



ICD-45

Thermally Broken Frame
Thermally Broken Blade

Insulated Control Damper

Application and Design

The ICD-45 is a low leakage thermally insulated damper with extruded airfoil blades. ICD-45 features thermally broken frame and blade to eliminate the transfer of heat or cold penetration and reduced condensation. Its also IECC (International Energy Conservation Code) compliant with a leakage rating of 3 cfm/ft² @ 1 in. wg (55 cmh/m² @ .25 kPa) or less.

The new quick connect frame allows you easy connection to ductwork.

Ratings

- Pressure:** Up to 8.0 in. wg (2 kPa) pressure differential
- Velocity:** 2500 to 4000 fpm (12.7 m/s - 20.3 m/s)
- Leakage:** 3 cfm/ft² @ 1 in. wg at -40°F (54.8 cmh/m² @ .25 kPa at -40°C)
6 cfm/ft² @ 4 in. wg at -40°F (110 cmh/m² @ 1 kPa at -40°C)
- Temperature:** -70°F to 200°F (-56°C to 93°C)



	Standard Construction	Optional Construction
Frame Material	Aluminum	-
Frame Material Thickness	.125 in. (3.2mm)	-
Frame Type	5 in. x 1in. (127mm x 25mm) Quick Connect	Single Flange Reverse Flange Channel
Blade Action	Opposed	Parallel
Blade Material	Extruded Aluminum	-
Blade Type	Thermally Broken Airfoil	-
Linkage	Plated Steel Out of Airstream	304SS
Axle Bearings	Dual Bearing With Acetal Inner Sleeve, Flanged Outer Bearing	-
Axle Material	½ Inch Plated Steel	304SS
Blade Seals	Silicone	-
Jamb Seals	Silicone	-



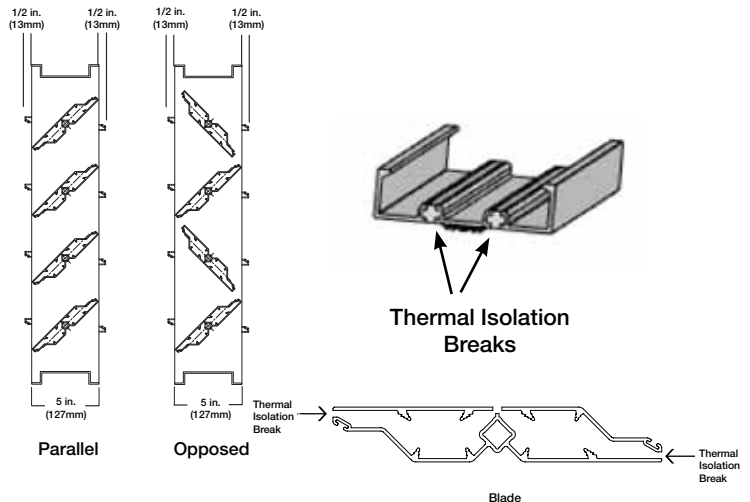
Greenheck Fan Corporation certifies that the model ICD-45 shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Programs. The AMCA Certified Ratings Seal applies to air performance ratings only.

Features

- Frame is insulated with polystyrene on four sides, thermally broken with dual polyurethane resin gaps.
- Blades is insulated with polyurethane foam, thermally broken with dual polyurethane resin gaps.
- Actuators - 120V, 24V, 230V, manual quadrant
- Dual bearing with acetal inner sleeve, flanged outer bearing resulting in no metal-to-metal or metal-to-plastic contact

Size Limitations

in. (mm) W x H		Frame Type			
		Quick Connect		Channel, Single or Reverse Flange	
Blade Action		Parallel	Opposed	Parallel	Opposed
Minimum Sizes	Internal Mount	12 x 6 (305 x 152)	12 x 10 (305 x 254)	12 x 7 (305 x 178)	12 x 12 (305 x 305)
	External Mount	8 x 6 (203 x 152)	8 x 10 (203 x 254)	8 x 7 (203 x 178)	8 x 12 (203 x 305)
Maximum Sizes	Single Section	48 in. W x 74 in. H (1219mm x 1880mm)			
	Multi-Section	96 in. W x 120 in. H (2438mm x 3048mm)		144 in. W x 120 in. H (3658mm x 3048mm)	

