

Smoke Damper

K1H

Class I • Galvanized Steel • Single Thickness Blade • UL Classified Damper

STANDARD CONSTRUCTION

- FRAME:** 5½" x 7⁄8" x 16-GA galvanized steel hat channel
BLADES: 16-GA galvanized steel single thickness; Parallel action
AXLES: Plated solid steel stub
BEARINGS: Oil impregnated bronze
LINKAGE: Plated steel angle and crank plates with stainless steel pivots, in-jamb type or on-blade type
STOPS: 18-GA galvanized steel angles at head and sill
BLADE SEALS: Silicone
JAMB SEALS: Stainless steel
SLEEVE: Minimum 20-GA galvanized steel by 18" long (sizes greater than 84" wide or 84" high require minimum 18-GA)
CAULKING: Hardcast Irongrip 601 or UL-listed equivalent
ACTUATOR: Electric or pneumatic; Factory-installed for Power-Open/Spring-Close (fail close) operation; External left hand mounted as viewed from jackshaft side of damper
FINISH: Mill

OPTIONS

- Exact Size
 Sleeve - Transition - Sideplate
 Flange - Front, Rear, or Both
 Actuators - 120V, 24V, 230V or Pneumatic
 Right Hand and/or Internal Actuator Mounting Locations (Restrictions Apply)
 Power-Close/Spring-Open Actuation
 Integral Dual Position Indication (IDPI) Switches
 Model SM-501 Flow-Rated Smoke Detector (10" Minimum Damper Height)
 Model 2151 No-Flow Smoke Detector (12" Minimum Damper Height)
 Remote Test Box
 Copper Tubing (For Pneumatic Actuators)
 Transformers
 Tab-Lock Retaining Angles - 1 or 2 Sets
 Bearings - OIB or Stainless Steel
 Axle - Stainless Steel
 Security Bars
 Short-Width (<16") and/or Short-Height (<8") Transitions

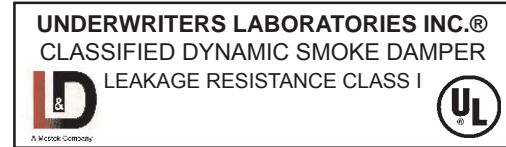
NOTES

- "A" width and "B" height are opening dimensions. Dampers are provided approximately ¼" undersize.
- Damper with smoke detector must have a minimum sleeve of 19" (10.5" on the actuator side and 3" on the non-actuator side).

DAMPER SIZE

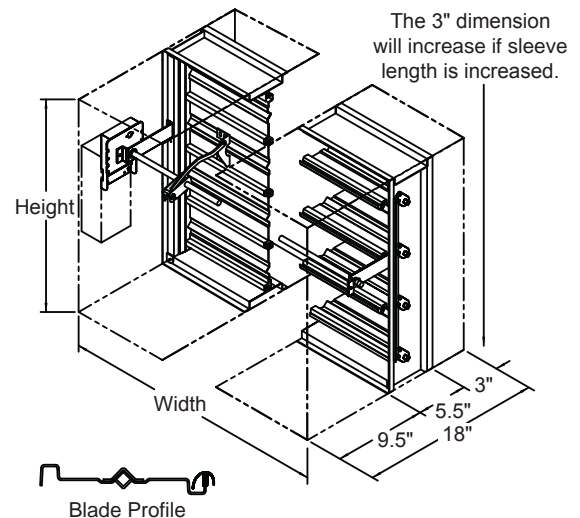
		2000 fpm, 4 in.wg				3000 fpm, 4 in.wg	
Orientation	Hor & Vert	Horizontal & Vertical				Horizontal & Vertical	
Panels	Minimum Panel	Max Panel 250°	Max Panel 350°	Max Assy 250°	Max Assy 350°	Max Panel 250°	Max Assy 250°
Rectangular	4"W x 4"H (16"W x 8"H frame)	36"W x 48"H 48"W x 36"H	36"W x 48"H	144"W x 70"H 288"W x 35"H	128"W x 62"H 256"W x 31"H	36"W x 36"H	108"W x 36"H
Round	4" dia. (16"W x 8"H frame)	34" dia.	34" dia.	68" dia.	60" dia.	34" dia.	n/a
Oval	4"W x 4"H (16"W x 8"H frame)	34"W x 46"H 46"W x 34"H	34"W x 46"H	45 sq.ft. 106"W x 68"H	106"W x 60"H	34"W x 34"H	106"W x 24"H

*Dampers smaller than minimum frame size require a transition. Reference SD-TRFS.



