FBH-33

Horizontal Face and Bypass Damper Low Leakage

Application

Horizontal style face and bypass control dampers are used in applications where face and bypass dampers are needed along side each other. The units are connected causing one damper to open and the other damper to close.

The FBH-33 is a horizontal style face and bypass low leakage damper with steel airfoil blades. This model is intended for application in medium to high pressure and velocity systems.

The FBH-33 is IECC (International Energy Conservation Code) compliant with a leakage rating of 3 cfm per square foot at 1 in. wg (55cmh/m^2) or less.

Width and Height is based on outside dimension. **Actual sizing only.**

Ratings

Pressure

Up to 8 in. wg (2 kPa) - pressure differential
For pressures greater than 8 in wg, consult factory.

Velocity

Up to 4,000 fpm (20.3 m/s)

Temperature

Up to 250°F (121°C). Consult factory for higher temperatures

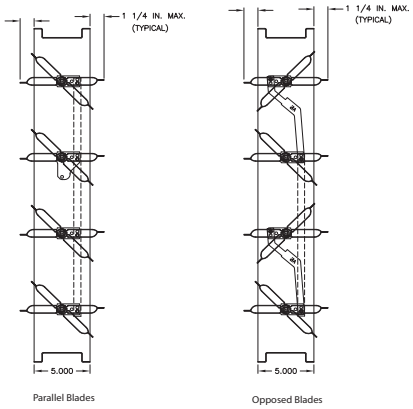
Leakage

Class 1A at 1 in. wg (.25 kPa)
Class 1 at 4-8 in. wg (1kPa - 2kPa)

Construction

	Standard	Optional
Frame Material	Galvanized steel	-
Frame Thickness	16 ga. (1.5mm)	-
Frame Type	5 in. x 1 in. Channel (127mm x 25mm)	-
Blade Material	Galvanized steel	-
Blade Thickness	14 ga. equivalent (2mm)	-
Blade Type	Airfoil	-
Blade Action	Opposed	Parallel
Bypass Location	Right of Face	Left of Face
Blade Seals	TPE	Silicone
Axle Bearings	Synthetic	316SS
Linkage Material	Plated steel	316SS
Axle Material	Plated steel	316SS
Jamb Seal	Stainless steel	-

Blade Operation



Size Limitations

W x H In. (mm)		Damper	
		Face	Bypass
Minimum Sizes*		8 x 6 (203 x 152)	8 x 6 (203 x 152)
Maximum Sizes*	**Single Section**	60 x 74 (1524 x 1880)	60 x 74 (1524 x 1880)
	Multiple Section	96 x 74 (2438 x 1880)	-
*varies by actuator configuration			

Features & Options

- Low profile head and sill are used on sizes less than 17 in. high (432mm).
- Electric actuators and manual operators availaible. Factory supplied actuators are sized for 1500 fpm (7 m/s) and a fully-closed differential pressure of 2 in. wg (.5kPa). Contact factory for actuator sizing and applications exceeding those levels.
- Clean wrap available.

Document Links

Installation Instructions

HVAC Control and Balancing Damper Catalog

Damper Product Selection Guide

Specifications

Damper Warranty

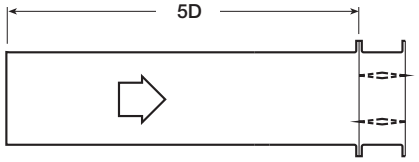
How to Select an Actuator

AMCA Certified Pressure Drop Data

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/ft^3(1.201 kg/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 5.2



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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.06
1500	0.13
2000	0.23
2500	0.35
3000	0.50
3500	0.68
4000	0.88

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.04
1500	0.10
2000	0.18
2500	0.28
3000	0.40
3500	0.54
4000	0.70

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.03
1500	0.06
2000	0.12
2500	0.18
3000	0.26
3500	0.35
4000	0.46

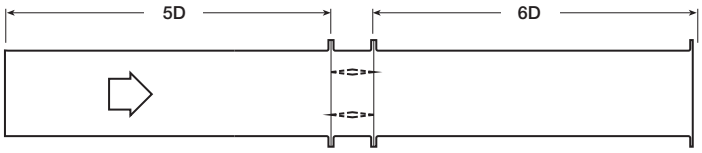
12 in. x 48 in. (305mm x 1219mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.04
1500	0.10
2000	0.17
2500	0.26
3000	0.38
3500	0.52
4000	0.68

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.03
1500	0.06
2000	0.10
2500	0.16
3000	0.23
3500	0.30
4000	0.39

AMCA 5.3



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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.03
1500	0.07
2000	0.14
2500	0.21
3000	0.29
3500	0.39
4000	0.51

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.02
1500	0.04
2000	0.08
2500	0.13
3000	0.19
3500	0.26
4000	0.34

