

Application and Design

The VCD-20 series is a ruggedly built general purpose damper for application as an automatic control or manual balancing damper. A wide range of electric and pneumatic actuators are available. The VCD-20 is intended for application in low to medium pressure and velocity systems.

Ratings (See page 4 for specific limitations)

Pressure: 2.5 - 5.0 in. wg (622 Pa - 1245 Pa) - pressure differential.

Velocity: 2000 to 3000 fpm (10.2 m/s - 15.2 m/s)

Temperature: 180°F (82°C)

Standard Construction

Frame: 5 in. x 1 in. (127mm x 25mm) 16 ga. (1.5mm) galvanized steel hat channel. Reinforced corners. Low profile head and sill are used on sizes less than 17 in. (432mm).

Blades: 16 ga. (1.5mm) galvanized steel, reinforced with 3 longitudinal structurally designed vee's.

Linkage: Side linkage out of airstream (concealed in frame).

Axles: 1/2 in. (13mm) dia. plated steel. Removable control shaft extends 6 in. (152mm) beyond frame.

Bearings: Synthetic (acetal) sleeve type.

Size Limitations

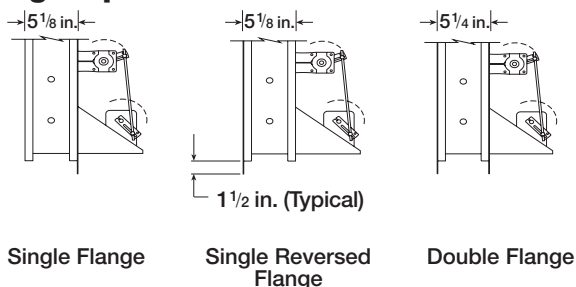
Minimum Size: One Blade 6 in. W x 6 in. H
(152mm x 152mm)
Two Blade 6 in. W x 10 in. H
(152mm x 254mm)

Maximum Size: Single Section 48 in. W x 74 in. H
(1219mm x 1880mm)
Multiple section size unlimited

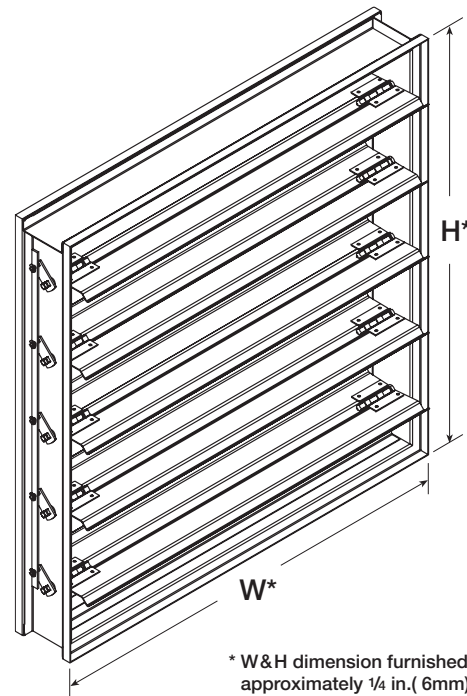
Features Available:

- Paint coatings: Baked Enamel, Epoxy, Hi Pro Polyester
- Wide range of electric and pneumatic actuators available

Flange Options

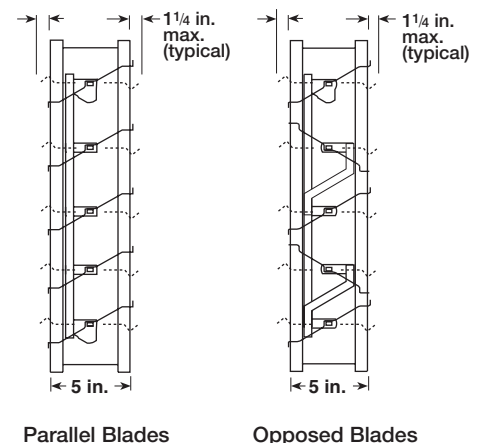


Greenheck Fan Corporation certifies that the model VCD-20 shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Programs. The AMCA Certified Ratings Seal applies to air performance ratings only.



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

Blade Operation



This pressure drop testing 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 (1.201 kg/m³).

