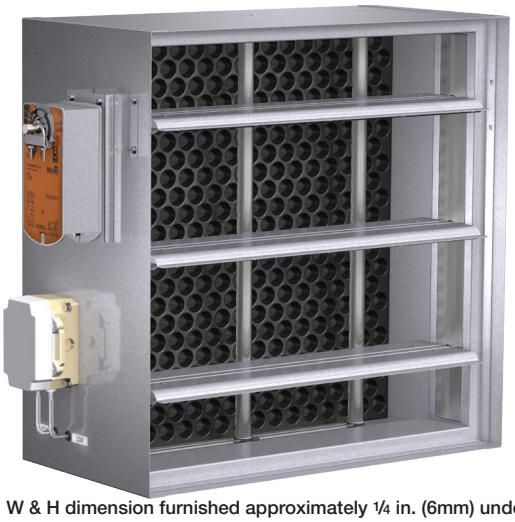
AMD-33

Air Measuring Station with VCD-33 Control Damper

Application and Design

The AMD-33 combines the functionality of an accurate airflow measuring station and a low leakage control damper into one compact assembly that both measures and regulates airflow volumes to a target set-point. The AMD-33 comes standard with a modulating actuator and a properly sized pressure transducer that output a signal proportional to cfm. A field supplied controller can use the transducer's signal along with the flow formula: $CFM = Area * K * (P_{transducer})^m$ to regulate the modulating actuator to the target set-point. K & m are factory supplied variables specific to each damper.



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

Ratings

Velocity: 300 to 3000 fpm (1.5 - 15.2 m/s)

Leakage: 6 cfm/ft^2 @ 4 in. wg
(110 cmh/m^2 @ 1 kPa)
3cfm/ft^2 @ 1 in. wg
(55 cmh/m^2 @ .25 kPa)

Temperature: -20°F to 180°F (-29°C to 82°C)
Consult factory for temperature lower than -20°F (-29°C)

Transducer Temperature: 14°F to 140°F (-10°C to 60°C)

Airflow Monitoring Accuracy: 5% of reading

Construction	Standard	Optional
Frame Material	Galvanized Steel	-
Frame Material Thickness	16 ga. (1.5mm)	12 ga. (2.7mm)*
Frame Type	5 in. x 1 in. hat channel	-
Blade Material	Galvanized steel	-
Blade Type	Airfoil	-
Blade Action	Parallel	-
Linkage	Plated steel out of airstream, concealed in jamb	316SS
Axle Bearings	Synthetic (acetal) sleeve type	316SS
Axle Material	Plated steel	316SS
Blade Seals	TPE	Silicone
Jamb Seals	Stainless steel	-
Sleeve	12 in. (305mm)	12 in. - 48 in. (305mm - 1219mm)
Sleeve Gauge	20 ga.	14 ga. or 16 ga.
Flange	None	1½ in. (38mm); Upstream side, Downstream side, Both Sides
Air Straightener	Polycarbonate Honeycomb	-
Actuator	24 VAC 50/60 Hz	24 VAC w/ auxiliary switches or manual quadrant

*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.

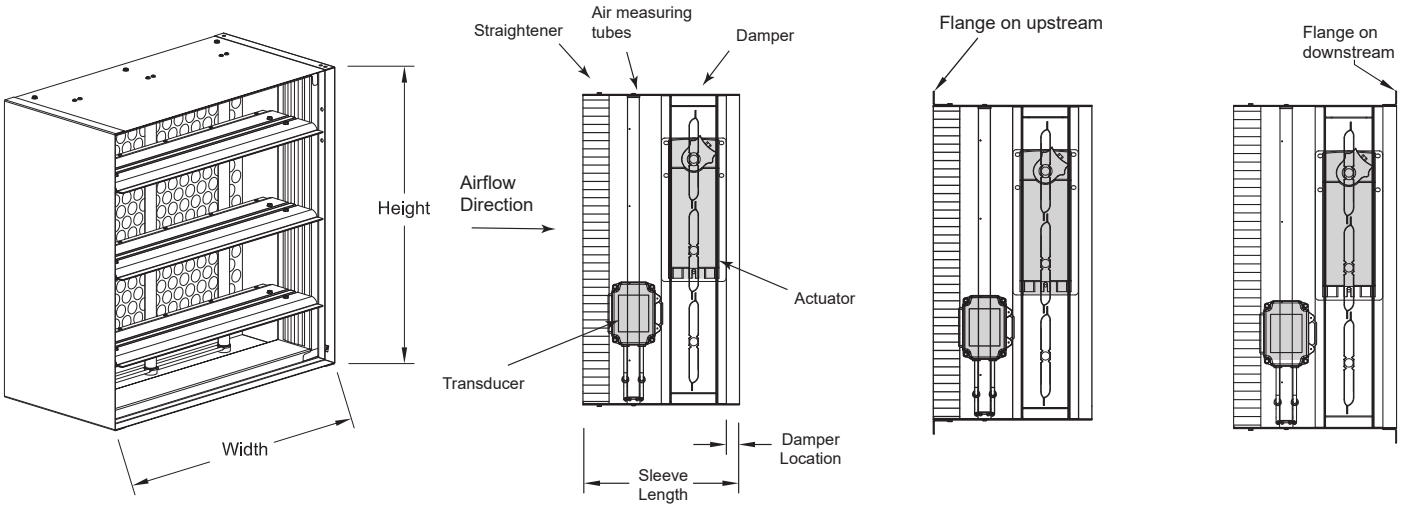
W x H	Minimum Size		Maximum Size	
	External	Internal	Single Section	Multiple Section*
Inches	6 x 6	8 x 6	48 x 74	144 x 148
mm	152 x 152	203 x 152	1219 x 1880	3658 x 3759
* For sizes larger than listed, consult factory.				

