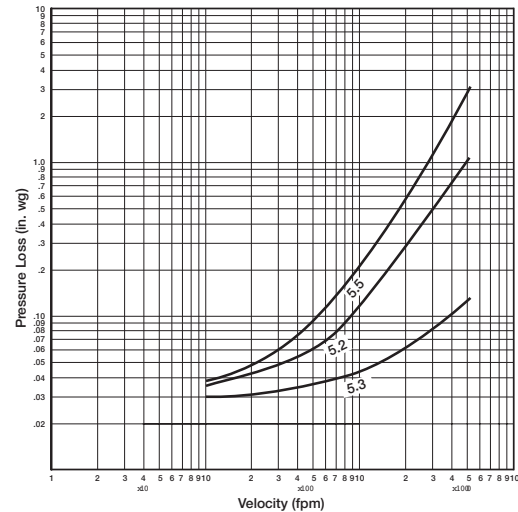
Pressure Drop
12 in. x 12 in. (305mm x 305mm) Damper



Pressure Drop
24 in. x 24 in. (610mm x 610mm) Damper



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



PERFORMANCE DATA

CONSTRUCTION OPTIONS

Pressure Limitations

The chart at the right shows conservative pressure limitations based on a maximum blade deflection of $w/360$.

Temperature Limitations

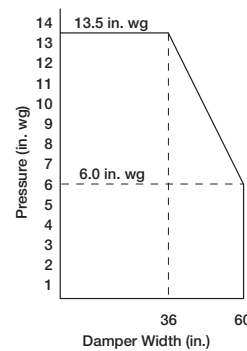
-40°F to +250°F (-40°C to 121°C)

For higher temperatures consult Greenheck

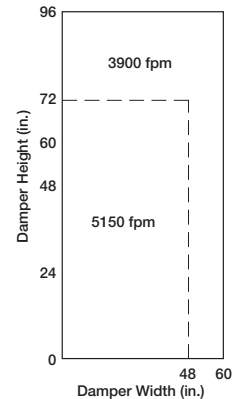
Velocity Limitations

The chart at far right shows conservative velocity limitations based on damper size.

Pressure Limitations

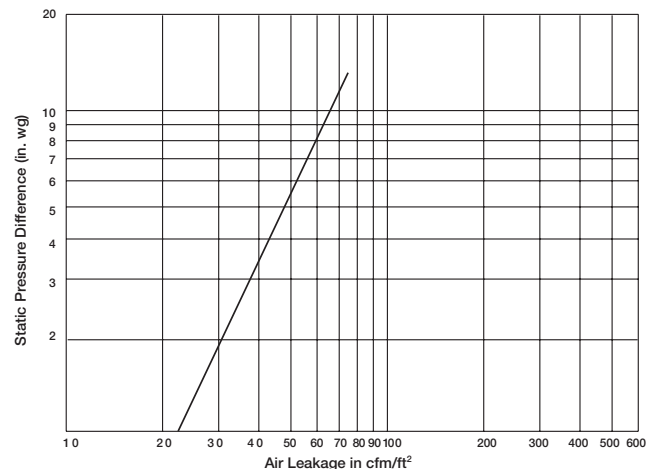


Velocity Limitations



Leakage

36 in. x36 in. (914mm x 914mm) Damper



Leakage Data

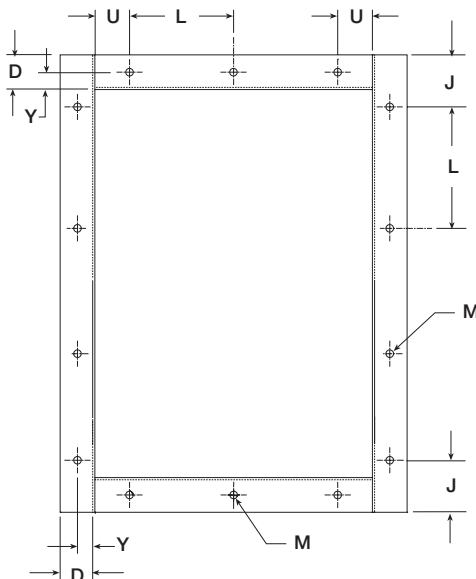
Leakage testing was conducted in accordance with AMCA Standard 500-D and is expressed as cfm/ft² of damper face area. All data has been corrected to represent standard air at a density of 0.075 lb/ft³ (1.2 kg/m³).

