

## Application

VCD-33V is a low leakage damper with vertical blade orientation designed to meet the highest standards established for commercial control dampers. The VCD-33V is intended for application in medium to high pressure and velocity systems.

This model is also IECC (International Energy Conservation Code) compliant with a leakage rating of 3 cfm/ft<sup>2</sup> at 1 in. wg (55 cmh/m<sup>2</sup> at .25 kPa) or less.

## Damper Ratings

### Velocity

Up to 4000 fpm (20.3 m/s)

### Leakage

Class 1A at 1 in. wg (.25 kPa)

Class 1 at 4 in. - 8 in. wg (1 kPa - 2 kPa)

### Pressure

Up to 8 in. wg (2 kPa) pressure differential

For pressures greater than 8 in wg, consult factory.

### Temperature

-40°F to 250°F (-40°C to 121°C). Consult factory for higher temperatures.



\* W & H dimension furnished approximately ¼ in. (6mm) undersize.

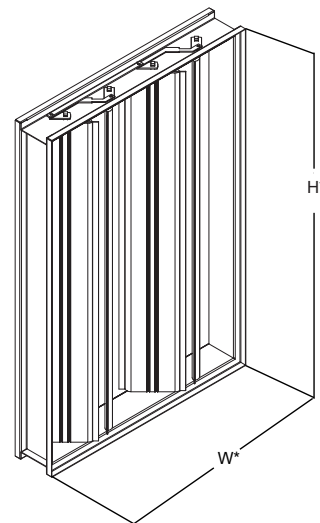
## Size Limitations

W x H	Minimum Size	Maximum Size	
		Single Section	Multiple Section
<b>Inches</b>	6 x 6	74 x 60	148 x 120
<b>mm</b>	152 x 152	1880 x 1524	3759 x 3048

## Construction

	Standard	Optional
<b>Frame Material</b>	Galvanized Steel	304SS
<b>Frame Thickness</b>	16 ga. (1.5 mm)	12 ga. (2.7 mm)*
<b>Frame Type</b>	5 in. x 1 in. (127mm x 25mm) hat channel	Single flange, Reversed flange, Double flange
<b>Blade Material</b>	Galvanized steel	304SS
<b>Blade Thickness</b>	2 skins of 20 ga. (1mm)	-
<b>Blade Type</b>	Airfoil	-
<b>Blade Action</b>	Opposed	Parallel
<b>Linkage</b>	Plated steel out of airstream	316SS
<b>Axle Bearings</b>	Synthetic (acetal) with thrust washers	316SS with thrust washers
<b>Axle Material</b>	Plated steel	316SS
<b>Blade Seals</b>	TPE	Silicone
<b>Jamb Seals</b>	Stainless Steel	-
<b>Paint Finishes</b>	Mill Finish	Baked Enamel, Hi Pro Polyester, Industrial Epoxy

\*When 12 ga. frame is selected and the damper height is less than 17 inches, low profile top and bottom frame members are utilized. These low profile frame members will be made from 16 ga. material.



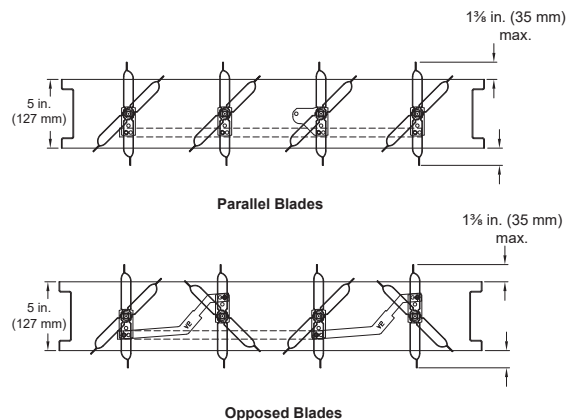
## Notes:

- Airfoil shape reduces pressure drop and turbulence at velocities to 4000 fpm (20.3 m/s).
- Frames are constructed with reinforced corners. Low profile jambs are used on sizes less than 17 in. (432mm) high.
- Electric actuator and manual quadrant available. Factory supplied actuators are sized for 1500 fpm (7m/s) and fully closed differential pressure of 2 in. wg (.5 kPa). contact factory for actuator sizing on applications exceeding those limits.
- In applications where airflow could be uneven, such as a discharge fan, it is imperative to verify that at no point the maximum velocity exceeds the damper's cataloged velocity.

## Blade Operation

**Parallel blade operation** - this configuration requires the damper blades to rotate in the same direction, parallel to one another.

