

Application

VCD-43V is a low leakage damper with vertical blade orientation designed to meet the highest standards established for commercial control dampers. The VCD-43V is intended for application in medium to high pressure and velocity systems.

This model is IECC (International Energy Conservation Code) compliant with a leakage rating of 3 cfm/ft² at 1 in. wg (55 cmh/m² at .25 kPa) or less, factory.

Damper Ratings

Velocity

Up to 6,000 fpm (30.5 m/s)

Leakage

6 cfm/ft² at 4 in. wg (110 cmh/m² at 1 kPa)
 3 cfm/ft² at 1 in. wg (55 cmh/m² at .25 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.

Construction

	Standard	Optional
Frame Material	Aluminum	-
Frame Thickness	0.125 in (3.2mm)	-
Frame Type	5 in. x 1 in. (127mm x 25mm) hat channel	Single flange, Reversed flange, Quick Connect
Blade Material	Extruded Aluminum	-
Blade Type	Airfoil	-
Linkage	Plated steel out of airstream, concealed in jamb	316SS
Axle Bearings	Synthetic with thrush washers	316SS with thrush washers
Axle Material	Plated steel	316SS
Blade Seals	TPE	Silicone
Jamb Seals	Stainless Steel	-
Paint Finishes	Mill Finish	Baked Enamel, Hi Pro Polyester, Industrial Epoxy, Kynar/Hylar (70% Kynar), Anodize

*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.

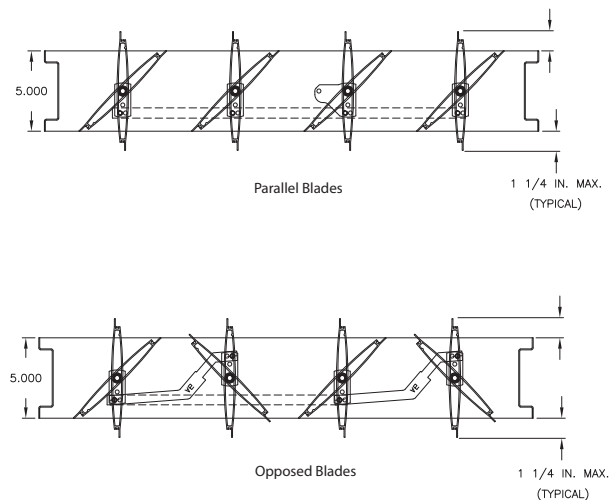


W & H dimension furnished approximately 1/4 in. (6mm) undersize.

Size Limitations

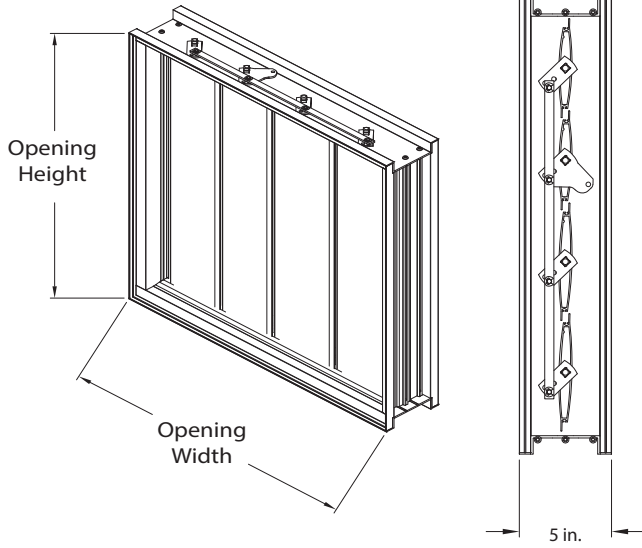
in. (mm) W x H	Frame Type		
	Channel	Quick Connect	Single or Reverse Flange
Minimum Sizes	6 x 8 (178 x 203)	5 x 8 (127 x 203)	6 x 8 (178 x 203)
Maximum Sizes	Single Section	78 x 60 (1981 x 1524)	
	Multi-Section	156 x 120 (3962 x 3048)	
* varies by actuator			

