

Model VCD-43
Ultra Low Leakage
Aluminum Frame Construction

Application and Design

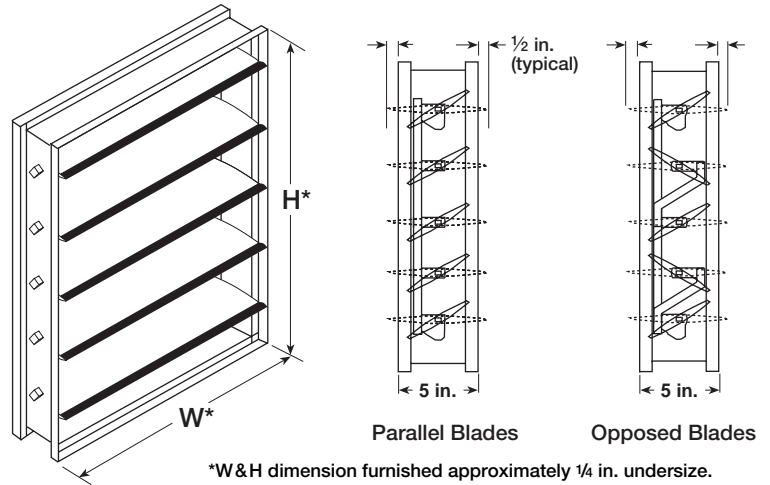
The VCD-43 is an extremely low leakage damper designed to meet the highest standards established for commercial control dampers. The VCD-43 is intended for application in medium to high pressure and velocity systems.

Ratings (See page 3 for specific limitations)

- Pressure:** 2.0 - 6.0 in. wg - pressure differential.
- Velocity:** 3000 to 6000 fpm.
- Leakage:** 6 cfm/ft² @ 4 in. wg
- Temperature:** 180°F.

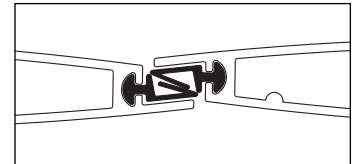
Standard Construction

- Frame:** 5 in. x 1 in. aluminum hat channel, 0.125 in. min. wall thickness. Low profile head and sill on dampers 16 in. high and smaller.
- Blades:** Heavy gauge extruded aluminum, airfoil shape with metal blade to blade overlap. 6 in. maximum depth.
- Linkage:** Side linkage out of airstream (concealed in frame).
- Seals:** Extruded silicone rubber blade seals. Stainless steel compression type jamb seals.
- Axles:** 1/2 in. dia. plated steel. Removable control shaft extends 6 in. beyond frame.
- Bearings:** Synthetic (acetal) sleeve type.



Blade Overlap

Blades overlap to provide added resistance to leakage. When pressure increases, the blade seals are forced together creating a tighter seal.



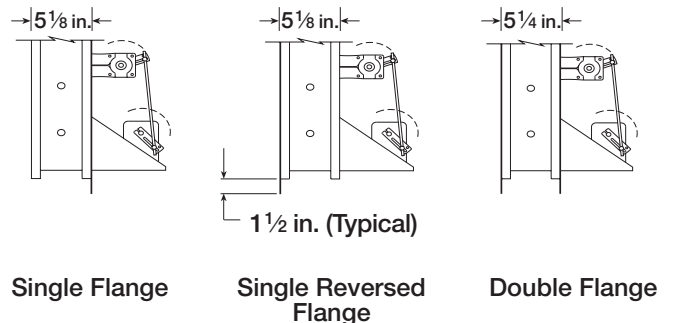
Size Limitations

- Minimum Size:** One Blade 6 in. W x 6 in. H
Two Blade 6 in. W x 10 in. H
- Maximum Size:** Single Section 60 in. W x 74 in. H
Multiple section size unlimited

Features

- Airfoil (streamlined) blade shape for reduced turbulence and lower pressure drop at velocities to 6000 fpm.
- Blade tips overlap to increase sealing and provide excellent structural rigidity against pressures.
- Blade seals - pressure activated to produce tighter sealing. As pressure increases, sealing increases.
- Wide range of electric and pneumatic actuators available. Factory installation available.