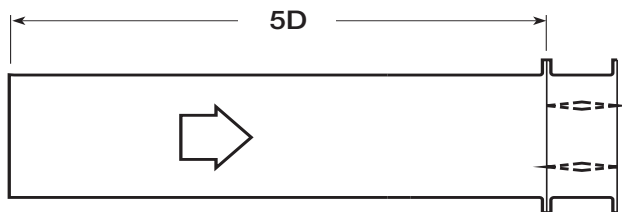
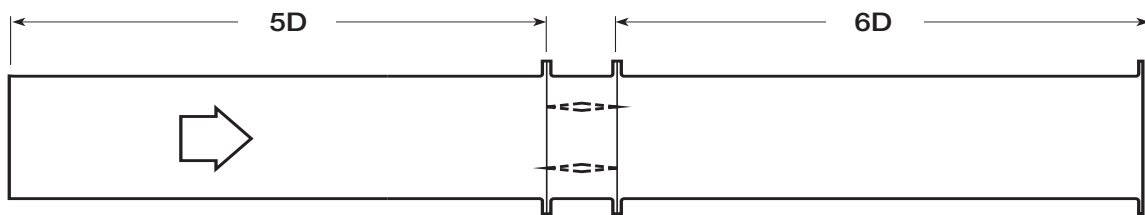
Actual pressure drop found in any HVAC system is a combination of many factors. This pressure drop information along with an analysis of other system influences should be used to estimate actual pressure losses for a damper installed in a given HVAC system.

AMCA Test Figures

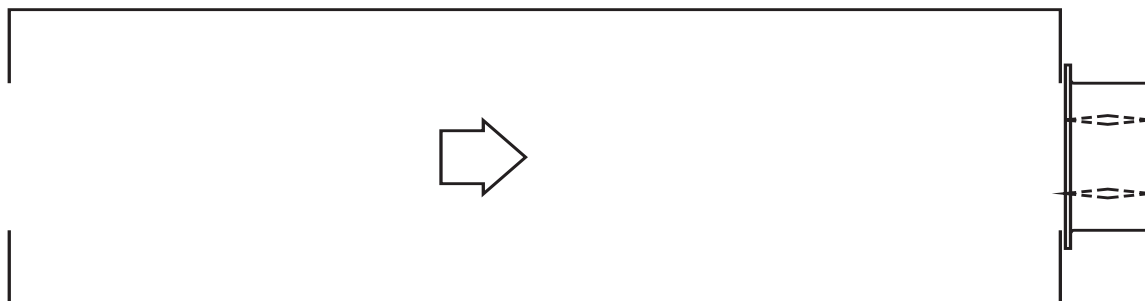
Figure 5.3 Illustrates a fully ducted damper. This configuration has the lowest pressure drop of the three test configurations because entrance and exit losses are minimized by straight duct runs upstream and downstream of the damper.

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 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 extremely high entrance and exit losses due to the sudden changes of area in the system.



