

Application and Design

The VCD-M20 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-M20 is intended for application in low to medium pressure and velocity systems.

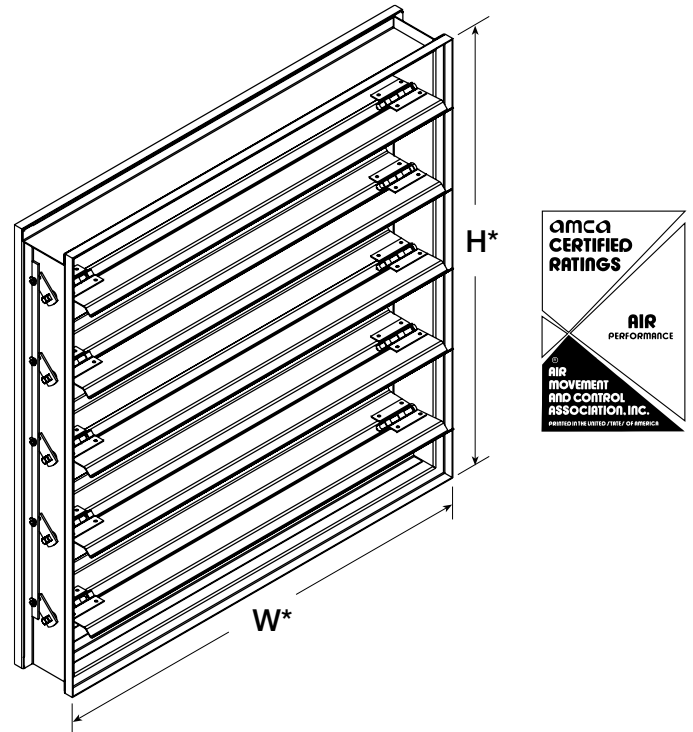
Ratings (See page 4 for specific limitations)

Pressure: .62 kPa - 1.2 kPa (2.5 - 5.0 in. wg) - pressure differential.

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

Temperature: 93°C to 121°C (200°F to 250°F)

Construction	Standard	Optional
Frame Material	Galvanized Steel	-
Frame Thickness	1.5mm (16 ga.)	-
Frame Type	127mm x 25mm (5 in. x 1 in.) Channel	-
Blade Material	Galvanized steel	-
Blade Thickness	1.5mm (16 ga.)	-
Blade Type	3V	-
Axle	13mm (1/2 in.) dia. Plated Steel	-
Axle Bearings	Synthetic	Bronze
Linkage Material	Plated Steel	-



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

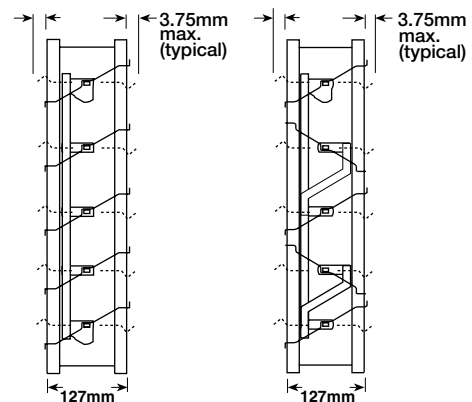
Size Limitations

W x H	Minimum Size	Maximum Size	
		Single Section	Multiple Section
Inches	8 x 6	48 x 74	144 x 144
mm	203 x 152	1219 x 1880	3658 x 3658

Features Available:

- Wide range of electric and pneumatic actuators available
- Sleeve with Integral flange on both side available

Blade Operation



Parallel Blades

Opposed Blades

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 1.201 kg/m³.