Flange Options



Mark	Qty.	W	H	Blades		Flange Arrangements	Remarks
				Parallel	Opposed		

Project	Location
Contractor	Design Specifier

This pressure drop testing 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.

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.

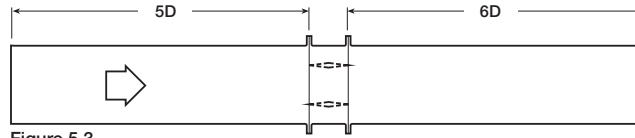


Figure 5.3

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 entrance losses are minimized by a straight duct run upstream of the damper.

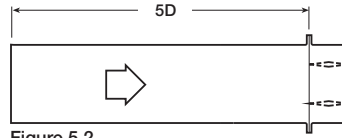


Figure 5.2

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

Figure 5.5 Illustrates a plenum mounted damper. This configuration has the highest pressure drop because of extremely high entrance and exit losses due to the sudden changes of area in the system.

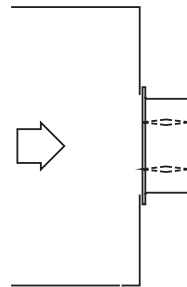
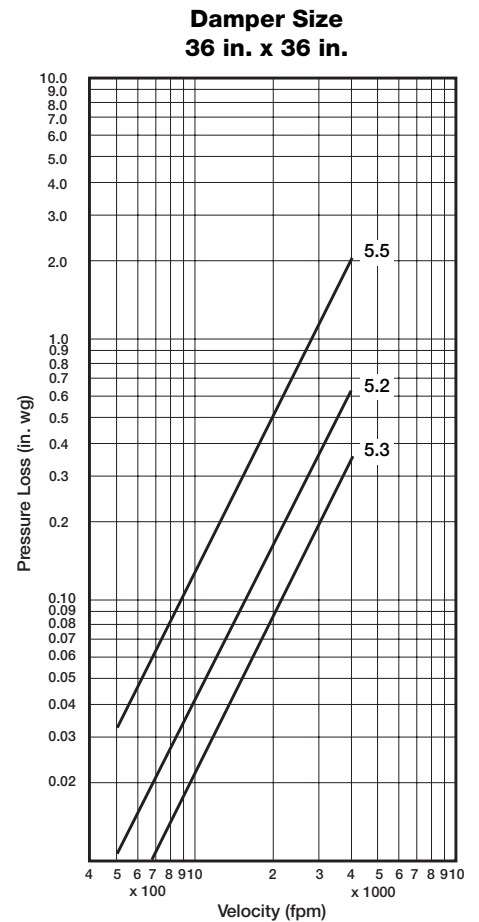
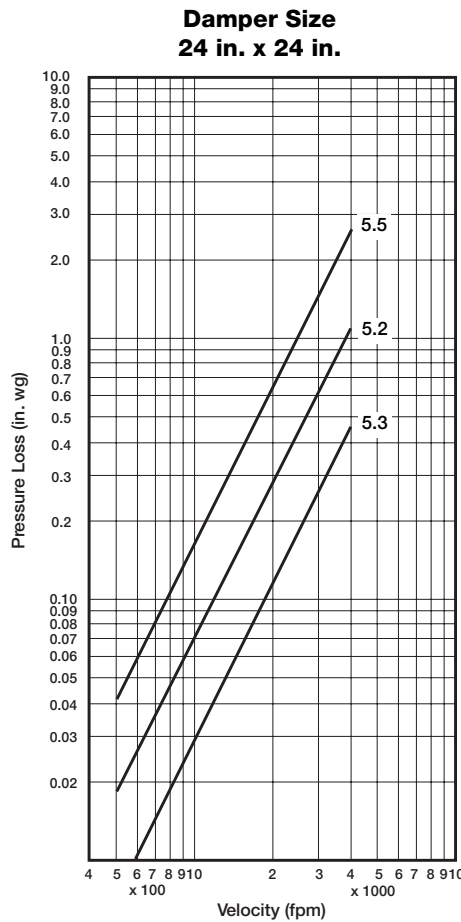
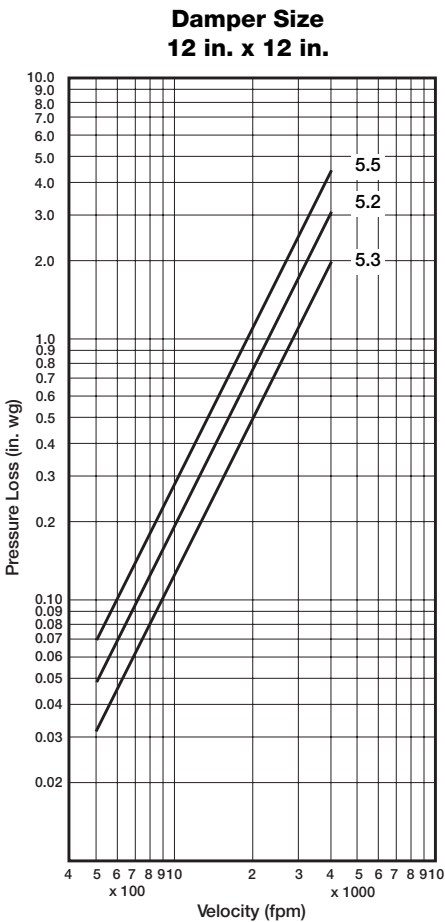
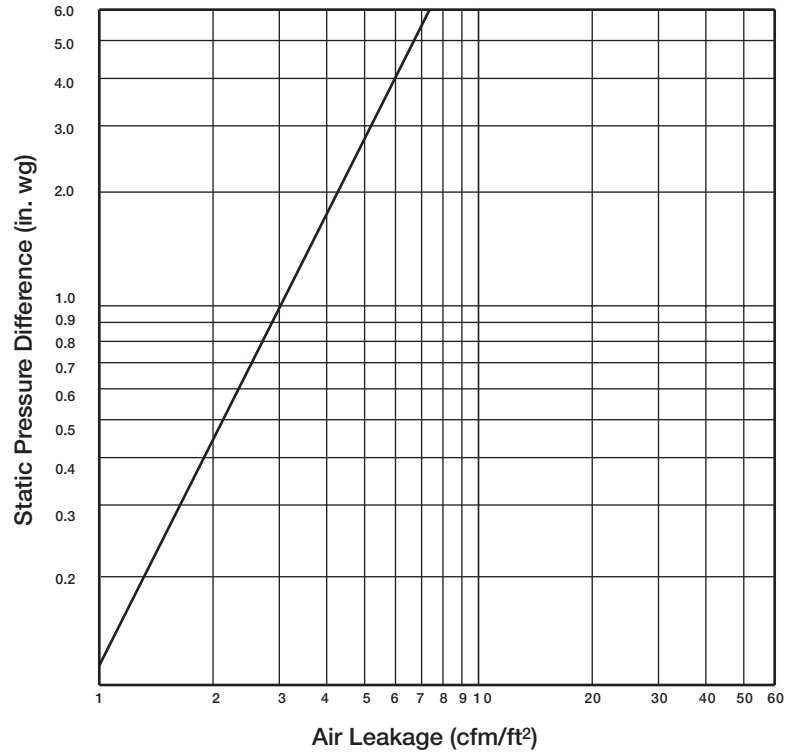