Features & Control Options

- 24 VAC modulating actuator mounted externally or internally
- Factory supplied 0-10 VDC pressure transducer
- Clean wrap
- Retaining angles

Installation instructions available at www.greenheck.com

AMD-33 mounting styles



AMCA Certified 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^2 (0.79 N·m) applied to close and seat the damper during the test.

AMD-33	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

Greenheck Fan Corporation certifies that the model AMD-33 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 Leakage and Air Performance ratings.

*Leakage Class Definitions

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

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

Pressure Drop AMD-33

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 0.075 lb/ft^3 (1.201kg/m^3).

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 5.2 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.

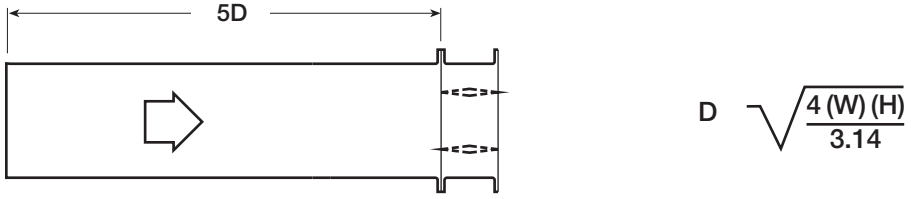


Figure 5.3 Illustrates a fully ducted damper. This configuration has the lowest pressure drop of the three test configurations because entrance and exit losses are minimized by straight duct runs upstream and downstream of the damper.

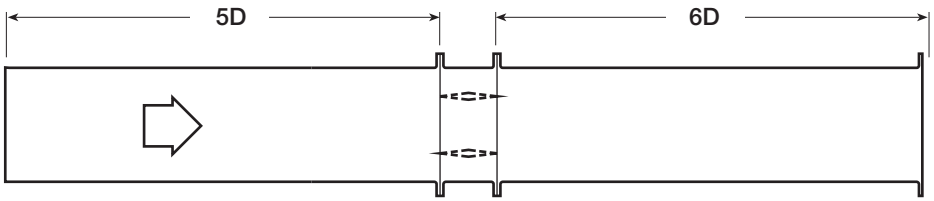
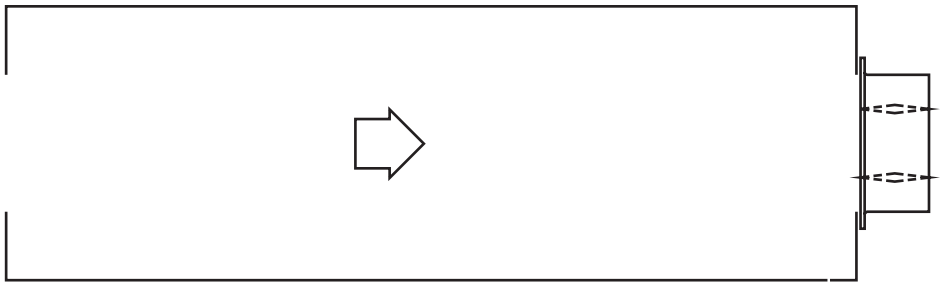


Figure 5.5 Illustrates a plenum mounted damper. This configuration has the highest pressure drop because of extremely high entrance and exit losses due to the sudden changes of area in the system.