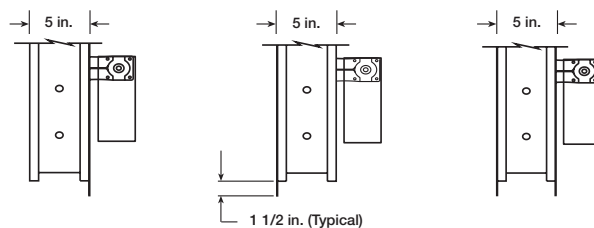
**Opposed blade operation** - adjacent damper blades rotate opposite one another.



## Options

- Actuators (24V, 120V, manual, pull chain)
- Actuator mounting (external, external kit (field assembly), internal)
- Flanges
- Multi-section fastening
- NEMA enclosures (7)
- R Transition
- [Retaining angles](#)
- Sleeves
- Transformers

### Flange options



Single Flange

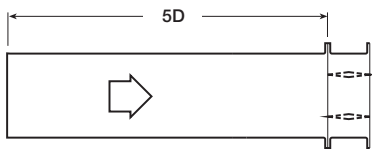
Reversed Flange

Double Flange

\* Shown with optional internally mounted actuator.

# Pressure Drop Data

## AMCA 5.2



12 in. x 12 in. (305mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.03
1500	0.07
2000	0.13
2500	0.19
3000	0.26
3500	0.35
4000	0.45

24 in. x 24 in. (610mm x 610mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.03
1500	0.06
2000	0.10
2500	0.15
3000	0.21
3500	0.28
4000	0.36

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.02
1500	0.04
2000	0.07
2500	0.11
3000	0.15
3500	0.20
4000	0.26

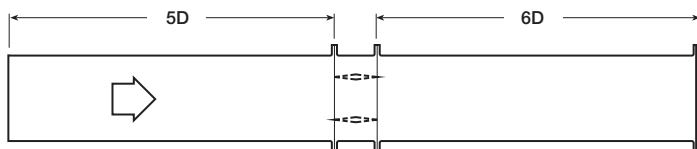
48 in. x 12 in. (1219mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.03
1500	0.07
2000	0.11
2500	0.17
3000	0.23
3500	0.31
4000	0.39

12 in. x 48 in. (305mm x 1219mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.02
1500	0.04
2000	0.08
2500	0.12
3000	0.16
3500	0.21
4000	0.27

## AMCA 5.3



12 in. x 12 in. (305mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.02
1500	0.05
2000	0.08
2500	0.12
3000	0.17
3500	0.23
4000	0.30

24 in. x 24 in. (610mm x 610mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.01
1500	0.03
2000	0.05
2500	0.09
3000	0.13
3500	0.17
4000	0.22

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.01
1500	0.02
2000	0.04
2500	0.06
3000	0.08
3500	0.12
4000	0.15

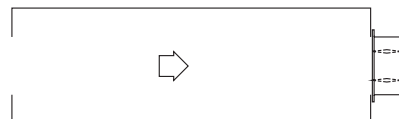
48 in. x 12 in. (1219mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.02
1500	0.04
2000	0.08
2500	0.12
3000	0.17
3500	0.22
4000	0.29

12 in. x 48 in. (305mm x 1219mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.02
1500	0.04
2000	0.07
2500	0.11
3000	0.15
3500	0.20
4000	0.25

## AMCA 5.5



12 in. x 12 in. (305mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.12
1500	0.27
2000	0.48
2500	0.74
3000	1.07
3500	1.46
4000	1.91

24 in. x 24 in. (610mm x 610mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.12
1500	0.26
2000	0.45
2500	0.71
3000	1.02
3500	1.40
4000	1.89

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.02
1000	0.09
1500	0.21
2000	0.38
2500	0.58
3000	0.85
3500	1.15
4000	1.52

48 in. x 12 in. (1219mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.11
1500	0.24
2000	0.43
2500	0.67
3000	0.96
3500	1.31
4000	1.71

12 in. x 48 in. (305mm x 1219mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.11
1500	0.24
2000	0.44
2500	0.68
3000	0.97
3500	1.32
4000	1.73

## Leakage Data

Air leakage is based on operation between 32°F (0°C) and 120°F (49°C).

Tested for leakage in accordance with ANSI/AMCA Standard 500-D, Figure 5.5.

Tested for air performance in accordance with ANSI/AMCA Standard 500-D, Figures 5.2, 5.3 and 5.5.

## Torque

Data are based on a torque of 7.0 in.lb./ft<sup>2</sup> (0.79 N·m) applied to close and seat the damper during the test.