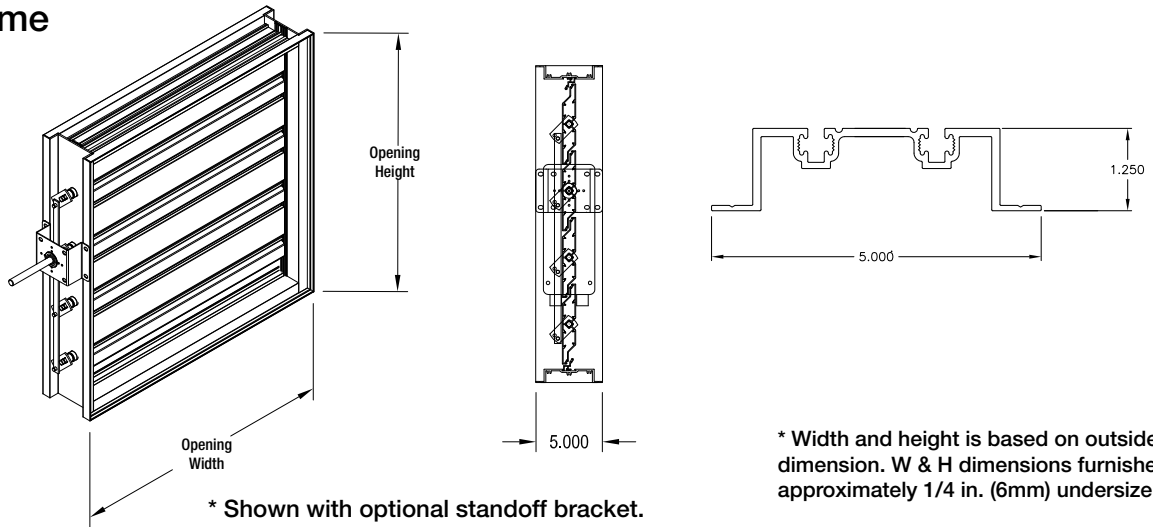


Installation instructions available at www.greenheck.com

Frame Type Options

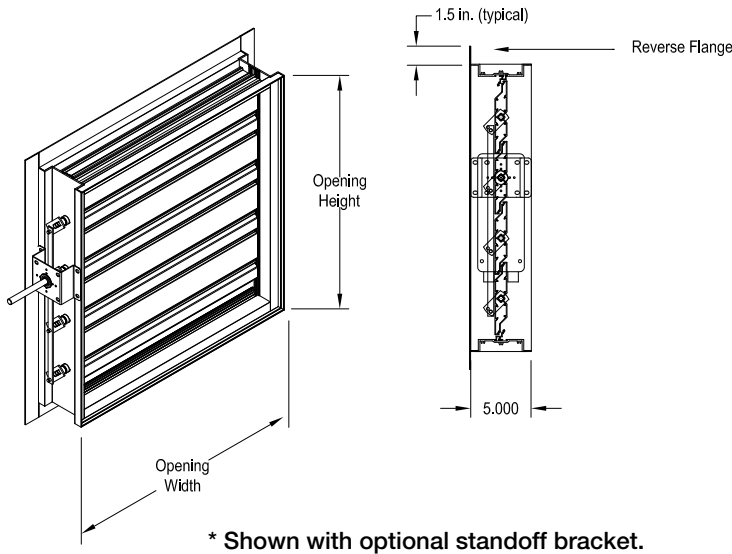
ICD-45

Channel Frame



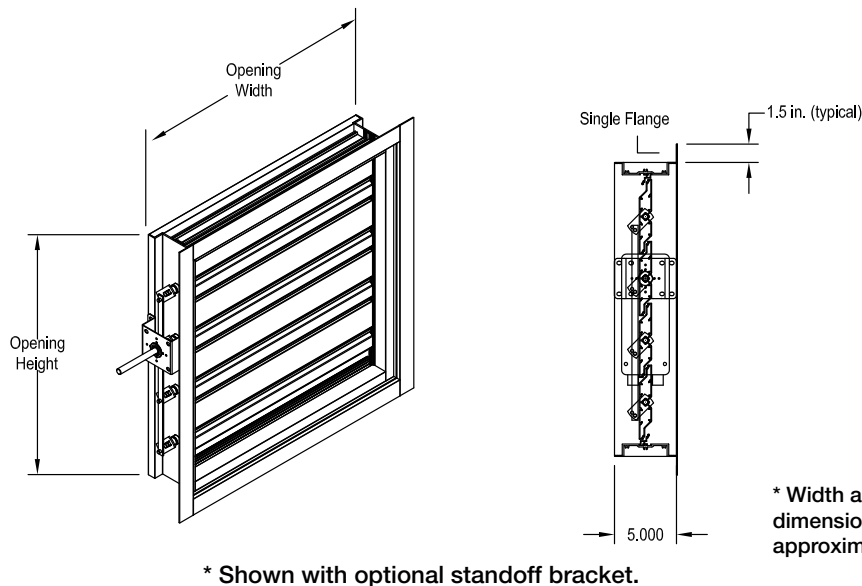
* Width and height is based on outside dimension. W & H dimensions furnished approximately 1/4 in. (6mm) undersize.

