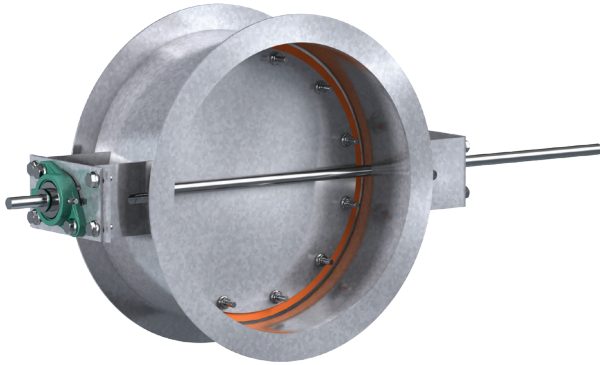


Application

The HBTR-451 is an isolation damper designed for isolation and decontamination applications. The damper has bubble tight leakage performance per AMCA 500-D up to 30 in. wg (7.5 kPa). The damper frame is flanged for easy mounting and the blade seal is mechanically fastened to the blade.



*Actual Inside Dimension

Construction	Standard	Optional
Frame Material	Painted Steel	304SS or 316SS
Frame Type	Flanged Channel	
Blade Material	Painted Steel	304SS or 316SS
Blade Type	Reinforced butterfly, field removable	
Blade Seals	Silicone rubber, field replaceable	
Blade Stop	full-open and full-close stops	
Axle Material	Plated Steel	303SS or 316SS
Axle Seal	Double gland	
Bearings	Relubricable ball, outboard mounting	
Flanges	Round	Square
Paint Finish	Hi Pro Polyester	Industrial Epoxy, Mill finish (304SS or 316SS)

Ratings

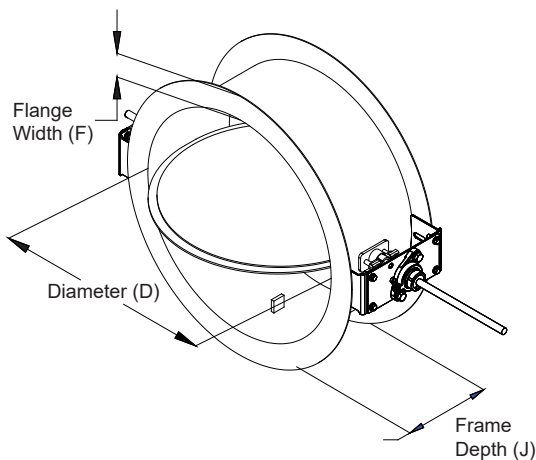
- Leakage:** Bubble tight per AMCA 500-D
- Pressure:** Up to 30 in. wg (7.5 kPa) - differential pressure
- Velocity:** Up to 6500 fpm (33 m/s)
- Temperature:** -40°F to 250°F (-40°C to 121°C)

Available Size:

- Minimum Size:** 6 in. (152mm) diameter
- Maximum Size:** 48 in. (1219mm) diameter

Options:

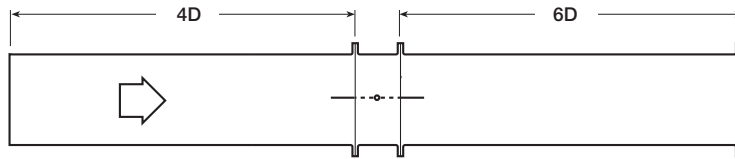
- Mounting holes in flanges
- Actuators
- Limit switches
- Special construction
- Temperatures greater than 250°F (121°C), consult factory.



