06

FIRE SMOKE DAMPER

@Performance
QATIF - AUJAM INDUSTRIAL AREA DHAHRAN - JUBAIL HI WAY
P.O. BOX 10848 - QATIF 31911
القطيف – صناعية الأوجام – طريق الظهران الجبيل السريع – ص.ب ١٠٨٤٨ – القطيف ٣١٩١١

PERFORMANCE for Metal Production
مصنع واحة الإنجاز للصناعات المعدنية

company profile 2022

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FIRE SMOKE DAMPER
MODEL KFSD-111-1PB

UL555 1-1/2 HOUR FIRE RATED,
UL555S LEAKAGE CLASS I

APPLICATION

MODEL KFSD-111 is a UL 555 & UL555S Classified combination fire smoke damper used in dynamic smoke management system and to be used in partitions with fire resistance ratings of less than 3 hours.
Operation & Dynamic closure for Vertical & Horizontal mount with airflow on both sides rated:
- Max Static Pressure: up to 4" W.G (1000Pa)
- Max Velocity: up to 4000 FPM (20.3m/s).
- Operating Temp: up to 350°F (177°C).

STANDARD CONSTRUCTION

FRAME
16 gauge (1.6mm) galvanized steel interlocking hat section channel frame construction.

BLADES
16 gauge (1.6mm) galvanized 3 "V" formed.

CLOSURE DEVICE.
Electronic Fusible link RS-100 with closure temperature of 165° F (74°C) (others available)

BEARINGS
Sintered bronze, oil impregnated.

AXLES
1/2" (12.7mm) square zinc plated steel studs.

LINKAGE
0.12 x 0.50 (3x12.7mm) zinc plated steel concealed in the channel frame.

FINISH
Mill galvanized.

BLADES SEALS
Silicone edge type for smoke seal to 450°F (232°C)

JAMB SEALS
300 Series stainless steel, flexible metal compression type.

JACK SHAFT
1/2"(12.7mm) diameter zinc plated steel with jack-shaft connector coupling.

ACTUATOR
Electric spring return 230V, 120V or 24V and pneumatic.

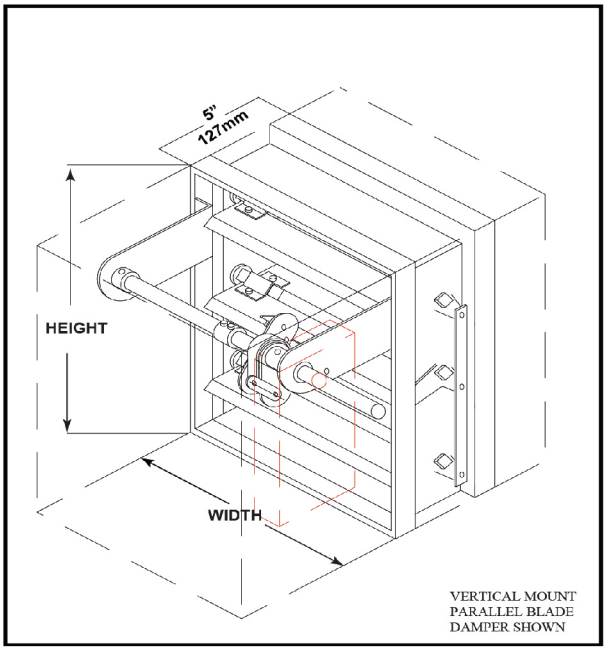
CAULKING
UL approved silicone sealants: Dow Corning RTV-732, Nuflex 302.

SLEEVES
Rectangular.

MINIMUM SIZE Single Section
8" (203mm) Width x 8" (203mm) Height.
MAXIMUM SIZE Single Section
36" (914mm) Width x 36"(914mm) Height.

FEATURES.

*Each damper is marked with a UL555 & UL555S Classified fire Smoke damper label for use in Dynamic system.
*Meets NFPA 90A, 92A&B criteria for primary fire smoke dampers in walls and floors with fire resistance ratings of less than 3 hours.



VERTICAL MOUNT
PARALLEL BLADE
DAMPER SHOWN

OPTIONS

CLOSURE DEVICE: RS-200, FUSIBLE LINK, RL.
BEARINGS: Stainless steel.
ACTUATOR MOUNTING: External & internal.
OPTIONAL MATERIAL: Stainless steel construction.
SLEEVES: Round, oval and specials.

NOTES.

*Dampers furnished approximately 1/4" (6mm) smaller than given duct dimension
*Refer to the KBE Installation Instruction and supplements for complete installation details.

CLASSIFIED UL

UNDERWRITERS LABORATORIES (UL 555 & UL555S) CLASSIFIED FIRE SMOKE DAMPERS. FIRE RESISTENCE RATED 1-1/2 HOURS WITH LEAKGE RATING CLASS I FOR USE IN UL CLASSIFIED BUILDING MATERIALS RATED LESS THAN 3 HOURS.

FIRE SMOKE DAMPER
MODEL KFSD-111 & KFSD-L-111

PERFORMANCE DATA

FREE AREA CONVERSION

DAMPER FREE AREA (FA)									
	WIDTH (inches)								
HEIGHT (inches)	8"	12"	16"	20"	24"	28"	30"	32"	36"
8 "	0.21	0.35	0.49	0.63	0.77	0.83	0.91	0.95	1.00
10 "	0.25	0.43	0.59	0.74	0.91	1.09	1.18	1.21	1.23
12 "	0.30	0.49	0.69	0.87	1.09	1.29	1.37	1.41	1.54
14 "	0.38	0.63	0.87	1.14	1.39	1.69	1.77	1.80	2.00
16 "	0.45	0.74	1.14	1.39	1.69	2.00	2.15	2.20	2.50
20 "	0.59	1.00	1.39	1.77	2.15	2.56	2.74	2.86	3.23
24 "	0.71	1.20	1.77	2.15	2.63	3.08	3.33	3.51	4.00
28 "	0.87	1.47	2.06	2.67	3.23	3.77	4.08	4.35	4.88
32 "	1.01	1.68	2.35	3.03	3.64	4.35	4.65	5.00	5.56
36 "	1.14	1.89	2.63	3.39	4.17	4.88	5.26	5.56	6.25
40 "	1.27	2.10	2.91	3.75	4.70	5.40	5.87	6.12	6.94
44 "	1.41	2.31	3.20	4.11	5.11	5.99	6.38	6.77	7.62
48 "	1.54	2.52	3.48	4.47	5.58	6.50	7.03	7.42	8.30

Free area factors listed are for standard type "A" sleeves. Performance testing performed in accordance with AMCA std 500.

Given:
1. Width "X height" of damper.
2. Operating C.F.M. (cubic feet per minute)

To determine damper pressure drop:

1. Establish the free area (FA): use the free area based on the damper width "X height". (Example: 24" W x 24" H damper =2.63 FA).