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



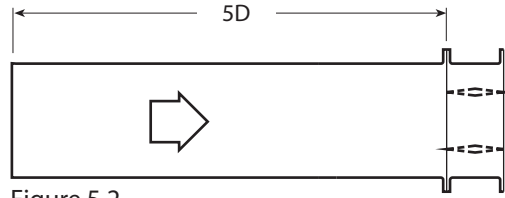
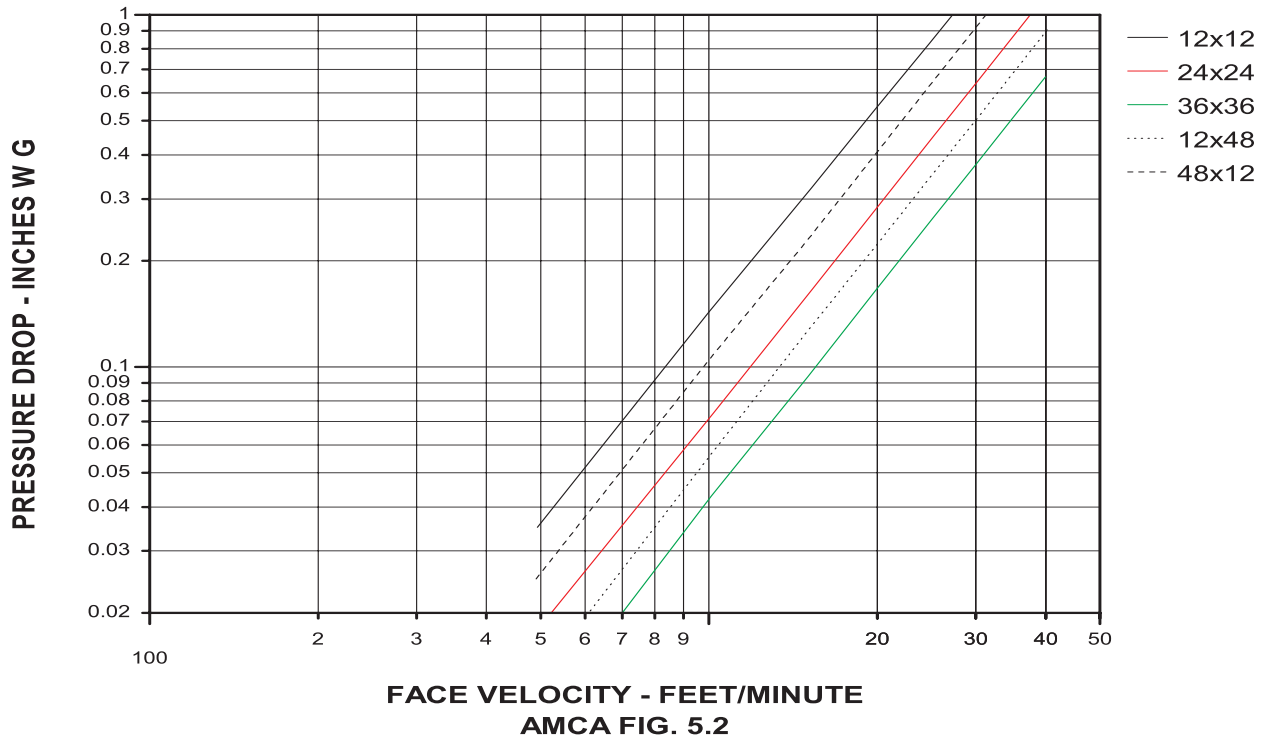


Figure 5.2

VELOCITY VS. PRESSURE DROP



FACE VELOCITY - FEET/MINUTE
AMCA FIG. 5.2

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

Velocity (fpm)	Pressure Drop (in. wg)
493.5	0.04
1000	0.14
1525	0.32
1977	0.54
2476	0.83
3056	1.25
3507	1.65
4099	2.25

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

Velocity (fpm)	Pressure Drop (in. wg)
495.2	0.02
1018	0.07
1529	0.17
2021	0.29
2540	0.46
3035	0.65
3562	0.90
4088	1.19

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

Velocity (fpm)	Pressure Drop (in. wg)
502	0.01
1010	0.04
1503	0.09
2009	0.17
2512	0.26
3003	0.38
3494	0.51
3992	0.67

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

Velocity (fpm)	Pressure Drop (in. wg)
494.2	0.01
1004	0.06
1504	0.13
2021	0.23
2531	0.36
3003	0.50
3542	0.70
4038	0.91

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

Velocity (fpm)	Pressure Drop (in. wg)
490.5	0.03
1002	0.11
1508	0.23
2035	0.42
2540	0.66
3079	0.97
3523	1.27
4081	1.70