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.01
1500	0.02
2000	0.04
2500	0.06
3000	0.09
3500	0.13
4000	0.17

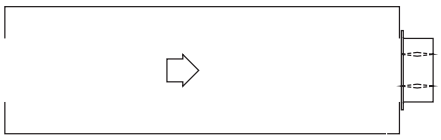
12 in. x 48 in. (305mm x 1219mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.03
1500	0.06
2000	0.11
2500	0.17
3000	0.25
3500	0.34
4000	0.45

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.02
1500	0.04
2000	0.08
2500	0.12
3000	0.18
3500	0.24
4000	0.31

AMCA 5.5



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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.04
1000	0.14
1500	0.31
2000	0.55
2500	0.86
3000	1.23
3500	1.67
4000	2.19

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.12
1500	0.27
2000	0.48
2500	0.75
3000	1.07
3500	1.47
4000	1.91

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.10
1500	0.22
2000	0.39
2500	0.61
3000	0.87
3500	1.19
4000	1.56

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.11
1500	0.25
2000	0.46
2500	0.72
3000	1.05
3500	1.43
4000	1.87

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

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.11
1500	0.26
2000	0.46
2500	0.72
3000	1.02
3500	1.40
4000	1.83

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 5.0 in. lb./ft² (0.56 N·m) applied to close and seat the damper during the test.

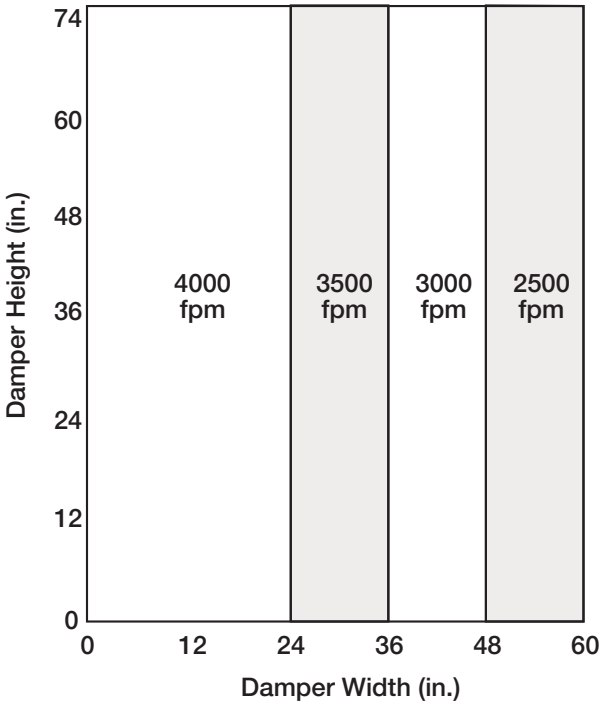
FBH-33	Leakage Class*		
Maximum Damper Width	1 in. wg (0.25 kPa)	4 in. wg (1 kPa)	8 in. wg (2 kPa)
60 in. (1524mm)	1A	1	1

***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 and Temperature Limitations

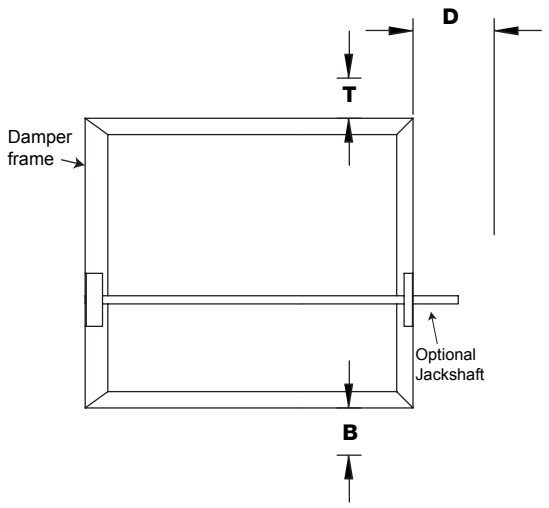


Blade Seal	Temperature Range
TPE	-10°F to 180°F (-23°C to 82°C)
Silicone	-40°F to 250°F (-40°C to 121°C)

