

Application and Design

Models HBS-330 and HBS-331 are heavy duty double flanged channel frame style backdraft dampers with double thickness fabricated airfoil blades. They are designed to protect against blasts and instantaneous pressure changes. External clevis type linkage and external mount relubricable ball bearings are standard. Model HBS-330 will close in the same direction as normal flow and HBS-331 will close in the opposite direction as normal flow.

Ratings

Pressure: 83 in. wg (20.7 kPa) (3 psi) - differential pressure

Velocity: 6400 fpm (32.5 m/s)

Temperature: Minimum: -40°F (-40°C)

Maximum: 250°F (121°C)

Pressure Rise or Decrease: 2 psi/second (13.8 kPa/sec)

Standard Construction

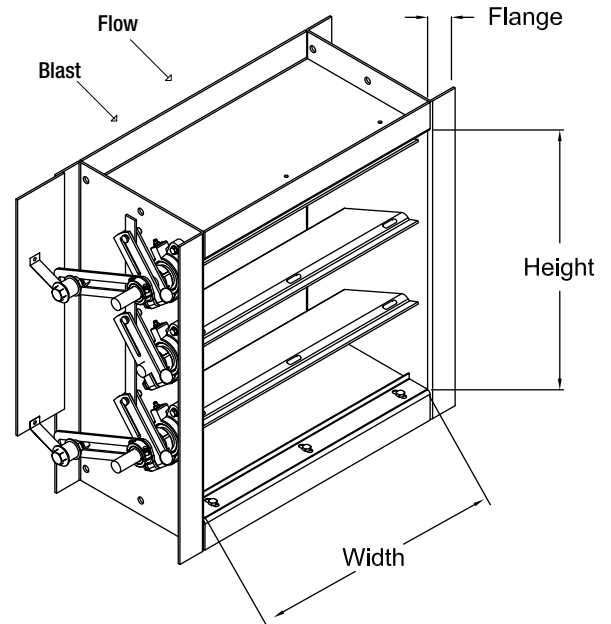
Construction	Standard	Optional
Frame Material	Galvanized steel	304SS
Frame Material Thickness	10 ga. (3.5mm)	-
Frame Type	10 in. x 2 in. (254mm x 51mm) channel	-
Blade Material	Galvanized steel	304SS
Blade Type	Airfoil	-
Blade Thickness	16 ga. (1.6mm)	-
Axle Diameter	3/4 in. (19mm)	-
Axle Material	3/4 in. (19mm) plated steel, full length	3/4 in. (19mm) 304SS
Bearings	Externally mounted relubricable ball	-
Blade Seal	None	EPDM, Silicone
Linkage Material	Galvanized steel	304SS
Flange	2 in. (51mm)	1 1/2 - 2 3/4 in. (38mm - 70mm)
Finish	Mill Galvanized	Hi Pro Polyester, Epoxy, Industrial Epoxy Mill (304SS)
Normal Airflow	Horizontal	Vertical Up or Vertical Down

Size Limitations

Size Limitations			
W x H	Minimum Size	Maximum Size	
		Single Section	Two Sections*
Inches	6 x 6	36 x 96	77 x 96
mm	152 x 152	914 x 2438	1956 x 2438

* Includes 5 in. (127mm) vertical mullion with removable cover plate

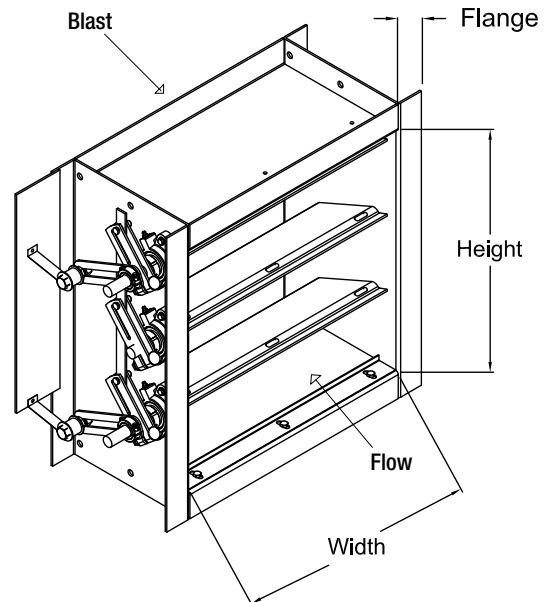
HBS-330



* Actual Inside Dimension.

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

HBS-331



Options Available:

- Bolt holes in flanges

PERFORMANCE DATA

HBS-330 & HBS-331

Pressure Drop Data - (not valid for counter flow operation)

This pressure drop data was conducted in accordance with AMCA Standard 500 using the three configurations shown. All data has been corrected to represent standard air at a density of 0.075 lb/ft³ (1.201 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.