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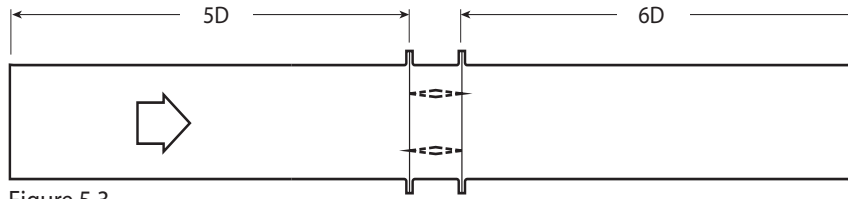
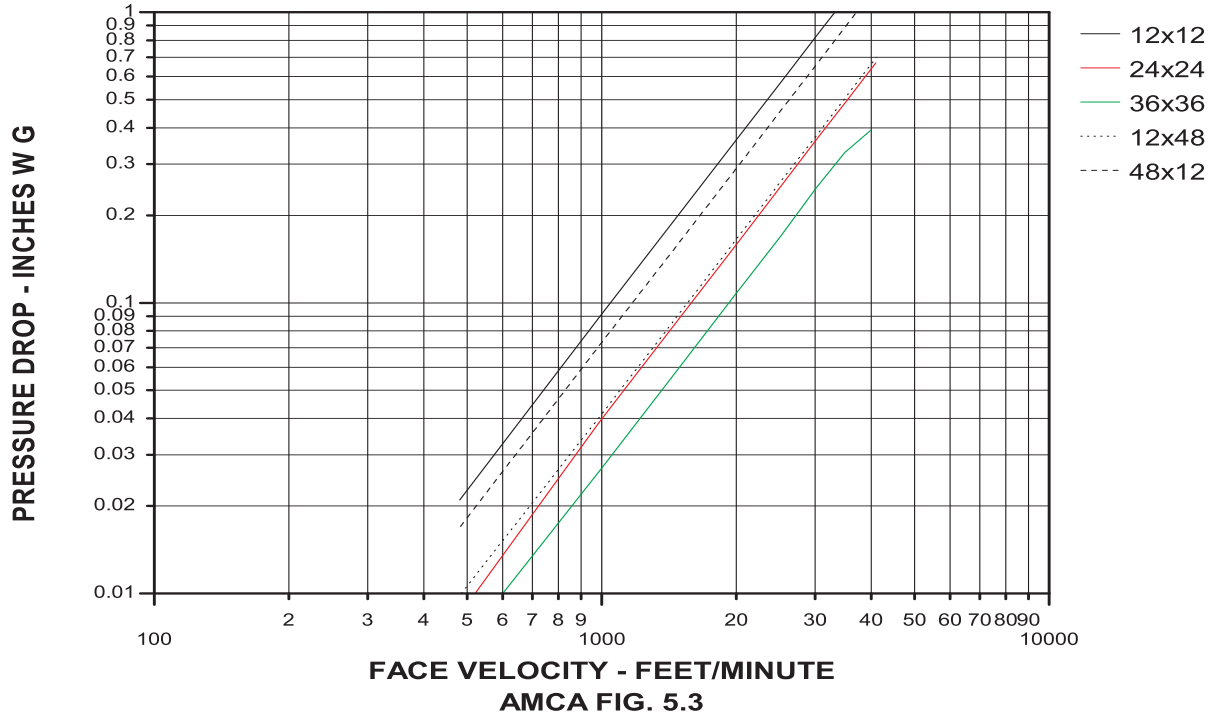


Figure 5.3

VELOCITY VS. PRESSURE DROP



FACE VELOCITY - FEET/MINUTE
AMCA FIG. 5.3

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

Velocity (fpm)	Pressure Drop (in. wg)
481.2	0.02
998.8	0.09
1527	0.21
2021	0.37
2534	0.58
3040	0.84
3485	1.10
4085	1.52

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

Velocity (fpm)	Pressure Drop (in. wg)
496.3	0.01
988.8	0.04
1514	0.09
2019	0.16
2513	0.25
3046	0.37
3523	0.49
4098	0.67

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1001	0.03
1504	0.06
1980	0.11
2514	0.17
3013	0.25
3492	0.33
3995	0.43

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

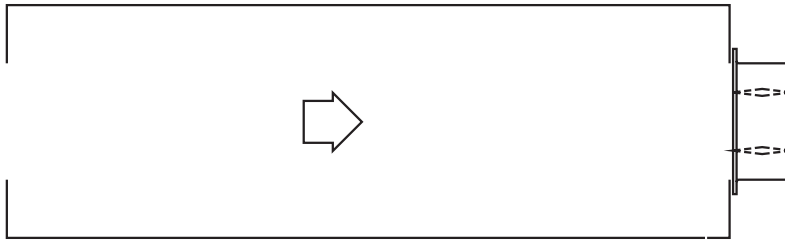
Velocity (fpm)	Pressure Drop (in. wg)
485.5	0.01
1007	0.04
1517	0.10
2031	0.17
2534	0.27
3086	0.40
3681	0.56
4112	0.70

