

# Industrial Backdraft Damper

*Aluminum Construction  
Corrosion Resistant  
Spark 'B' & 'C' Resistant*

## Application and Design

Model HB-110 is a heavy duty, double flanged, galvanized steel channel frame style backdraft damper with extruded aluminum 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:** 5.0 in. wg (1.2 kPa) - differential pressure

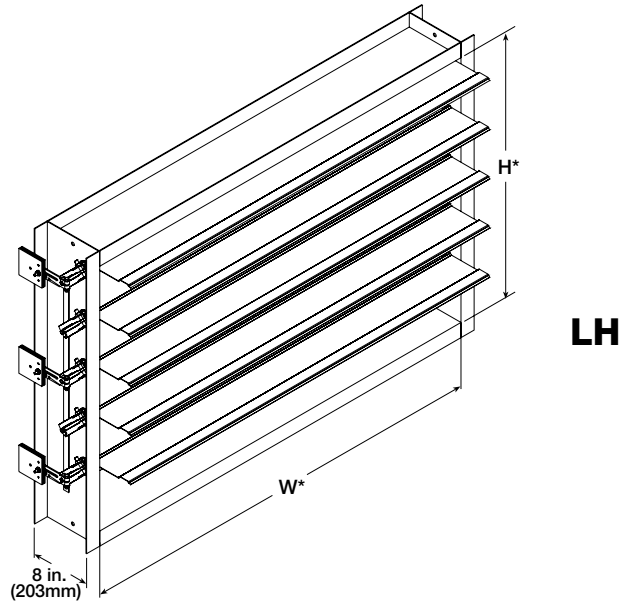
**Velocity:** 2900 - 3900 fpm (14.7 - 19.8 m/s)

**Temperature:** Minimum: -20°F (-29°C)

Maximum: 200°F (93°C)

## Standard Construction

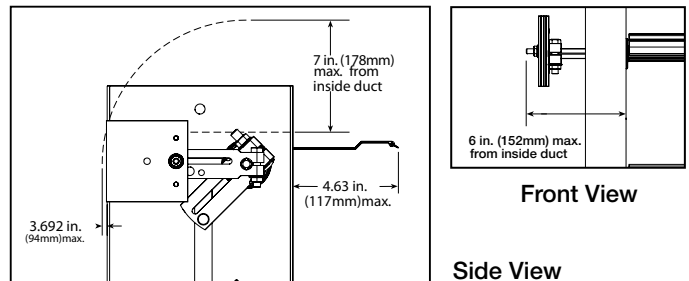
	Standard	Optional
<b>Frame Material</b>	Galvanized Steel	Aluminum, 304SS or 316SS
<b>Frame Type</b>	Flanged Channel	
<b>Frame Gauge</b>	14 ga. (2mm)	.125 in. (3mm)
<b>Frame Depth</b>	8 in. (203mm)	8 in. - 12 in. (203mm - 305mm)
<b>Blade Material</b>	Aluminum	-
<b>Blade Type</b>	Single	
<b>Blade Gauge</b>	.070 in. (1.8mm)	-
<b>Blade Seals</b>	TPE	None
<b>Flanges</b>	2 in. (51mm)	1 1/2 in. - 4 in. (38mm - 102mm)
<b>Axle Bearing</b>	Galvanized Steel Ball	Acetal with SS Ball
<b>Axle Diameter</b>	3/8 in. (9.5mm)	-
<b>Axle Material</b>	Plated Steel	304SS or 316SS
<b>Linkage</b>	External heavy duty type with steel clevis arms and plated steel tie bars & pivot pins with nylon pivot bearings	304SS or 316SS
<b>Flow Direction</b>	Horizontal	Vertical Up, Vertical Down, Angular Up, Angular Down
<b>Paint Finishes</b>	Mill Finish	Permatector™, Epoxy, Hi Pro Polyester, Industrial Epoxy



## RH

- \* 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



**Advise flow direction & counterbalance weight location when ordering**

## Size Limitations

W x H	Minimum Size	Maximum Size	
		Single Section	Multi - Section
Inches	6 x 6	48 x 96	96 x 96
mm	152 x 152	1219 x 2438	2438 x 2438