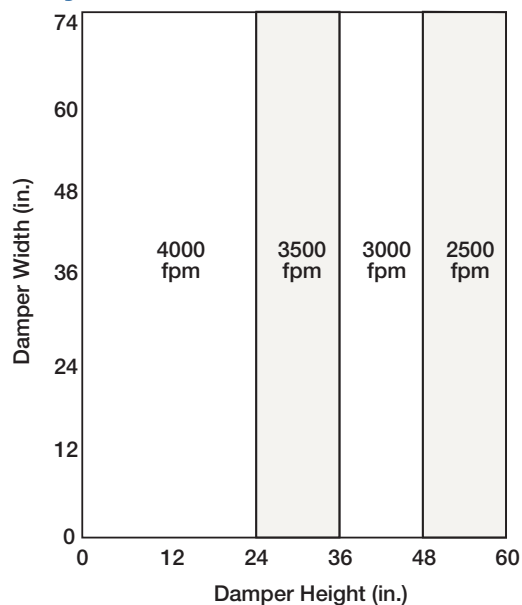
VCD-33V	Leakage Class*		
Maximum Damper Width	1 in. wg (0.25 kPa)	4 in. wg (1 kPa)	8 in. wg (2 kPa)
60 in. (1524mm)	1A	1	NA

### \*Leakage Class Definitions

The maximum allowable leakage is defined by AMCA as the following:

- Leakage Class 1A - 3 cfm/ft<sup>2</sup> at 1 in. wg (class 1A is only defined at 1 in. wg).
- Leakage Class 1
  - 4 cfm/ft<sup>2</sup> at 1 in. wg
  - 8 cfm/ft<sup>2</sup> at 4 in. wg
  - 11 cfm/ft<sup>2</sup> at 8 in. wg
  - 12.6 cfm/ft<sup>2</sup> at 10 in. wg

## Velocity Limitations

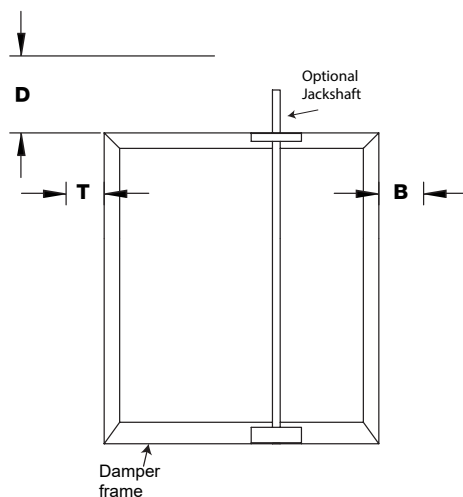


## Temperature Limitations

Blade Seal	Temperature Range
TPE	-10°F to 180°F (-23°C to 82°C)
Silicone	-40°F to 250°F (-40°C to 121°C)
No Seal	-40°F to 250°F (-40°C to 121°C)

## Space Envelopes

On dampers less than 18 in. (457mm) high, actuators may also require clearances above and/or below the damper frame. “B” and “T” dimensions are **worst case clearance requirements for some dampers less than 18 in. (457mm) high**. All damper sizes under 18 in. (457mm) high do not require these worst case clearances. If space availability above or below the damper is limited, each damper size should be individually evaluated.



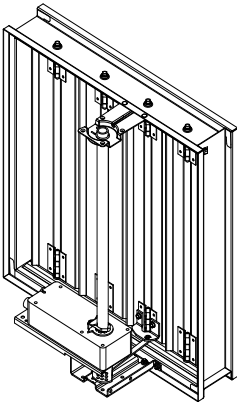
Actuator Type/Model	Height	T	B	D
	Inches	Inches		
AFBUP (-S) and FSNF Series, Belimo MSxx20 Series, Honeywell	≥6 to <10	0	12 <sup>3</sup> / <sub>4</sub>	6 <sup>1</sup> / <sub>4</sub>
	≥10 to <18	0	2	6 <sup>1</sup> / <sub>4</sub>
	≥18	0	0	6 <sup>1</sup> / <sub>4</sub>
FSLF, LF and TFB Series, Belimo	≥6 to <10	0	3 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>4</sub>
	≥10	0	0	6 <sup>1</sup> / <sub>4</sub>
MSxx04 & MSxx09 Series, Honeywell	≥6 to <9	0	4 <sup>3</sup> / <sub>4</sub>	6 <sup>1</sup> / <sub>4</sub>
	≥9	0	0	6 <sup>1</sup> / <sub>4</sub>
MS75xx Series, Honeywell	≥6 to <10	0	12 <sup>3</sup> / <sub>4</sub>	6 <sup>1</sup> / <sub>4</sub>
	≥10 to <18	0	7	6 <sup>1</sup> / <sub>4</sub>
	≥18	0	0	6 <sup>1</sup> / <sub>4</sub>
GRD and GVD Series, Siemens	≥6 to <10	0	12 <sup>3</sup> / <sub>4</sub>	6 <sup>1</sup> / <sub>4</sub>
	≥10 to <18	0	2	6 <sup>1</sup> / <sub>4</sub>
	≥18	0	0	6 <sup>1</sup> / <sub>4</sub>
GJD Series, Siemens	≥6 to <10	0	3 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>4</sub>
	≥10 to <18	0	0	6 <sup>1</sup> / <sub>4</sub>
	≥18	0	0	6 <sup>1</sup> / <sub>4</sub>

# Actuator Mounting

Actuators may be installed at the factory, shipped loose with the necessary linkage and brackets for mounting, or field supplied. For more detail information on actuator mounting, click on link below or scan QR code.