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

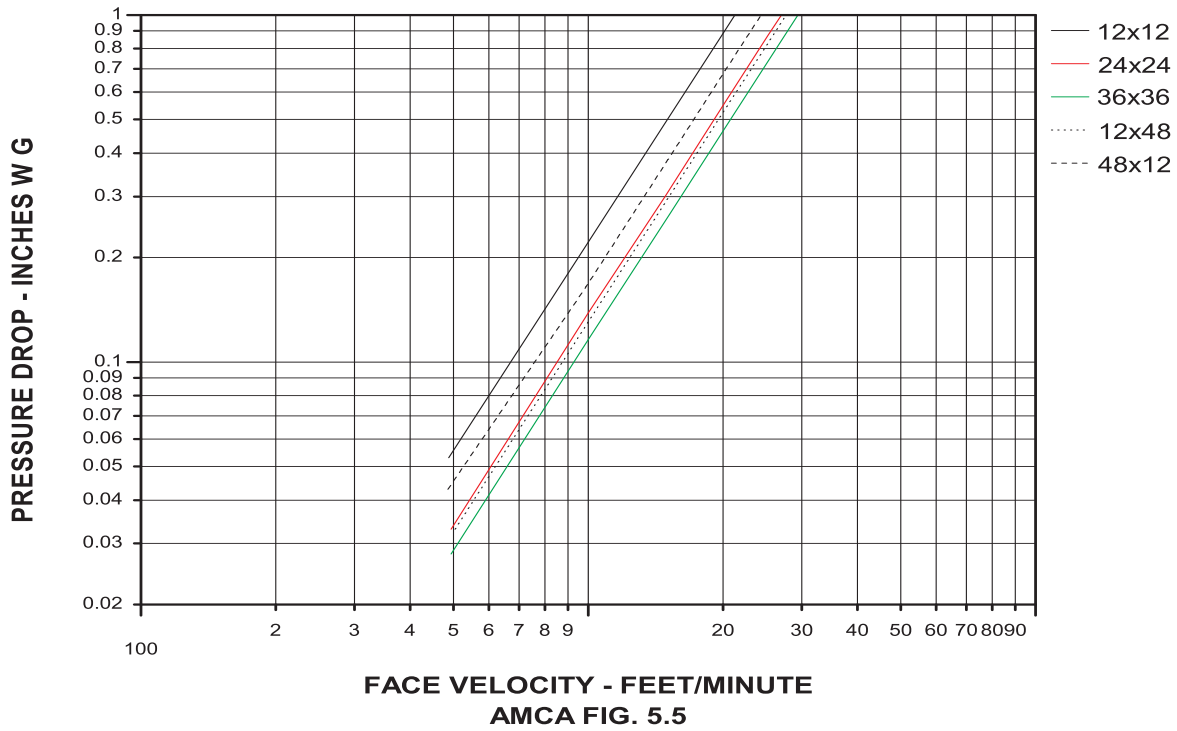
Velocity (fpm)	Pressure Drop (in. wg)
483.8	0.02
1013	0.08
1497	0.16
1994	0.29
2491	0.45
3015	0.66
3545	0.91
4056	1.20



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VELOCITY VS. PRESSURE DROP



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

Velocity (fpm)	Pressure Drop (in. wg)
487.3	0.05
994.5	0.22
1486	0.49
2000	0.89
2517	1.40
3035	2.04
3531	2.76
4056	3.64

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

Velocity (fpm)	Pressure Drop (in. wg)
493.3	0.03
998.9	0.14
1488	0.30
2018	0.56
2520	0.87
3017	1.24
3482	1.64
4098	2.28

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

Velocity (fpm)	Pressure Drop (in. wg)
493.5	0.03
1001	0.12
1524	0.27
1999	0.46
2534	0.74
3059	1.08
3508	1.42
4048	1.89

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

Velocity (fpm)	Pressure Drop (in. wg)
503.5	0.03
1003	0.13
1508	0.30
2003	0.52
2494	0.81
3049	1.21
3571	1.67
4054	2.15

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

Velocity (fpm)	Pressure Drop (in. wg)
485.7	0.04
989.7	0.17
1508	0.38
2027	0.69
2504	1.06
3013	1.53
3517	2.09
4102	2.84

