

Application

The SD-181 smoke damper employs airfoil blades for point-of-origin control of smoke in static and dynamic smoke management systems. The SD-181 is qualified to 4,000 ft/min (20.3 m/s) and 4 in.wg. (1.0 kPa) and may be installed in, or adjacent to vertical walls or partitions, or horizontally in, or adjacent to floors or assemblies.

Standard Construction

Frame: 5" × 1" (127 × 25) galvanized steel hat channel with interlocking corner gusset. Equivalent to 13 gauge (2.4) channel frame. Low profile head and sill are used on sizes less than 13" (330) high.

Blades: 6" × 14 gauge (152 × 2.0) equivalent galvanized steel airfoil.

Side-Plate: 12" × 20 gauge (305 × 1.0) galvanized steel.

Axles: 1/2" (13) diameter plated steel hex.

Linkage: Concealed in frame.

Bearings: Stainless steel oilite, sleeve-type.

Seals: Silicone blade edge seals integrally rolled and mechanically fastened to blades. Flexible metal jamb seals.

Actuator: 120 VAC, power-open, spring-close, external mount.

Minimum Size: 8" × 8" (203 × 203)

Maximum Size:** Single section: 36" × 48" (914 × 1219)
 Multiple Section: 144" × 96" (3658 × 2438) or
 288" × 48" (7315 × 1219)

Options

- Alternate actuator: (Power-open, spring close)
 - Internal mount (actuator in air-stream).
 - 24 VAC 230 VAC Pneumatic 24V Modulating**
- Alternate power-close, spring-open position.
 - Alternate actuator:
 - Internal mount (actuator in air-stream).
 - 24 VAC 230 VAC
- PI-50 — Dual position indicator switch package.
- Factory installed sleeve:
 - Gauge: 20 (1.0) 18 (1.3) 16 (1.6)
 - 14 (2.0) 10 (3.5)
 - Length: 12" (305) 16" (406) 24" (610) Other___
- Transitions (sleeve required): Flanged
 - Round Oval
 - Duct connections: 1" (25) S-clip 1 1/2" (38) S-clip
 - DM25 DM35 S & Drive Ward
- Retaining angle systems:
 - Gauge: 20 (1.0) 16 (1.6)
 - Picture frame: SSPF (single-side) DSPF (2-sided)
 - Individual angle sets: SS (single-side) DS (2-sided)
- Duct smoke detector factory mounted and wired (sleeve required):
 - D4120 (100-4,000 fpm [0.5-20.3 m/s])
 - 2151 (0-3,000 fpm [0-15.2 m/s])
- Duct access door factory mounted in common sleeve.
- Remote control stations:
 - RCP-1 (single) RCP-1K (single, key controlled)
 - RCP-1M (single, momentary switch)

** Special Sizing

	Power Close Option	24V Modulating Option (opposed blade action)
Maximum Single Section	36" × 36" (914 × 914)	36" × 24" (914 × 610)
Maximum Multiple Section:	288" × 36" (7315 × 914)	144" × 48" or 288" × 24" (3658 × 1219 or 7315 × 610)
Maximum Dynamic Closure Velocity:	2000 fpm (10.2 m/s)	2000 fpm (10.2 m/s)
Maximum Temperature:	250° F (121° C)	250° F (121° C)

Information is subject to change without notice or obligation.

Ratings

UL 555S Leakage Class: 1 [8 cfm/sq.ft. @ 4 in.wg.]
 [(0.04 m³/s/m² @ 1.0 kPa)]

Maximum Dynamic Closure Velocity:** 4,000 fpm (20.3 m/s)

Maximum UL555S Rated Pressure: 4 in.wg. (1.0 kPa)

Maximum Temperature:** 350°F (177°C)