Reverse Flange



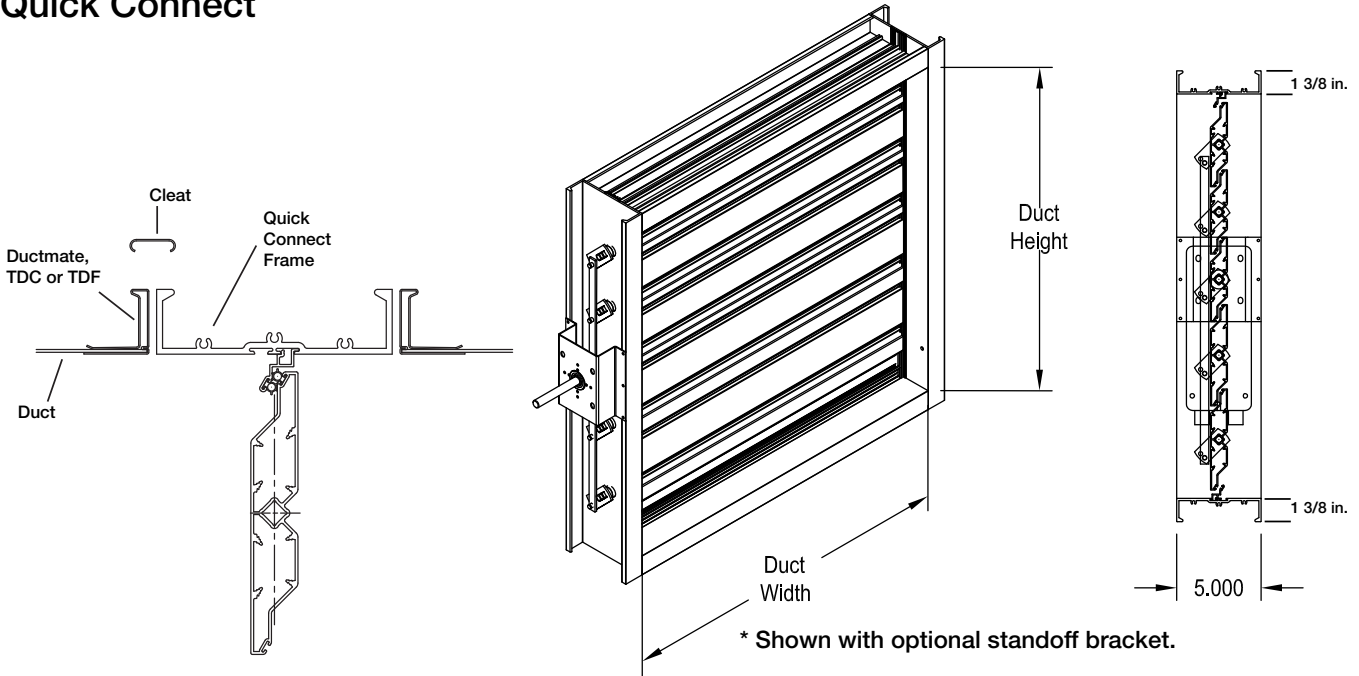
* Width and height is based on outside dimension. W & H dimensions furnished approximately 1/4 in. (6mm) undersize.