Blade Operation

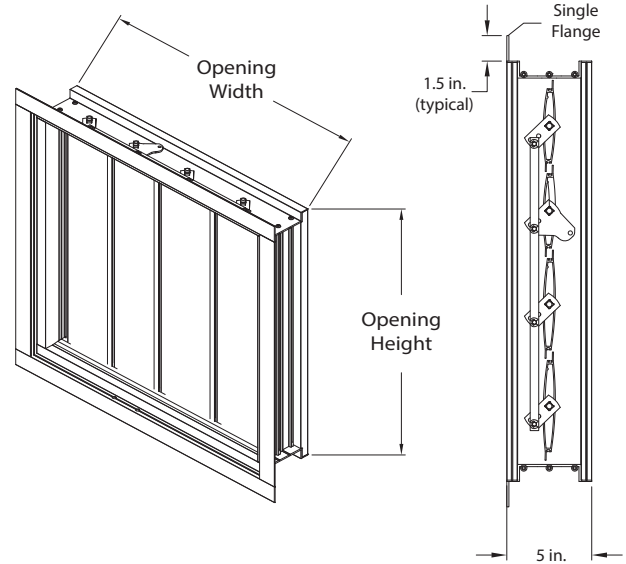


Frame Type Options

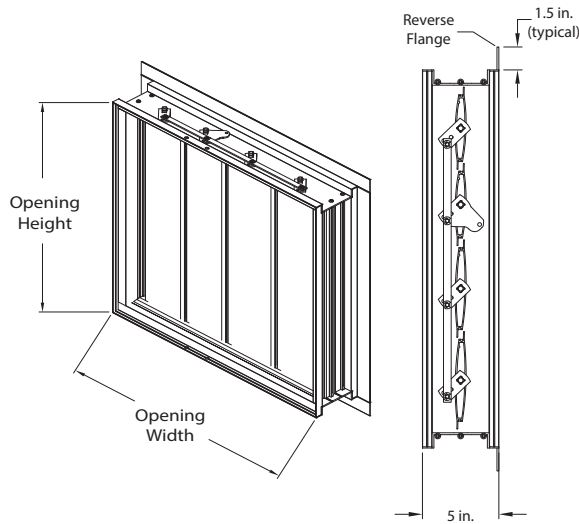
Channel Frame



Single Flange

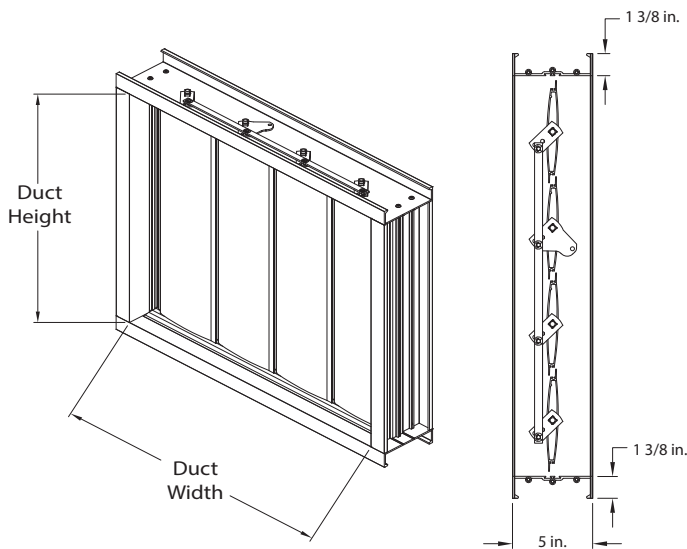


Reverse Flange

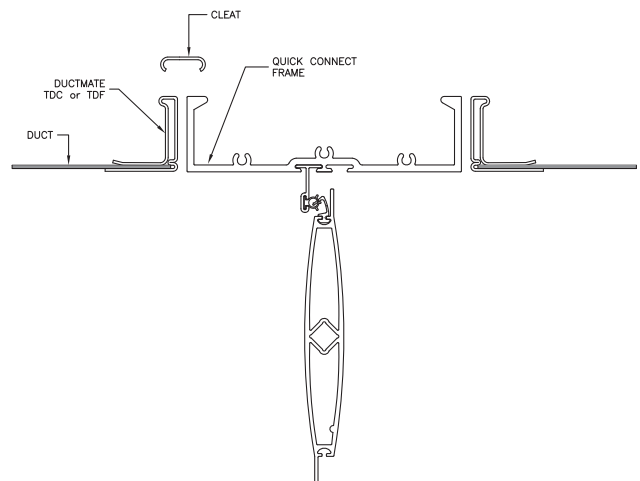


* Width and height is based on outside dimension. W & H dimensions furnished approximately 1/4 in. (6mm) undersize.

Quick Connect



Note: When ordering the Quick Connect Frame, size is based on duct size (or inside dimension of the damper frame). Quick connect frame is actual size.