Frame Construction Options

Flange (D Dim.): Standard - 2 in. (51mm)
Optional - 1 1/2 in. - 4 in. (38mm - 102mm)

Frame Depth : Standard - 8 in. (203mm)
Optional - 8 in. - 12 in. (203mm - 305mm)

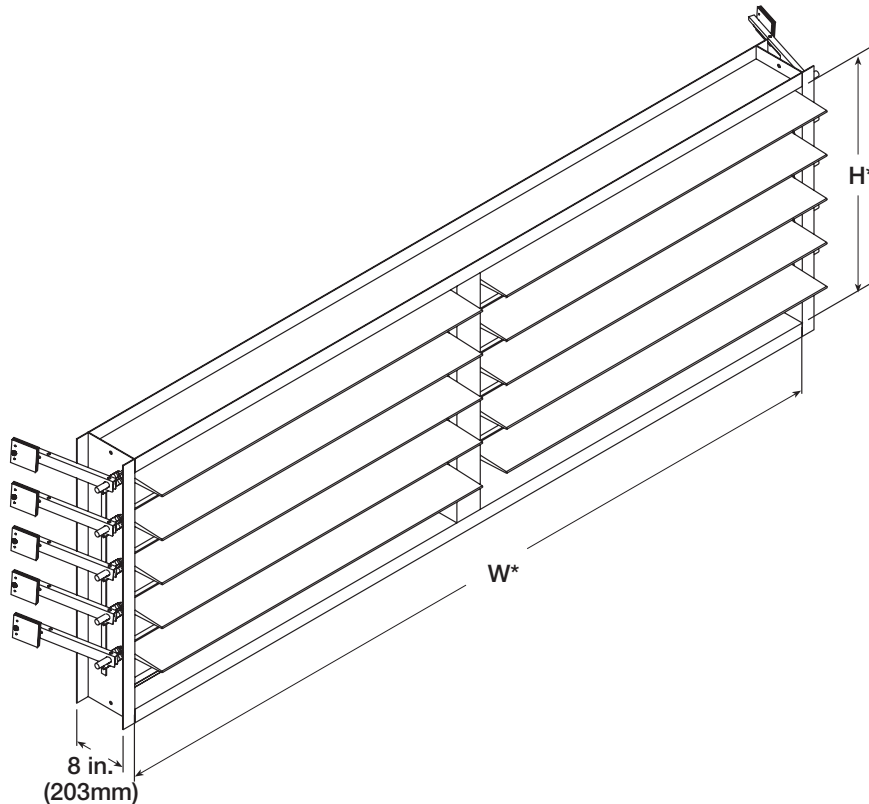
Bolt Holes: Standard - Does not include bolt holes
Optional - Greenheck recommended standard pattern.
7/16 in. (11mm) Dia. holes (M dimension)
Spaced 6 in. (152mm) C-C (L dimension)
Optional - Customer may specify within limits shown in table below.



| Dim. | Standard | (Min./Max.) | Description |
|------|---------------|-----------------------------------|---|
| J | | (1/2 min.) | First/Last Space in Jamb |
| F | | (1 min.) | No. of Holes in Jamb |
| L | 6 in. [152] | (2 in. [51] / 12 in. [305]) | Hole Spacing |
| M | 7/16 in. [11] | (1/4 in. [6] / 1 1/16 in. [17]) | Mounting Hole Diameter |
| U | | (3/4 in. [19] min.) | First/Last Space in Head/Sill |
| V | | (1 min.) | No. of Holes in Head/Sill |
| Y | D/2 in. | (3/4 in. [19] / D - 3/4 in. [19]) | Centerline of bolt hole from inside edge of frame |

Multiple Section Assembly

Damper sizes larger than 60 in. x 96 in. (1524mm x 2438mm) and up to 120 in. x 96 in. (3048mm x 2438mm) will be supplied in one frame with two sets of blades separated by a mullion as shown below. Counterbalance weights supplied on right hand and left hand side. Consult factory for sizes larger than 120 in. x 96 in. (3048mm x 2438mm).



Specifications

Industrial grade backdraft dampers meeting the following specifications shall be furnished and installed where shown on plans and/or as described in schedules.

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, 18 ga. (1.3mm) galvanized steel double skin construction blades; silicone blade seals; 3/4 in. (19mm) dia. plated steel axles turning in galvanized steel ball bearings press fit into frame; and external (out of the airstream) heavy duty linkage with counterbalance weights.

Damper manufacturer's printed application and

performance data including pressure, velocity and temperature limitations shall be submitted for approval showing damper suitable for pressures to 13.5 in. wg (3.4 kPa), velocities to 5150 fpm (26.2 m/s) and temperatures to 250°F (121°C). Testing and ratings to be in accordance with AMCA Standard 500-D.

Basis of design is Greenheck model HB-230.