Single Flange



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

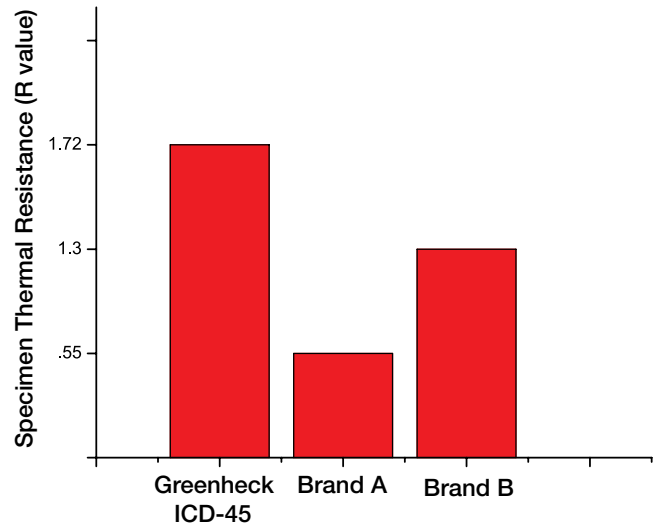
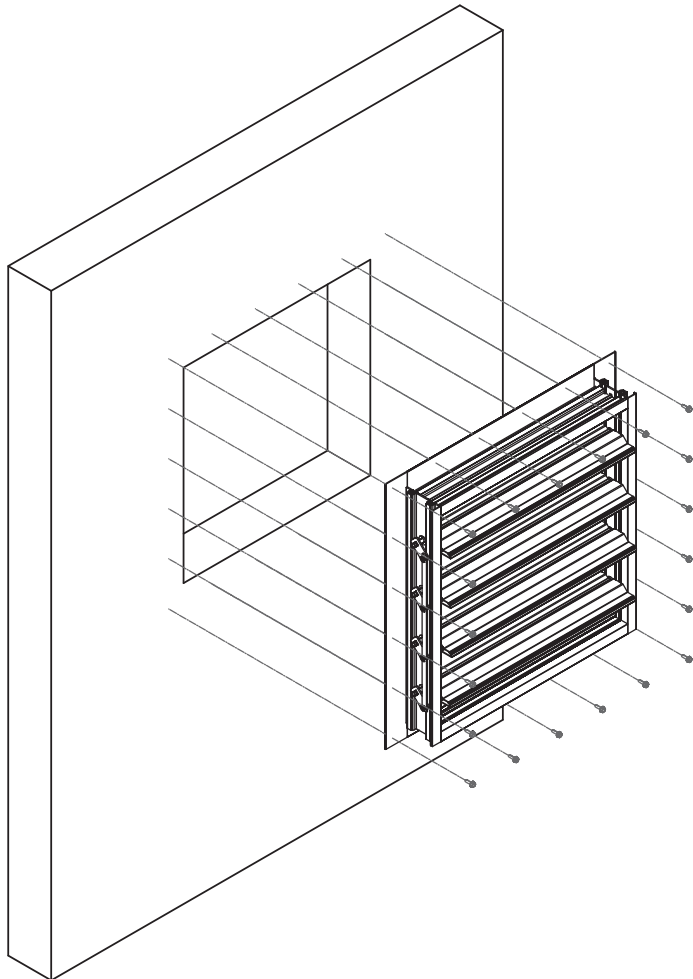
Quick Connect



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.

Thermal Performance Chart

Thermal Performance testing conducted per ASTM standard 1363-97 at Architectural Testing Laboratories (ATI), test report no. 53166.01-201-46 .



There are applications that require mounting an ICD-45 into a plenum wall. This illustration depicts how to mount an ICD-45 into a plenum wall.

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).

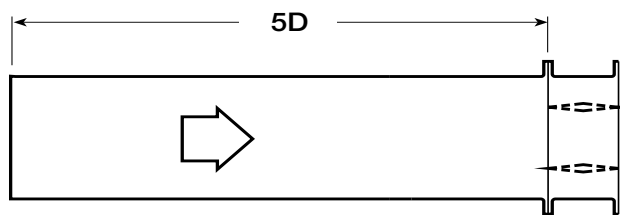
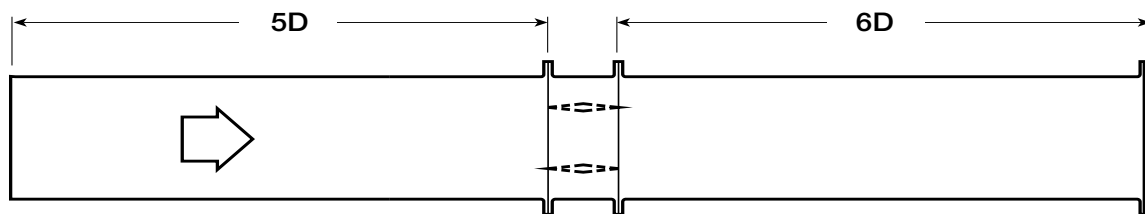
Actual pressure drop found in any HVAC system is a combination of many factors. This pressure drop information along with an analysis of other system influences should be used to estimate actual pressure losses for a damper installed in a given HVAC system.