Diameter (D) Inches (mm)		Frame Depth J Inches (mm)	Frame & Flange gauge (mm)	Flange Width F Inches (mm)	Axle Diameter Inches (mm)	Blade Thickness gauge (mm)
Above	Through					
5.906 (150)	12 (305)	6 (152)	12 (2.7)	1.5 (38)	0.75 (19)	12 (2.7)
12 (305)	18 (457)	8 (203)	10 (3.5)	1.5 (38)	.75 (19)	10 (3.5)
18 (457)	24 (610)	8 (203)	10 (3.5)	1.5 (38)	1 (25)	10 (3.5)
24 (610)	27 (686)	8 (203)	.188 (4.8)	2 (51)	1 (25)	10 (3.5)
27 (686)	35 (889)	8 (203)	.188 (4.8)	2 (51)	1.25 (32)	10 (3.5)
35 (889)	39 (991)	8 (203)	.188 (4.8)	2 (51)	1.25 (32)	10 (3.5)
39 (991)	42 (1067)	8 (203)	.188 (4.8)	2 (51)	1.5 (38)	10 (3.5)
42 (1067)	48 (1219)	8 (203)	.25 (6)	2 (51)	1.5 (38)	.188 (4.8)

AMCA Test Figure 5.3

Figure 5.3 illustrates a fully ducted damper. This configuration has low pressure drop because entrance and exit losses are minimized by straight duct runs upstream and downstream of the damper.



Pressure Drop Data

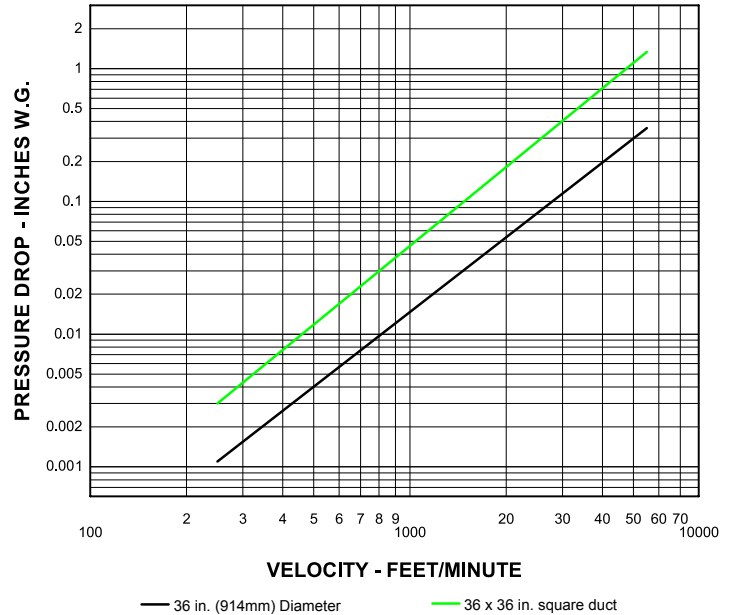
This pressure drop data was conducted in accordance with AMCA 500-D using Test Figure 5.3. All data has been corrected to represent standard air at a density of 0.075 lb/ft³ (1.2 kg/m³).

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.

Leakage

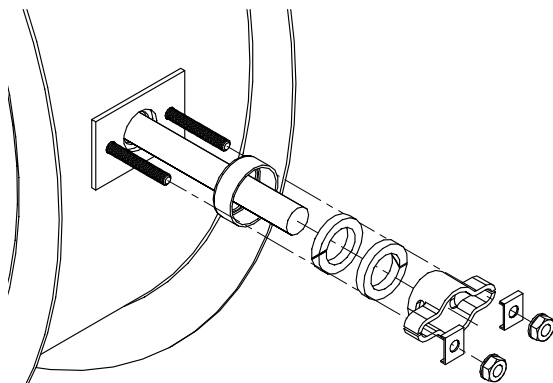
Every HBTR-451 is leakage tested at 30 in. wg (7.5 KPa) in accordance with AMCA 500-D before it leaves the factory. Greenheck does not ship a HBTR-451 unless it meets the requirements of the standard.

HBTR-451 Pressure Drop
36in. (914mm) dia. Damper



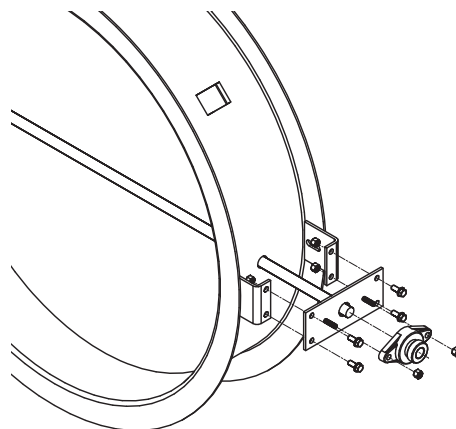
Axle Seal Detail

The double gland axle seal is mounted externally for easy access and provides bubble tight performance.