Pressure Drop Data AMD-33

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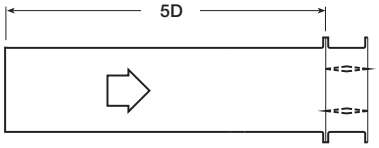
AMCA 5.2



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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.041
1000	0.131
1500	0.266
2000	0.437
2500	0.658
3000	0.927
3500	1.245
4000	1.591

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.025
1000	0.099
1500	0.222
2000	0.394
2500	0.616
3000	0.887
3500	1.208
4000	1.577

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.025
1000	0.078
1500	0.156
2000	0.259
2500	0.388
3000	0.533
3500	0.706
4000	0.914

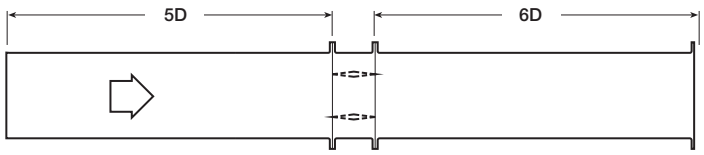
12 in. x 48 in. (305mm x 1219mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.034
1000	0.103
1500	0.213
2000	0.357
2500	0.541
3000	0.757
3500	1.017
4000	1.326

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.036
1000	0.102
1500	0.214
2000	0.359
2500	0.547
3000	0.772
3500	1.034
4000	1.339

AMCA 5.3



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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.04
1000	0.12
1500	0.24
2000	0.40
2500	0.60
3000	0.84
3500	1.12
4000	1.44

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.09
1500	0.17
2000	0.28
2500	0.43
3000	0.60
3500	0.80
4000	1.03

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.07
1500	0.14
2000	0.23
2500	0.35
3000	0.48
3500	0.64
4000	0.82

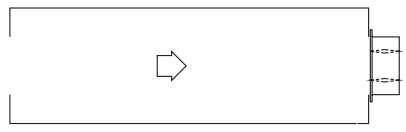
12 in. x 48 in. (305mm x 1219mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.10
1500	0.20
2000	0.34
2500	0.51
3000	0.72
3500	0.97
4000	1.26

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.09
1500	0.19
2000	0.33
2500	0.50
3000	0.71
3500	0.96
4000	1.24

AMCA 5.5



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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.07
1000	0.24
1500	0.50
2000	0.86
2500	1.33
3000	1.89
3500	2.57
4000	3.30

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.05
1000	0.19
1500	0.41
2000	0.71
2500	1.10
3000	1.56
3500	2.13
4000	2.80

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.05
1000	0.16
1500	0.34
2000	0.57
2500	0.88
3000	1.24
3500	1.67
4000	2.19

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.06
1000	0.19
1500	0.41
2000	0.71
2500	1.09
3000	1.54
3500	2.08
4000	2.70

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.05
1000	0.19
1500	0.41
2000	0.71
2500	1.10
3000	1.55
3500	2.10
4000	2.75

Factory Supplied Controls

By adding a factory supplied controller AMD series airflow measuring dampers become a turn-key solution for measuring and controlling the flow of air. Go to www.greenheck.com for complete instructions on these two controllers.

Vari-Green® Constant Volume Controller

Greenheck's Vari-Green Constant Volume Controller is a highly configurable analog based controller. The controller can accept a cfm setpoint either remotely by way of an analog input or locally by using touch sensitive buttons on its cover. The controller then regulates the position of the AMD's actuator to deliver the requested cfm. An analog output on the controller also supplies a signal that is proportional to the real-time cfm.

The Vari-Green Constant Volume Controller features a two line backlit LCD display to show the user the current CFM setpoint, the real-time cfm, the current pressure reading, and the AMD's actuator position.

Specifications

Control dampers meeting the following specifications shall be installed where shown on plans as an air monitor station integral to the minimum outside air damper. The air measuring damper shall control the minimum amount of outside air as recommended by ASHRAE Standard 62 or California Title 24.

The air measuring damper shall consist of: 16 ga. (1.5mm) galvanized steel hat channel frame with 5 in. (127mm) depth; airfoil shaped, galvanized steel double skin construction blades (14 ga. [2mm] equivalent thickness); blades shall be completely symmetrical relative to their axle pivot point, presenting identical resistance to airflow in either direction or pressure on either side of the damper. Axles shall be ½ in. (13mm) dia. plated steel turning in acetal bearings; TPE blade seals for 250°F (121°C) maximum temperature; flexible stainless steel jamb seals; and external (out of the airstream) blade-to-blade linkage.

Damper leakage rating to be in compliance with the IECC (International Energy Conservation Code) and not to exceed 3 cfm/ft^2 (55 cmh/m^2) at 1 in. wg (0.25 kPa). Testing and ratings to be in accordance with AMCA standard 500-D.

Basis of design is model AMD-33.

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