AMCA Test Figures

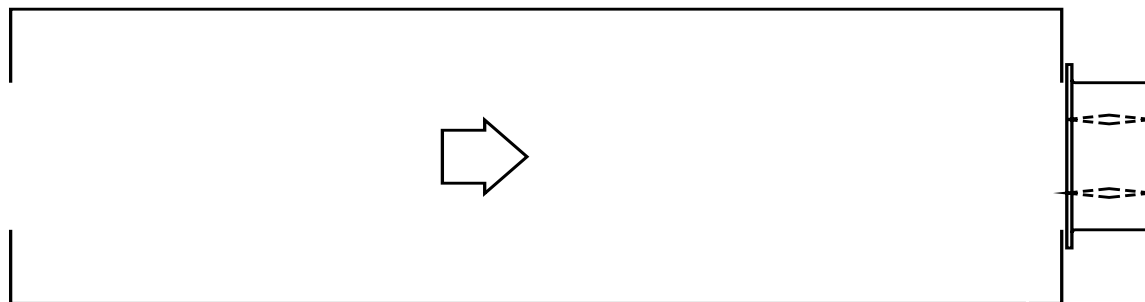
Figure 5.3 Illustrates a fully ducted damper. This configuration has the lowest pressure drop of the three test configurations because entrance and exit losses are minimized by straight duct runs upstream and downstream of the damper.

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.



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



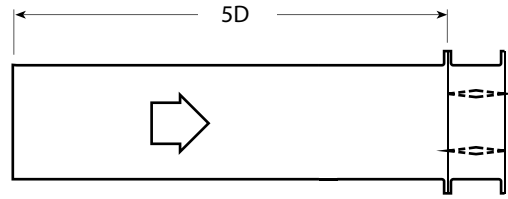
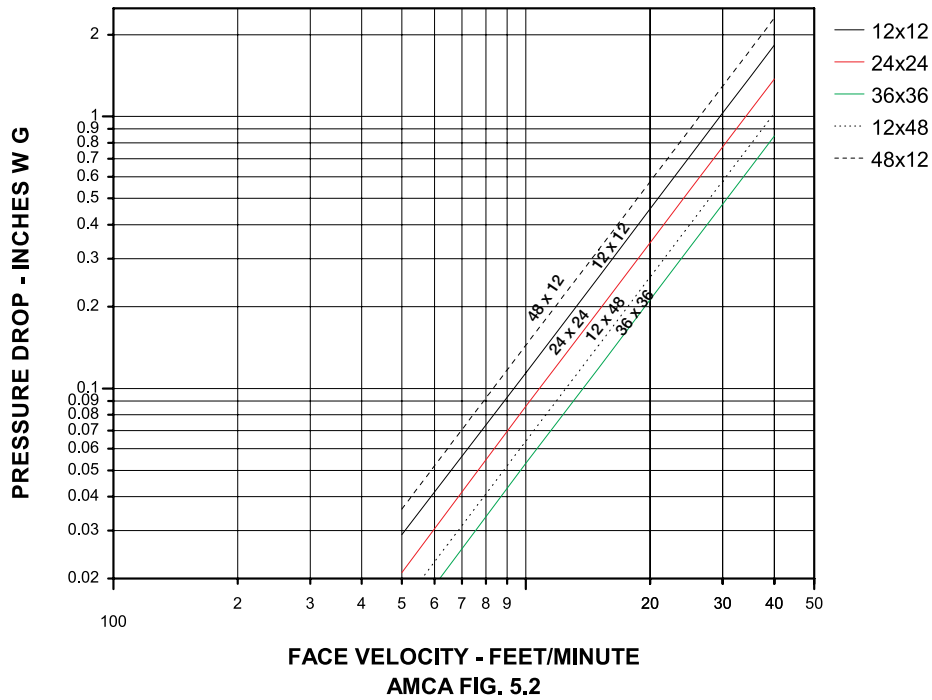


Figure 5.2

VELOCITY VS. PRESSURE DROP



12 x 12 (305mm x 305mm)	
Velocity (fpm)	Pressure Drop (in. wg)
500	.03
1000	.11
1500	.25
2000	.45
2500	.71
3000	1.03
3500	1.40
4000	1.83

24 x 24 (610mm x 610mm)	
Velocity (fpm)	Pressure Drop (in. wg)
500	.02
1000	.08
1500	.19
2000	.34
2500	.53
3000	.77
3500	1.05
4000	1.37