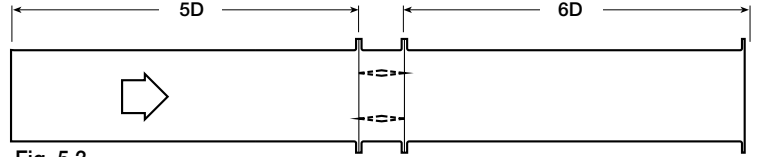


Fig. 5.3

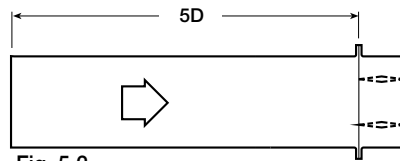


Fig. 5.2

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

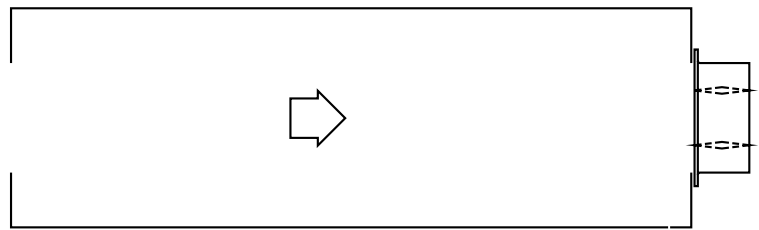
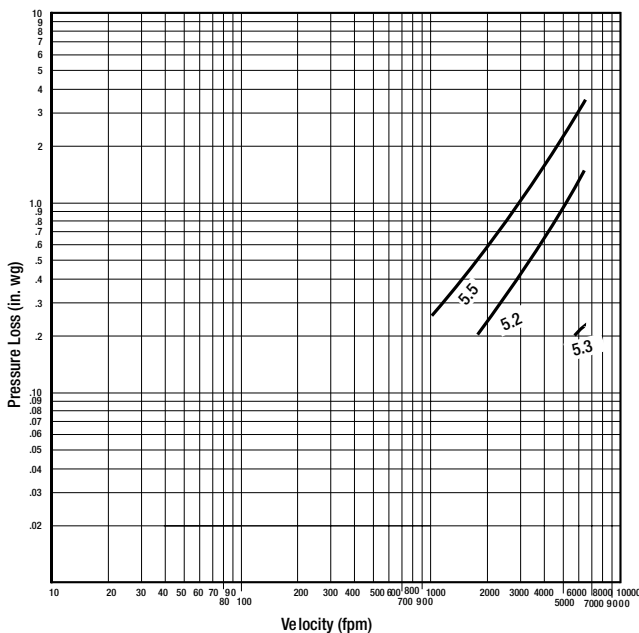


