MASTER GRILLE
ماستر غريل

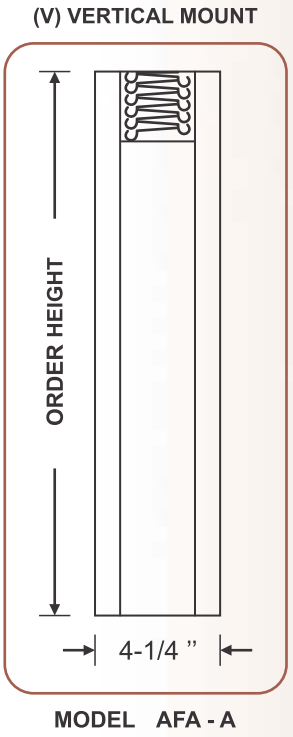
Fire Dampers

AFA - AFS

Fire Damper Model AFA TYPE A
1-1/2 HOURS RATING

APPLICATIONS :

MODEL AFA approved for use in walls and floors and partitions with fire resistance ratings less than 3 hours. UL 555 classified dynamic rated fire damper for use in HVAC systems that are operational in the event of fire .
Dynamic closure with airflow on both sides rated:
- Maximum pressure: to 4" W.G
- Maximum velocity: to 2400 FPM



STANDARD CONSTRUCTION :

FRAME :
4 1/4″ maximum × 22 gauge galvanized steel channel .

BLABE :
22 gauge galvanized steel curtain type in the air stream .

FINISH :
Mill .

COLSURE SPRINGS:
301 Stainless steel spring .

FUSIBLE LINK :
Standard 165° F . Other available .

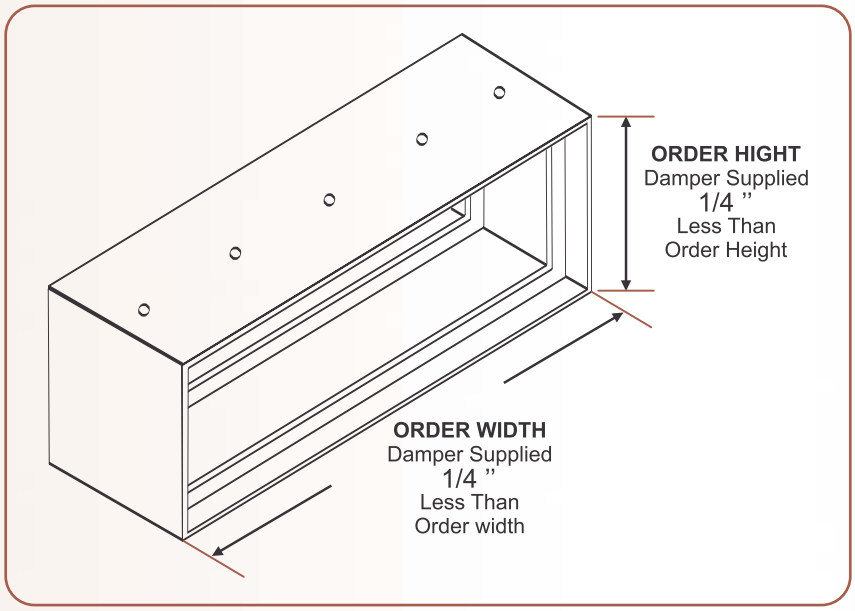
MOUNTING :
Vertical .

MINIMUM SIZE :
Vertical installation ----- 4″W× 4″H .

MAXIMUM SIZE :
Vertical installation ---- 36″W×36″H .

FEATURES :

* Closure spring operation for assured closure under air flow (fans on) in HVAC System
* Each damper is marked with a 1-1/2 hours UL 555 Classified fire damper label for use in dynamic system.
*Meets all UL and NFPA criteria for primary fire dampers in walls and floors with fire resistance ratings of less than 3 hours.



VARIATION :

All UL Classified fire dampers must be fabricated in accordance with UL procedures. Available variations are limited to those incorporated in the approved procedures. Approved variations available at additional cost are:
Factory furnished sleeves
Sleeves are available in 10 through 20 gauge steel and in lengths required for the specific application .

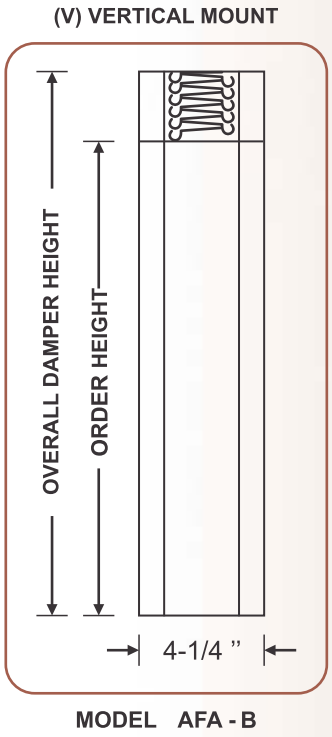
NOTE :

* Dampers furnished approximately 1/4" smaller than given duct dimensions .
* Refer to the MASTER GRILLE installation instructions and supplements for complete installation details .

Fire Damper Model AFA TYPE B
1-1/2 HOURS RATING

APPLICATIONS :

MODEL AFA approved for use in walls and floors and partitions with fire resistance ratings less than 3 hours. UL 555 classified dynamic rated fire damper for use in HVAC systems that are operational in the event of fire .
Dynamic closure with airflow on both sides rated:
- Maximum pressure: to 4" W.G
- Maximum velocity: to 2400 FPM



STANDARD CONSTRUCTION :

FRAME :
4 1/4″ maximum × 22 gauge galvanized steel channel .

BLABE :
22 gauge galvanized steel curtain type in the air stream .

FINISH :
Mill .

COLSURE SPRINGS:
301 Stainless steel spring .

FUSIBLE LINK :
Standard 165° F . Other available .

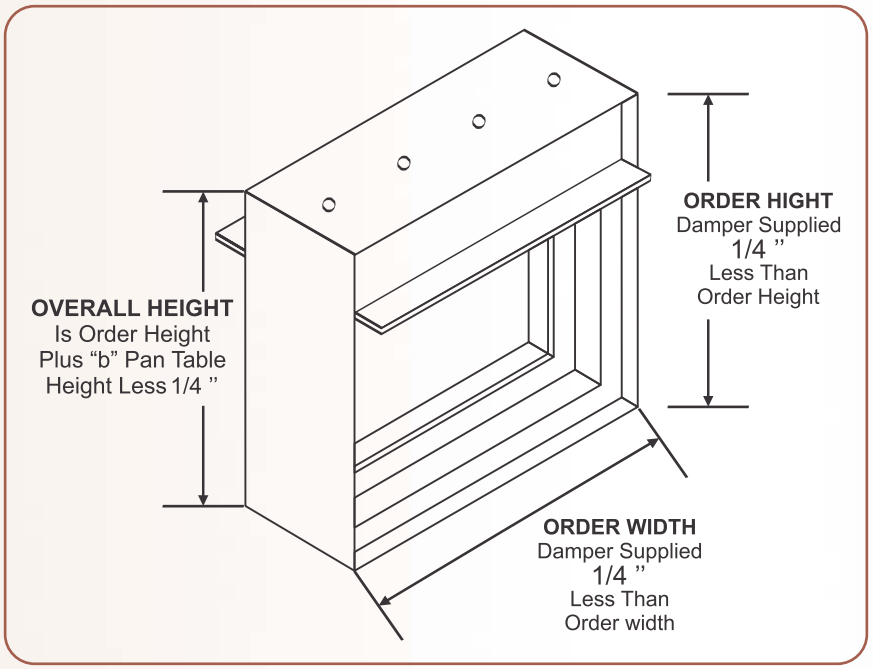
MOUNTING :
Vertical .

MINIMUM SIZE :
Vertical installation ----- 4″W× 4″H .

MAXIMUM SIZE :
Vertical installation ---- 36″W×36″H .

FEATURES :

* Closure spring operation for assured closure under air flow (fans on) in HVAC System
* Each damper is marked with a 1-1/2 hours UL 555 Classified fire damper label for use in dynamic system.
*Meets all UL and NFPA criteria for primary fire dampers in walls and floors with fire resistance ratings of less than 3 hours.



VARIATION :

All UL Classified fire dampers must be fabricated in accordance with UL procedures. Available variations are limited to those incorporated in the approved procedures.
Approved variations available at additional cost are:
Factory furnished sleeves
Sleeves are available in 10 through 20 gauge steel and in lengths required for the specific application .

NOTE :

* AFA TYPE B = AFS
* Dampers furnished approximately 1/4" smaller than given duct dimensions .
* Refer to the MASTER GRILLE installation instructions and supplements for complete installation details .