Options

- Actuators (24V, 120V, manual, pull chain)
- Actuator mounting (external, external kit (field assembly), internal)
- Flanges
- Multi-section fastening
- NEMA enclosures (3, 4, 4X, 7)
- R Transition
- [Retaining angles](#)
- Sleeves
- Transformers

Document Links

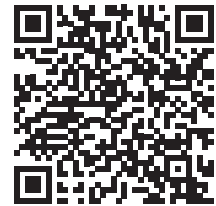
[HVAC Control & Balancing
Damper Catalog](#)



[Installation Instructions](#)



[Specifications](#)



[Warranty](#)



[Damper Selection Guide](#)



Notes:

- Blade seals - pressure activated to produce tighter sealing
- 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. Actuators (when supplied) are mounted on the top or bottom.
- 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.

Pressure Drop Data

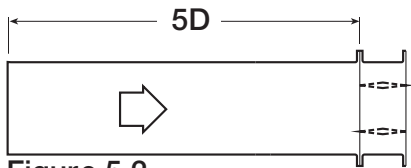


Figure 5.2

12 in. x12 in. (305mm x 305mm)		24x24 (610 mm x 610mm)		36x36 (914mm x 914mm)		12x48 (305mm x 1219mm)		48x12 (1219mm x 305mm)	
Velocity (fpm)	Pressure Drop (in. wg)	Velocity (fpm)	Pressure Drop (in. wg)	Velocity (fpm)	Pressure Drop (in. wg)	Velocity (fpm)	Pressure Drop (in wg)	Velocity (fpm)	Pressure Drop (in. wg)
500	.01	500	.01	500	.01	500	.01	500	.01
1000	.06	1000	.04	1000	.03	1000	.03	1000	.06
1500	.13	1500	.10	1500	.06	1500	.06	1500	.13
2000	.23	2000	.18	2000	.12	2000	.10	2000	.23
2500	.35	2500	.28	2500	.18	2500	.16	2500	.36
3000	.50	3000	.40	3000	.26	3000	.23	3000	.51
3500	.68	3500	.54	3500	.35	3500	.30	3500	.71
4000	.88	4000	.70	4000	.46	4000	.39	4000	.93

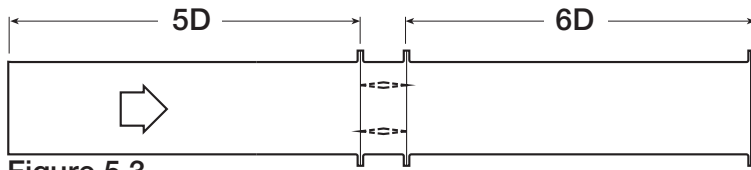


Figure 5.3

12 in. x12 in. (305mm x 305mm)		24x24 (610 mm x 610mm)		36x36 (914mm x 914mm)		12x48 (305mm x 1219mm)		48x12 (1219mm x 305mm)	
Velocity (fpm)	Pressure Drop (in. wg)	Velocity (fpm)	Pressure Drop (in. wg)	Velocity (fpm)	Pressure Drop (in. wg)	Velocity (fpm)	Pressure Drop (in wg)	Velocity (fpm)	Pressure Drop (in. wg)
500	.01	500	.01	500	.01	500	.01	500	.01
1000	.03	1000	.02	1000	.01	1000	.02	1000	.03
1500	.07	1500	.04	1500	.02	1500	.04	1500	.06
2000	.14	2000	.08	2000	.04	2000	.08	2000	.11
2500	.21	2500	.13	2500	.06	2500	.12	2500	.17
3000	.29	3000	.19	3000	.09	3000	.18	3000	.25
3500	.39	3500	.26	3500	.13	3500	.24	3500	.34
4000	.51	4000	.34	4000	.17	4000	.31	4000	.45

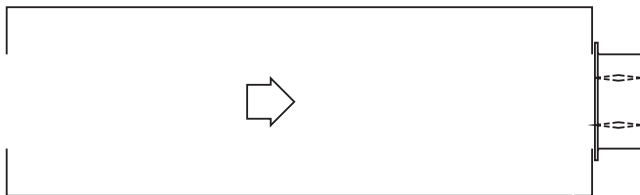


Figure 5.5

12 in. x12 in. (305mm x 305mm)		24x24 (610 mm x 610mm)		36x36 (914mm x 914mm)		12x48 (305mm x 1219mm)		48x12 (1219mm x 305mm)	
Velocity (fpm)	Pressure Drop (in. wg)	Velocity (fpm)	Pressure Drop (in. wg)	Velocity (fpm)	Pressure Drop (in. wg)	Velocity (fpm)	Pressure Drop (in wg)	Velocity (fpm)	Pressure Drop (in. wg)
500	.04	500	.03	500	.03	500	.03	500	.03
1000	.14	1000	.12	1000	.10	1000	.11	1000	.11
1500	.31	1500	.27	1500	.22	1500	.26	1500	.25
2000	.55	2000	.48	2000	.39	2000	.46	2000	.46
2500	.86	2500	.75	2500	.61	2500	.72	2500	.72
3000	1.23	3000	1.07	3000	.87	3000	1.02	3000	1.02
3500	1.67	3500	1.47	3500	1.19	3500	1.40	3500	1.40
4000	2.19	4000	1.91	4000	1.56	4000	1.83	4000	1.83

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./ft² (0.79 N·m) applied to close and seat the damper during the test.