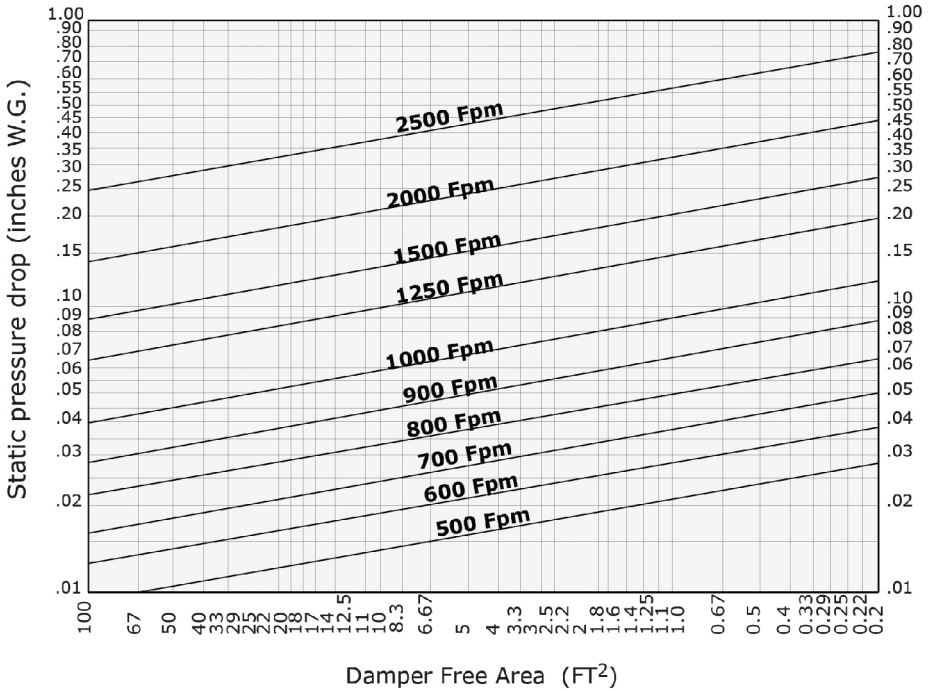
2. Establish the velocity use the formula FPM = CFM / FA (example: FPM = 4000 CFM / 2.63 FA = 1520 FPM)

3. Determine the pressure drop:
Using the pressure drop table find the free area number (2.63) on the bottom line of the table.

4. Project a line vertically locating the conversion velocity previously determined.

5. Project this intersect horizontally to the left or right and read the pressure drop in inches of water (example: 0.18 inches W.G.)

PRESSURE DROP TABLE



SMOKE & FIRE SMOKE DAMPER
KFSD, KSD & KCFSD

Allowable Leakage by Classification

1" Water Gauge :

Damper Leakage Classifications	Damper Leakage Allowed Maximum CFM/SQ/FT	8" x 8" SQ/FT 0.44	8" X 36" SQ/FT 2.00	24" X 24" SQ/FT 4.00	36" X 36" SQ/FT 9.00
Class 1 (CFM)	4	1.76	8.00	16.00	36.00
Class 2 (CFM)	10	4.40	20.00	40.00	90.00
Class 3 (CFM)	40	17.60	80.00	160.00	360.00

4" Water Gauge :

Damper Leakage Classifications	Damper Leakage Allowed Maximum CFM/SQ/FT	8" x 8" SQ/FT 0.44	8" X 36" SQ/FT 2.00	24" X 24" SQ/FT 4.00	36" X 36" SQ/FT 9.00
Class 1 (CFM)	8	3.52	16.00	32.00	72.00
Class 2 (CFM)	20	8.80	40.00	80.00	180.00
Class 3 (CFM)	80	35.20	160.00	320.00	720.00

8" Water Gauge :

Damper Leakage Classifications	Damper Leakage Allowed Maximum CFM/SQ/FT	8" x 8" SQ/FT 0.44	8" X 36" SQ/FT 2.00	24" X 24" SQ/FT 4.00	36" X 36" SQ/FT 9.00
Class 1 (CFM)	11	4.84	22.00	44.00	99.00
Class 2 (CFM)	28	12.32	56.00	112.00	252.00
Class 3 (CFM)	112	49.28	224.00	448.00	1008.00

fire smoke damper

CUSTOMER ORDERING INFORMATION

FIRE - SMOKE - FIRE & SMOKE DAMPERS

1- Standard Models for Fire & Fire Smoke dampers will be provided as 1.5hr rated.
2- Standard dampers will be provided for use on 2000 Fpm velocities and 4"W.G.
3- Standard Models Smoke & Fire Smoke dampers will be provided for use in 250°F temperature rating applications with Class III leakage rating. (350°F is optional and other Leakage class are optional).
4- Standard dampers will be provided with 220 VAC actuators mounted in the right/front - position, and the jack-shaft down-stream. (options available)
5- Standard dampers will be provided with type "A" sleeves in 20 Gauge x 16" long galvanized steel.
6- Standard dampers construction will be 16Ga galvanized steel (refer to the product specification sheets).
7- Standard dampers will be provided with RS-100 Electronic Fusible links with 165°F closing ratings. (options available)

ORDERING STANDARD DAMPERS

Order Qty	DAMPER MODEL	WIDTH X HEIGHT	MAXIMUM VELOCITY (FPM)	MAXIMUM PRESSURE (in w.g.)	VOLTS AC	Heat Sensing Device	Heat Sensing Device Rating
2	KFSD -111-3	24 W x 24 H	2000 (REF)	4 (REF)	220	RS-100	165

ORDERING NON-STANDARD DAMPERS

DAMPER OPTIONS															SLEEVE OPTIONS					
6	KFSD-111	1	SC	250	26W x 24H	2000	4	24	FSNF	INT	LF	SB	F	165	DSD-DH98	DIAM CR 24"	16	24	7	SS	1

Order Qty

Damper Model
KFSD-111
KFSD-L-111
KCFSD-222
KSD-333
KFD-555
KFD-L-555

Leakage Rating (*)
1 - Class I
2 - Class II
3 - Class III (Std)

Damper Construction
-- : Galvanized (Std)
SB : Stainless steel Blade
SC : Stainless steel Construction

Temperature rating (*):
250°F (Std)
or 350°F

Damper Width" x Height"

Operating Velocity
2000(Std)
or 4000 FPM

Static pressure (WG)

Electric
220V, 120V or 24V AC
P- pneumatic

Actuator models

Actuator installation
EXTernal (Std)
or INTernal

Actuator location:
Right Front (RF) (Std)
or Left Front (LF)

Bearings:
-- : Bronze (Std)
SB: Stainless Steel

Heat Sensing device (**):
RS -100 (Std)
RS-200
F (Fusible links)

Temp Rating of Heat Sensing device:
165°F (Std)
212°F
250°F(***)
286°F
350°F (***)

Factory Mounted Smoke Detector

Sleeve specify
Type: **A (Std)**, AF, C, CR, CO and sizes

Sleeve Gauge
20Ga (Std)

O.A. Sleeve lenght
L=16" (Std)

Set distance:
Specify end of sleeve to face of damper on the jack-shaft side
K=7" (Std)

Sleeve construction
--: Galvanized (Std)
SS: Stainless steel

Flanged Sleeve (1) end

(*) Applicable for Smoke & Fire Smoke Dampers
(**) Applicable for Fire & Fire Smoke Dampers
(***) only available on RS-100 & RS-200

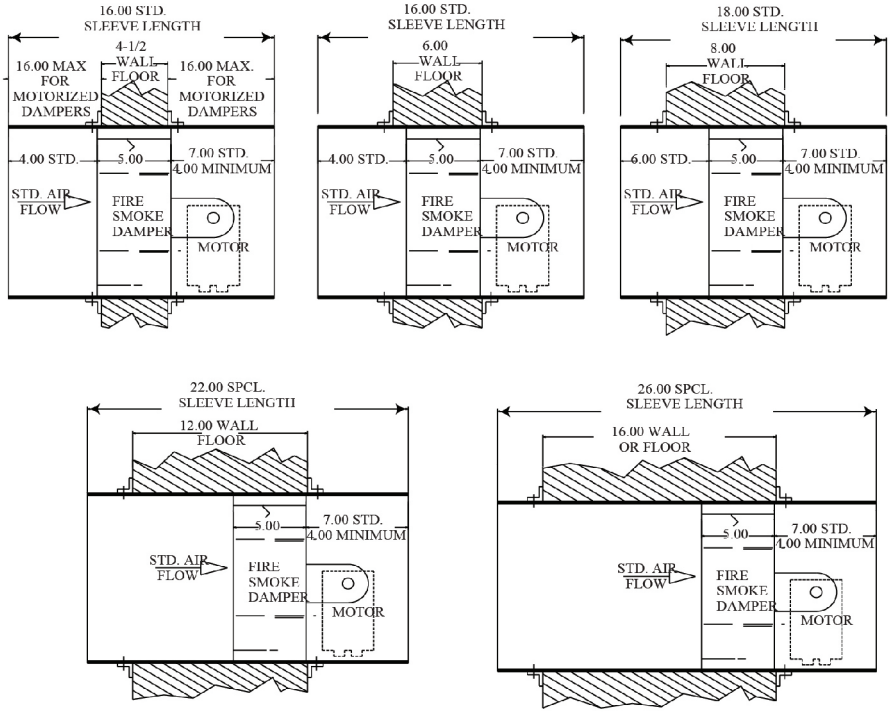
fire smoke damper

INSTALLATION INSTRUCTION FIRE / SMOKE DAMPER

SLEEVE LENGTH IN VARIOUS PARTITION THICKNESSES

Sample installations of fire smoke dampers with sleeves in various partition thicknesses using external and internal mount models: KFSD-111, KSD-333, KFD-555