Application Data

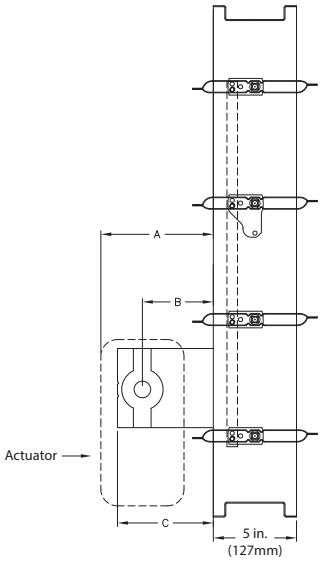
Space Envelopes

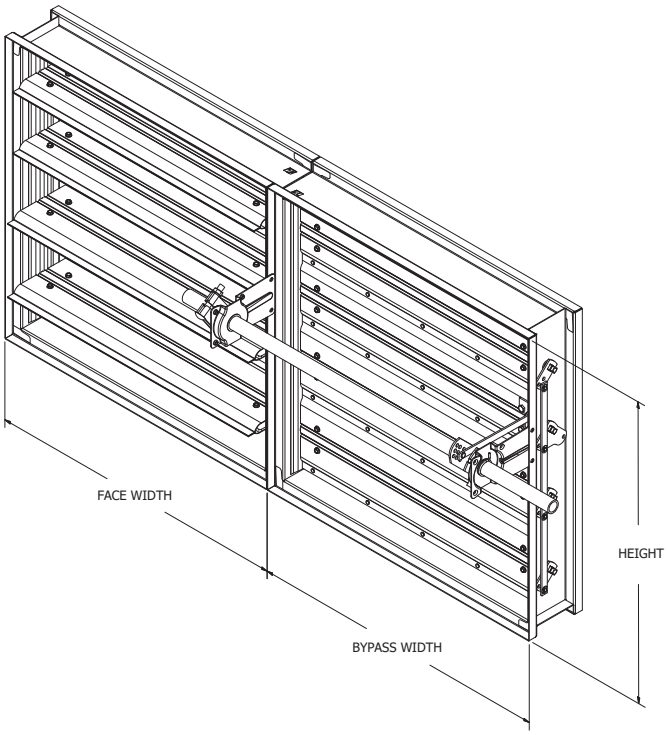
Dampers less than 18 in. (457mm) high may require actuator clearances above and/or below the damper frame. **"B" and "T" dimensions are worst case clearance requirements for some dampers less than 18 in. (457mm) high.** All damper sizes under 18 in. (457mm) high do not require these worst case clearances. 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 (mm)	Inches		
AFBUP (-S) and FSNF Series, Belimo MSxx20 Series, Honeywell	>6 to <10	0	1 ¾	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

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

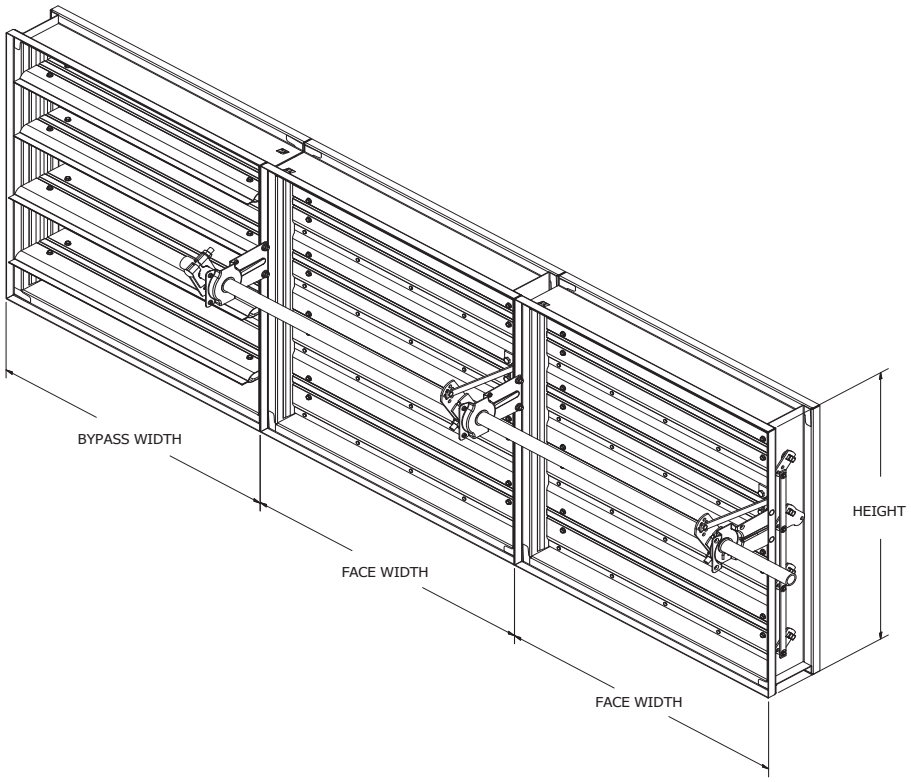




Width and height is based on outside dimension. **Actual sizing only.**

Multi-Section Assembly

Dampers larger than the maximum single section size will be made up of a multiple of equal size sections. The bypass damper can be mounted to the right or left of the face damper. This example depicts the face damper is two sections wide and the bypass damper is mounted to the left of the face, which is one section wide.



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