MODEL AFA TYPE E, F & G

UL CLASSIFIED 1-1/2 HOURS RATING

APPLICATION:

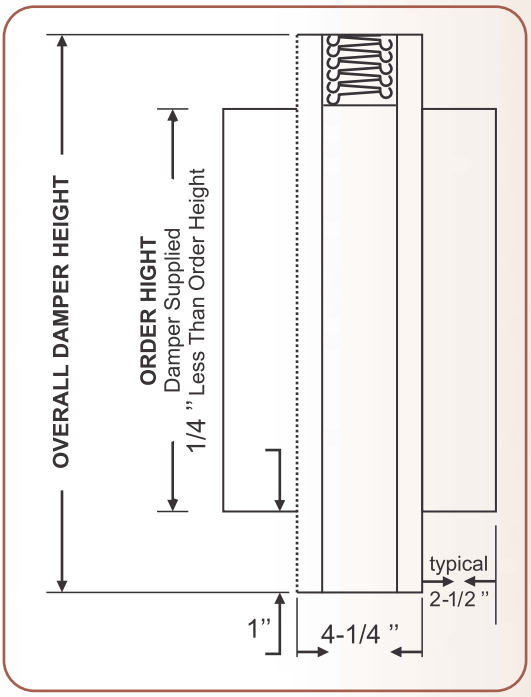
MODEL AFA is approved for use in walls and partition with fire resistance ratings less than 1-1/2 hours. UL 555 classified dynamic rated fire damper for use in HVAC~ systems that are operational in the event of fire

Dynamic closure with airflow on both sides rated :

Maximum pressure: to 4" W.G

Maximum velocity: to 2400 FPM

(V) VERTICAL MOUNT



MODELS : AFA - E
AFA - F
AFA - G

STANDARD CONSTRUCTION:

FRAME

4 1/4" maximum x 22 gauge galvanized steel channel.

BLADES :

22 gauges galvanized steel curtain type out of the air stream.

FINISH:

Mill.

CLOSURE SPRINGS :

301 Stainless steel spring .

FUSIBLE LINK :

Standard 165° F .

Others available.

MOUNTING :

Vertical .

MINIMUM SIZE :

Model AFA E --- 4"W x 4"H.

Model AFA F --- diameter 3".

Model AFA G --- diameter 3"

MAXIMUM SIZE :

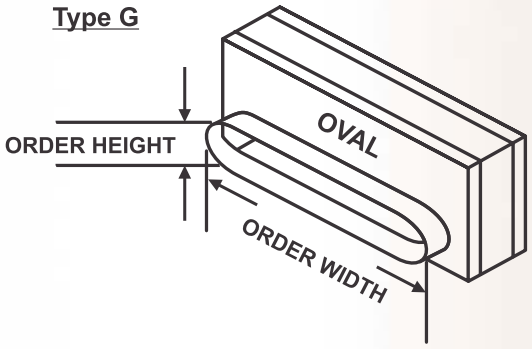
Model AFA "E" Single section
Vertical installation--- 36"W x 36"H.
Model AFA"F" & "G" Single section
Vertical installation --- Diameter 36".

FEATURES:

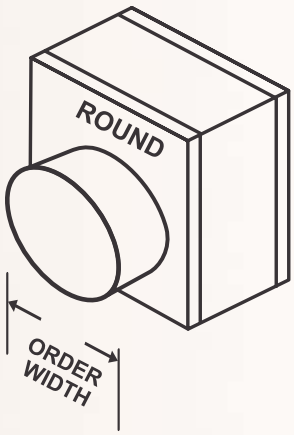
* Closure spring operation for assured closure under air flow (fans on) in HVAC System
* Each damper is marked with a 1-1/2 hours UL 555 Classified fire damper label.
* Meets all UL and NFPA criteria for primary fire dampers in walls and floors with fire resistance ratings of less than 3 hours.

MODELS : AFA - E
AFA - F
AFA - G

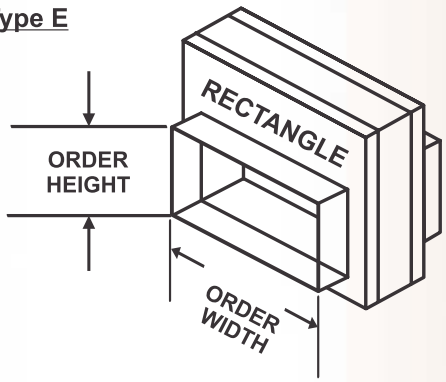
Type G



Type F



Type E



VARIATION :

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Factory furnished sleeves
Sleeves are available in 10 through 20 gauge steel and in lengths required for the specific application .

NOTE :

* Dampers furnished approximately 1/4" smaller than given duct dimensions .
* Refer to the MASTER GRILLE installation instructions and supplements for complete installation details .

DAMPER INSTALLATION INSTRUCTIONS

ATTACHING FIRE DAMPER TO SLEEVE :

Fire dampers must be attached to sleeves as shown in fig . 1 . all four sides of the dampers frame 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 6″ on centers and a maximum of 2″ from corners . A minimum of 4 attachment (2 on each side of the blade channels) per side (16 per damper) are required . One of the methods of attachment shown below must be used .

- Tack or spot welds .
- No. 10 sheets metal screws .
- 1/4″ bolts and nuts .
- 3/16″ steel pop rivets .

NOTE : ATTACHMENTS MUST NOT ENTER BLADE CHANNEL OR THEY MAY CAUSE INTERFERENCE WITH BLADE CLOSURE. NARROW LINE AND ULTRA THIN DAMPERS DO NOT HAVE FLANGE FOR ATTACHMENTS AND MUST BE WELDED TO SLEEVE.

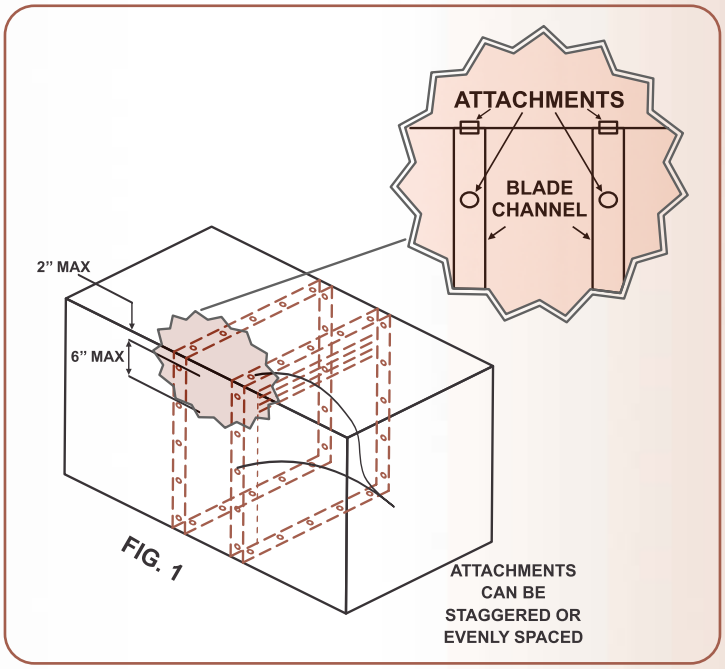


FIG. 1

SECURING FIRE DAMPER AND SLEEVES TO WALL OPENING :

Fire damper and sleeve assemblies must be installed in wall openings retaining angles on each side of the wall as described below :

* retaining angles must be a minimum of 16 gauge steel and have a minimum of 11/2″× 11/2″ legs
* retaining angles must completely cover the clearance space between the sleeve and the wall opening, plus overlap the wall a minimum of 1″ . This coverage includes all corners (fig. 2) .

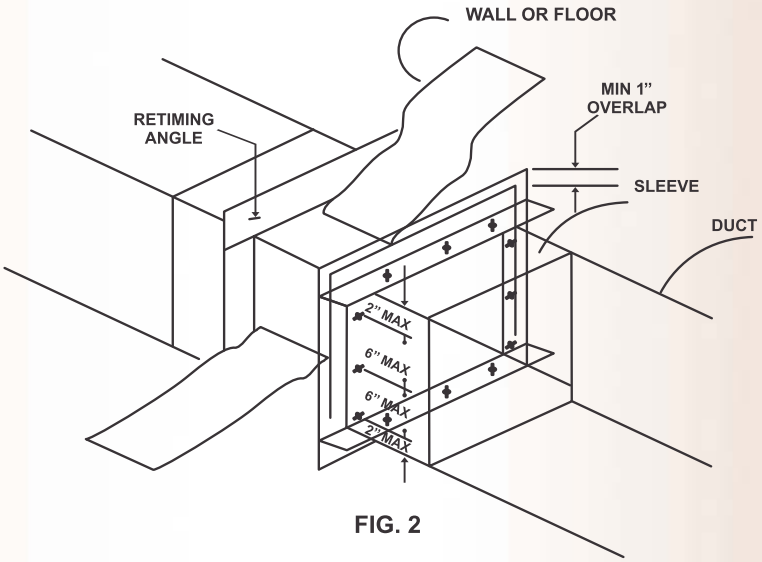
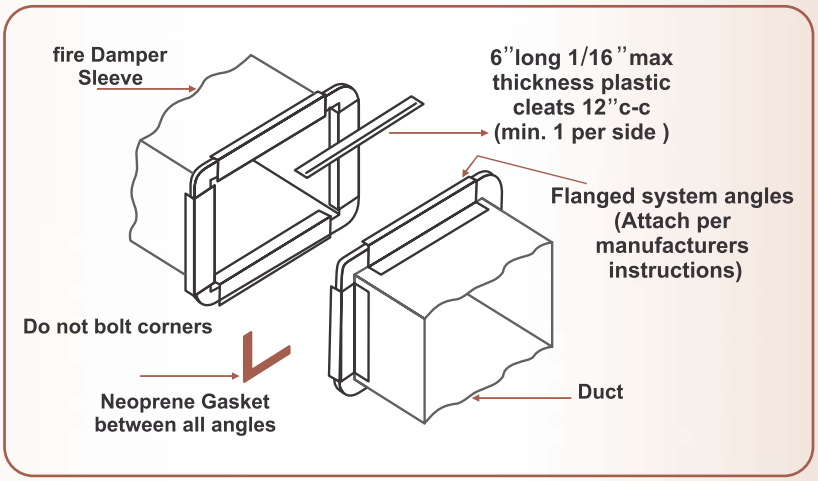


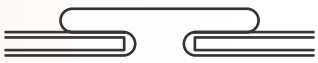
FIG. 2

* Retaining angles must be attached to the sleeve using the procedures and methods described hereunder . The angles must be attached to all 4 sides of the sleeve with butt joints at each corner . A minimum of two attachments are required on each side, top and bottom . The angles need not to be attached to each other at the corners .
* Retaining angles should not be fastened to the wall material. The angles should only sandwich the wall and allow for damper/sleeve expansion during periods of intense heat .
* For grille installation, angles legs may be reversed and one leg inserted into the wall opening provided that required clearance is maintained between angel leg fasteners and the wall opening .