KFSD-111, KSD-333, KFD-555 AND TYPE "A" SLEEVES



NOTES

-Minimum sleeve length from the face of dampers on the motor side of damper is 4".
-Maximum sleeve length beyond fire walls on motorized dampers is 16".
-Internally mounted motors may be rotated about the jack shaft when required.
-Angle sets are required for installation in partitions (refer to UL installation sheets) 20 gauge sleeves will be provided for use with break-away connectors unless specified.
-External motors will be provided in the right/front location unless specified ("left front") special sleeve lengths and configurations are available (specify).

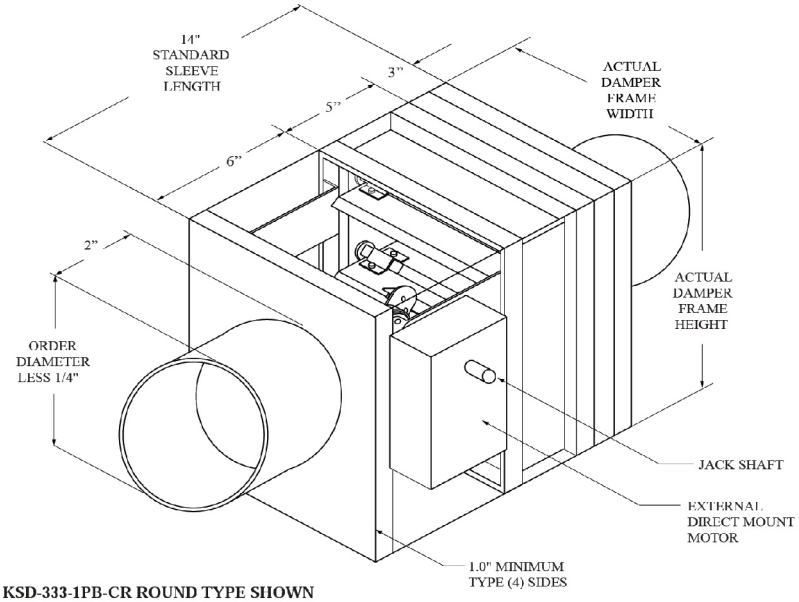
STANDARD SLEEVE DIMENSIONS FOR GIVEN PARTITIONS

PARTITION THICKNESS	OVERALL SLEEVE LENGTH FOR MOTORIZED DAMPERS	SLEEVE DIMENSION ON MOTOR MOUNT SIDE	SLEEVE DIMENSION OPPOSITE MOTOR MOUNT SIDE
4"	18"	7"	4"
6"	18"	7"	4"
8"	18"	7"	6"
12"	22"	7"	10"
16"	26"	7"	14"

INSTALLATION INSTRUCTION
FIRE / SMOKE DAMPER

OPTIONAL SLEEVES TYPES
TYPE CR - ROUND
TYPE CO - OVAL

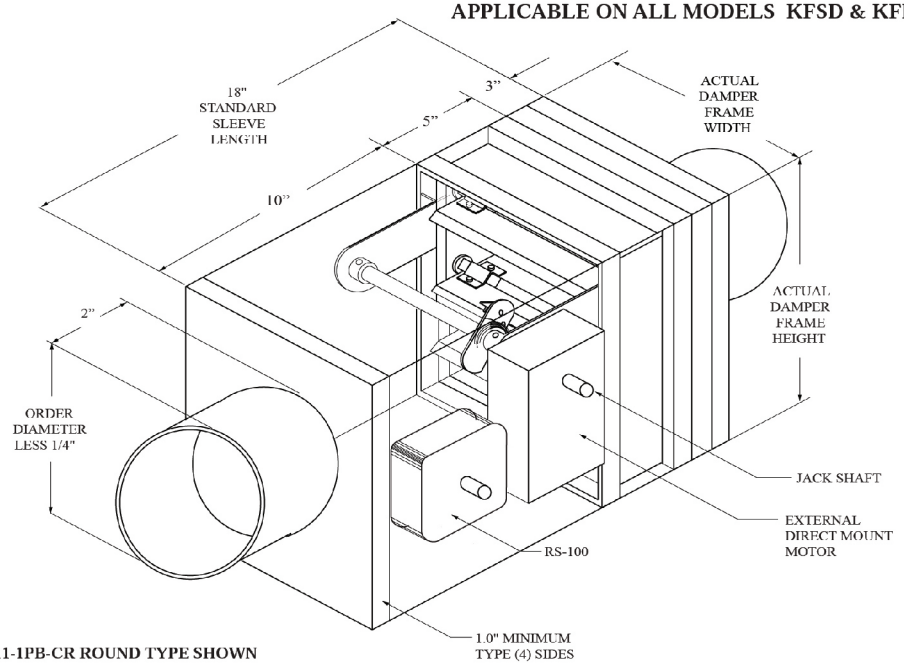
Sample of fire smoke dampers with Round (Oval) sleeves using external mount actuator applicable on models: KFSD-111, KSD-333, KFD-555



KSD-333-1PB-CR ROUND TYPE SHOWN

APPLICABLE ON ALL MODELS:
- **KFSD & KFD WITH HEIGHT ABOVE 16"**
- **ALL KSD SIZES**

APPLICABLE ON ALL MODELS KFSD & KFD WITH HEIGHT LESS THAN 16"



KFSD-111-1PB-CR ROUND TYPE SHOWN

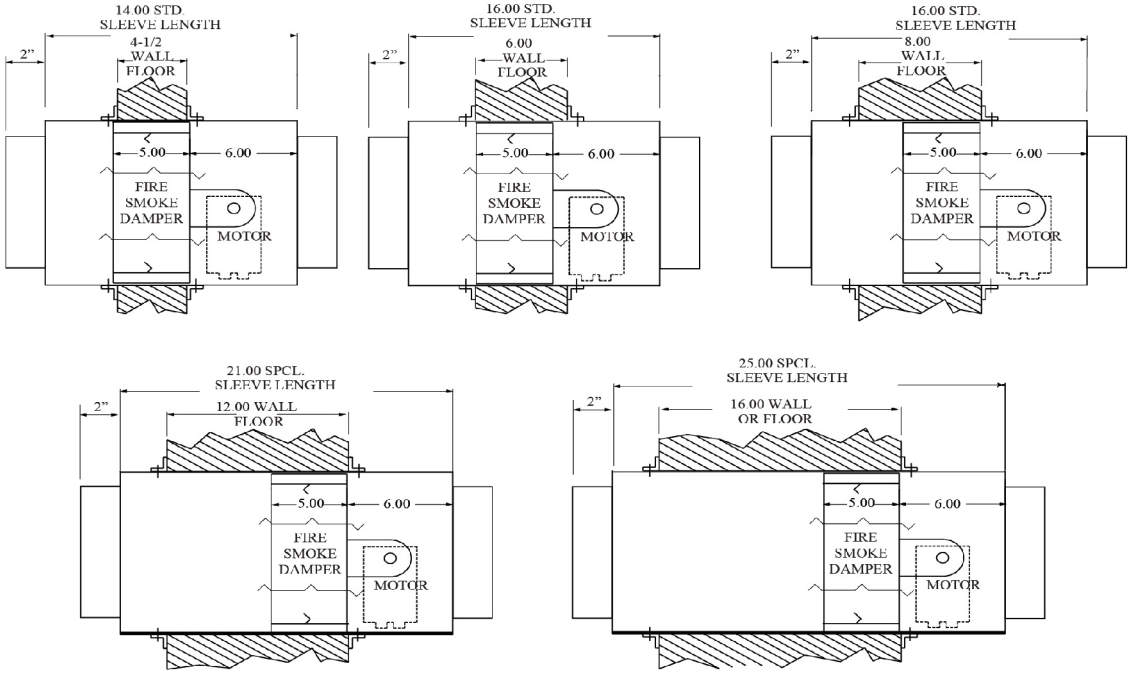
fire smoke damper

INSTALLATION INSTRUCTION
FIRE / SMOKE DAMPER

SLEEVE LENGTH IN VARIOUS PARTITION THICKNESSES

Sample installations of fire smoke dampers with sleeves in various partition thicknesses using external mount models: KFSD-111, KSD-333, KFD-555