Fig. 5.5

AMCA Test Figures

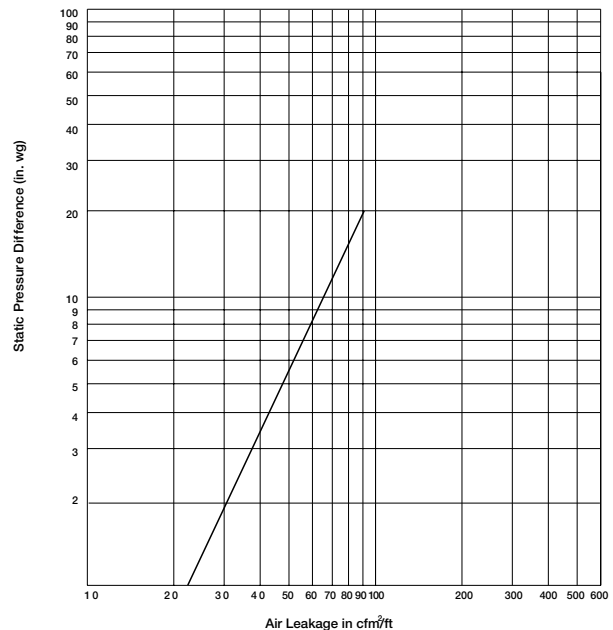
HBS-331

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



HBS-331

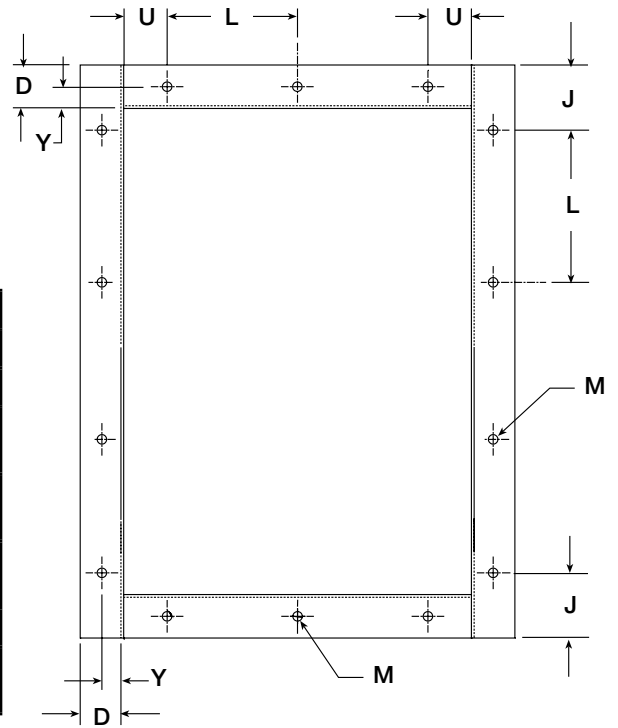
Leakage
36 in. x 36 in. Damper
(914mm x 914mm)



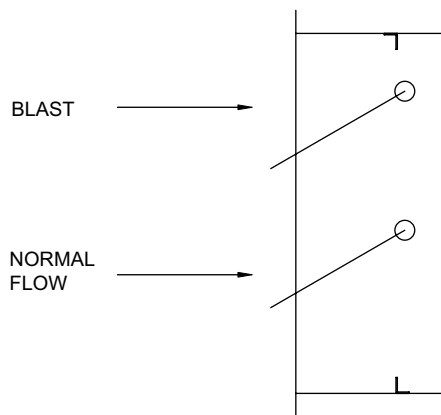
Bolt Hole Limitations

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). Also available is custom bolt hole pattern within the limitations of the chart below.

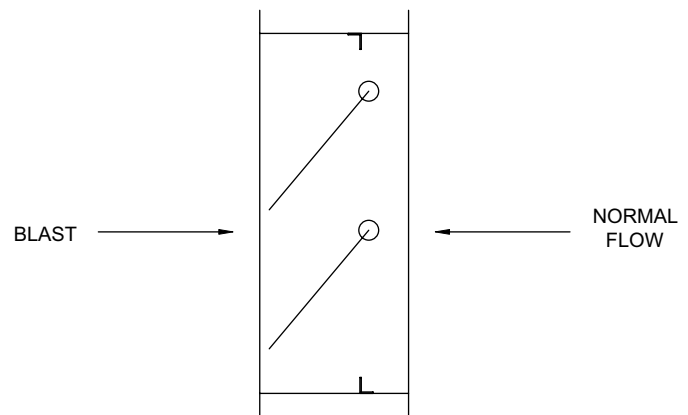
Dimension	Standard	Min./Max.	Description
J		D/2 min.	First/Last Space in Jamb
F		1 min.	No. of Holes in Jamb
L	6 in. (152mm)	2 - 12 in. (51mm - 305mm)	Hole Spacing
M	7/16 in. (11mm)	1/4 - 11/16 in. (6mm - 17mm)	Mounting Hole Diameter
U		3/4 in. min. (19mm)	First/Last Space in Head/Sill
V		1 min.	No. of Holes in Head/Sill
Y	D/2 in.	5/8 in./D - 5/8 in. (16mm/D1-6mm)	Centerline of bolt hole from inside edge of frame



Model HBS-330 and HBS-331 Difference



Model HBS-330
This model closes in the same direction as normal flow.



Model HBS-331
This model closes in the opposite direction as normal flow.

Specifications for HBS-330

Industrial grade blast 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 10 ga. (3.5mm) galvanized steel channel frame with 10 in. (254mm) minimum depth and 2 in. (51mm) flanges; airfoil shaped, 16 ga. (1.6mm) galvanized steel double skin construction blades; $\frac{3}{4}$ in. (19mm) dia. plated steel axles turning in externally mounted relubricable sealed ball bearings; and external (out of the airstream) $\frac{3}{8}$ in. (9.5mm) clevis pin linkage with adjustable constant force springs to hold blades open under normal flow conditions.

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 83 in. wg (20.7 kPa), velocities to 6400 fpm (32.5 m/s) and temperatures to 250°F (121°C). Testing and ratings to be in accordance with AMCA Standard 500.

Basis of design is Greenheck model HBS-330.

Specifications for HBS-331

Industrial grade blast 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 10 ga. (3.5mm) galvanized steel channel frame with 10 in. (254mm) minimum depth and 2 in. (51mm) flanges; airfoil shaped, 16 ga. (1.6mm) galvanized steel double skin construction blades; $\frac{3}{4}$ in. (19mm) dia. plated steel axles turning in externally mounted relubricable sealed ball bearings; and external (out of the airstream) precision $\frac{3}{8}$ in. (9.5mm) clevis pin 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 83 in. wg (20.7 kPa), velocities to 6400 fpm (32.5 m/s) and temperatures to 250°F (121°C). Testing and ratings to be in accordance with AMCA Standard 500.

Basis of design is Greenheck model HBS-331.