TRANSVERSE JOINTS :

right have always been approved as SMACNA testing has also approved breakaway connections .



DOUBLE "S" SLIP

BREAKAWAY STYLE

Transverse joints illustrated at breakaway connections.
the following variations as

ROUND AND OVAL DUCT BREAKAWAY CONNECTIONS :

Duct to 22" wide (or dia.) may use 5 screws .

NOTE : All breakaway connections described may have duct sealant applied in accordance with SMACNA recommendations .

MANUFACTORED FLANGED SYSTEM BREAKAWAY CONNECTIONS :

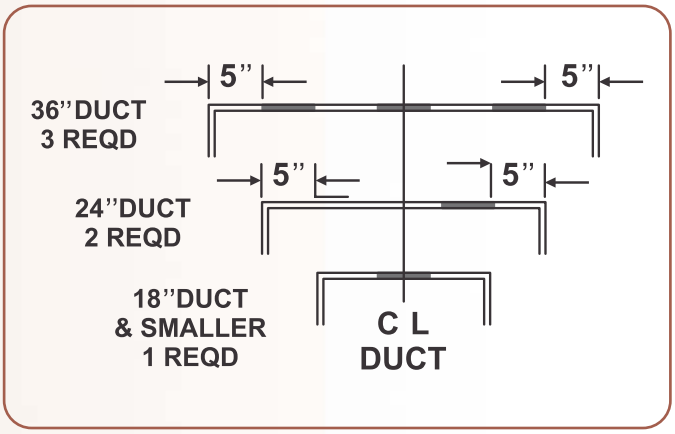
Flanged connection system manufactured duct mate , ward, and nexus are approved as breakaway connections when installed as illustrated .

MOUNTING ANGLES :

Secure mounting angles to the sleeve and not to the wall . Mounting angles to frame the sides of the sleeve on both faces .
When reverse mounting angles are used the size of the opening must be increased to maintain the specified expansion clearance between the angel/fasteners and the opening. Angles shall be a minimum of 11/2″× 11/2″ ×16 gauge on dampers 36"×36" and smaller . For dampers greater than 36"×36", angles to be a minimum of 11/2″× 11/2″ ×14 gauge fasten angles to the sleeve using 1/4" dia . bolts and nuts or by welding with beads 1/2" in length, or with no.10 steel sheet metal screws, or with 3/16" steel rivets. Fasteners or weld beads shall be 8" maximum on centers .

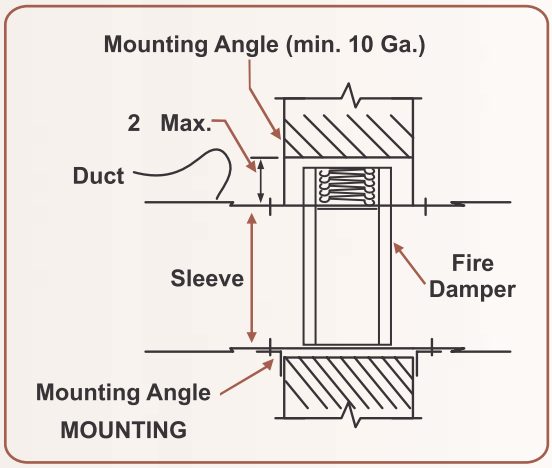
ACCSESS :

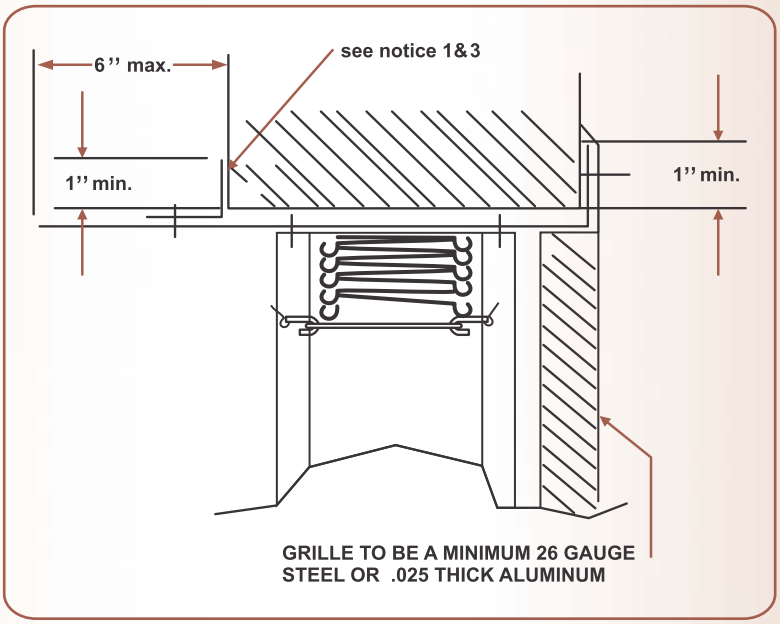
Suitable access must be provided for damper inspection and servicing . Where it is not possible to achieve sufficient size access , it will be necessary to install a removable section of duct .



DUCT CONNECTION :

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 . All duct connecting ducts shall also conform to UL 555 . Connection ducts shall not be continuous but shall terminate at the damper sleeve . Duct connections to the sleeve will be either of the breakaway or rigid type double "s" slip shown below. All connections not listed as breakaway shall be considered as rigid. Breakaway joints of the types shown below shall have no more than two no.10 (4.8 mm) diameter sheet metal screws on each side and on the top and bottom located in the center of the slip pocket and shall penetrate both sides of the slip pocket . Breakaway joints of the type shown below are permitted on the top and bottom of horizontal ducts (vertical dampers) with flat slip not exceeding 20 inches (508 mm) in length on the sides .

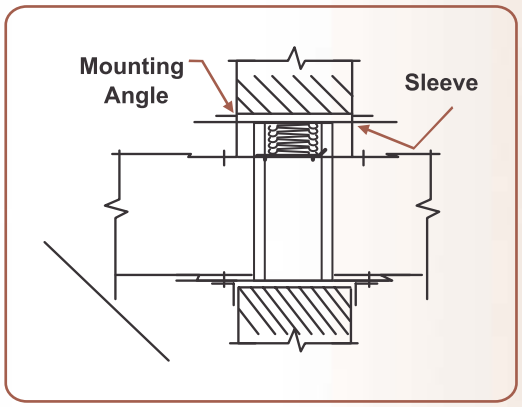




MAINTENANCE :

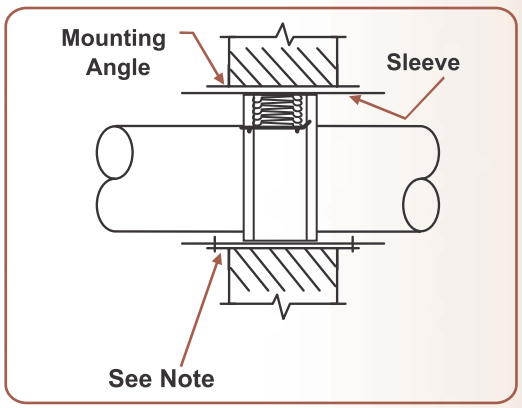
Dampers shall be maintained in the intervals as stated in NFPA-90A, Unless local codes require more frequent inspections. Check the fusible link, check for free operation and complete closure, clean with mild detergent or solvent, secure damper open with fusible link

DOUBLE ''S'' SLIP



The factory supplied 22 gauge collar to 18 gauge .
Cap connection under the following conditions :

1. Round unit duct diameters are not larger than 35".
2. Oval duct sizes are not larger than 40" W × 29" H .
3. Duct gauges shall conform to the SMACNA or ASHRAE duct standards.
4. Duct diameters of 22 inches (559 mm) and smaller shall have three (3) no. 10 (4.8 mm) diameter sheet metal screws evenly spaced around the circumference of the duct .
5. Dampers outside of these restrictions (i.e.) multiple dampers and special size and application dampers must use a 4" wide draw band radiation damper installation guide .