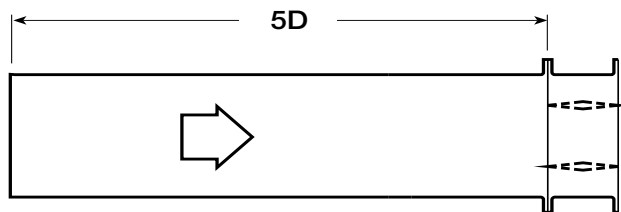
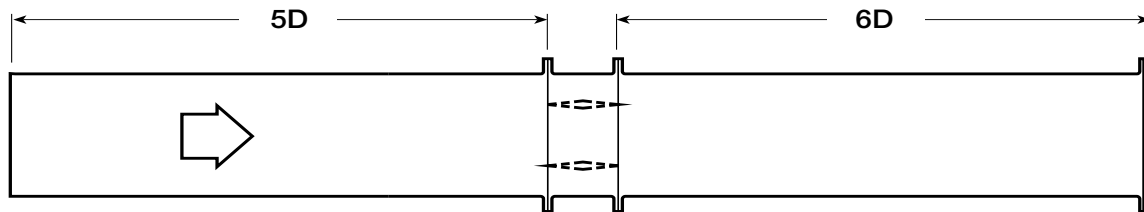
Actual pressure drop found in any HVAC system is a combination of many factors. This pressure drop information along with an analysis of other system influences should be used to estimate actual pressure losses for a damper installed in a given HVAC system.

AMCA Test Figures

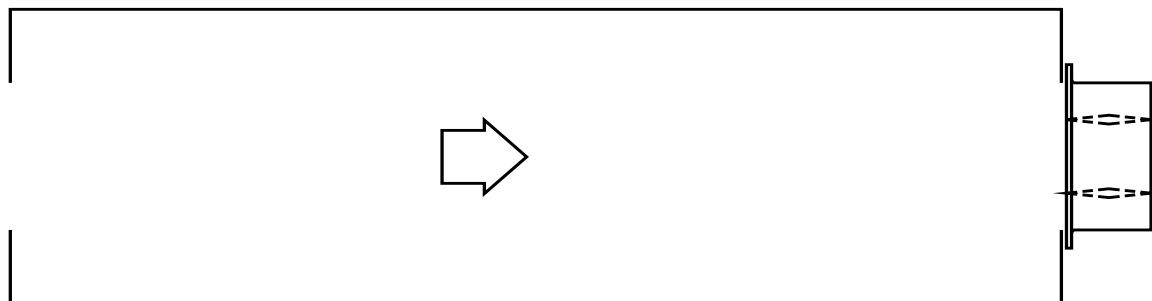
Figure 5.3 Illustrates a fully ducted damper. This configuration has the lowest pressure drop of the three test configurations because entrance and exit losses are minimized by straight duct runs upstream and downstream of the damper.

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.



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



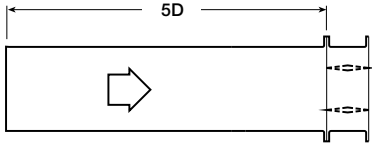
AMCA Certified Pressure Drop Data

VCD-M20



Greenheck Kunshan Co. Ltd. and Greenheck Fan Corporation certifies that the model VCD-M20 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.

AMCA 5.2



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

Velocity m/s (fpm)	Pressure Drop Pa (in. wg)
2.5 (500)	2 (0.01)
5.1 (1000)	12 (0.05)
7.6 (1500)	27 (0.11)
10.2 (2000)	47 (0.19)
12.7 (2500)	72 (0.29)
15.2 (3000)	102 (0.41)
17.8 (3500)	137 (0.55)
20.3 (4000)	179 (0.72)

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

Velocity m/s (fpm)	Pressure Drop Pa (in. wg)
2.5 (500)	2 (0.01)
5.1 (1000)	7 (0.03)
7.6 (1500)	15 (0.06)
10.2 (2000)	25 (0.10)
12.7 (2500)	40 (0.16)
15.2 (3000)	57 (0.23)
17.8 (3500)	75 (0.30)
20.3 (4000)	99 (0.40)

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

Velocity m/s (fpm)	Pressure Drop Pa (in. wg)
2.5 (500)	2 (0.01)
5.1 (1000)	5 (0.02)
7.6 (1500)	12 (0.05)
10.2 (2000)	22 (0.09)
12.7 (2500)	35 (0.14)
15.2 (3000)	47 (0.19)
17.8 (3500)	67 (0.27)
20.3 (4000)	87 (0.35)

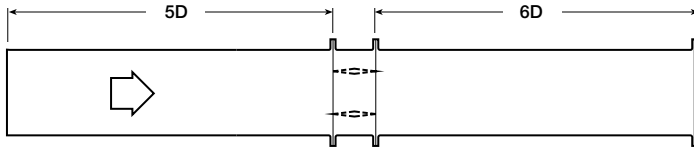
305mm x 1219mm (12 in. x 48 in.)