VCD-43V	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	1

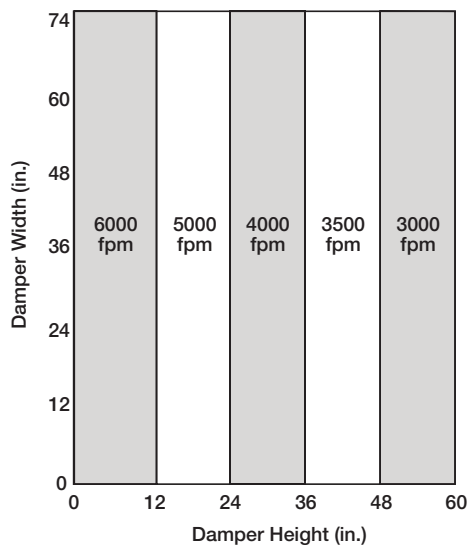
*applies to opposed blades only

*Leakage Class Definitions

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

- Leakage Class 1A - 3 cfm/ft² at 1 in. wg (class 1A is only defined at 1 in. wg).
- Leakage Class 1
 - 4 cfm/ft² at 1 in. wg
 - 8 cfm/ft² at 4 in. wg
 - 11 cfm/ft² at 8 in. wg
 - 12.6 cfm/ft² at 10 in. wg

Velocity Limitations

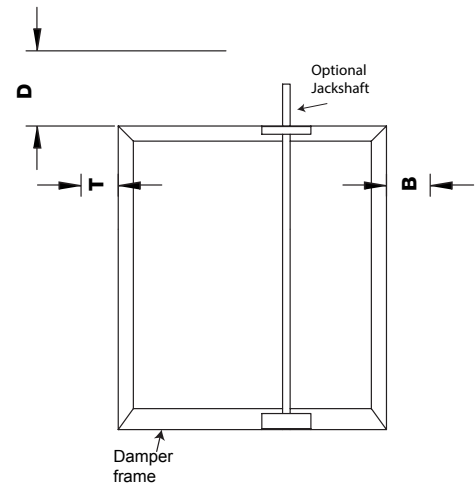


Temperature Limitations

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.

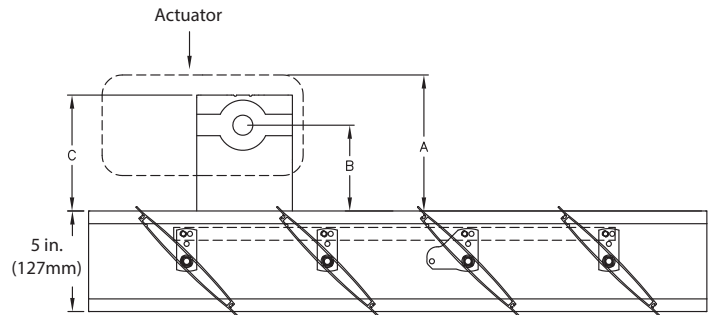


Actuator Type/Model	Height	T	B	D
	Inches			
AFBUP (-S) and FSNF Series, Belimo MSxx20 Series, Honeywell	≥6 to <10	0	12¾	6
	≥10 to <18	0	2	6
	≥18	0	0	10
FSLF, LF and TFB Series, Belimo	≥6 to <10	0	3½	6
	≥10	0	0	6
MSxx04 & MSxx09 Series, Honeywell	≥6 to <9	0	4¾	6
	≥9	0	0	6
MS75xx Series, Honeywell	≥6 to <10	0	12¾	6
	≥10 to <18	0	7	6
	≥18	0	0	6

Mounting

- External - includes extension pin (standoff bracket optional)
- External kit - actuator and all mounting hardware
- Internal - blade lever

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 (136.5 mm)
EFB & EFCX Series	8 ½ in (216 mm)	6 in (152mm)	8 ½ in (216 mm)

