

Model SSSMD-23

Stainless Steel 3-V Blades
UL 555S Leakage Class I

Application

Model SSSMD-23 is a stainless steel leakage rated smoke damper with 3 Vee style blades and extremely low leakage. While the SSSMD-23 has been qualified to 3,000 fpm and 8" w.g. for operational closure in emergency smoke control situations, its recommended application is in HVAC systems with velocities to approximately 2000 fpm and 4" w.g. Model SSSMD-23 may be installed vertically (with blades running horizontally) or horizontally and is rated for airflow and leakage in either direction.

Ratings

UL 555S Leakage Rating

Leakage Class: I
 Operational Rating—Limits are actuator dependant
 Maximum Velocity: 3000 fpm
 Maximum Pressure: 8 in. wg
 Maximum Temperature: 350°F—Depending on actuator

Standard Construction

- Frame:** 5"x1" 304 stainless steel hat channel with reinforced corners (meets 13 ga. criteria). A low profile head and sill are used on sizes less than 17" high to maximize free area and performance.
- Blades:** 16 ga. 304 stainless steel steel, reinforced with 3 longitudinal structurally designed vee's.
- Seals:** Flexible stainless steel jamb seals.
- Linkage:** Concealed in jamb.
- Fusible Link:** UL listed 165°F.
- Axles:** 1/2" dia. plated steel.
- Bearings:** 304 stainless steel sleeve type.

Size Limitations

Minimum Size: 8" W x 6" H
Maximum Size: Single Section: 24" W x 30" H
 Multiple Section: Unlimited

Optional Features

- 304 stainless steel steel sleeves.
- OCI (Open closed indication switches)
- Electric or pneumatic actuators to accomplish smoke management and system functions.

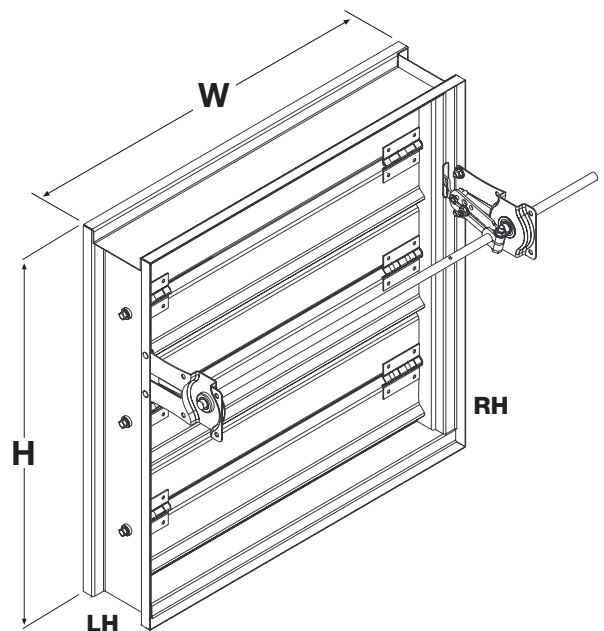
Model SSSMD-23 meets the requirements for smoke dampers established by:

National Fire Protection Association
 NFPA Standards 90A, 92A, 92B & 101
BOCA National Building Codes
ICBO Uniform Building Codes
SBCCI Standard Building Codes
New York City (MEA listing #260-91-M)
CSFM California State Fire Marshal
 Leakage (Smoke) Damper Listing (#3230-0981:110)

"UL CLASSIFIED (see complete marking on product)"
"UL CLASSIFIED to Canadian safety standards (see complete marking on product)"
 Standard 555S (Listing #R13447)



Greenheck certifies that the model SSSMD-23 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.



*W & H dimensions furnished approximately 1/4" undersize.
 (Add sleeve thickness for overall sleeved damper dimension)
 Right hand drive is shown. Left hand drive is available upon request.

This pressure drop testing was conducted in accordance with AMCA Standard 500 using the three configurations shown. All data has been corrected to represent standard air at a density of 0.075 lb/ft³.

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.

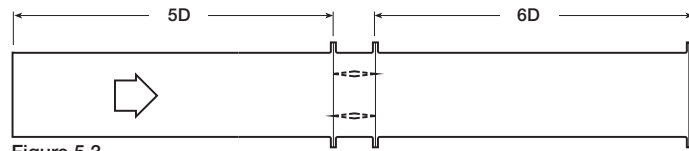


Figure 5.3

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.