This smoke damper meets the construction and performance requirements of:

- Underwriters Laboratories Inc. Standard 555S
- National Fire Protection Association Standards 80 and 90A
- ICC's International Building Code
- California State Fire Marshal Listing #3230-1328:106
- Underwriters Laboratories Inc. Approved for dual direction airflow and dynamic conditions.
- Underwriters Laboratories Inc. Classified for use in smoke control systems for Leakage Class I and 250°F or 350°F.
- Actuators must be controlled by a smoke detection system.



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Operations Rating:

Maximum Differential Pressure: 4 in.wg

Maximum Face Velocity: 2000 fpm (3000 fpm for selected size/actuator combinations)

Leakage Rating:

UL Class I

4 cfm per sq.ft. maximum @ 1 in.wg

8 cfm per sq.ft. maximum @ 4 in.wg

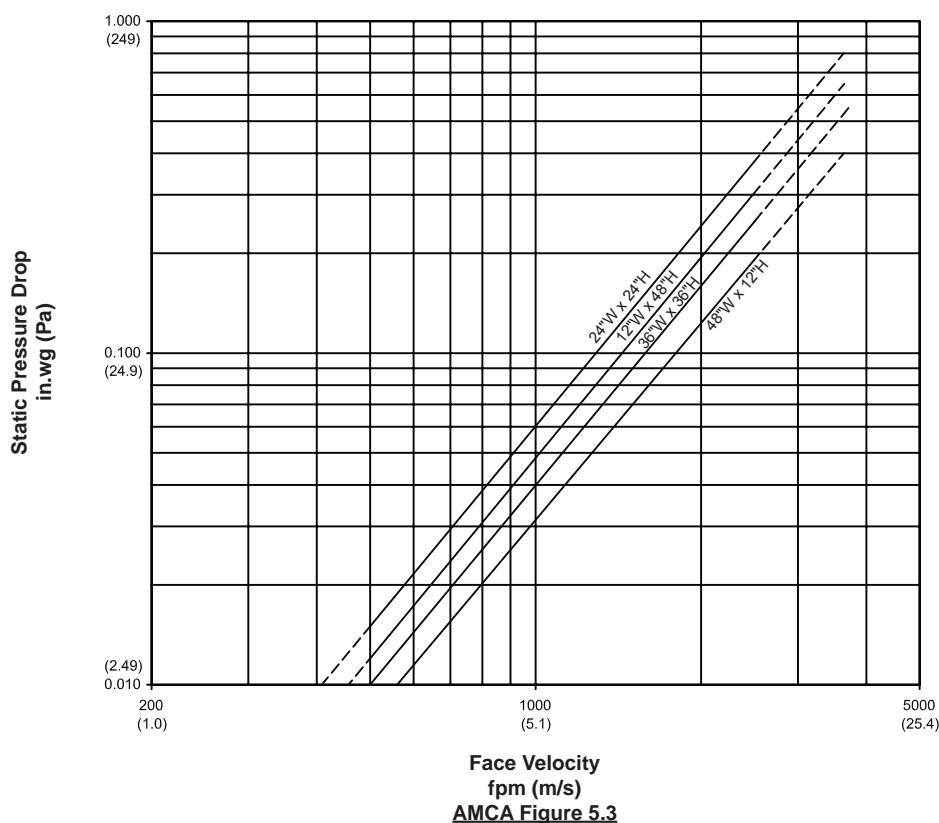
Sound Ratings:

The Noise Criterion data below was tested in accordance with ASTM E477.99 in the center octave band.

Damper Size	Noise Criterion (NC)			
	Velocity (fpm)			
	1000	2000	3000	4000
12"W x 12"H	31	53	64	71
24"W x 24"H	33	54	65	n/a

Pressure Drop Ratings:

The pressure drop data shown below is based on laboratory conditions. The test setup does not take into account elbows or other duct fittings that are part of every actual duct system. The configuration of the actual duct system immediately upstream and downstream of the damper often contributes more pressure loss than the damper itself.



This product was tested in accordance with AMCA Standard 500D.