KFSD-111, KSD-333 & KFD-555 TYPE "CR" SLEEVES



NOTES

- Minimum sleeve length from the face of dampers on the motor side of damper is 6" for Diam 16" and above & 8" on Diam less than 16" .
- Maximum sleeve length beyond fire walls on motorized dampers is 16".
- For Internally mounted motors please contact the factory.
- Angle sets are required for installation in partitions (refer to UL installation sheets) 20 gauge sleeves will be provided for use with break-away connectors unless specified.
- External motors will be provided in the right/front location unless specified ("left front") special sleeve lengths and configurations are available (specify).

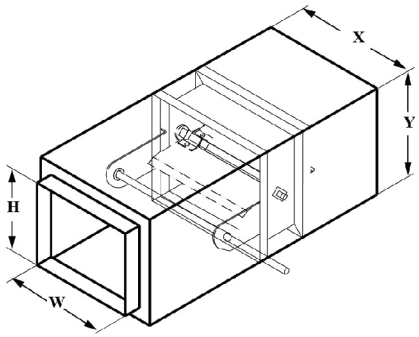
STANDARD SLEEVE DIMENSIONS FOR GIVEN PARTITIONS

PARTITION THICKNESS	OVERALL SLEEVE LENGTH FOR MOTORIZED DAMPERS	SLEEVE DIMENSION ON MOTOR MOUNT SIDE	SLEEVE DIMENSION OPPOSITE MOTOR MOUNT SIDE
4"	14"	6"	3"
6"	16"	6"	3"
8"	16"	6"	5"
12"	21"	6"	10"
16"	25"	6"	14"

MODEL KFSD, KSD & KFD

UNDERSIZED DIMENSIONAL DATA

Minimum size of this damper is 8 in. wide x 8 in. heigh for Class I, Class II & III. Dampers smaller than this will be fabricated in a sleeve with transitions at each end of the sleeve to match your duct size. Damper sizes can be determined using the tables on this page.

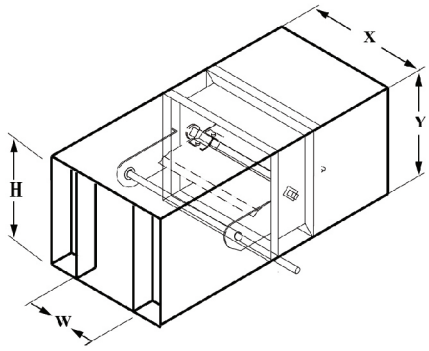


TYPE C

The damper you have ordered has a width dimension less than 8 in. and a height dimension less than 8 in. The damper dimensions can be determined using the chart below. Transitions will be provided at each end of the sleeve to match your duct size.

Width (W)		Damper Width (X)
Above	Under	
3.99 in.	5 in.	H + 4 in.
4.99 in.	6 in.	H + 3 in.
5.99 in.	8 in.	H + 2 in.

Height (H)		Damper Height (Y)
Above	Under	
3.99 in.	5 in.	H + 4 in.
4.99 in.	6 in.	H + 3 in.
5.99 in.	8 in.	H + 2 in.

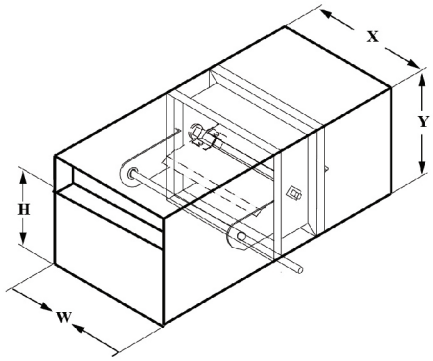


TYPE B

The damper you have ordered has a width dimension less than 8 in or a height less than 8 in.The damper width/height can be determined using the chart below.Transitions will be provided at each end of the sleeve to match your duct size.

Width (W)		Damper Width (X)
Above	Under	
3.99 in.	5 in.	W + 4 in.
4.99 in.	6 in.	W + 3 in.
5.99 in.	7 in.	W + 2 in.
6.99 in.	8 in.	W + 1 in.

Height (H)		Damper Height (Y)
Above	Under	
3.99 in.	5 in.	W + 4 in.
4.99 in.	6 in.	W + 3 in.
5.99 in.	7 in.	W + 2 in.
6.99 in.	8 in.	W + 1 in.



fire smoke damper

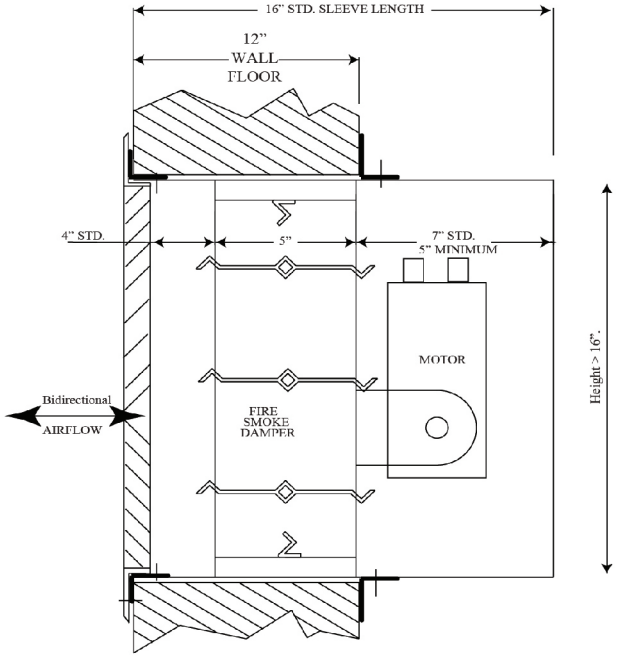
INSTALLATION INSTRUCTION
FIRE SMOKE DAMPER

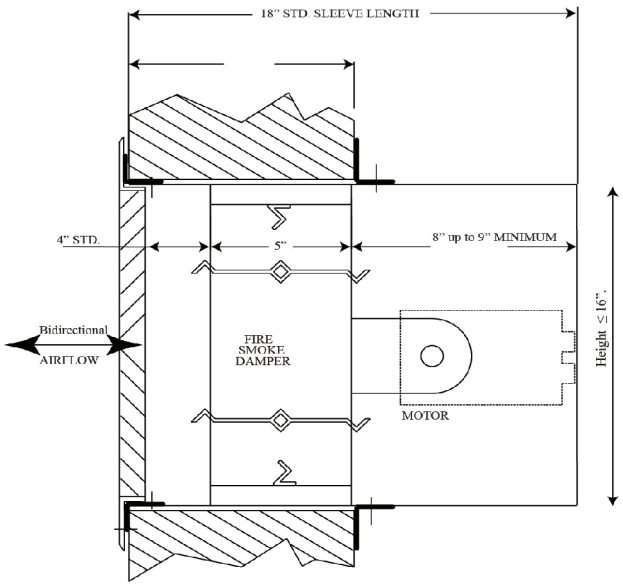
FOR GRILLE MOUNTING ASSEMBLY

Installation Details

Model KFSD-111, KSD-333 & KFD-555 with sleeve that terminate at a grille, has to follow the below installation instruction.
Sleeve can be ended with flange shape with exact countersunk screwholes from KBE can be provided or a reverse retaining angle should be installed.
Damper is offset in the sleeve to accomodate a single or double deflection grille