Listings

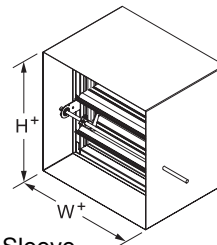
UL 555S listing: R14981

CSFM listing: 3230-1404:116

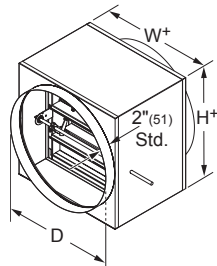
New York City MEA listing: 295-98-E

Meets NFPA Standards: 90A, 92A, 92B and 101

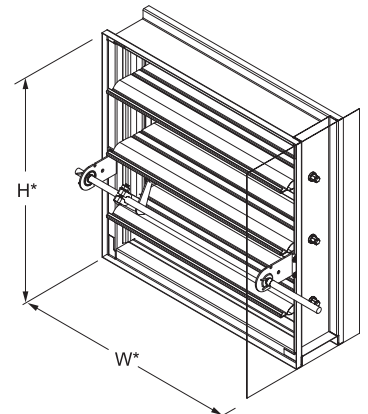
Meets Building Code Standards: IBC, NBC, NFPA, SBC and UBC



Sleeve
(optional)

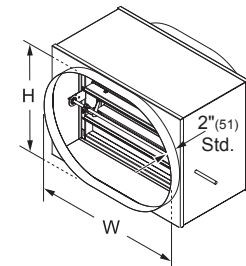


Sleeve Type R
(optional)
 Round duct transitions are standard with D=W=H.
 (available with D<W and H)



Model **SD-181**
(standard)

*Damper dimensions furnished approximately 1/4" (6) undersize.



Sleeve Type O (optional)
 Oval duct transitions are standard with W and H equal to damper width and height dimensions. (available with W and H smaller than damper width and height)

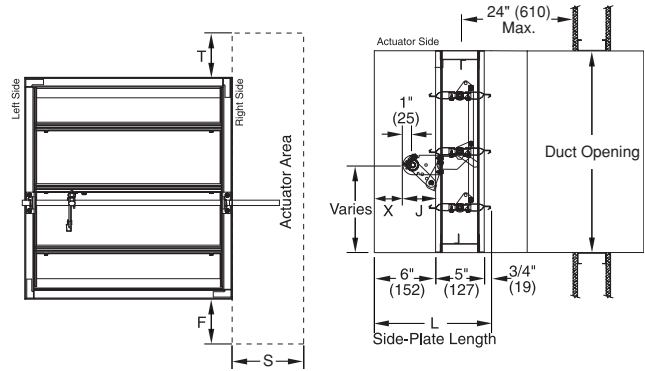
*Damper dimensions furnished approximately 1/4" (6) undersize. (sleeve thickness not included)

NOTE: Dimensions in parentheses () are millimeters.

Actuator and Sleeve Dimensional Data

The drawings and corresponding table illustrate the position of the damper when mounted in a factory sleeve and the relative space required for a given actuator. The standard mounting locations provide enough space for installation of retaining angles and duct connections.

Damper Height	Actuator Model							
	FSLF120 FSLF24	FSNF120 FSNF24	GGD221 GGD121	ML4115 ML8115	MS4120 MS8120	331-4826	331-2998	
F	8"-9"	4"	7"	8"	4"	8"	8"	12"
	10"-11"	1"	4"	6"	1"	5"	5"	9"
	12"-13"	1"	3"	5"	0"	4"	4"	8"
	14"	0"	2"	4"	0"	3"	4"	8"
	15"-16"	0"	1"	3"	0"	2"	3"	7"
	17"	0"	3"	5"	0"	4"	5"	9"
	18" and 23"	0"	0"	0"	0"	0"	0"	0"
	19"-20" and 25"	0"	0"	0"	0"	0"	0"	0"
	21"-22" and 24"	0"	0"	0"	0"	0"	0"	0"
	26"-27" >27"	0"	0"	0"	0"	0"	0"	0"
T	6" and 10"	3"	3"	3"	3"	4"	3"	3"
	7" and 11"-12"	2"	2"	2"	2"	3"	2"	2"
	8", 13"-14" and 21"	1"	1"	1"	1"	2"	1"	1"
	9", 15"-17" and 20"	0"	0"	0"	0"	0"	0"	0"
	18"-19" 22"-23" and >24" 24"	0"	0"	0"	0"	0"	0"	0"
S	All	4-1/2"	4-1/2"	4-1/2"	4-1/2"	4-1/2"	5"	7-1/4"
X	<8"	4"	4"	4"	4"	4"	4"	4"
	≥8"	2-5/8"	2-5/8"	2-5/8"	2-5/8"	2-5/8"	2-5/8"	2-5/8"
J	<8"	2"	2"	2"	2"	2"	2"	2"
	≥8"	3-3/8"	3-3/8"	3-3/8"	3-3/8"	3-3/8"	3-3/8"	3-3/8"