S L E E V E S A N D S I D E P L A T E S



SLEEVES & SIDEPLATES

Smoke Damper Models: S, SG, KH, A, SA, GA, KA, AA

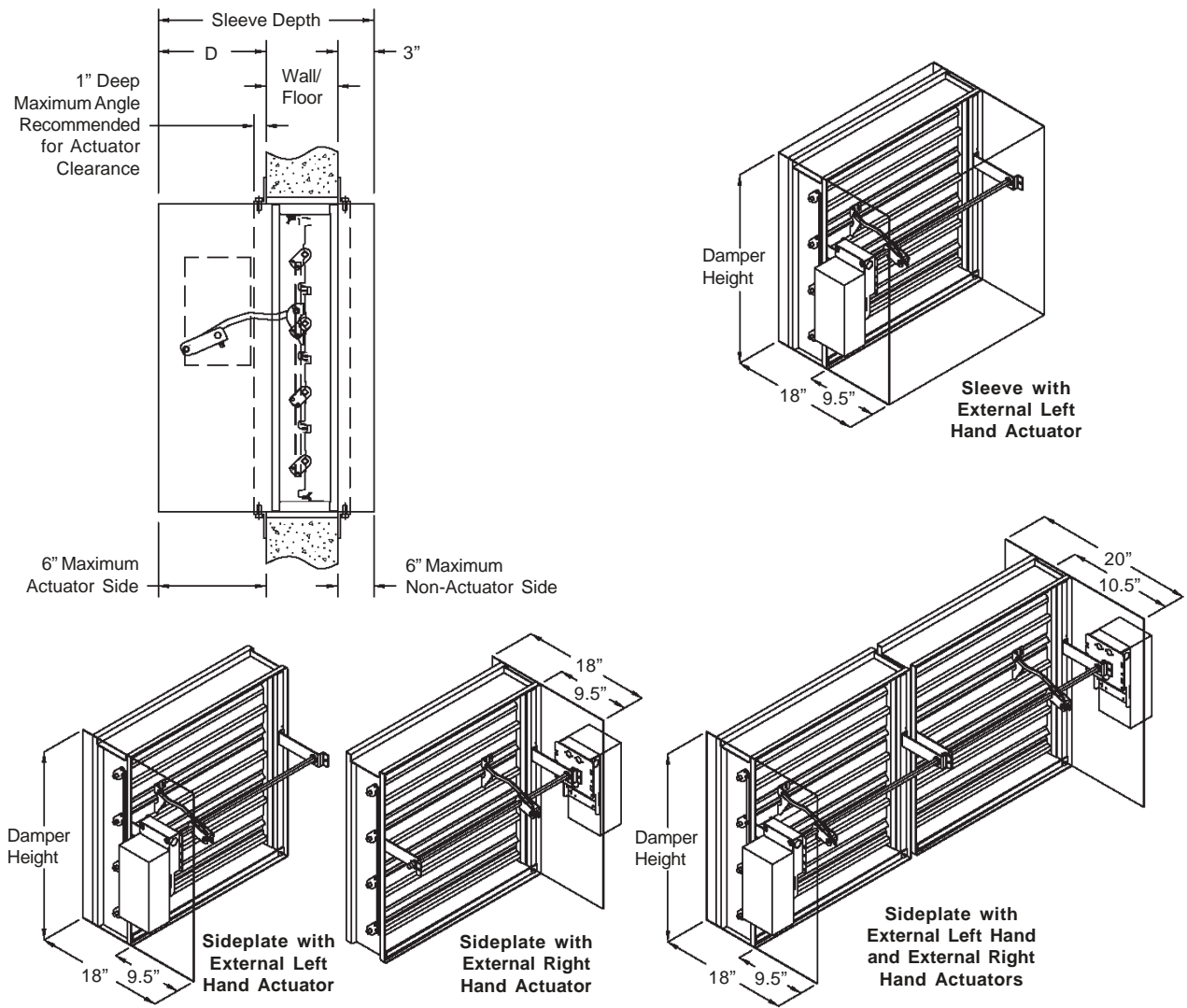
Notes

1. Sleeves may be factory provided or field provided, but are not required. Reference damper installation instruction for sleeve attachment procedure.
2. Large units that require multiple ship sections will be individually sleeved if sleeve is factory provided.
3. Units with externally mounted actuators require a factory supplied sleeve or sideplate.
4. The standard sleeve is 20-GA x 18" deep (dampers that exceed 84" in width or height require minimum 18-GA sleeve).
5. 10-GA, 12-GA, 14-GA, 16-GA, and 18-GA sleeves are available.
6. Sleeve depths through 48" are available.
7. Refer to Installation Instruction II-S for sleeve attachment in the field.

Sleeve Depth Determination (for optional mounting in barrier)

The standard sleeve depth allows for an external actuator, 1" retaining angles on both sides of the wall, and 1.5" duct connections on both ends of the sleeve. Sleeve depth and "D" will increase by 1" if a factory-mounted smoke detector is required. A shorter sleeve may be provided and properly installed if internal actuators or one-side retaining angles are utilized, or if the duct connections on one or both ends of the damper are not required. Consult the factory for details.