Model KFSD-111 & KFD-555 Maximum single unit 36" wide x 36" height or 30" Wide x 36" height
Model KSD-333 Maximum single unit 36" wide x 48" height
Model KCFSD -222 Maximum single unit 24" wide x 24" height

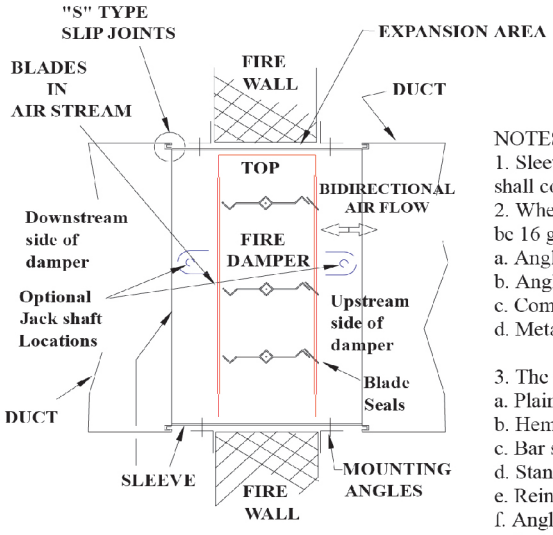




fire smoke damper

INSTALLATION INSTRUCTIONS
MODEL KFSD-111

VERTICAL & HORIZONTAL MOUNT
FOR USE IN 2 HRS OR LESS RATED PARTITION

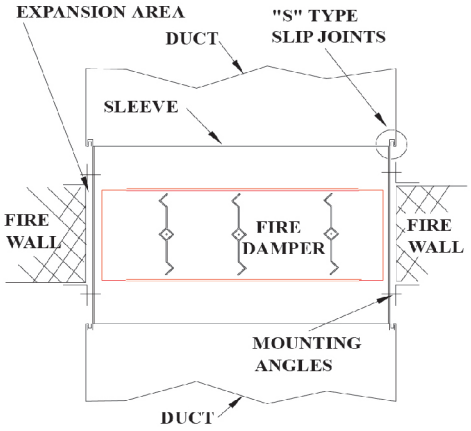


VERTICAL INSTALLATION

NOTES:
1. Sleeves shall be of the same gauge or heavier than the duct to which it attached. Gauge shall conform to SMACNA or ASHRAE standards.
2. When the following sleeve connections are used, the minimum gauge of the sleeve shall be 16 gauge on dampers not exceeding 36" W x 24" H and 14 gauge on larger dampers.
a. Angle reinforced standing seam.
b. Angle reinforced pocket lock.
c. Companion angles.
d. Metal fasteners approximately 16" on centers.

3. The following breakaway sleeve connections may be used on all systems :
a. Plain "S" slip
b. Hemmed "S" slip
c. Bar slip
d. Standing "S" slip
e. Reinforced bar slip
f. Angle slip
g. Inside slip joint
h. Double "S" slip

4. Clearance for expansion of 1/8" per foot of sleeve dimension is required. Angles should lap masonry a minimum of 1" around the entire opening.
5. The connecting ducts shall not be continuous, but shall terminate at the sleeve or frame.
6. An ACCESS DOOR is a NFPA requirement for damper inspection and testing.
7. Maximum sleeve extension is 16" on access door or actuator side of wall or floor opening.
8. Maximum sleeve extension is 6" on side of wall or floor opening for dampers withoutaccess door or actuator.
9. Dampers may be installed in wall or partition (mansory or gypsum wallboard) or concrete floor.
10. The connecting ducts shall not be continuous , but shall terminate at the sleeve or frame.
11. Dampers are supplied with factory mounted RS-100 (std) or fusible 165°F located in pin groove to close automatically upon detecting heat or the loss of actuator power.
12. CAUTION : THE HEAVY DAMPER CLOSURE SPRING IS UNDER LOAD When damper is order with Fusible link.
13. A continuous bead of Dow Corning RTV-732, Dow Corning 999A, or GE-1200 silicone rubber sealant shall be applied between the damper and the sleeve for its entire profile on one side of the installation as a minimum.
14. Installed damper units require operational checks upon completion to ensure proper function-ing.
15. Damper is rated for Bidirectinal airflow
16. Factory mounted electrical actuator are supplied with the following voltage: 24VAC, 120VAC and 220VAC. All wiring and connection shall conform to NEC or local electrical code.
17. Pneumatic actuator requires metallic airlines connections and a minimum of 20 psi supply air (Not to exceed 30 psi)



HORIZONTAL INSTALLATION

CLASSIFIED UL® INSTALLATION INSTRUCTIONS IN CONFORMANCE TO UNDERWRITERS LABORATORIES REQUIREMENTS

MAXIMUM DAMPER SIZES

TYPE INSTALLATION	SINGLE UNITS IN INCHES Height	Width
VERTICAL	36	36
VERTICAL	48	30
HORIZONTAL	36	36

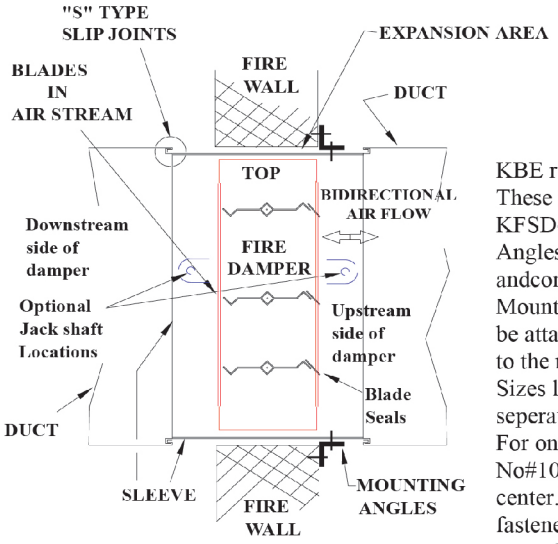
RS -100
165° F is standard rating

*When used, Fusible link located in pin grooves.

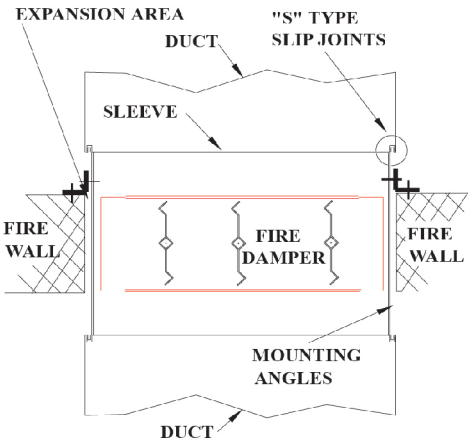
fire smoke damper

INSTALLATION INSTRUCTIONS MODEL KFSD-111

VERTICAL & HORIZONTAL MOUNT SINGLE SIDE RETAINING ANGLES FOR USE IN 2 HRS OR LESS RATED PARTITION



VERTICAL INSTALLATION



HORIZONTAL INSTALLATION
KBE Rapid mounting angle MUST be installed on top of floor