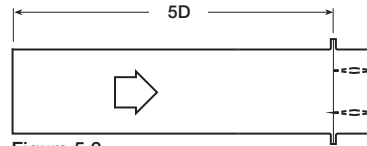


Figure 5.2

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

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.

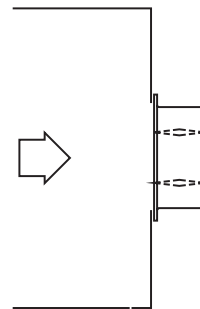


Figure 5.5

Pressure Drop Calculations

As explained in chapter 32 of the 1997 ASHRAE fundamentals handbook, pressure drop is a function of two variables: pressure velocity and a dimensionless parameter called the pressure loss coefficient (C_o).

To calculate the pressure drop across your damper: first select the AMCA test figure shown above that most closely resembles how your damper will be mounted, then substitute the duct face velocity and the appropriate damper pressure loss coefficient (C_o) found on the following page into equation 1.

Equation 1: $\Delta p = C_o * (V / 4005)^2$

where Δp = pressure drop measured in inches wg
 C_o = pressure drop coefficient
 V = Face velocity measured in fpm

Example: Calculate the pressure drop of a 24" x 24" damper in a fully ducted configuration (fig 5.3) that sees a face velocity of 1500 fpm.

Using the pressure loss coefficient table corresponding to AMCA fig 5.3 it can be seen that the C_o value for a 24" x 24" damper is 0.65. Substituting C_o and the velocity into equation 1:

$$\Delta p = 0.65 * (1500 / 4005)^2$$

$$\Delta p = 0.091 \text{ in. wg}$$



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Pressure Loss Coefficient (Co) Table for AMCA Test Figure 5.3

Height	Width				
	8	12	16	20	24
6	11.74	11.74	6.34	6.34	5.14
8	6.34	4.30	4.30	2.41	2.41
12	4.30	2.41	1.69	1.32	1.32
16	2.41	1.32	1.10	0.90	0.90
20	2.41	1.32	1.10	0.90	0.90
24	1.69	1.10	0.90	0.76	0.65
28	1.69	1.10	0.90	0.76	0.64
30	1.69	0.90	0.76	0.64	0.64

Pressure Loss Coefficient (Co) Table for AMCA Test Figure 5.2

Height	Width				
	8	12	16	20	24
6	12.81	12.81	7.23	7.23	6.07
8	7.23	5.25	5.25	3.35	3.35
12	5.25	3.35	2.48	1.96	1.96
16	3.35	1.96	1.62	1.30	1.30
20	3.35	1.96	1.62	1.30	1.30
24	2.48	1.62	1.30	1.07	0.92
28	2.48	1.62	1.30	1.07	0.90
30	2.48	1.30	1.07	0.90	0.90

Pressure Loss Coefficient (Co) Table for AMCA Test Figure 5.5

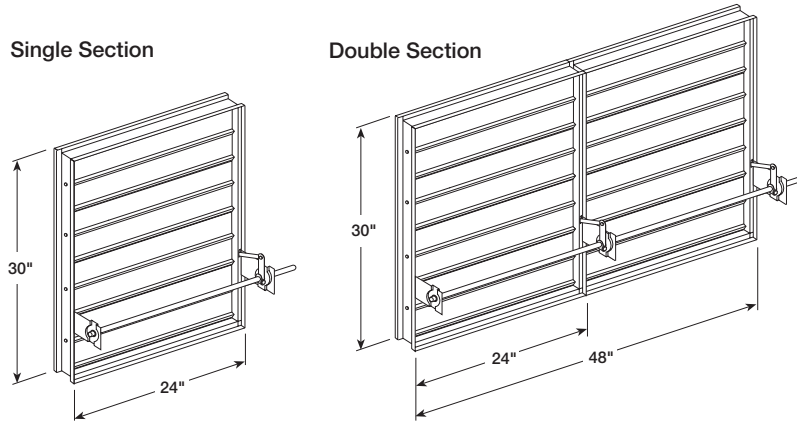
Height	Width				
	8	12	16	20	24
6	15.45	15.45	8.35	8.35	7.03
8	8.35	6.15	4.36	4.36	4.36
12	6.15	4.36	3.62	3.16	3.16
16	4.36	3.16	2.83	2.49	2.49
20	4.36	3.16	2.83	2.49	2.49
24	3.62	2.83	2.49	2.21	2.02
28	3.62	2.83	2.49	2.21	2.00
30	3.62	2.49	2.21	2.00	1.90