Standard Sleeve Depth (18") = D (9") + wall/floor thickness (6") + non-actuator side distance (3").



March 2011



SLEEVES & SIDEPLATES

Smoke Damper Models: S, SG, KH, A, SA, GA, KA, AA

SD-SLVS-11.03

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INSTALLATION INSTRUCTIONS —

INSTALLATION INSTRUCTION

Standard Installation

Smoke Damper Models: S, K, A, SA, KA, AA

APPLICATION

These dynamically rated smoke dampers are intended to restrict the passage of smoke. This smoke damper may be mounted in the vertical or horizontal position with the damper blades running horizontally. Airflow can be from either direction. When mounted in the vertical position, the damper may be mounted right side up or upside down. It can be mounted within the plane of a smoke barrier, but can also be mounted out of the plane of a smoke barrier. When mounted out of the plane of the smoke barrier, it is to be installed within 24" of the barrier and before any duct inlets or outlets.

MULTIPLE PANEL SIZE LIMITATIONS

		Actuation	Electric			
		Orientation	Horizontal & Vertical			
Model	Assembly	Max Panel	Max Assy 250°	Max Assy 350°		
	S1, K1, A1, S2, K2, A2	36"Wx48"H 48"Wx36"H	144"Wx70"H 288"Wx35"H	128"Wx62"H 256"Wx31"H		
	SA1, KA1, AA1, SA2, KA2, AA2	36"wx48"H	144"Wx96"H 288"Wx48"H	144"Wx96"H 288"Wx48"H		

		Actuation	Pneumatic			
		Orientation	Vertical			
Model	Assembly	Max Panel	Max Assy 250°	Max Assy 350°		
	S1, K1, A1, S2, K2, A2	36"Wx48"H	108"Wx36"H	108"Wx36"H		
	SA1, KA1, AA1, SA2, KA2, AA2	36"Wx48"H	144"Wx96"H 288"Wx48"H	144"Wx96"H 288"Wx48"H		

SUPPLEMENTAL INSTALLATION INSTRUCTIONS / SUBMITTAL DATA

Sleeve Extension
Integral Duct Access Door
Integral Dual Position Indication (SD-IDPI)
Flow-Rated Smoke Detector (SM-501)
No-Flow Smoke Detector (2151)
Transitions (SD-TRFS)
Sleeves (SD-SLVS)

INSTALLATION INSTRUCTION

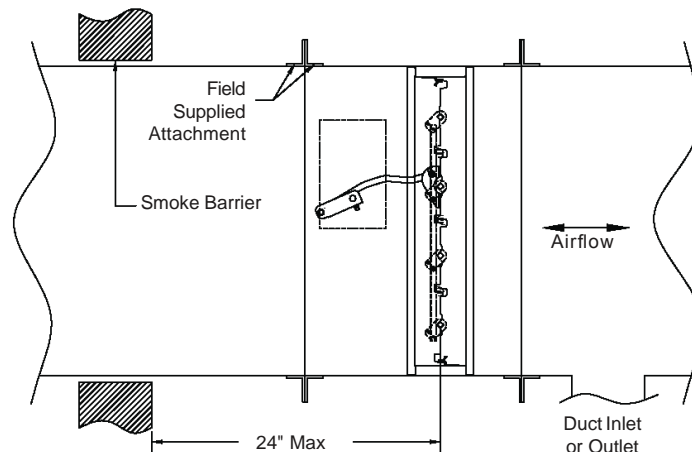
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INSTALLATION