KBE rapid mounting angles (for use on one sided angle installations).
These instructions apply to 1-1/2hrs rated dynamic multi-blades fire damper model: KFSD-111mounted in masonary, block or metal stud, walls and floors.
Angles shall be minimumof 1-1/2" x 1-1/2" x 16 gauge for opening in metal stud andconcrete / masonary walls and floors of 36"x36" and less.
Mounting angles are only required on one side of wall or top of the floor. They must be attached to both the sleeve and the wall.Mounting angles may be installed directly to the metal stud under wall board on metalinstallations only.
Sizes larger will require the previous retaining angle design which consisted of 4 seperate angle per side.
For one sided KBE rapid mounting angle installations, the sleeve fastners shall be No#10 sheet metal screws spaced 3" from each end and no greater than 12" on center.With a minimum of two (2) fastners on each side, top and bottom wall/floor fasteners shall be No#10 sheet metal screw 2" long. Two screws on each side angle spaced 3inches from each end, Three screws on each head and sill angles with one screw in the center and one at each end spaced 3 inches from the ends. Screw fasteners used in metal stud must engage the metal stud a minimum of 1/2".
Screw fastner used in masonary walls or floors must engage the wall or floor a minimum of 2".
Angles should verlap the partition a minimum of 1" around the entire opening.
**Refer to notes on page (2) for duct connection to fire damper and expansion clearance

CLASSIFIED UL® INSTALLATION INSTRUCTIONS IN CONFORMANCE TO UNDERWRITERS LABORATORIES REQUIREMENTS

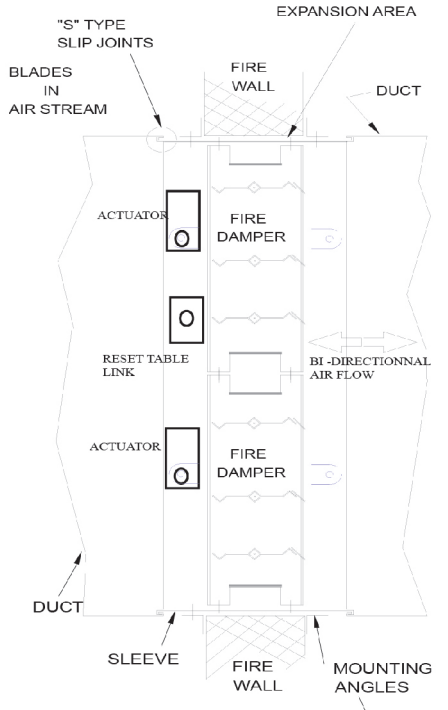
MAXIMUM DAMPER SIZES

TYPE INSTALLATION	SINGLE UNITS IN INCHES Height	Width
VERTICAL	36	36
HORIZONTAL	36	36

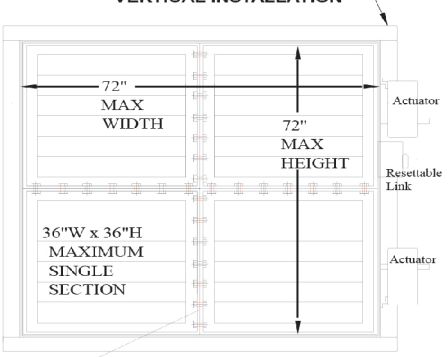
fire smoke damper

INSTALLATION INSTRUCTIONS
MODEL KFSD-L-111

MULTIPLE SECTIONS - VERTICAL MOUNT
FOR USE IN 4 HRS OR LESS RATED PARTITION



VERTICAL INSTALLATION



DAMPER FRAME TO
DAMPER FRAME ASSEMBLY
1/4" BOLTS AND NUTS ON
8" CENTERS MAXIMUM.

The damper sections must be attached together with following:

1- #10 (3/4".max) sheet metal screws,
2- 1/4 in. diameter nuts & bolts
3- 1/2" long fillet welds
4- 3/16" diameter steel self-piercing rivets.

Attachments must be spaced a minimum of 6 in. on centers & a maximum of 2 in. from corners, except 1/4" nuts & bolt could be spaced of 8 in. on center.
Attachments must be made on front face & back face of the damper sections.
Multi-section damper could be provided with one Resettable link as per space restrictions
Installation per NFPA. 90A, UL555, and SMACNA fire smoke and radiation installation guide.
FASTENERS MUST BE PLACED WHERE THEY DO NOT INTERFERE WITH THE DAMPER OPERATION.

NOTES:

1. Sleeves shall be of the same gauge or heavier than the duct to which it attached. Gauge shall conform to SMACNA or ASIIRAE standards.
2. When the following sleeve connections are used, the minimum gauge of the sleeve shall be 14 gauge.
   a. Angle reinforced standing seam.
   b. Angle reinforced pocket lock.
   c. Companion angles.
   d. Metal fasteners approximately 16" on centers.
3. The following breakaway sleeve connections may be used on all systems:
   a. Plain "S" slip
   b. Hemmed "S" slip
   c. Bar slip
   d. Standing "S" slip
   e. Reinforced bar slip
   f. Angle slip
   g. Inside slip joint
   h. Double "S" slip
4. Clearance for expansion of 1/8" per foot of sleeve dimension is required. Angles should lap masonry a minimum of 1" around the entire opening.
5. The connecting ducts shall not be continuous, but shall terminate at the sleeve or frame.
6. An ACCESS DOOR is a NFPA requirement for damper inspection and testing.
7. Maximum sleeve extension is 16" on access door or actuator side of wall or floor opening.
8. Maximum sleeve extension is 6" on side of wall or floor opening for dampers without access door or actuator.
9. Dampers are supplied with factory mounted actuators designed to close automatically upon detecting heat, or the loss of actuator power.
10. CAUTION : THE HEAVY DAMPER CLOSURE SPRING IS UNDER LOAD.
11. A continuous bead of Nuflex 302, Dow Corning RTV-732, Dow Corning 999A, or GE-1200 silicone rubber
sealant shall be applied between the damper and the sleeve for its entire profile on one side of the installation as a minimum.
12. Installed damper units require operational checks upon completion to ensure proper functioning.
14. Damper is rated for Bidirectinal airflow
15. Factory mounted electrical actuator are supplied with the following voltage: 24VAC, 120VAC and 220VAC. All wiring and connection shall conform to NEC or local electrical code.

CLASSIFIED UL
INSTALLATION INSTRUCTIONS IN CONFORMANCE TO UNDERWRITERS LABORATORIES REQUIREMENTS

MAXIMUM MULTIPLE SECTIONS

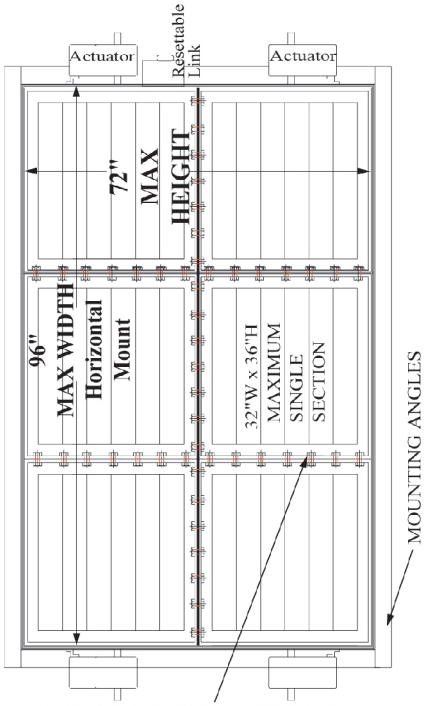
TYPE INSTALLATION	SINGLE UNITS IN INCHES	
	Width	Height
VERTICAL	72	72

RS -100
165° F is standard rating

fire smoke damper

INSTALLATION INSTRUCTIONS MODEL KFSD-111 & KFSD-L-111

MULTIPLE SECTIONS
Horizontal MOUNT- 1.5hr & 3hrs FIRE RATED
FOR USE IN UP TO 4 HRS RATED OPENING



The damper sections must be attached together with 1/4" (6mm) Diam nuts & bolts or 1/2" (13mm) long fillet welds. Attachments must be spaced a minimum of 5" (127mm) on centres & a maximum of 1" (25mm) from corners. Attachments must be made on front face & back face of the damper sections. A 14Ga (2.5mm) Galvanized steel Mullion plate should be placed between mating dampers as shown in Annexure (A). Multi-section damper could be provided with one RS-100 Resettable link as per space restrictions, Installation per NFPA. 90A, UL555, and SMACNA fire smoke and radiation installation guide. IN CASE OF USING FUSIBLE LINK JACKSHAFT HAS TO BE FROM THE BOTTOM. FASTENERS MUST BE PLACED WHERE THEY DO NOT INTERFERE WITH THE DAMPER OPERATION.