Velocity m/s (fpm)	Pressure Drop Pa (in. wg)
2.5 (500)	2 (0.01)
5.1 (1000)	10 (0.04)
7.6 (1500)	20 (0.08)
10.2 (2000)	37 (0.15)
12.7 (2500)	55 (0.22)
15.2 (3000)	80 (0.32)
17.8 (3500)	107 (0.43)
20.3 (4000)	139 (0.56)

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

Velocity m/s (fpm)	Pressure Drop Pa (in. wg)
2.5 (500)	2 (0.01)
5.1 (1000)	7 (0.03)
7.6 (1500)	17 (0.07)
10.2 (2000)	30 (0.12)
12.7 (2500)	45 (0.18)
15.2 (3000)	64 (0.26)
17.8 (3500)	89 (0.36)
20.3 (4000)	117 (0.47)

AMCA 5.3



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

Velocity m/s (fpm)	Pressure Drop Pa (in. wg)
2.5 (500)	2 (0.01)
5.1 (1000)	7 (0.03)
7.6 (1500)	20 (0.08)
10.2 (2000)	32 (0.13)
12.7 (2500)	50 (0.20)
15.2 (3000)	72 (0.29)
17.8 (3500)	99 (0.40)
20.3 (4000)	127 (0.51)

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

Velocity m/s (fpm)	Pressure Drop Pa (in. wg)
2.5 (500)	2 (0.01)
5.1 (1000)	5 (0.02)
7.6 (1500)	10 (0.04)
10.2 (2000)	17 (0.07)
12.7 (2500)	27 (0.11)
15.2 (3000)	40 (0.16)
17.8 (3500)	52 (0.21)
20.3 (4000)	70 (0.28)

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

Velocity m/s (fpm)	Pressure Drop Pa (in. wg)
2.5 (500)	2 (0.01)
5.1 (1000)	5 (0.02)
7.6 (1500)	7 (0.03)
10.2 (2000)	15 (0.06)
12.7 (2500)	22 (0.09)
15.2 (3000)	32 (0.13)
17.8 (3500)	47 (0.19)
20.3 (4000)	62 (0.25)

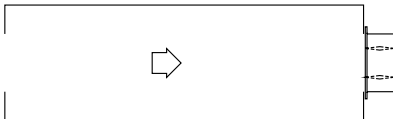
305mm x 1219mm (12 in. x 48 in.)

Velocity m/s (fpm)	Pressure Drop Pa (in. wg)
2.5 (500)	2 (0.01)
5.1 (1000)	7 (0.03)
7.6 (1500)	17 (0.07)
10.2 (2000)	30 (0.12)
12.7 (2500)	45 (0.18)
15.2 (3000)	64 (0.26)
17.8 (3500)	89 (0.36)
20.3 (4000)	114 (0.46)

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

Velocity m/s (fpm)	Pressure Drop Pa (in. wg)
2.5 (500)	2 (0.01)
5.1 (1000)	7 (0.03)
7.6 (1500)	15 (0.06)
10.2 (2000)	25 (0.10)
12.7 (2500)	40 (0.16)
15.2 (3000)	55 (0.22)
17.8 (3500)	75 (0.30)
20.3 (4000)	97 (0.39)

AMCA 5.5



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

Velocity m/s (fpm)	Pressure Drop Pa (in. wg)
2.5 (500)	7 (0.03)
5.1 (1000)	32 (0.13)
7.6 (1500)	75 (0.30)
10.2 (2000)	132 (0.53)
12.7 (2500)	204 (0.82)
15.2 (3000)	296 (1.19)
17.8 (3500)	403 (1.62)
20.3 (4000)	522 (2.10)

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

Velocity m/s (fpm)	Pressure Drop Pa (in. wg)
2.5 (500)	7 (0.03)
5.1 (1000)	30 (0.12)
7.6 (1500)	64 (0.26)
10.2 (2000)	117 (0.47)
12.7 (2500)	186 (0.75)
15.2 (3000)	259 (1.04)
17.8 (3500)	351 (1.41)
20.3 (4000)	472 (1.90)