ACTUATOR MOUNTING

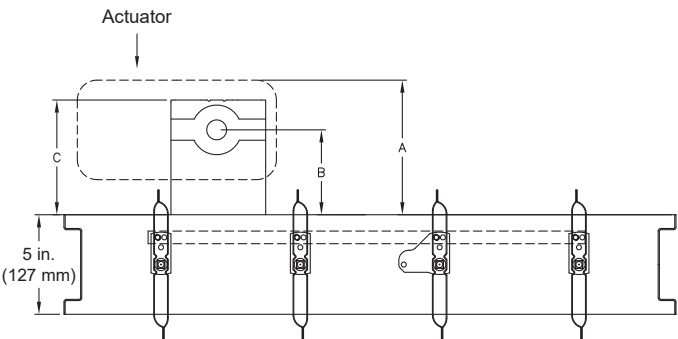


Jackshafted internal bottom

# Clearance Requirements

This drawing depicts the worst case clearance requirements for an actuator with a jackshaft.

Internal mount only Actuator model	A	B	C
All except - EFB & EFCX Series	7 ¾ in (197 mm)	3 ¾ in (95 mm)	5 ⅜ in (137 mm)
EFB & EFCX Series	8 ½ in (216 mm)	6 in (152mm)	8 ½ in (216 mm)

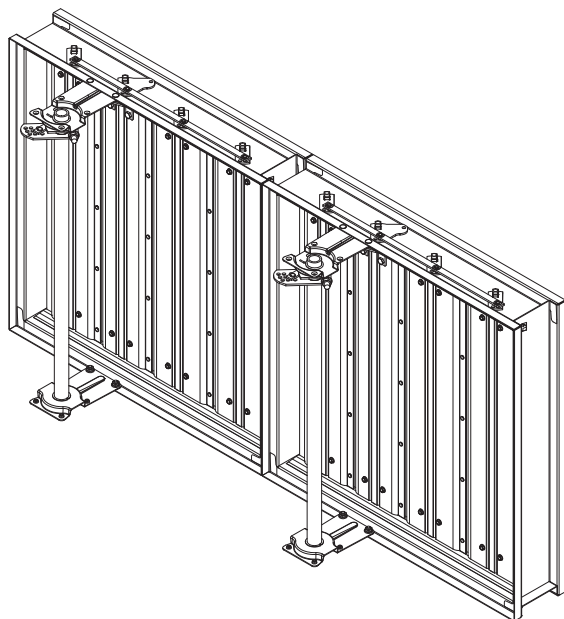


## Multi-Section Dampers

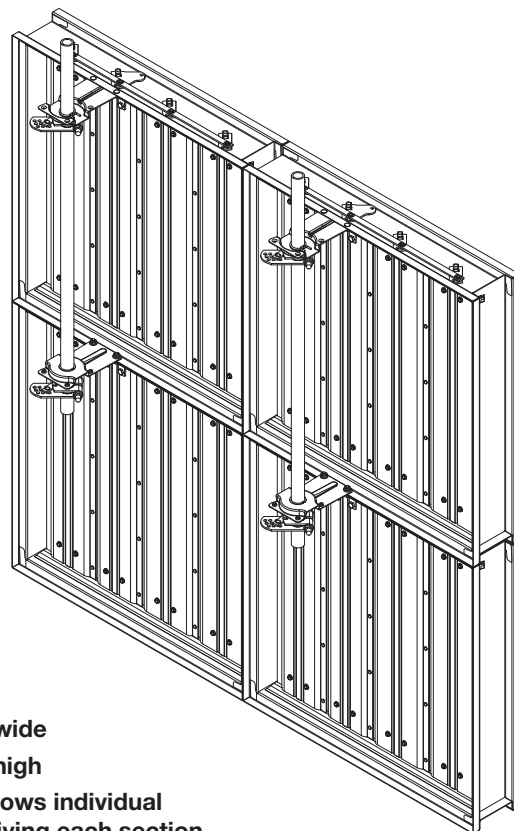
VCD-33V  
Control Damper

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 74 in. x 60 in. (1880mm x 1524mm) are not intended to be structurally self supporting. Refer to IOM document 463384 for structural support requirements on multi-section assemblies.



2 section example shows single jackshaft driving multiple sections



2 sections wide  
2 sections high  
example shows individual actuator driving each section

## Document Links



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