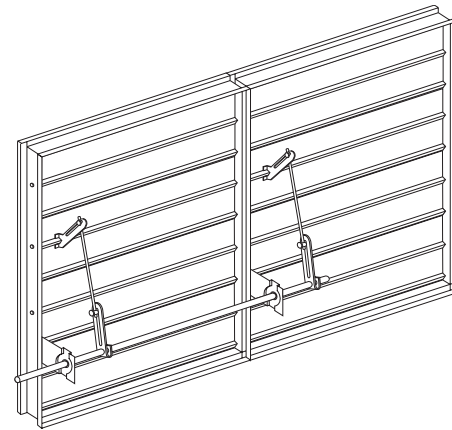


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Multi-Section Assembly

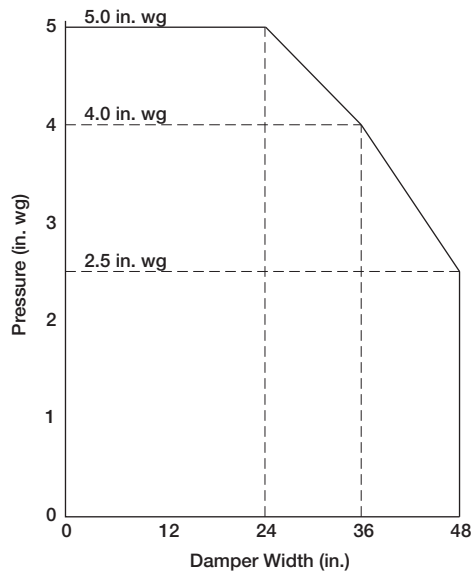
Dampers larger than the maximum single section size, will be made up of a multiple of equal size sections. Multiple section dampers can be jackshafted together so that all sections operate together as shown below.

NOTE: Dampers larger than 48 in. x 74 in. (1219mm x 1880mm) 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.

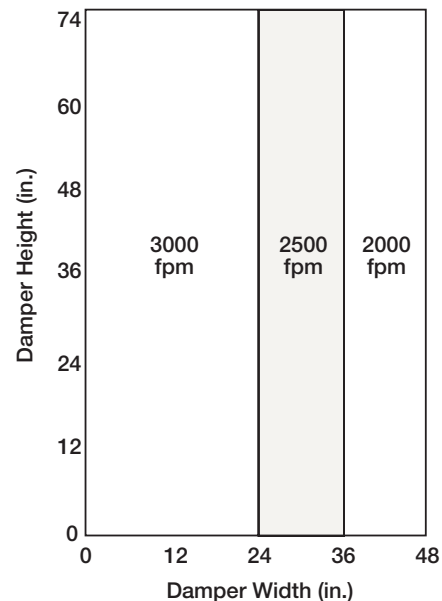


Selection Criteria

Pressure Limitations



Velocity Limitations



NOTE: VCD-20 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 (82°C) require special consideration.

Specifications

Control dampers meeting the following specifications shall be furnished and installed where shown on plans and/or as described in schedules.

Damper blades shall be 16 ga. (1.5mm) galvanized steel 3 Vee type with three longitudinal grooves for reinforcement. 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 ½ in. [13mm] are unacceptable). Linkage shall be blade-to-blade concealed in jamb (out of the airstream) to protect linkage and reduce pressure drop and noise.

Damper frame shall be 16 ga. (1.5mm) galvanized steel formed into a structural hat channel shape with reinforced corners to meet 11 ga. (3.1mm) criteria. Bearings shall be corrosion resistant, permanently lubricated, synthetic (acetal)

sleeve type rotating in extruded holes in the damper frame for maximum service. Axles shall be square and positively locked into the damper blade.

The Damper Manufacturer's submittal data shall certify all air performance pressure drop data is licensed in accordance with the AMCA Certified Ratings Program for Test Figures 5.2, 5.3 and 5.5. Damper air performance data shall be developed in accordance with the latest edition of AMCA Standard 500-D.

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 5 in. wg. (1245 Pa), velocities to 3000 fpm (15.2 m/s) and temperatures to 180°F(82°C). Testing and ratings to be in accordance with AMCA Standard 500-D.

Basis of design is Greenheck model VCD-20.