DAMPER BEHINED A GRILLE :

1. Perimeter mounting angles to be a minimum of 11/2 × 1/2 × 16 gauge . on dampers 36"× 36" and smaller.

2. Grille to flange fasteners cannot penetrate fire wall .

3. Secure angles to sleeve only , so as to frame the wall opening. Fasten to the sleeve only using the same means as required for fastening the damper to the sleeve .

4. Grill to flange attachment by means of 1/4" dia. Pop rivets , #8 bolts and nuts. Fasteners to be plated steel or stainless steel , minimum two fasteners per side .
The length of the sleeve or frame extending as per standard beyond the wall opening for both the rigid and breakaway joints between the sleeve or frame and duct shall not exceed:

a) Six inches (152 mm) on each side for fire dampers intended to be installed in the plane of a fire barrier and for use without an actuator or a factory installed access door in the sleeve.

b) Six inches (152 mm) on one side and 16 in (406 mm) on the opposite side for fire dampers intended for use with an actuator and/or a factory installed access door on the longer side.

c) Sixteen inches (406 mm) on each side for fire dampers intended for use with an actuator on one side and a factory installed access door on the other side.

d) Six inches (152 mm) on one side and sixteen in (406 mm) on damper side for fire dampers intended to be installed outside of wall plane.

The connecting ducts shall not be continuous, and shall terminate at the sleeve or frame. Instructions for mounting and joining with the duct are in accordance with the Standard for the Installation of Air-Conditioning and Ventilating Systems, NFPA 90A.

DAMPER INSTALLATION AND MAINTENANCE INSTRUCTIONS 1-1/2 HOURS RATED, UL CLASSIFIED FIRE DAMPER FOR USE IN FIRE BARRIERS WITH RATINGS OF LESS THAN 1-1/2 HOURS

INSPECTION :

Inspect for shipping damage .
Inspect for proper size and model .
Inspect installed damper for proper orientation, as stated on damper label .
Inspect for obstructions which could interfere with free operation and complete closure .
Manually cycle the damper to verify proper operation .

TYPICAL WALL INSTALLATION :

Fig.

INSTALLATION :

The basic intent of a proper installation is to secure the fire damper in, not to, the opening in such a manner as to prevent distortion and disruption of the damper operation by allowing the fire damper in openings to expand and the connecting duct to separate in the event of the collapse of the hanging system . The fire damper must be positioned within the masonry block or gypsum wallboard fire barrier .

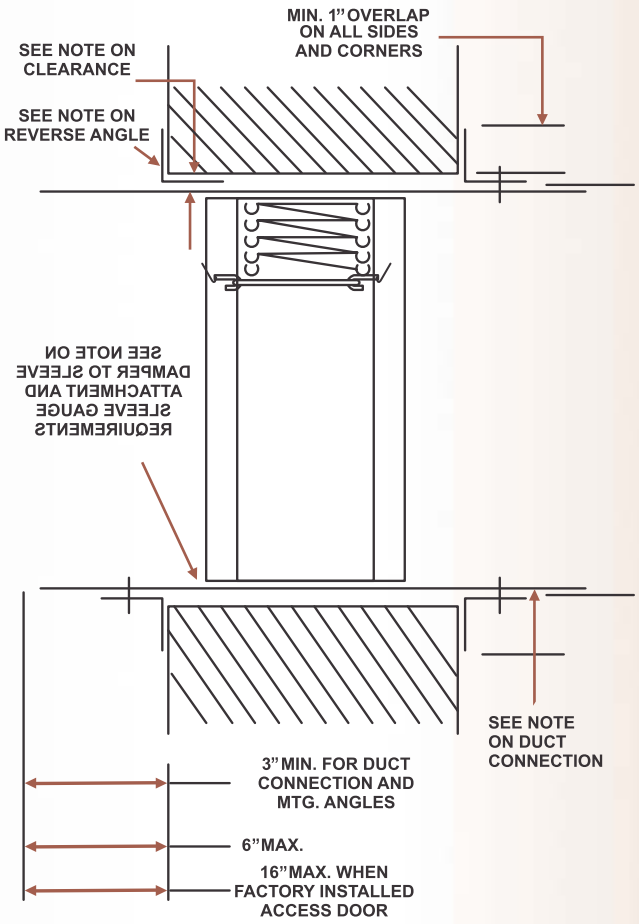


Fig.

Wall Mount Shone
Vertical Installation

DAMPER TO SLEEVE ATTACHMENT :

A sleeve shall be used of sufficient length to permit direct attachment of perimeter mounting angles . This damper can be supplied with factory mounted sleeve . If the sleeve is not factory supplied , it must be attached on both side of the damper by one of the following method : Secure with 1/4" dia. Bolts and nuts or by welding with beads 1.2" in length , or no. 10 steel sheet metal screws, or 3/16" steel rivets . Fasteners shall be 8" maximum on centers . Fasteners cannot be placed where they interfere with damper installation.
Gaps at corners between the damper and its sleeve must be small enough to prohibit the passage of an 1/8" diameter rod through the entire depth of the gap between the damper panels and its sleeve .

SLEEVE THICKNESS :

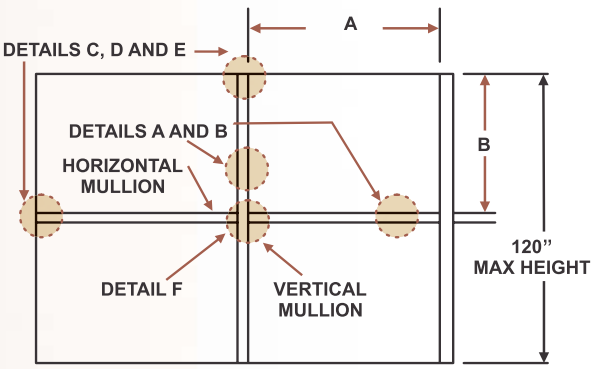
Sleeves shall be the same gauge or heavier as the duct to which it is attached . Gauges shall conform to SMACNA or ASHRAE duct standards . Damper sleeve can be no thicker than 10g . steel . On type C dampers , the sleeve must be 20 ga. Or heavier .

EXPANSION CLEARANCE :

The opening in the wall for the fire damper shall be sized so as to provide expansion clearance between the sleeve and opening . Clearances do not vary with walls constructed of different materials. A minimum of 1/8" per foot of overall width and height is required . The maximum opening size shall not exceed 1/8" per foot plus 1", minimum total clearance shall be at least 1/4" larger than overall assembly .

DAMPER INSTALLATION INSTRUCTIONS
Mullion installation instructions for dampers Installed oversized wall openings

These fabricated galvanized steel mullions are intended to subdivided a large vertical wall opening into smaller openings .
Theses smaller openings are not to exceed the maximum size restrictions of the UL classified 1-1/2 hours galvanized steel fire damper assembly.



A and B opening sizes are not to exceed the damper's approved maximum - multiple assembly size.

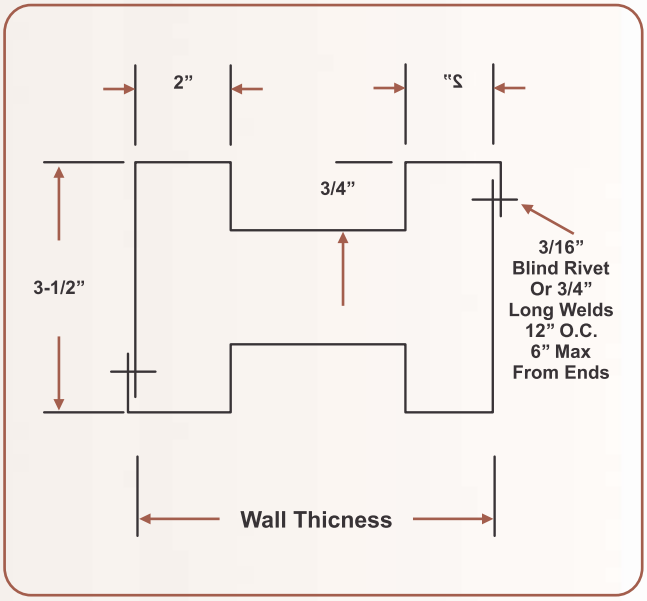
Vertical, horizontal, or vertical and horisontal mullions can be used, depending on the opening size.

CONDITIONS & RESTRUCTIONS :

Fabricated from galvanized steel with a normal yield strength of 42,000 psi .
Intended for use in concrete block or poured walls only with a minimum wall thickness of 7" and maximum wall thickness of 12" to permit proper embedding of anchors, hollow concrete block walls are to be filled at the opening by minimum 3,500 psi concrete .
Steel mullions are not to be inside the ductwork . For ducted systems , each subdivided opening must be individually ducted .