36 x 36 (914mm x 914mm)	
Velocity (fpm)	Pressure Drop (in. wg)
500	.01
1000	.05
1500	.11
2000	.21
2500	.33
3000	.47
3500	.64
4000	.84

12 x 48 (305mm x 1219mm)	
Velocity (fpm)	Pressure Drop (in. wg)
500	.01
1000	.06
1500	.14
2000	.25
2500	.40
3000	.57
3500	.78
4000	1.02

48 x 12 (1219mm x 305mm)	
Velocity (fpm)	Pressure Drop (in. wg)
500	.03
1000	.14
1500	.32
2000	.57
2500	.89
3000	1.29
3500	1.76
4000	2.30



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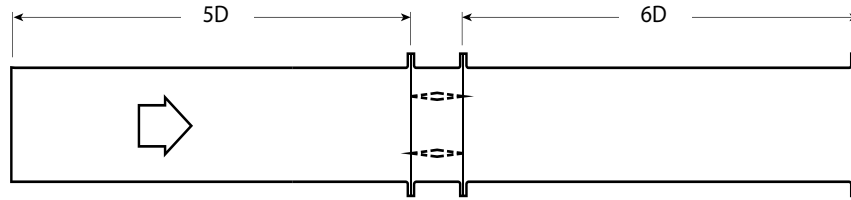
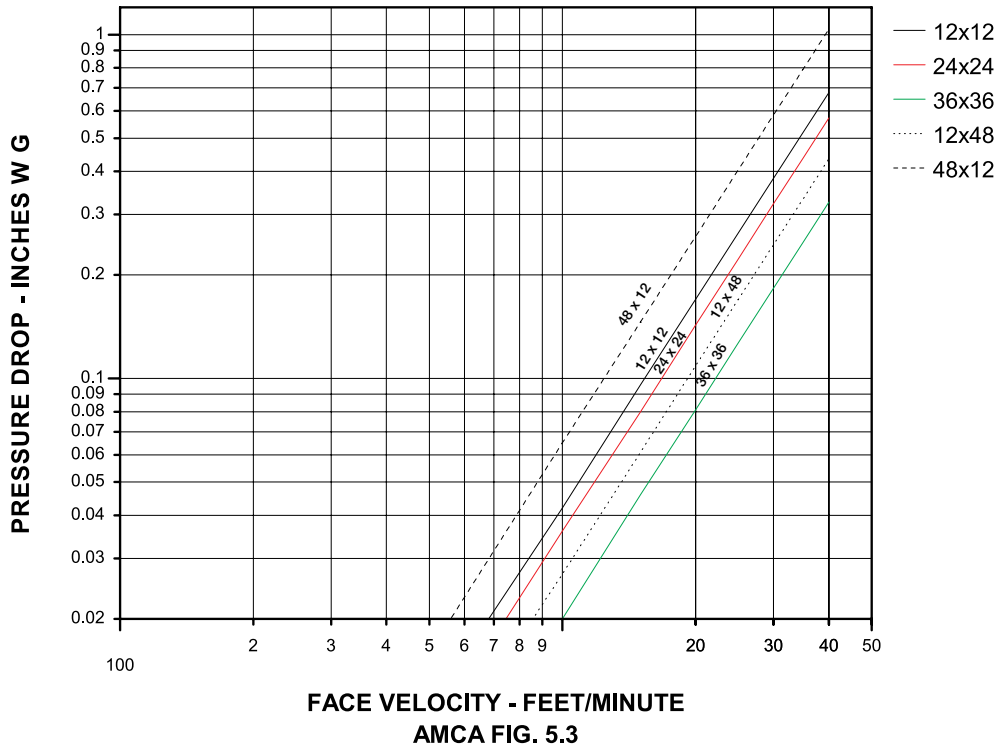


Figure 5.3

VELOCITY VS. PRESSURE DROP



12 x 12 (305mm x 305mm)	
Velocity (fpm)	Pressure Drop (in. wg)
500	.01
1000	.04
1500	.09
2000	.17
2500	.26
3000	.38
3500	.52
4000	.67

24 x 24 (610mm x 610mm)	
Velocity (fpm)	Pressure Drop (in. wg)
500	.01
1000	.03
1500	.08
2000	.14
2500	.22
3000	.32
3500	.43
4000	.57