NOTES:

1. Sleeves shall be of 16Ga (1.5mm) or heavier than the duct to which it's attached. Gauge shall conform to SMACNA or ASHRAE standards.
2. Fire dampers assembly must be attached to sleeves on all four sides & must be attached to the sleeve with one row of attachments on each side of the blade channel. Attachments must be spaced a maximum of 5" (127mm) on centers and a maximum of 2" (50mm) from corners. The Sleeve will attached by 5mm Steel Pop Rivet or self-piercing rivet or Welds 1/2" (13mm) min Long.
3. Fire damper and sleeve assemblies must be installed in wall using retaining angles on each side of the wall. Retaining angles must be attached to the sleeve using No.10 sheet metal screws or 1/4"(6mm) bolts and nuts.
4. When the following sleeve connections are used, the minimum gauge of the sleeve shall be 14 gauge.
   a. Angle reinforced standing seam. c. Companion angles.
   b. Angle reinforced pocket lock. d. Metal fasteners approximately 16" on centers.
5. The following breakaway sleeve connections may be used on all systems:
   a. Plain "S" slip b. Hemmed "S" slip c. Bar slip
   d. Standing "S" slip e. Reinforced bar slip f. Angle slip
   g. Inside slip joint h. Double "S" slip
6. Clearance for expansion of 1/8" per foot (10mm per meter) of sleeve dimension is required. Angles should lap Wall a minimum of 1"(25mm) around the entire opening.
7. The connecting ducts shall not be continuous, but shall terminate at the sleeve or frame.
8. An ACCESS DOOR is a NFPA requirement for damper inspection and testing.
9. Maximum sleeve extension is 16" (401mm) on access door or actuator side of wall opening.
10. Maximum sleeve extension is 6" (152mm) on side of wall opening for dampers without access door or actuator.
11. Dampers are supplied with factory mounted actuators designed to close automatically upon detecting heat, or the loss of actuator power.
12. CAUTION : THE HEAVY DAMPER CLOSURE SPRING IS UNDER LOAD When damper is order with Fusible link. Make sure to respect the TOP OF UNIT when using the fusible link.
13. A continuous bead of Nuflex 302, Dow Corning RTV-732, Dow Corning 999A, or GE-1200 silicone rubber sealant shall be applied between the damper and the sleeve for its entire profile on one side of the installation as a minimum.
14. Installed damper units require operational checks upon completion to ensure proper functioning.
15. Factory mounted electrical actuator are supplied with the following voltage: 24VAC, 120VAC & 220VAC. All wiring and connection shall conform to NEC or local electrical code.

HORIZONTAL INSTALLATION

MAXIMUM MULTIPLE SECTIONS

TYPE INSTALLATION	Width	Height
HORIZONTAL	96	72

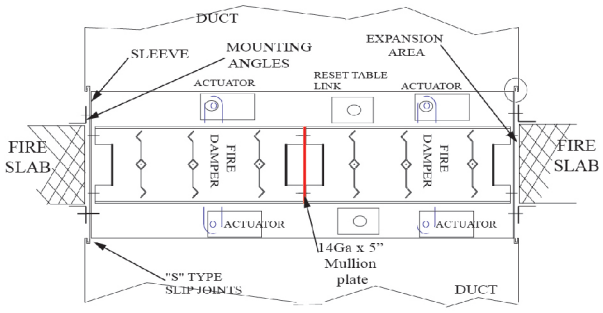
Single Section 32"x36" X 6 sections

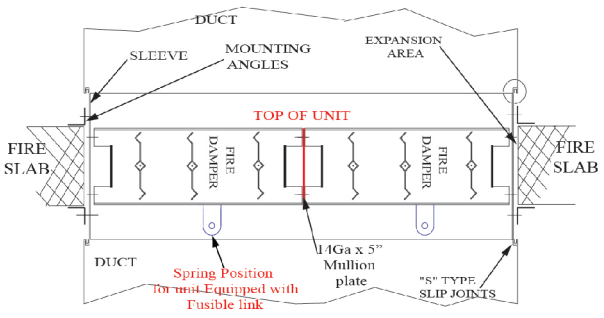
RS -100 with standard 165° F rating (Standard)

REFER TO the installation with Mullion Frame DETAIL for Large opening

CLASSIFIED UL® INSTALLATION INSTRUCTIONS IN CONFORMANCE TO UNDERWRITERS LABORATORIES REQUIREMENTS

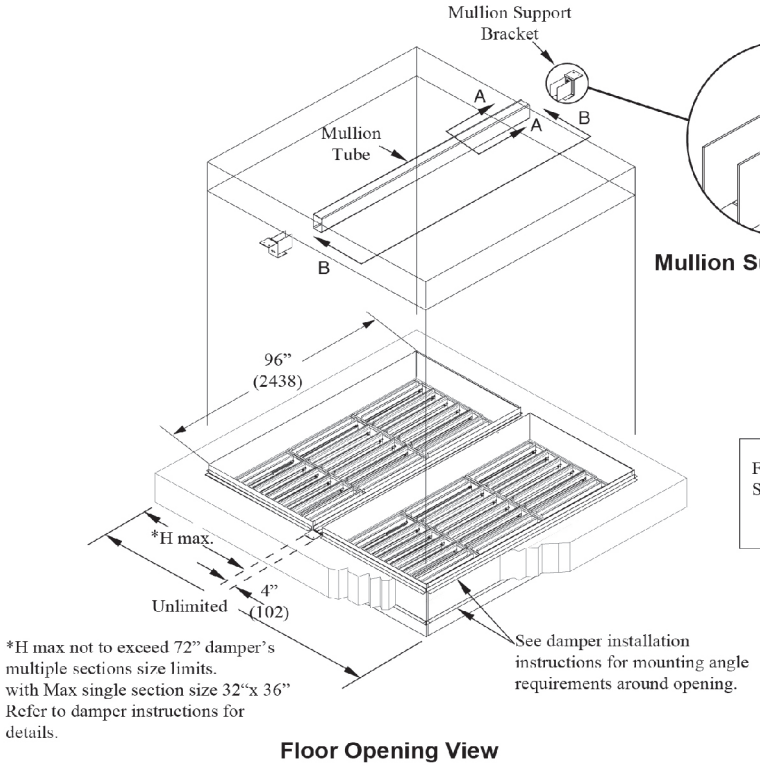
REFER TO ANNEXURE - A For actuator Details Wiring & Assembly





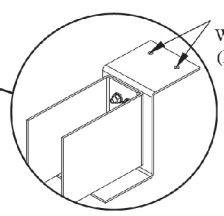
fire smoke damper

FIRE SMOKE DAMPER MODEL KFSD-111 & KFSD-L-111
FIRE DAMPER MODEL KFD-555 & KFD-L-555
INSTALLATION INSTRUCTIONS
HORIZONTAL MOUNT WITH MULLION FRAME
FOR 1-1/2 & 3 HRS RATING STATIC
(FOR USE IN FLOOR OPENING UP TO 4HRS RATED)

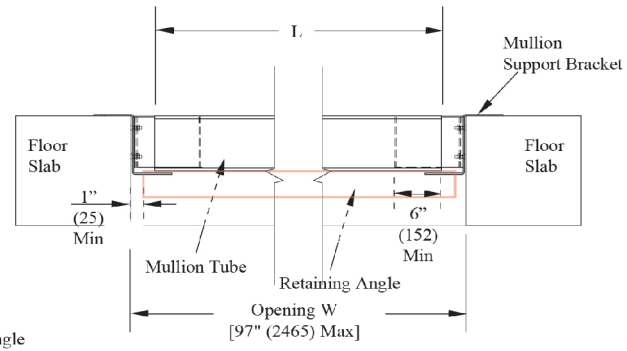


*H max not to exceed 72" damper's multiple sections size limits. with Max single section size 32"x 36" Refer to damper instructions for details.