Figure 5.5



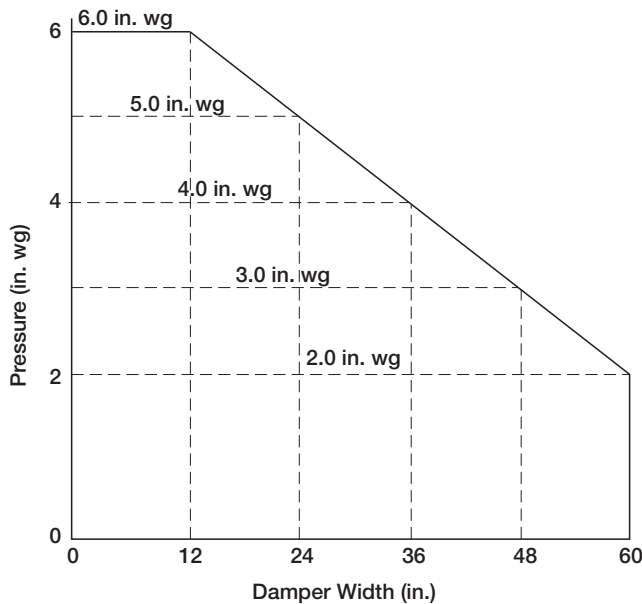
Leakage Data

Damper leakage (with blades fully closed) varies based on the type of low leakage seals applied. Model VCD-43 is available with silicone blade seals and aluminum jamb seals (standard) or optional stainless steel jamb seals. Leakage testing was conducted in accordance with AMCA Standard 500 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.

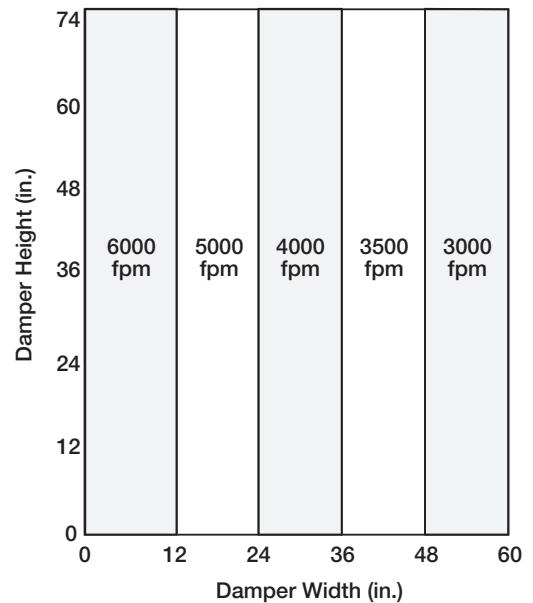


Selection Criteria

Pressure Limitations



Velocity Limitations



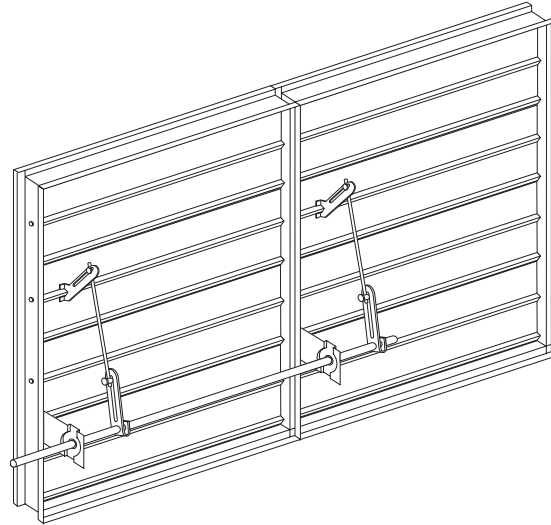
NOTE: VCD-43 will withstand higher pressures and velocities. Displayed ratings are conservative to prevent misapplication. Consult Greenheck if you have an application outside these limitations.

Temperatures in excess of 180°F require special consideration.