## Options:

- Mounting holes in flanges

## Pressure Limitations

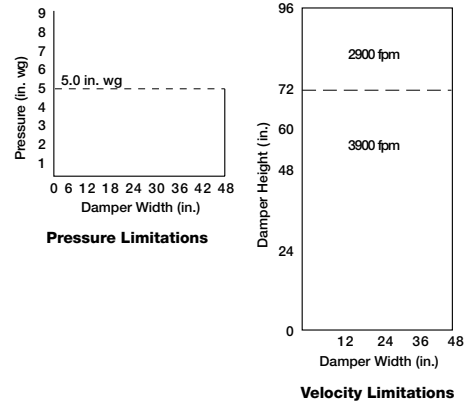
The chart at the right shows conservative pressure limitations based on a maximum blade deflection of  $w/360$ .

## Temperature Limitations

Blade seals: TPE -20° to +200°F (-29°C to 93°C)  
For higher temperatures consult Greenheck

## Velocity Limitations

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



## 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/ft<sup>3</sup> (1.2 kg/m<sup>3</sup>).

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.

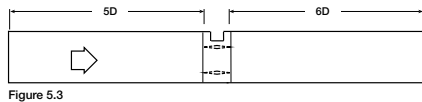


Figure 5.3

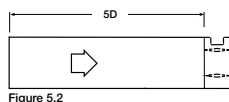


Figure 5.2

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

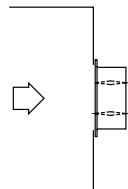


Figure 5.5

## AMCA Test Figures

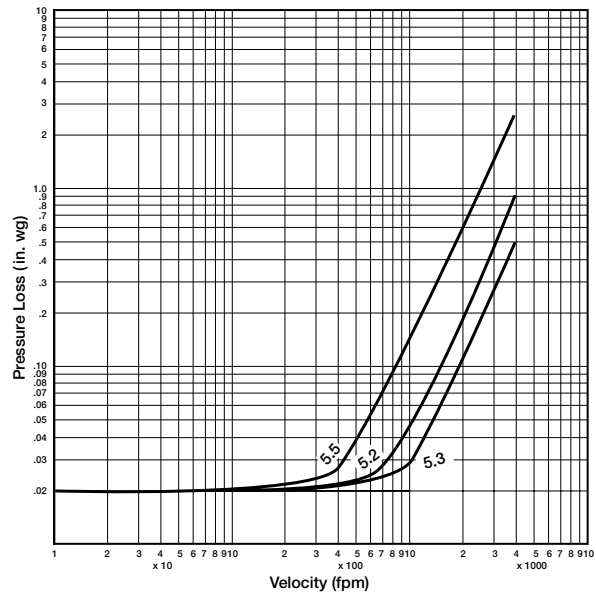
### Figure 5.5

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.

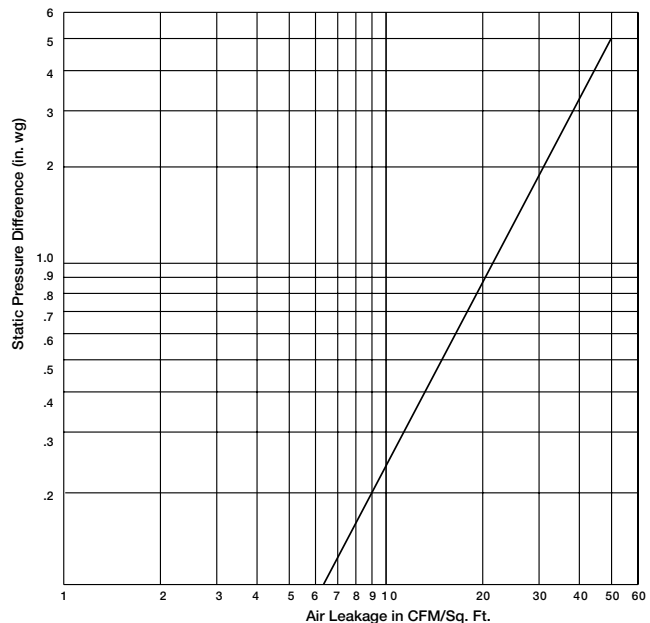
## Leakage Data

Leakage testing was conducted in accordance with AMCA Standard 500-D and is expressed as CFM per sq.ft. of damper face area. All data has been corrected to represent standard air at a density of 0.075 lb/ft<sup>3</sup> (1.2 kg/m<sup>3</sup>).