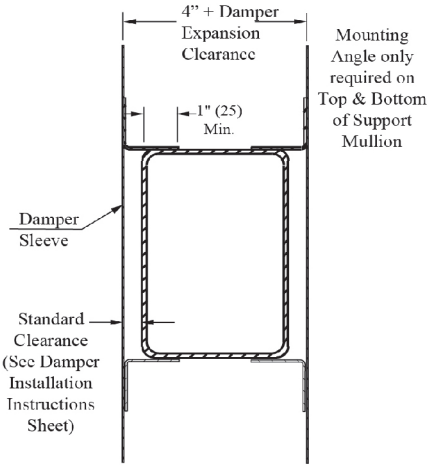
Floor Opening View



Mullion Support Bracket



Section B-B



Section A-A

Application
Support mullions allow oversized openings in fire resistant rated floors to be subdivided into smaller openings that do not exceed the fire damper's maximum rated size limits. Whenever the duct size exceeds the maximum damper width, the opening must be divided into two or more separate openings with a mullion installed between horizontally mounted damper sections.The support mullion consists of a structural steel tube and two mullion support brackets. Maximum mullion spans must not exceed 97" (2465). The mullions are not intended to be in the airstream and are not part of the duct work.The horizontal steel mullion is intended for use in fire resistant floors rated to a maximum of 4 hours.

General Installation
Insert one mullion support bracket into each end of the mullion tube allowing the tube to float between the brackets. DO NOT fasten the brackets to the tube in any way. Locate in the opening to provide correct expansion clearance for the dampers. Refer to Damper Installation Instructions for details. Drill 1/16" (8) diameter holes in the mullion support brackets for anchoring. Drill 1/2" (12.5) diameter holes in the Concrete and introduce the **M8 RawlBolt** (8mm steel concrete anchors) for anchoring.
Each bracket must be anchored to conceret in at least 2 places with a M8x70mm bolts. (Construction Details figure 2).
Retaining Angle on the BOTTOM of the mullion Frame shall be cut short to allow 1/8 in. per ft expansion clearance at ends, if the angles are located within the confines of the floor opening. The retaining angles at top of floor at the mullion are to overlap the floor at each end by min 1 in.
Galvanized coat structural steel mullion tube in accordance with local code requirements.

NOTE: Size in ( ) are in mm

- our productions based on coopration with (K.B.E) factory

CLASSIFIED UL® INSTALLATION INSTRUCTIONS IN CONFORMANCE TO UNDERWRITERS LABORATORIES REQUIREMENTS

fire smoke damper

FIRE SMOKE DAMPER MODEL KFSD-111 & KFSD-L-111
FIRE DAMPER MODEL KFD-555 & KFD-L-555
INSTALLATION INSTRUCTIONS
HORIZONTAL MOUNT WITH MULLION FRAME
FOR 1-1/2 & 3 HRS RATING STATIC
(FOR USE IN FLOOR OPENING UP TO 4HRS RATED)

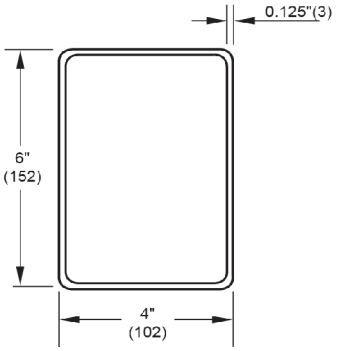
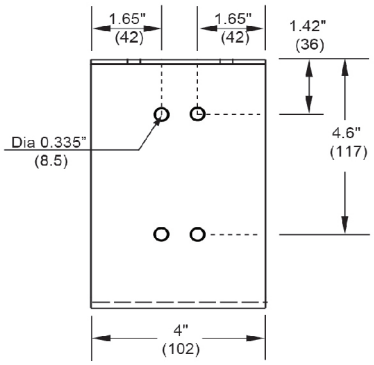


Figure 1: Mullion Tube



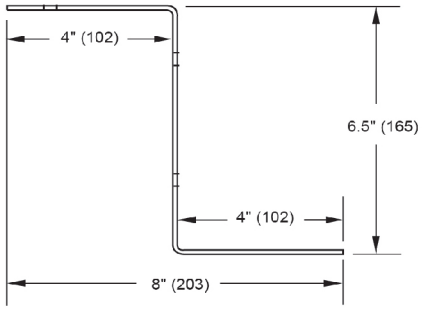


Figure 3: Shelf Bracket

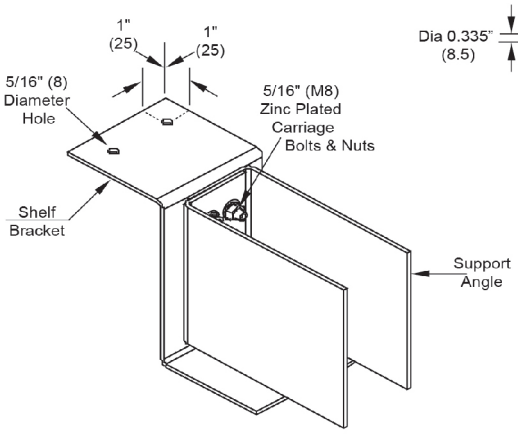


Figure 2: Mullion Support Bracket

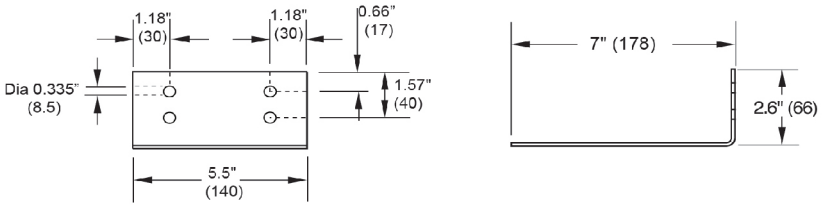


Figure 4: Support Angle

CLASSIFIED UL
INSTALLATION INSTRUCTIONS IN CONFORMANCE TO UNDERWRITERS LABORATORIES REQUIREMENTS

Construction

Fabricate mullion tubes from 6" x 4" x 1/8" thick (152 x 102 x 3) hot rolled steel tubing (Construction Fig 1).
Size mullion tube to be a 2 ± 1/2" (51 ± 13) shorter than the height of the rough opening. Fabricate two mullion support brackets per each mullion tube from 10 gauge (3.5) galvanized steel (Construction Details Fig 2).
The brackets are to be assembled from one shelf bracket and from two support angles (See Construction Details Fig 3 & 4).
The shelf bracket and support angles must be bolted together with minimum 5/16" x 1" (M8 x 25) diameter zinc plated or stainless steel carriage bolts to create the mullion support bracket. The mullion tube must overlap each support bracket by a minimum of 6" (152) (See Detail B-B).

Note: M8 Bolt =8mm

- our productions based on coopration with (K.B.E) factory

fire smoke damper

PERFORMANCE
for Metal Production
مصنع واحة الإنجاز للصناعات المعدنية

FIRE SMOKE DAMPER

@Performance

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AREA DHAHRAN - JUBAIL HI WAY
P.O. BOX 10848 - QATIF 31911

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ص.ب ١٠٨٤٨ – القطيف ٣١٩١١ – المملكة العربية السعودية