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

Velocity m/s (fpm)	Pressure Drop Pa (in. wg)
2.5 (500)	5 (0.02)
5.1 (1000)	25 (0.10)
7.6 (1500)	55 (0.22)
10.2 (2000)	99 (0.40)
12.7 (2500)	154 (0.62)
15.2 (3000)	224 (0.90)
17.8 (3500)	306 (1.23)
20.3 (4000)	403 (1.62)

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

Velocity m/s (fpm)	Pressure Drop Pa (in. wg)
2.5 (500)	7 (0.03)
5.1 (1000)	30 (0.12)
7.6 (1500)	67 (0.27)
10.2 (2000)	117 (0.47)
12.7 (2500)	186 (0.75)
15.2 (3000)	266 (1.07)
17.8 (3500)	360 (1.45)
20.3 (4000)	475 (1.91)

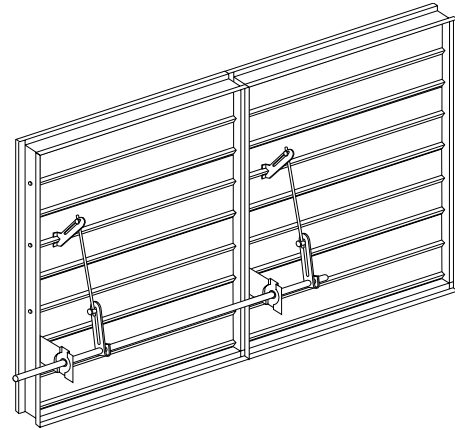
1219mm x 305mm (48 in. x 12 in.)

Velocity m/s (fpm)	Pressure Drop Pa (in. wg)
2.5 (500)	7 (0.03)
5.1 (1000)	30 (0.12)
7.6 (1500)	70 (0.28)
10.2 (2000)	122 (0.49)
12.7 (2500)	191 (0.77)
15.2 (3000)	278 (1.12)
17.8 (3500)	380 (1.53)
20.3 (4000)	500 (2.01)

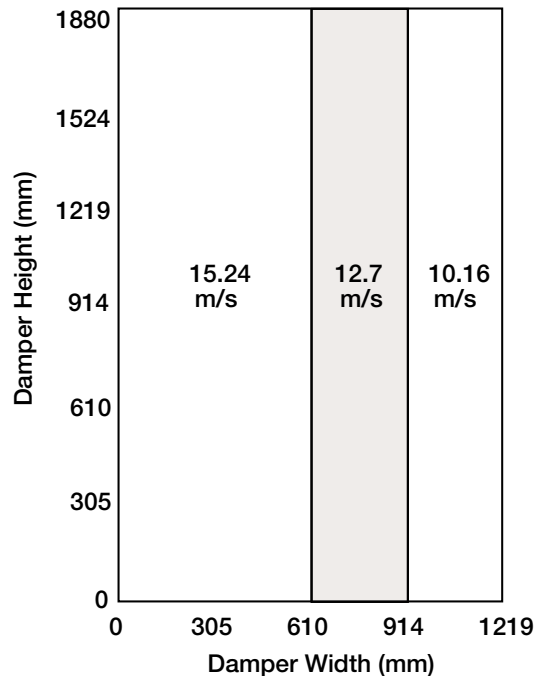
Multi-Section Assembly

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 1219mm x 1880mm (48 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.



Velocity Limitations



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 1.5mm (16 ga.) 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 13mm [½ in.] 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 1.5mm (16 ga.) galvanized steel formed into a structural hat channel shape with reinforced corners to meet 3.1mm (11 ga.) criteria. Bearings shall be corrosion resistant, permanently lubricated, synthetic (acetel) 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 1.2 kPa (5 in. wg), velocities to 15.2 m/s (3000 fpm) and temperatures to 121°C (250°F). Testing and ratings to be in accordance with AMCA Standard 500.

Basis of design is Greenheck model VCD-M20.



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VCDM-20 Rev. 5 February 2012