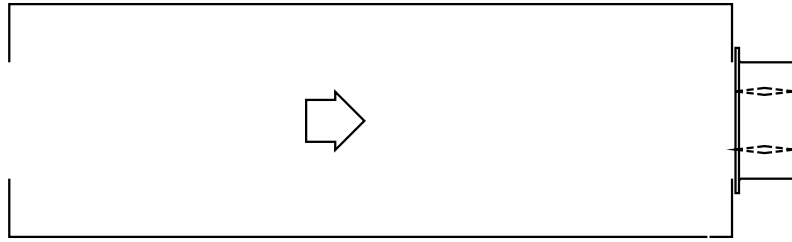
36 x 36 (914mm x 914mm)	
Velocity (fpm)	Pressure Drop (in. wg)
500	.01
1000	.02
1500	.04
2000	.08
2500	.12
3000	.18
3500	.24
4000	.32

12 x 48 (305mm x 1219mm)	
Velocity (fpm)	Pressure Drop (in. wg)
500	.01
1000	.02
1500	.06
2000	.10
2500	.17
3000	.24
3500	.33
4000	.43

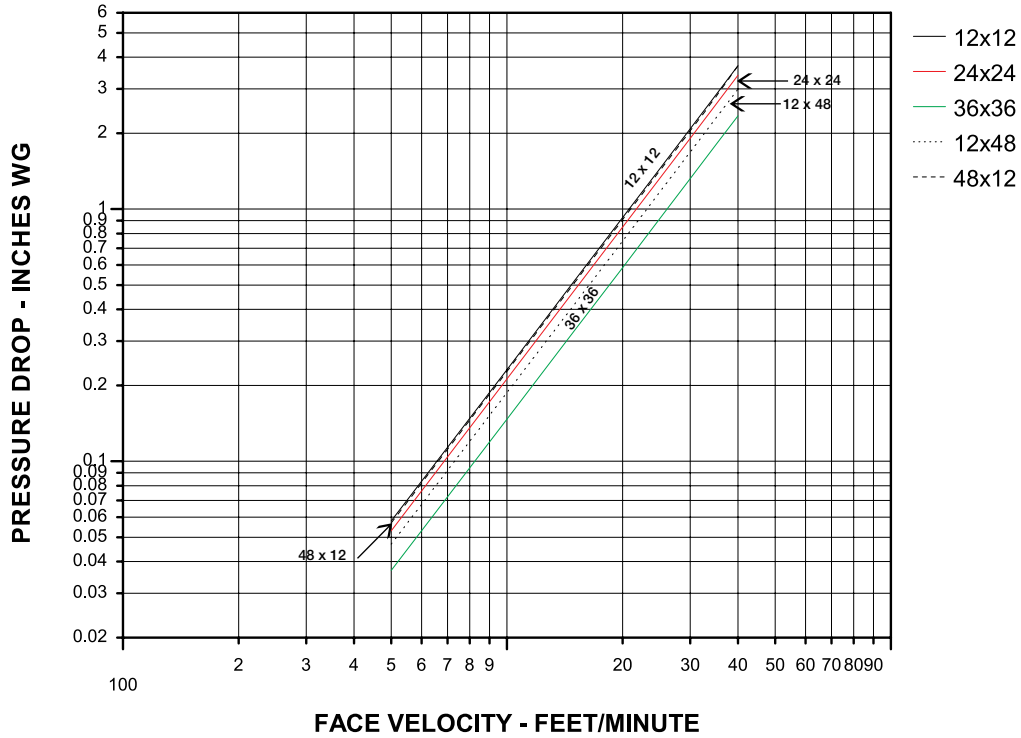
48 x 12 (1219mm x 305mm)	
Velocity (fpm)	Pressure Drop (in. wg)
500	.01
1000	.06
1500	.14
2000	.25
2500	.40
3000	.58
3500	.79
4000	1.03



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VELOCITY VS. PRESSURE DROP



FACE VELOCITY - FEET/MINUTE
AMCA FIG. 5.5

12 x 12 (305mm x 305mm)	
Velocity (fpm)	Pressure Drop (in. wg)
500	.05
1000	.23
1500	.52
2000	.93
2500	1.44
3000	2.08
3500	2.83
4000	3.70

24 x 24 (610mm x 610mm)	
Velocity (fpm)	Pressure Drop (in. wg)
500	.05
1000	.21
1500	.47
2000	.84
2500	1.32
3000	1.90
3500	2.59
4000	3.39

36 x 36 (914mm x 914mm)	
Velocity (fpm)	Pressure Drop (in. wg)
500	.03
1000	.14
1500	.33
2000	.58
2500	.91
3000	1.31
3500	1.79
4000	2.34