DIMENSIONAL DATA

SPECIFICATIONS

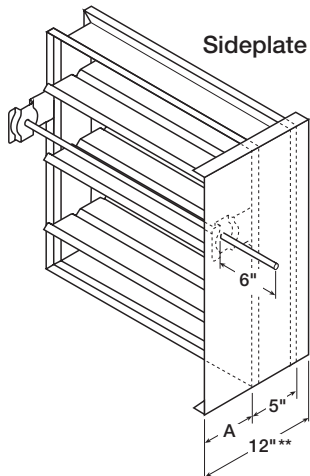
Damper Sizing Information

Dampers larger than maximum single section size are supplied as a factory assembly of two or more sections of equal size. The following figures show maximum damper section size and assembly configurations for multi-section dampers.



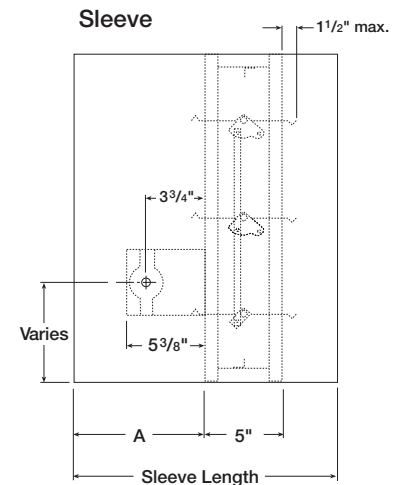
Damper Sideplate and Sleeve Dimensional Data

The drawings below illustrate the factory standard sideplate and sleeve mountings for the SSSMD-23. The standard "A" dimensions listed in the table provide adequate space for the mounting of actuators and controls. If space constraints are a problem the "A" dimension can be varied between 5 3/8" and 12".



	"A" Dimension		
	Sleeve		Sideplate
	Standard	Maximum	
All Dampers*	7 3/16"	12"	6 3/16"
When H is 10" or less w/OCI	11 3/16"	12"	10 3/16"

* With the exception of dampers 10" high or less with OCI option.
 ** On dampers 10" high or less with OCI option, sideplate is 16".



Specifications

Smoke Dampers meeting the following specifications shall be furnished and installed where shown on plans and/or as described in schedules. Dampers shall meet the requirements of the latest edition of NFPA 90A, 92A and 92B.

Dampers shall be tested, rated and labeled in accordance with the latest edition of UL Standard 555S. Dampers shall be UL labeled for use in dynamic systems. The damper shall have a dynamic closure airflow rating equal to or greater than the airflow at the damper's installed location and a dynamic closure pressure rating of 8 in. wg.

Dampers shall have a UL 555S Leakage rating of Class I and a Temperature rating of 350°F. Dampers shall have a UL 555S operational airflow rating equal to or greater than the airflow at its installed location and an operational pressure rating of 8 in. wg. Damper actuators shall be factory mounted and qualified for use with the damper in accordance with UL 555S. Damper actuators shall be (specifier select one of the following) electric type for 120 (or 24) volt operation or pneumatic type for 20 psi minimum operation. Manufacturers submittal data shall indicate actuator space requirements around the damper.

All UL 555S Dynamic Closure Ratings, Operational Ratings and Leakage Ratings shall be qualified for airflow and pressure in either direction through the damper. UL ratings shall allow for mounting

damper vertically (with blades running horizontal) or horizontally.

The Damper Manufacturers 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. Dampers shall be labeled with the AMCA Air Performance Seal.

Dampers shall be listed by the California State Fire Marshal. Dampers shall be listed by the New York City Department of Buildings Material and Equipment Acceptance (MEA).

Damper blades shall be 16 ga. 304 stainless 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 1/2" are unacceptable).

Damper frames shall be 304 stainless steel formed into a structural hat channel shape with reinforced corners. Bearings shall be stainless steel sleeve type rotating in extruded holes in the damper frame. Jamb seals shall be stainless steel compression type.

Basis of design is Greenheck Model SSSMD-23.

