



HBT-221

Bubble Tight Damper

Application and Design

The HBT-221 is heavy duty rectangular damper designed for isolation and decontamination applications. The damper has bubble tight leakage performance per AMCA 500-D up to 10 in. wg (2.5 kPa). The damper frame is flanged for easy mounting and the blade seal is mechanically fastened to the blade.

Ratings

Leakage: Bubble tight per AMCA 500-D

Pressure: 10 in. wg (2.5 kPa) - differential pressure

Velocity: 4000 ft/min. (20.3 m/s)

Temperature: -40° to 250°F (-40°C to 121°C)

Construction

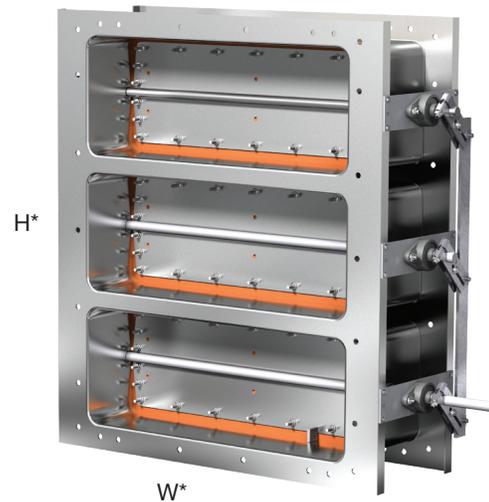
	Standard	Optional
Frame Depth (C)	Size Dependent (see chart)	
Frame Material	Painted	304SS, 316SS
Frame Type	Flanged Channel	
Frame Thickness	12 ga. (2.7mm)	-
Flange Width (D)	2 in. (51mm)	2 - 3 in. (51 - 76mm)
Blade Action	Parallel	-
Blade Material	Painted	304SS, 316SS
Blade Seals	Silicone	-
Blade Thickness*	12 ga. (2.7mm)	-
Blade Type	Rectangular Butterfly	
Linkage	Plated steel	304SS, 316SS
Axle Diameter**	¾ in. (19mm) or 1 in. (25mm)	-
Axle Bearing	Outboard Ball	-
Axle Material	Plated Steel	303SS, 316SS
Axle Seals	Double gland stuffing box	-
Paint Finishes	Hi Pro Polyester	Industrial Epoxy, Mill finish (304SS or 316SS)
Mounting Holes	None	Standard; Standard with corner holes

* with 12 ga. backing plate

** Axle diameter is based on damper size, required torque, and actuator selection. Consult factory for specific information.

Options

- Wide range of actuators available
- Mounting holes in flanges



* Actual inside dimension. The W dimension is ALWAYS parallel with the damper blade length. Axles must always be in the horizontal plane.

Size Limitations

W x H	Minimum Size	Maximum Size			
		1 Blade	2 Blades	3 Blades	4 Blades
Inches	6 x 6	48 x 14	48 x 25½	48 x 39	48 x 52
mm	152 x 152	1219 x 356	1219 x 648	1219 x 991	1219 x 1321

Frame Depth

Damper Height Inches (mm)		Number of Blades			
		1	2	3	4
Above	Through	Frame Depth - Inches (mm)			
5.99 (152)	8 (203)	8 (203)	-	-	-
8 (203)	10 (254)	10 (254)	-	-	-
10 (254)	12 (305)	12 (305)	-	-	-
12 (305)	14 (356)	14 (356)	-	-	-
14 (356)	17½ (445)	-	8 (203)	-	-
17½ (445)	21½ (546)	-	10 (254)	-	-
21½ (546)	25½ (648)	-	12 (305)	-	-
25½ (648)	27 (686)	-	-	8 (203)	-
27 (686)	33 (838)	-	-	10 (254)	-
33 (838)	39 (991)	-	-	12 (305)	-
39 (991)	44½ (1130)	-	-	-	10 (254)
44½ (1130)	52 (1321)	-	-	-	12 (305)

Performance Data

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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 .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 the 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.

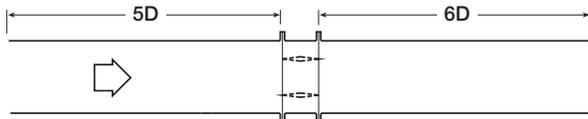


Fig. 5.3

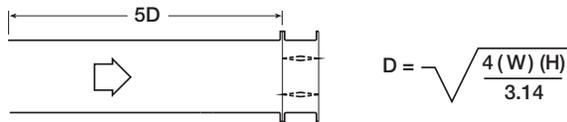


Fig. 5.2

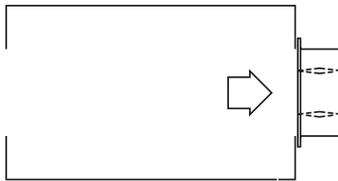
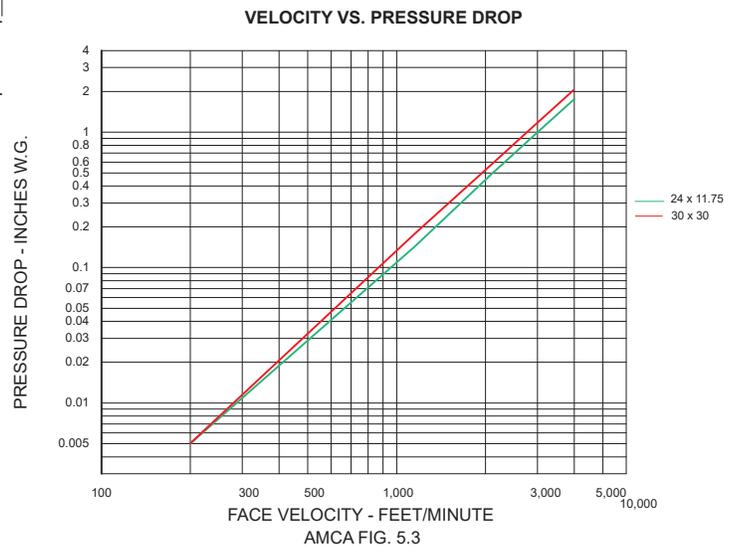