12 x 48 (305mm x 1219mm)	
Velocity (fpm)	Pressure Drop (in. wg)
500	.04
1000	.18
1500	.42
2000	.74
2500	1.16
3000	1.68
3500	2.28
4000	2.98

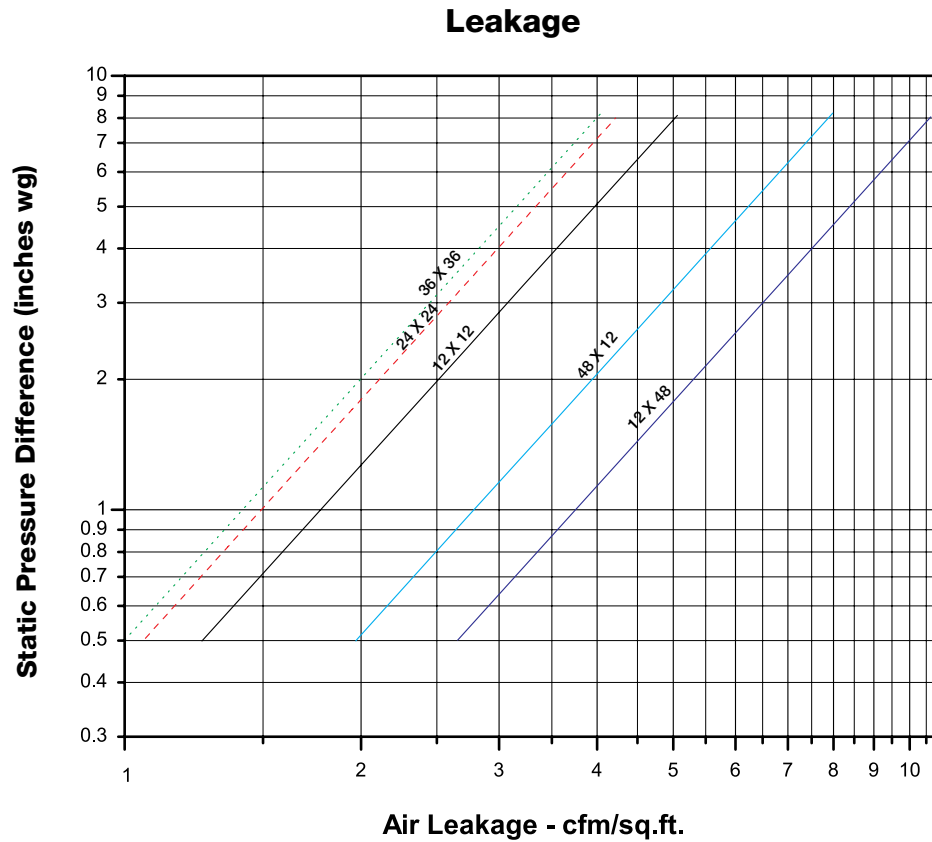
48 x 12 (1219mm x 305mm)	
Velocity (fpm)	Pressure Drop (in. wg)
500	.05
1000	.22
1500	.51
2000	.90
2500	1.41
3000	2.04
3500	2.78
4000	3.70



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Leakage Data

Leakage testing was conducted in accordance with AMCA Standard 500-D and is expressed as CFM/sq. ft. of damper face area. All data has been corrected to represent standard air at a density of .075 lb/ft³ (1.2 kg/m³).



Specifications

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

Dampers shall consist of: .125 (3.2mm) aluminum quick connect frame insulated with polystyrene on four sides and thermally broken with dual polyurethane resin gaps; aluminum airfoil blade internally insulated polyurethane foam and thermally broken. 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. Axle will be 1/2 in. (13mm) diameter plated steel; bearings are dual bearing with acetal inner sleeve, flanged outer bearing resulting in no metal-to-metal or metal-to-plastic contact.

Blade and jamb seals to be silicone rubber and external (out of the airstream) blade-to-blade linkage.

Dampers manufacturer's printed application and performance data including pressure, velocity, leakage, and temperature limitations shall be submitted for approval showing damper suitable for pressures to 8 in. wg (2 kPa), velocities to 4000 fpm (20.3 m/s), standard air leakage less than 6 cfm/sq. ft. @ 4 in. wg (110 cmh/m² @ 1kPa) and temperatures to 200 °F (93°C). Damper air performance data shall be developed in accordance with the latest edition of AMCA Standard 500-D.

Basis of design is ICD-45.