- General:** The installation of the damper and all duct connections to the damper sleeve shall conform to NFPA-90A and the SMACNA Fire, Smoke and Radiation Damper Installation Guide.
- Actuators:** Dampers must be supplied with factory mounted actuators and are intended to close automatically upon loss of electrical power or release of air pressure and is to be controlled by a smoke detector. See additional instructions, which detail damper actuator sequence of operations.
- Multiple Panel / Multiple Section Assembly:** Large damper assembly sizes may require multiple factory assembled modules that ship separately. Refer to page 4 for details.
- Sleeves:** Sleeve are not required as dampers can be installed into continuous ductwork. Dampers with factory mounted external actuators can be supplied without sleeves, but require sideplates. Dampers with factory mounted internal actuators can be supplied without sleeves or sideplates. Sleeves shall be the same gauge or heavier as the duct to which it is attached. Gauges shall conform to SMACNA or ASHRAE duct standards. A field supplied sleeve is attached to the damper frame with $\frac{3}{16}$ " diameter steel rivets, $\frac{1}{4}$ " diameter steel bolts, #10 steel sheet metal screws, or $\frac{1}{2}$ " long welds. Fasteners shall be staggered on each side of the damper frame on 6" maximum centers and 3- $\frac{1}{2}$ " maximum from each corner. For Class I Smoke dampers, approved caulking (reference note 6) shall be applied along the perimeter between the sleeve and the damper on both sides. For Class II Smoke dampers, approved caulking (reference note 6) shall be applied along the perimeter between the sleeve and the damper on only one side.
- Attachment:** For dampers without sleeves, use metal shims, if required, between the damper frame and ductwork to prevent distortion. The damper is to be anchored to the ductwork along the perimeter on both sides of the hat channel frame.
- Caulking:** Caulk shall be one of the following: Dow Corning RTV732, Silco Sil-Bond RTV 4500, General Electric IS808, or Novagard RTV300. For Class I dampers, approved caulking shall be applied along the perimeter between the sleeve/ductwork and frame on both sides. For Class II dampers, approved caulking shall be applied along the perimeter between the sleeve/ductwork and frame on only one side.
- Maintenance:** Dampers shall be maintained at intervals as stated in NFPA 90A and 92A. Local codes or building conditions may require more frequent inspections and maintenance.

STANDARD MOUNTING DETAILS

Smoke Only, Vertical or Horizontal



INSTALLATION INSTRUCTION

MULTIPLE PANEL / MULTIPLE SECTION INSTALLATION DETAILS

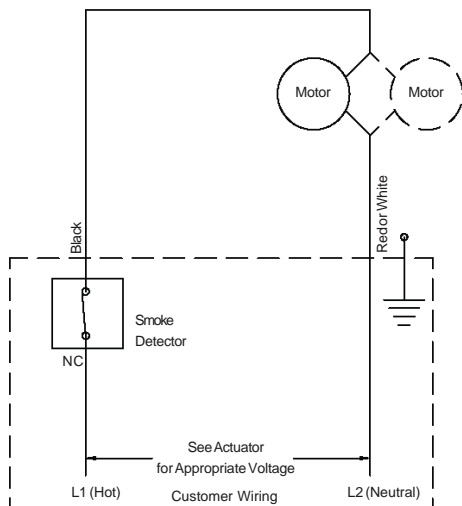
Smoke Dampers (Models S, K, A, SA, KA, AA)

1. Damper assemblies ordered without factory mounted sleeves are limited in size, so that the entire assembly ships as a single section.
2. Multiple panel high damper assemblies are electrically/pneumatically, but not mechanically linked between top and bottom panels if assembled within a common sleeve. Large sizes may require multiple sleeve sections - multiple sleeve sections are not mechanically or electrically/pneumatically linked.
3. Multiple panel wide damper assemblies are mechanically and electrically/pneumatically linked if assembled within a common sleeve. Large sizes may require multiple sleeve sections - multiple sleeve sections are not mechanically or electrically/pneumatically linked.
4. Damper assembly sections that are not mechanically or electrically/pneumatically linked each have their own supply connection point, such that they operate independently. Multiple actuators within a linked section are factory wired/plumbed together.
5. Damper assembly sections that are mechanically and electrically/pneumatically linked share a single supply connection point. Multiple actuators within a linked section are factory wired/plumbed together.
6. Damper assemblies that ship in multiple sections shall be fastened together using 1/4" diameter steel bolts, lockwashers, and nuts. Fasteners shall be on 6" maximum centers on both faces of the sleeve.

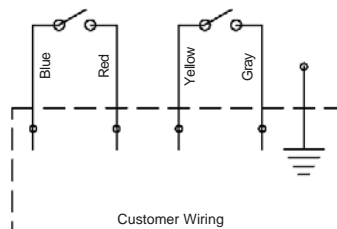
ELECTRIC WIRING SCHEMATICS

Notes

1. All wiring to be in accordance with N.E.C. (NFPA 70).
2. Refer to actuator label for appropriate voltage.
3. Connect incoming ground to the actuator assembly.



Integral Dual Position Indication (IDPI)



Integral Dual Position Indication (IDPI) Wiring Chart			
actuator mounting location	damper full open	damper full close	damper mid-stroke
	closed circuit		
external left	red / blue	yellow / gray	none
external right	yellow / gray	red / blue	none
internal left	yellow / gray	red / blue	none
internal right	red / blue	yellow / gray	none

* This wiring is opposite if the actuator is rotated 90°, so that it is parallel to the duct.