Fig. 5.5



Leakage

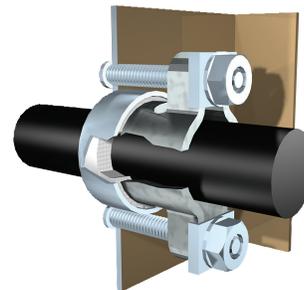
Every HBT-221 is leakage tested at 10 in. wg (2.5 kPa) in accordance with AMCA 500-D before it leaves the factory. The HBT-221 does not ship unless it meets the requirements of the standard.

Bearings and Axle Seal



Relubricable Ball Bearing

The relubricable ball bearing features a flanged cast iron housing that is bolted externally to the damper frame. Capable of high radial loads, this bearing can be applied in applications with high pressures or velocities. Seals protect the bearings' balls from the environment, making this bearing a better choice for application in dirty environments. External grease zerks allow for easy relubrication of the bearing.



Double Gland Stuffing Box

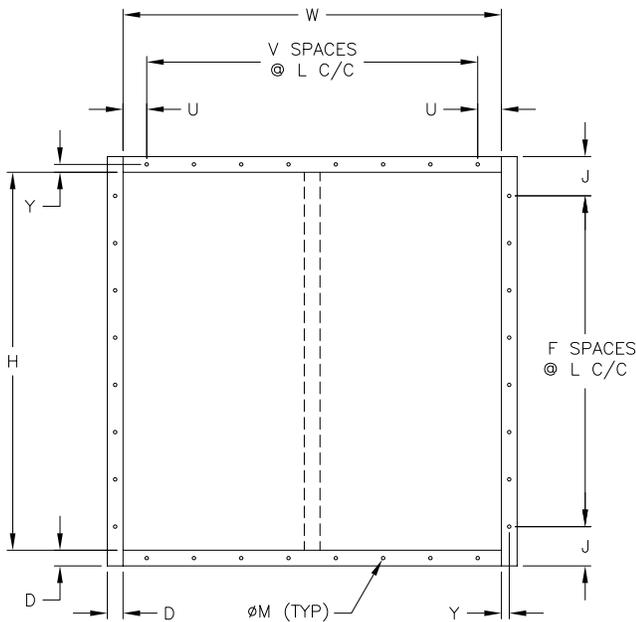
The double gland stuffing box is recommended for clean air, contaminated air, and high temperatures.

Specifications

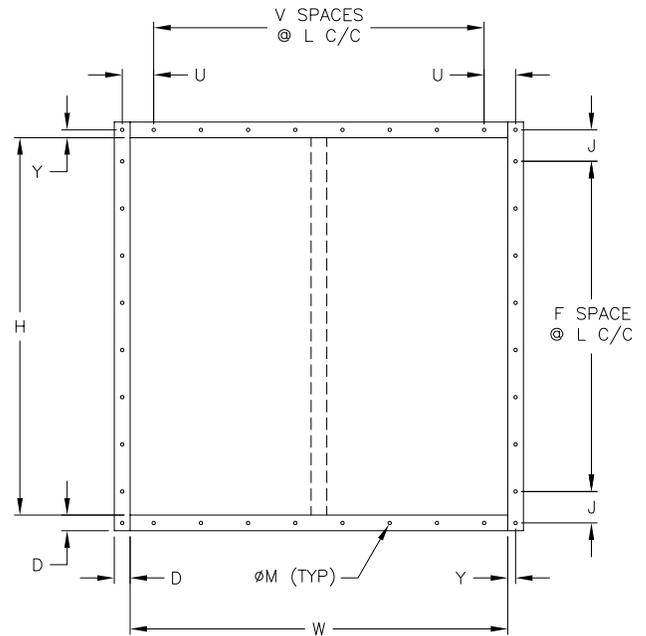
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Mounting Holes

Bolt holes are available as an option. The standard pattern is 7/16 in. (11mm) diameter holes (M dimension) spaced 4 in. (102mm) on center (L dimension). Custom bolt hole patterns are available. Contact factory 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 isolation 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 12 in. (305mm) depth and 2 in. (51mm) flanges; double skin blade from 12 ga. (2.7mm) galvanized steel with solid silicone blade seal. Blade seal shall be mechanically fastened to the blade and be field replaceable. Axles shall be 3/4 in. (9.5mm) dia. plated steel axles turning in outboard ball bearing. Double gland stuffing box shall prevent leakage around the axle.

Each damper shall be tested in accordance to AMCA Standard 500-D Bubble Tight test at 10 in. wg (2.5kPa) prior to shipping.

Damper manufacturer's printed application and performance data including pressure and velocity limitations shall be submitted for approval showing damper suitable for pressures up to 10 in. wg (2.5 kPa), velocities up to 4000 ft/min. (20.3 m/s), and temperatures to 250°F (121°C) maximum.

Basis of design is model HBT-221.