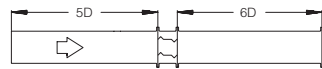
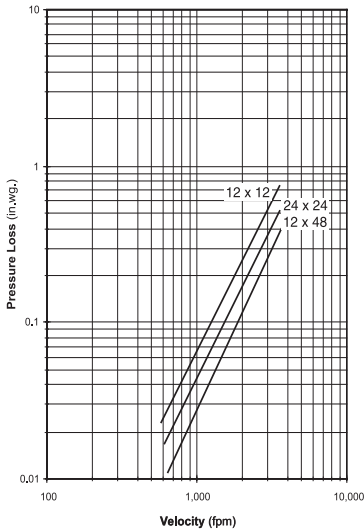


- NOTE:**
- Sleeve length "L" = wall/floor thickness + 10" (254). Standard sleeve length "L" = 16" (406).
 - Damper may be rotated 180° to position actuator area on the left side.
 - The entire damper frame is not required to be installed within the wall, partition or floor. However, the closed plane of the damper blades must be within 24" (610) of the wall, partition or floor.
 - Dimensions for FSNF24 apply to FSAF24-SR and FSAF24-BAL.
 - Dimensions for FSLF24 apply to FSAFB24.
 - Dimensions for ML4115/ML8115 apply to MS4209/MS8209.
 - For dimensions on actuators not shown above, contact factory.

Airflow Performance Data

Pressure Loss vs. Velocity

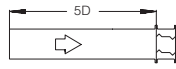
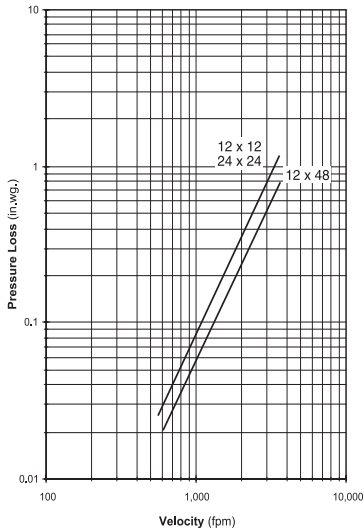
Figure 5.3 — Ducted Inlet and Outlet



Ducted Inlet and Outlet

AMCA Figure 5.3 illustrates a fully ducted damper. This configuration represents 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.

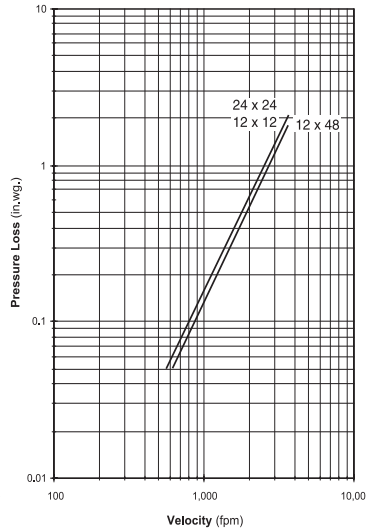
Figure 5.2 — Ducted Inlet



Ducted Inlet

AMCA 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 Plenum Mount



Plenum Mount

AMCA 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 testing was performed in accordance with AMCA Standard 500-D using the three configurations shown. All data has been corrected to represent air density of 0.075 lb/ft. Actual pressure drop in any ducted HVAC system is a combination of many elements. This information, along with analysis of other system influences, should be used to estimate actual pressure losses for a damper installed in a given HVAC system.