Bearing Detail

The ball bearings are mounted outboard for easy access. The bearing comes with a grease fitting, allowing for easy lubrication (axle seals included but not shown in bearing detail).



Mounting Holes

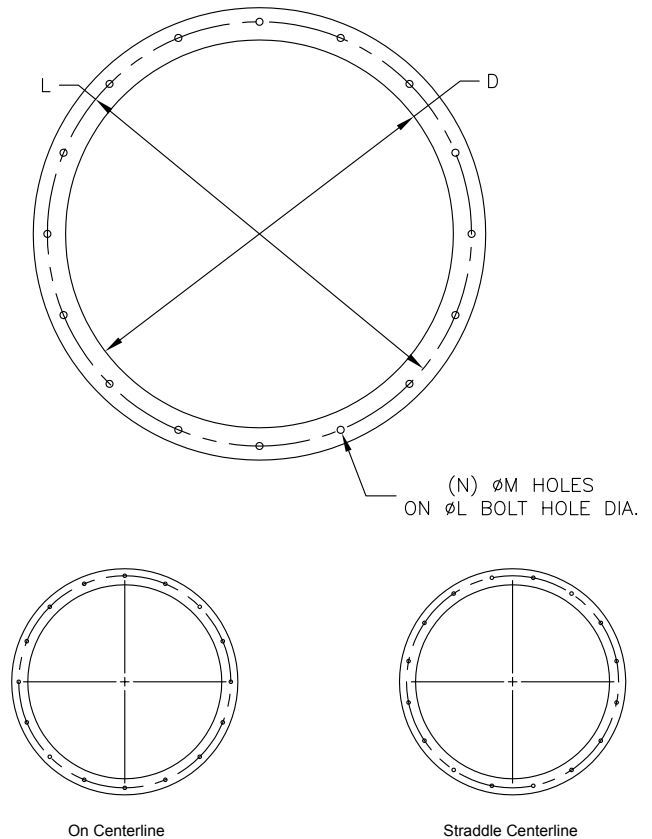
Standard - Does not include mounting holes

Optional - Bolt holes in both flanges

Greenheck recommended bolt hole pattern is shown in the table below. Customer must specify bolt holes that are parallel to the axle centerline (P) or that straddle the axle centerline (S) as shown in the diagrams below. Greenheck can also provide bolt hole sizes and patterns other than those shown below.

Greenheck Recommended Bolt Hole Pattern (Bolt Holes Parallel to Axle Centerline)					
Diameter Inches (mm)		Number of Holes	Mounting Hole Diameter in. (mm) N	Bolt Circle Diameter L	Degrees Between Holes
Above	Through				
6 (152)	8 (203)	4	$\frac{3}{8}$ (9.5)	*	90
8.001 (203)	18 (457)	8	$\frac{7}{16}$ (11)	*	45
18.001 (457)	24 (610)	12	$\frac{7}{16}$ (11)	*	30
24.001 (610)	36 (914)	16	$\frac{7}{16}$ (11)	*	22½
36.001 (914)	48 (1219)	24	$\frac{7}{16}$ (11)	*	15

* Bolt Circle Diameter = Damper Diameter + Flange Height + ¼ in. (6mm)



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 round flanged frame, reinforced axle, double skin blade, and single removable circular blade fabricated from steel with Hi Pro Polyester finish. Damper axle shall be pivoting in relubricable ball bearings bolted outboard of damper frame. Axle seal shall be double gland. Dampers shall be equipped with silicone rubber blade seals for bubble tight leakage performance up to 250°F (121°C) maximum.

Each damper shall be tested in accordance to AMCA Standard 500-D Bubble Tight Test at 30 in. wg (7.5 kPa) 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 30 in. wg (7.5 kPa), velocities up to 6500 fpm (33 m/s), and temperatures to 250°F (121°C) maximum.

Frame gauge, blade gauge, and axle diameters shall be equal to or exceed those of the model which is the basis of design.

Basis of design is model HBTR-451.