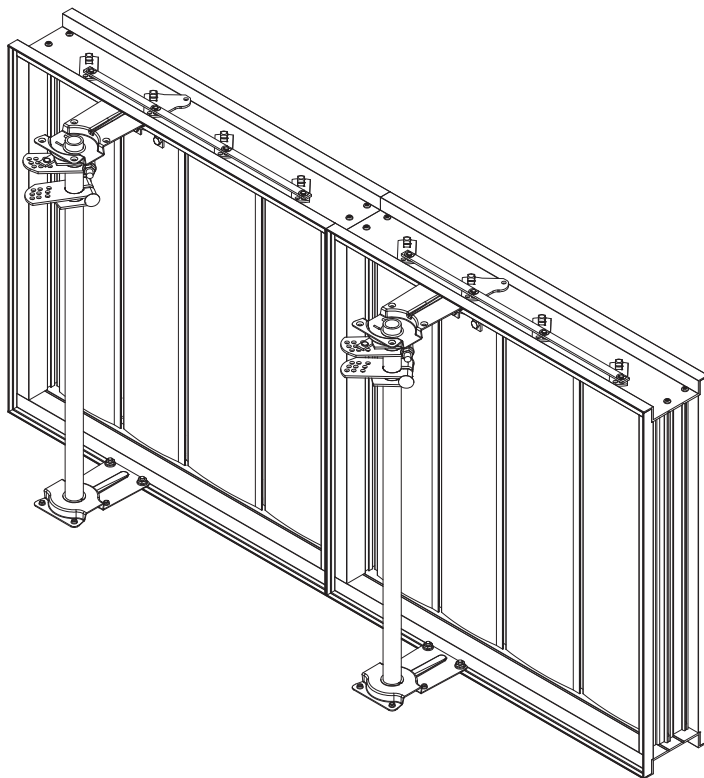


This drawing depicts the worst case clearance requirements for an actuator with a jackshaft.

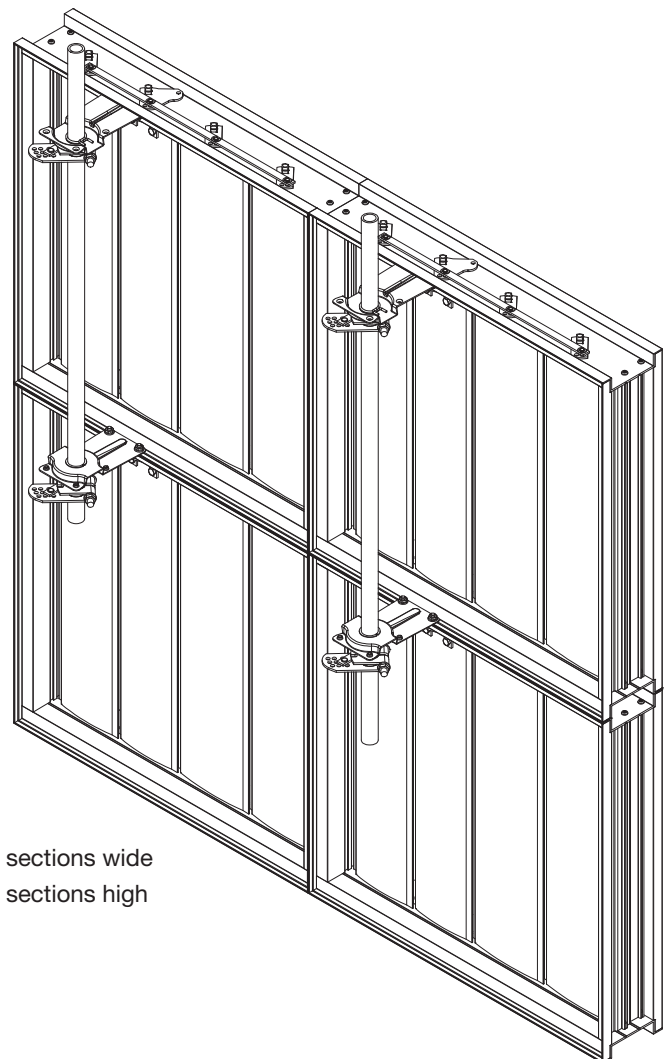
Dampers larger than the maximum single section size, will be made up of a multiple of equal size sections. Multiple section dampers can be jackshafted together so that all sections operate together as shown below.

NOTE: Dampers larger than 74 in. x 60 in. (1880mm x 1524mm) are not intended to be structurally self supporting. 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.

Refer to IOM document 463384 for structural support requirements on multi-section assemblies.



2 sections wide



2 sections wide
2 sections high