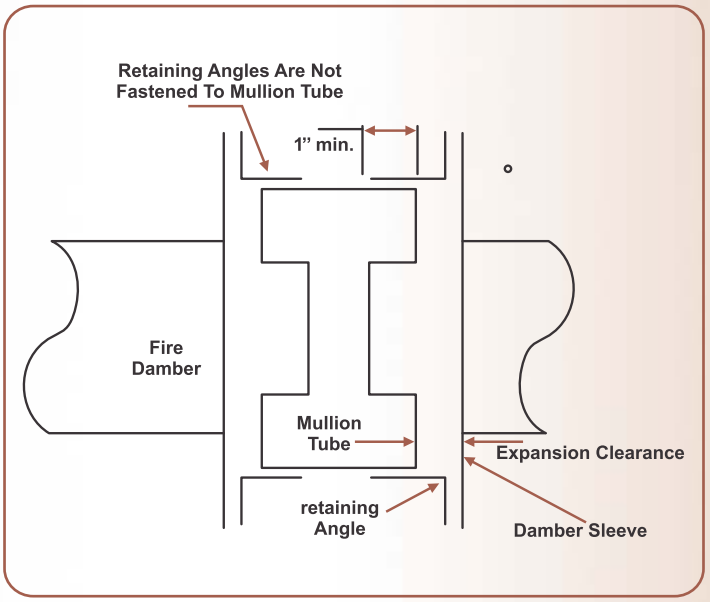
Detail A

Mullion Cross Section
16 GA. Galvanized Steel



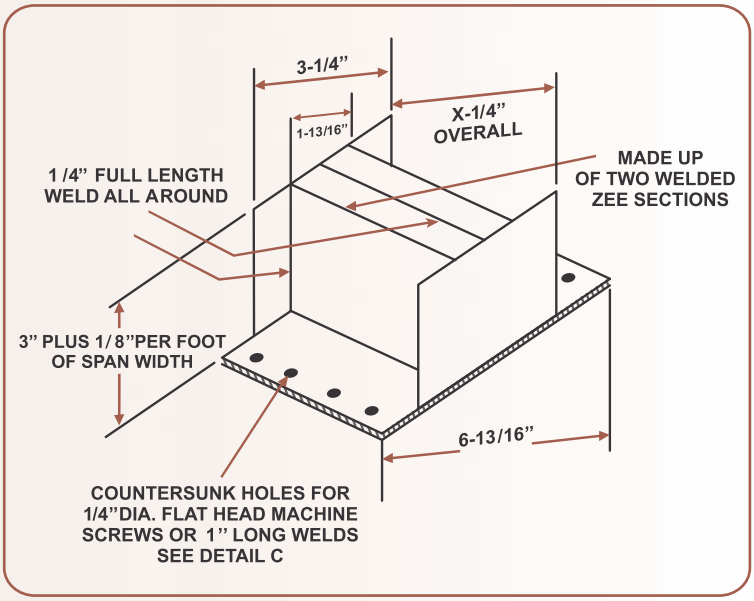
Detail B

Reference the damper's installation instruction regarding the approved method of attaching the damper to the sleeve, attaching the retaining angles to the sleeve, required expansion clearances, sleeve gauge, etc...



Detail D

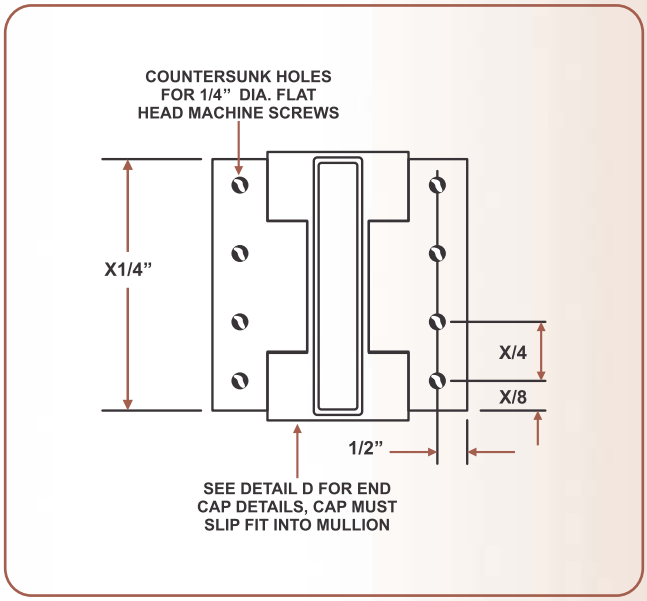
Top, bottom or side end caps
12 GA galvanized steel



Detail E

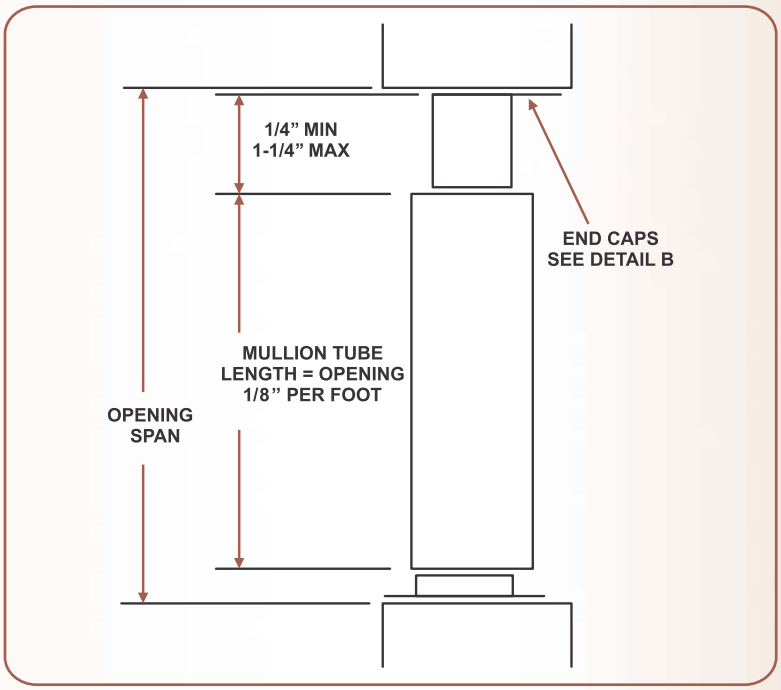
END CAP INSERTED INTO MULLION

All Horizontal And Vertical Mullion Tubes Must Be Terminated With An End Cap. These End Caps May Not Be Fastened To The Mullion Tube And Must Slide Freely Inside The Mullion Tube.



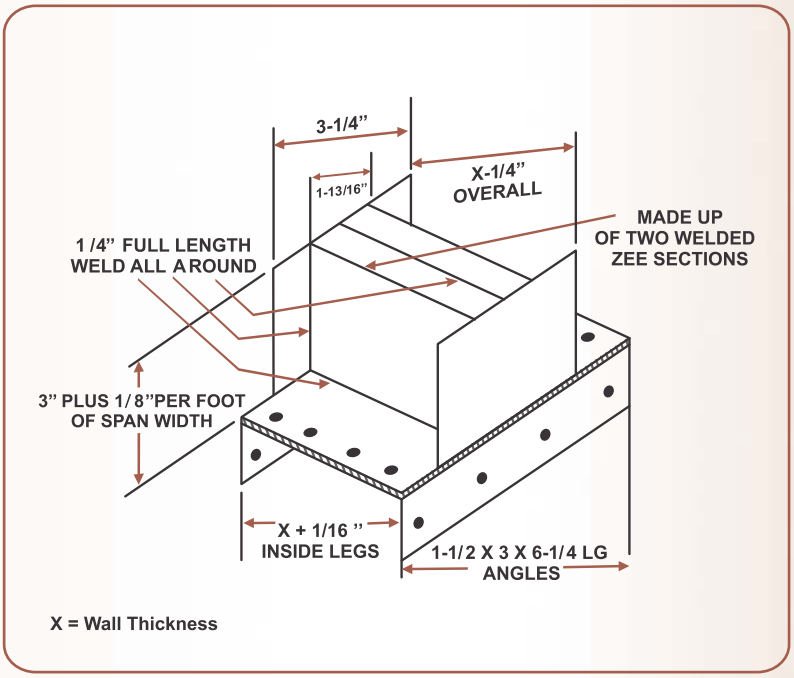
DETAIL C

The end caps are attached by means of 1" long x 3 / 8" dia. steel expansion anchors embedded into the opening with 1 / 4" dia. flat head machine screws, eight per end cap. if a steel lintel is used, four 1" long welds per end cap (tow per leg) may be used



DETAIL F

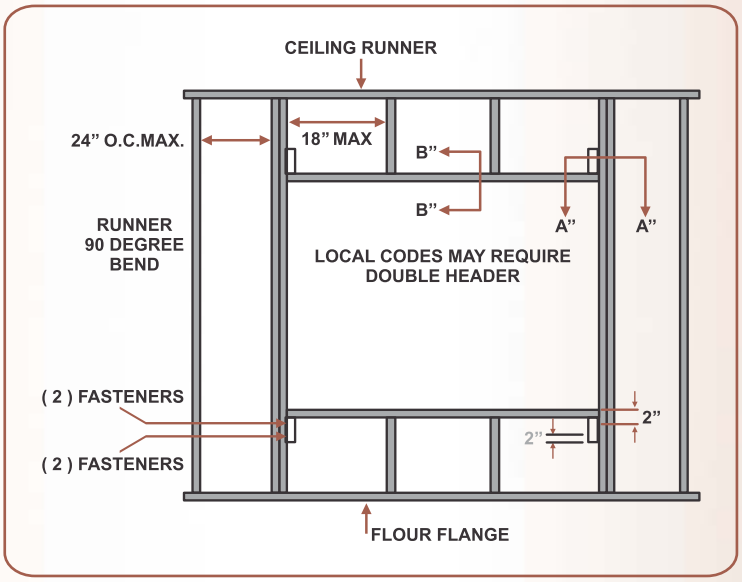
Horizontal to vertical end cap 12 gauge galvanized steel attach the horizontal mullion end caps to the vertical mullion tube by means of (12) 3 / 16" dia. blind rivets or 1 / 8" full lenght weld