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



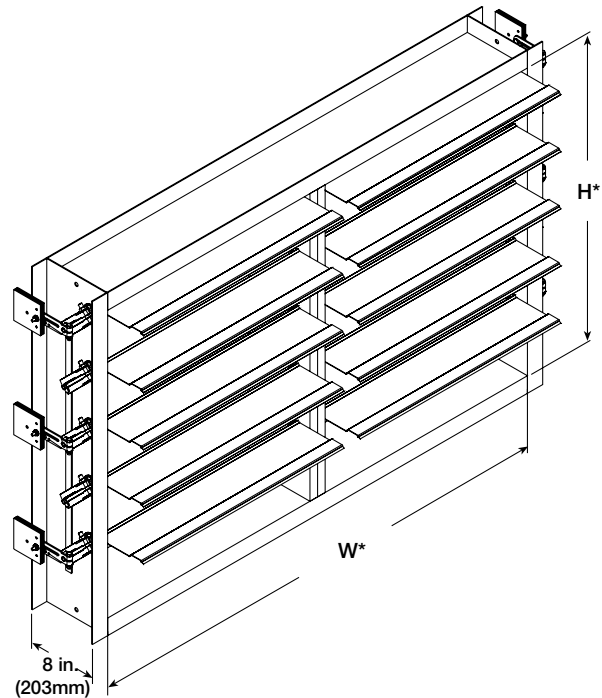
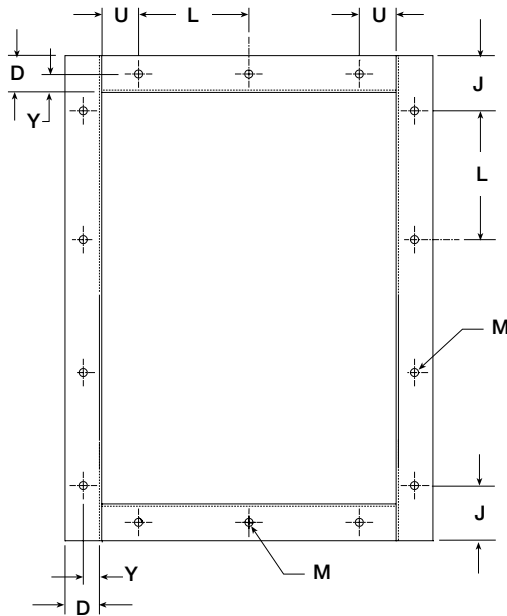
## Leakage 36 in. x 36 in. (914mm x 914mm) Damper



Mounting Hole Option		
	Standard	Optional
Mounting Holes in Flanges	None	Greenheck standard pattern (7/16 [11mm] in. diameter holes, spaced 6 in. [130mm] on center) or Customer Specified within limits shown in table below.

## Multiple Section Assembly

Damper sizes larger than 48 in. x 96 in. (1219mm x 2438mm) and less than 96 in. x 96 in. (2438mm 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. For sizes larger than 96 in. x 96 in. (2438mm x 2438mm) consult factory.



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

## 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 14 ga. (2mm) galvanized steel channel frame with 8 in. (203mm) minimum depth and 2 in. (51mm) flanges; 0.070 in. (1.8mm) thick 6063T5 extruded aluminum blades; 3/8 in. (9.5mm) dia. type 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 5.0 in. wg (1.2 kPa), velocities to 3900 fpm (19.8 m/s) and temperatures to 200°F (93°C). Testing and ratings to be in accordance with AMCA Standard 500-D.

Basis of design is Greenheck model HB-110.