Multi-Section Assembly

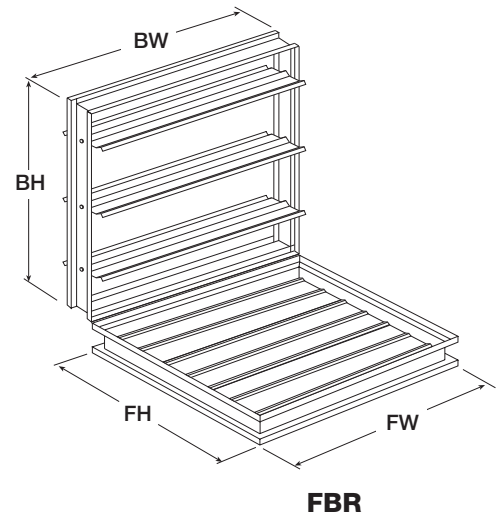
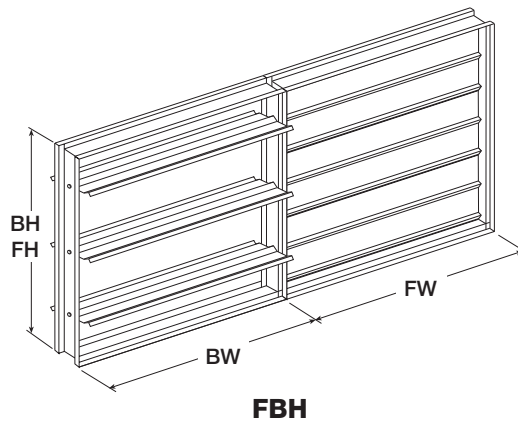
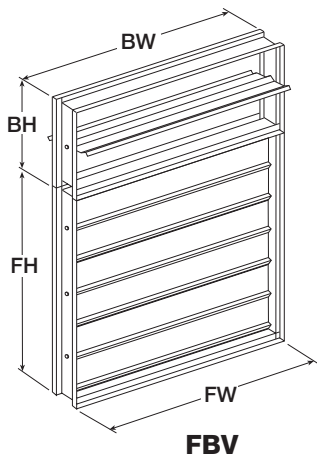
Dampers larger than the maximum single section size, will be made up of a multiple of equal size sections. Multiple section dampers can be jackshafted together so that all sections operate together as shown below.

NOTE: Dampers larger than 60 in. x 74 in. are not intended to be structurally self supporting. Additional horizontal bracing is recommended to support the weight of the damper and vertical bracing should be installed as required to hold against system pressure.



Face and Bypass Configurations

VCD-43 series control dampers can be assembled for face and bypass configurations. Face and bypass dampers are available in vertical, horizontal and right angle arrangements as shown below.



Specifications

Control dampers meeting the following specifications shall be furnished and installed where shown on plans and/or as described in schedules. Dampers shall consist of: heavy gauge aluminum frame (0.125 in. thick) with 5 in. depth formed into a structural hat channel shape with reinforced corners; airfoil shaped, extruded aluminum blades (0.063 in. thick) with metal blade to blade overlap (seal to seal only contact is not acceptable); blades shall be completely symmetrical relative to their axle pivot point, presenting identical resistance to airflow and operation in either direction through the damper (blades that are non-symmetrical relative to their axle pivot point or utilize blade stops larger than 1/2 in. are unacceptable); 1/2 in. dia. plated steel axles turning in synthetic (acetal) sleeve bearings; mechanically fastened extruded silicone rubber blade seals for 400°F maximum temperature; flexible stainless steel jamb seals; and external

(out of the airstream) blade-to-blade linkage. 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 6 in. wg, velocities to 6000 fpm and temperatures to 180°F. Damper air performance data shall be developed in accordance with the latest edition of AMCA Standard 500-D for Test Figures 5.2, 5.3 and 5.5. Basis of design is Greenheck model VCD-43.

Damper manufacturer's printed performance data showing standard air leakage less than 6 cfm/ft² @ 4 in. wg in either direction through the damper shall be submitted for approval. Testing and ratings shall be developed in accordance with the latest edition of AMCA Standard 500-D.