X = Wall Thickness

DAMPER INSTALLATION INSTRUCTIONS
1/2 HOURS UL CLASSIFIED FOR 1- FIRE DAMPERS INSTALLED INTO METAL OR WOOD FRAMED 1 HOUR AND 1-1/2 HOURS RATED DRYWALL PARTITIONS

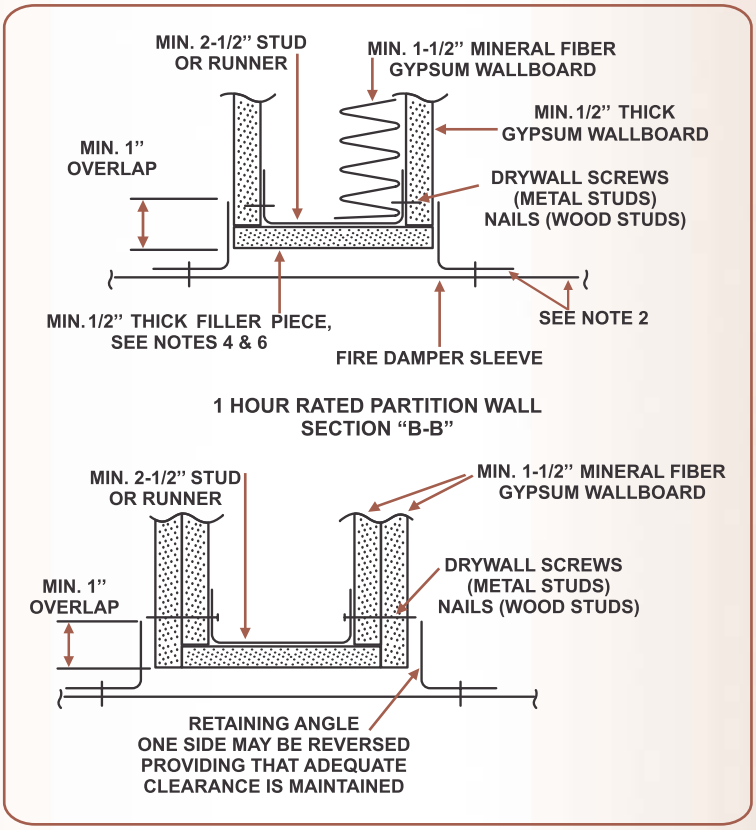
1- These illustrated partition designs have successfully been tested in conjunction with 1-1/2 hours classified fire dampers, for additional designs, reference Underwriters Laboratories, Inc. Fire Resistance Directory. Specific framing requirements of openings may vary with the local authority that has jurisdiction. Specific framing requirements should be provided in the architectural and structural drawings .



2- Reference the damper's installation instructions regarding the approved method of attaching the to the sleeve, attaching the damper retaining angles to the sleeve, required expansion clearances, Sleeve gauge,_ etc. Type of framing does not affect the stated required -~ expansion clearance .

3- Gypsum panels surrounding the opening are to be fastened to all studs and runner flanges, 12" o.c, maximum .

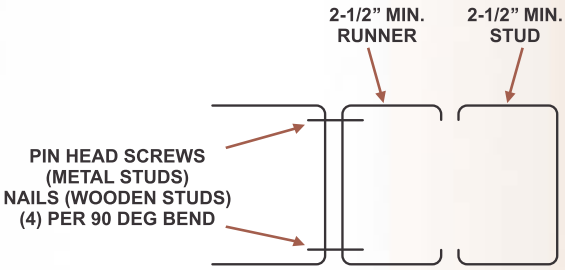
4- When wooden studs are used, filler pieces must be installed around



the entire opening. Filler pieces are optional when metal studs are used (consult local codes to determine if filler pieces are required). Filler pieces are to be double screwed (or nailed to wooden studs) on 12" max. centers to the web of runners and studs .

5- The Office of the California State Fire ~Marshal and other local jurisdictions require filler pieces around both wood and metal framed openings (no filler pieces around concrete or masonry openings). These codes also require a double header for wood framed openings, consult local code authorities .

6- Double jamb studding shown and required when opening width or height exceeds 36", Single jamb_ studding acceptable for openings 36" x 36" and smaller .



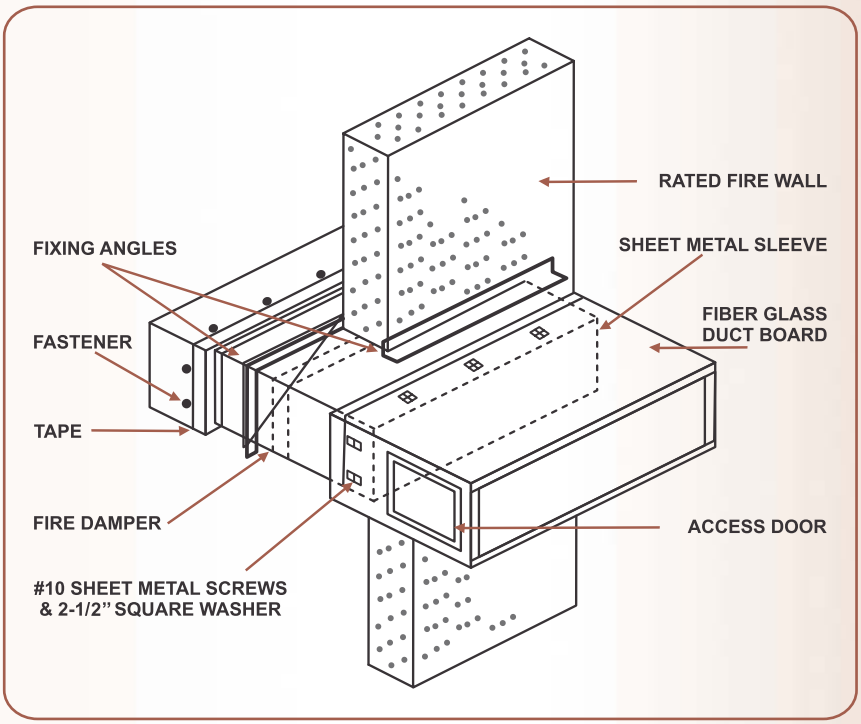
SECTION "A-A"

DAMPER INSTALLATION INSTRUCTIONS
INSTALLATION IN FIBROUS DUCT

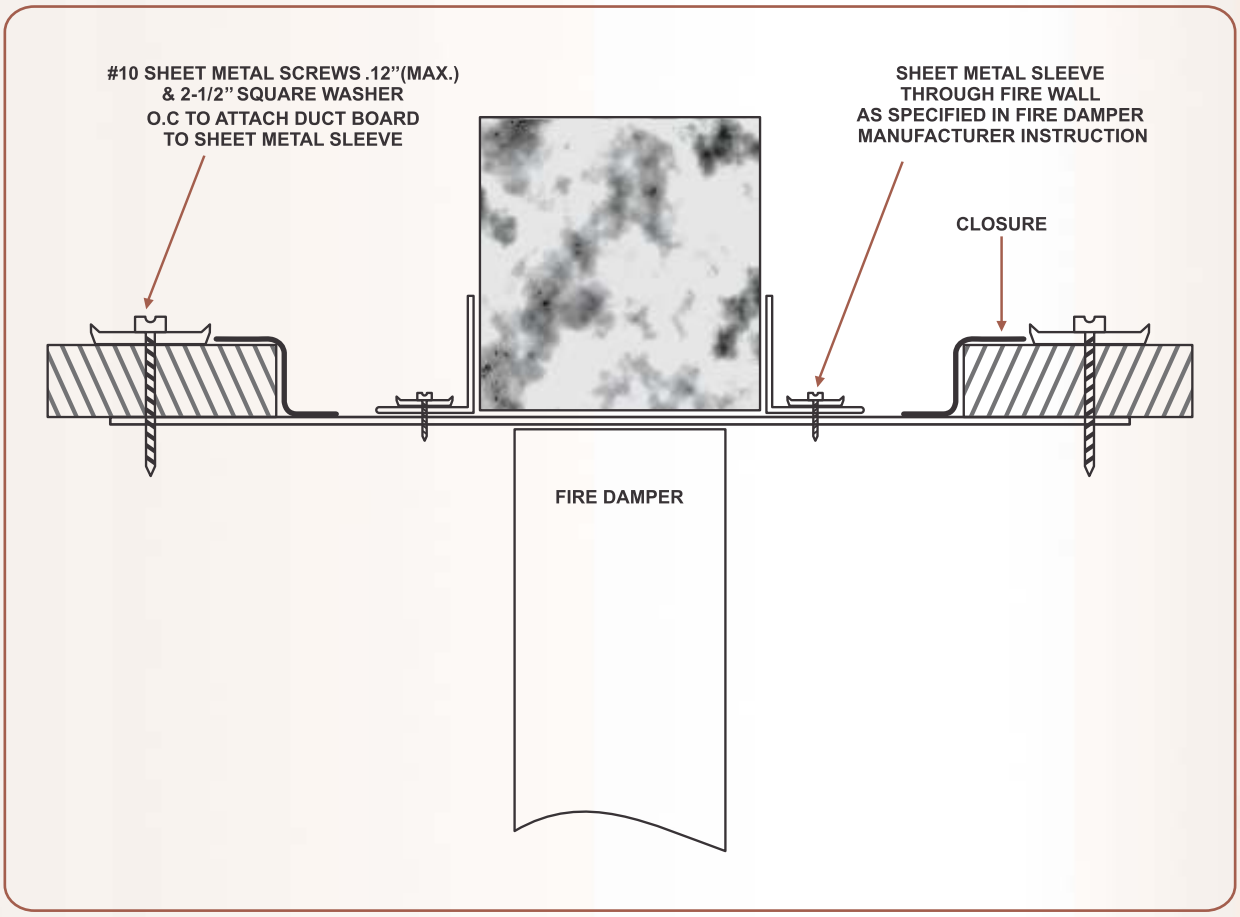
FIRE DAMPER INSTALLATION:

Sheet metal sleeve must be installed through rated fire wall. Check local codes for proper sheet metal gauge and attachment angle

NOTE: Sealing of fibrous glass duct board to sheet metal sleeve must be made with glass fabric and mastic, except where operation pressure is less than 1" w.g. and sheet metal surfaces are carefully cleaned. I this case pressure sensitive aluminum foil tape may be used.

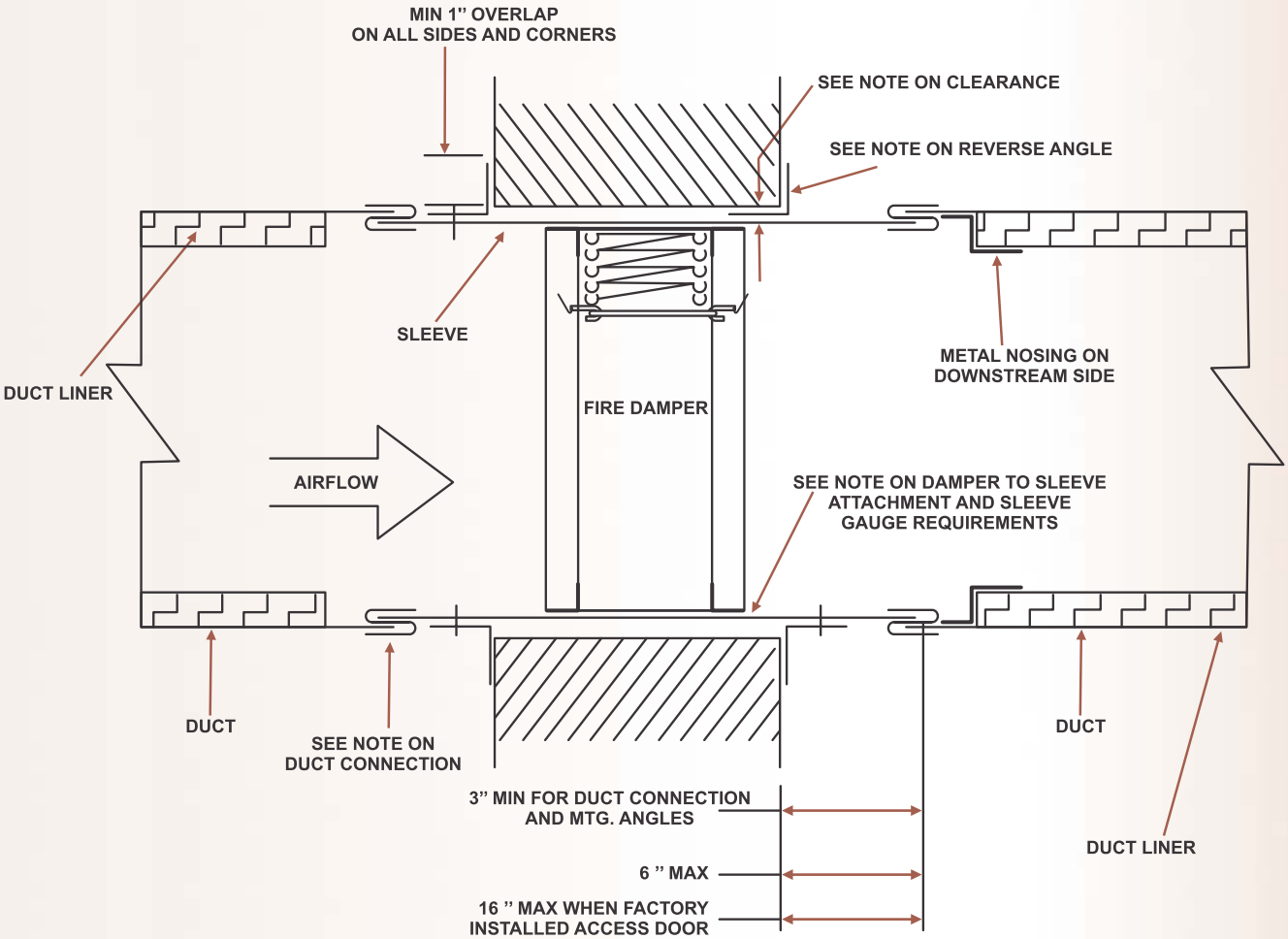


DAMPER INSTALLATION INSTRUCTIONS
INSTALLATION WITH DUCT LINER



Interruption of duct liner at the fire damper is required by NFPA Standard 90A. Where 90A is applicable installation should be made as shown and should otherwise conform to SMACNA HVAC Duct Construction Standards-Metal and Flexible.

The Designer should specify external insulation as shown to prevent condensation occurring on unlined metal at penetrations. Where the provisions of NFPA 90A are applicable, neither insulation nor liner can extend through the walls .



WALL MOUNT SHOWN

FIRE DAMPER MODEL AFA

CURTAIN TYPE FIRE DAMPER PERFORMANCE DATA

Free Area and Static Friction Loss at various velocities.

DUMPER FREE AREA (SQ FT)

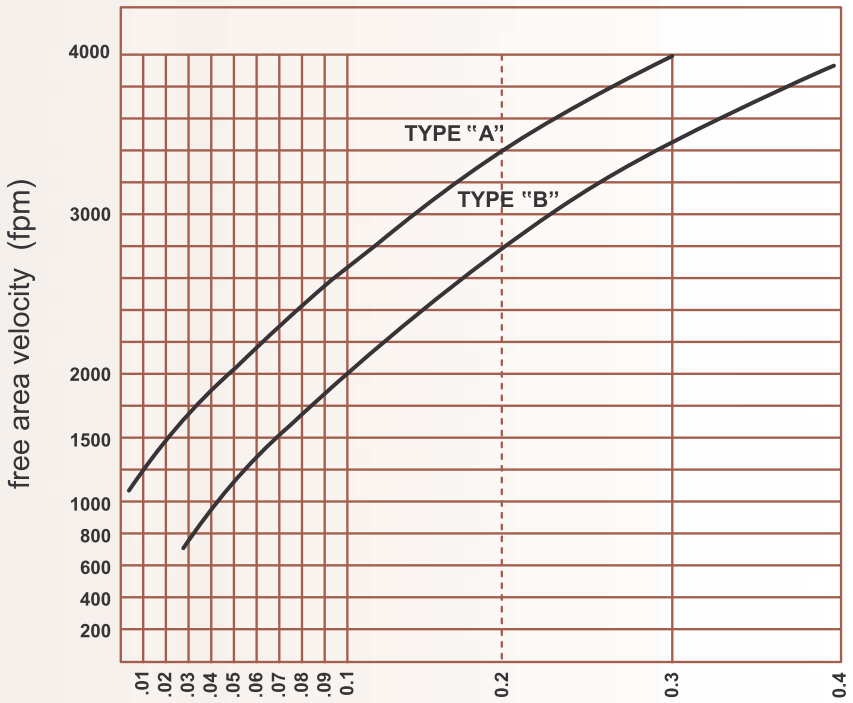
HEIGHT (INCHES)	WIDTH (INCHES) 6"	12"	18"	24"	30"	36"
6 "	.14	.33	.52	.70	.89	1.1
12"	.13	.72	1.1	1.5	1.9	2.4
18"	.48	1.1	1.7	2.4	3.0	3.7
24"	.65	1.5	2.4	3.2	4.1	5.0
30"	.82	1.9	3.0	4.1	5.2	6.3
36"	.99	2.3	3.6	4.9	6.3	7.6

TYPE A

HEIGHT (INCHES)	WIDTH (INCHES) 6"	12"	18"	24"	30"	36"
6 "	.16	.38	.60	.81	1.0	1.3
12 "	.31	.81	1.3	1.8	2.2	2.7
18 "	.53	1.3	2.0	2.7	3.4	4.1
24 "	.72	1.7	2.7	3.6	4.6	5.6
30 "	.91	2.1	3.3	4.6	5.8	7.0
36 "	1.1	2.6	4.0	5.5	7.0	8.4

TYPE B

PRESSURE DROP CURVE



To find pressure drop compute FREE AREA VELOCITY intersect desired damper type curve and extend line perpendicular to velocity lines down to Static Pressure Drop (in w.g.).

$$\frac{\text{CFM}}{\text{FREE AREA}} = \text{Free Area Velocity}$$

(FAV) in feet per min .

EXAMPLE :

A 24" x 24" type-A damper is required ' for a 3,000 cfm application.

$$\text{Fav} = \frac{3{,}000}{3{,}2 \text{ Square Feet}} = 937 \text{ FPm}$$

By locating 937 fpm on the "An damper curve and following the vertical intersection point down to the bottom of the graph,

Cfm = cubic feet per minute
Fprn = feet per minute
FAV = free area velocity
SP = Static Pressure
DP = Pressure difference or pressure drop
FA = Free Area

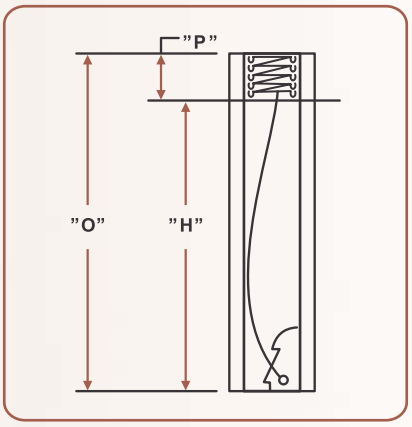
Metric system conversions :
Multiply
Cfm by .4719 to obtain l/s
Fpm by .00508 for m/s
In w.g. by .2486 to obtain kilopascals
Sq.ft. by .0929 for square meters
Test data in accordance with AMCA Std 500.

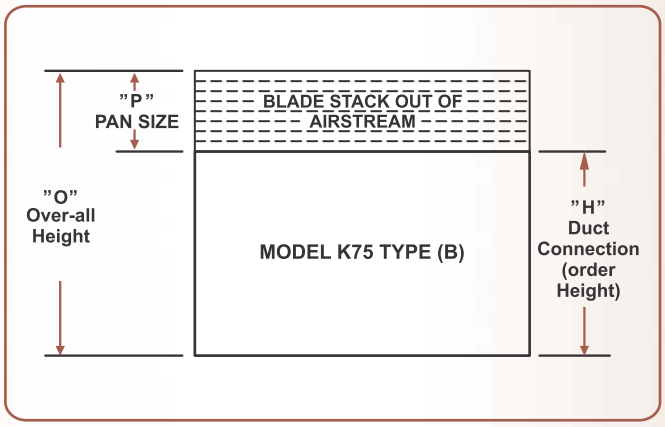
MODEL AFA TYPE - B

PAN SIZING CHART VERTICAL MOUNT

MAXIMUM OVERALL SIZES :

Type installation	Single section Width × Height	Multiple section Width × Height
Vertical	41" × 41"	82" × 82"





"H" Duct Opening Order Size	"O" Over-all Height	"P" PAN SIZE
4	5	1
5	6	1
6	7	1
7	8	1
8	10	2
9	11	2
10	12	2
11	13	2
12	14	2
13	15	2
14	16	2
15	17	2
16	18	2
17	20	3
18	21	3
19	22	3
20	23	3
21	24	3
22	25	3
23	26	3
24	27	3
25	28	3
26	29	3

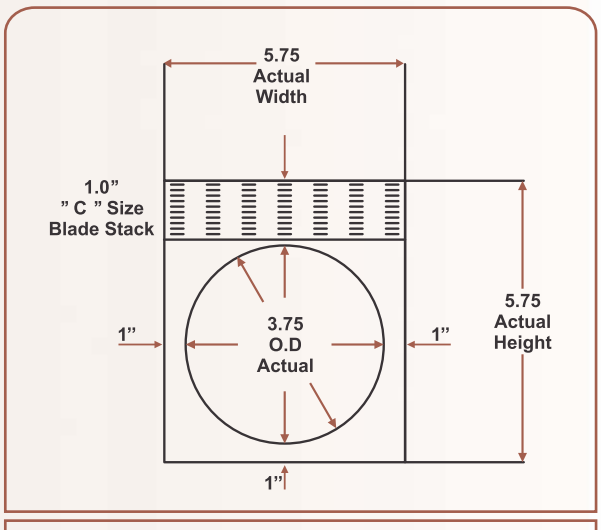
"H" Duct Opening Order Size	"O" Over-all Height	"P" PAN SIZE
27	31	4
28	32	4
29	33	4
30	34	4
31	35	4
32	36	4
33	37	4
34	38	4
35	39	4
36	41	5

NOTE : All sizing in inches

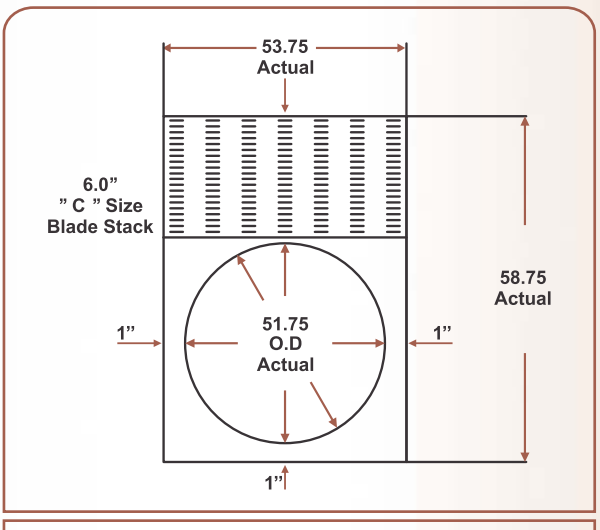
MODEL AFA - F
ROUND SIZING CHART

ORDER DIAMETER	DAMPER FRAME WIDTH X HEIGHT
4	6 X 6
5	7 X 7
6	8 X 8
7	9 X 9
8	10 X 11
9	11 X 12
10	12 X 13
11	13 X 14
12	14 X 15
13	15 X 16
14	16 X 17
15	17 X 18
16	18 X 19
17	19 X 21
18	20 X 22
19	21 X 23
20	22 X 24
21	23 X 25
22	24 X 26
23	25 X 27
24	26 X 28
25	27 X 29
26	28 X 30
27	29 X 32
28	30 X 33

ORDER DIAMETER	DAMPER FRAME WIDTH X HEIGHT
29	31 X 34
30	32 X 35
31	33 X 36
32	34 X 37
33	35 X 38
34	36 X 39
35	37 X 40
36	38 X 41



4 " Order Diameter



36 " Order Diameter

NOTE : All sizing in inches

FIRE DAMPER TYPE AFA –A

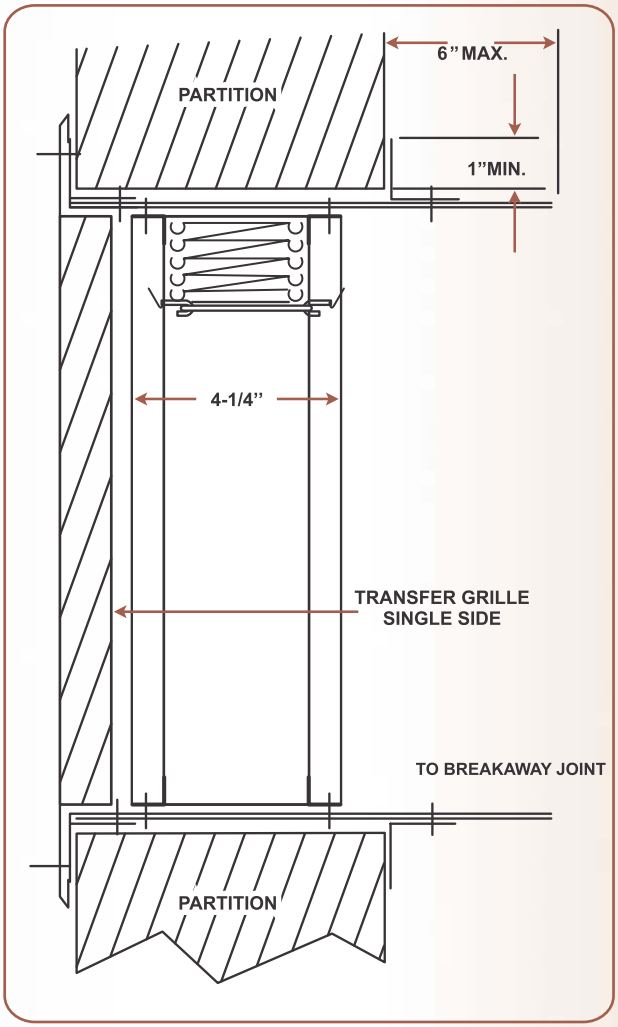
DAMPER INSALLATION INSTRUCTION
TRANSFER OPENING AND DUCT TERMINALS
FOR 1-1/2 HOURS

1- Perimeter mounting angles to be minimum of 1 1/2 x1 1/2 X 16 ga. on dampers 36" x 36" angles to be a minimum of 1 1/2 x 1 1/2 x smaller 14 ga.

2- Grille to flange fasteners cannot penetrate the fire wall .

3- Secure angles to sleeve only, so as to frame the wall opening. Fasten to the sleeve only using the same means as required for fastening the damper to the sleeve.

4- Grille to flange attachment by means of 1/4" dia. pop rivets, #8 sheet metal screws or #8 bolts and nuts. Fasteners to be plated steel or stainless steel, minimum two fasteners per side.



Model AFA Type A

SLEEVE

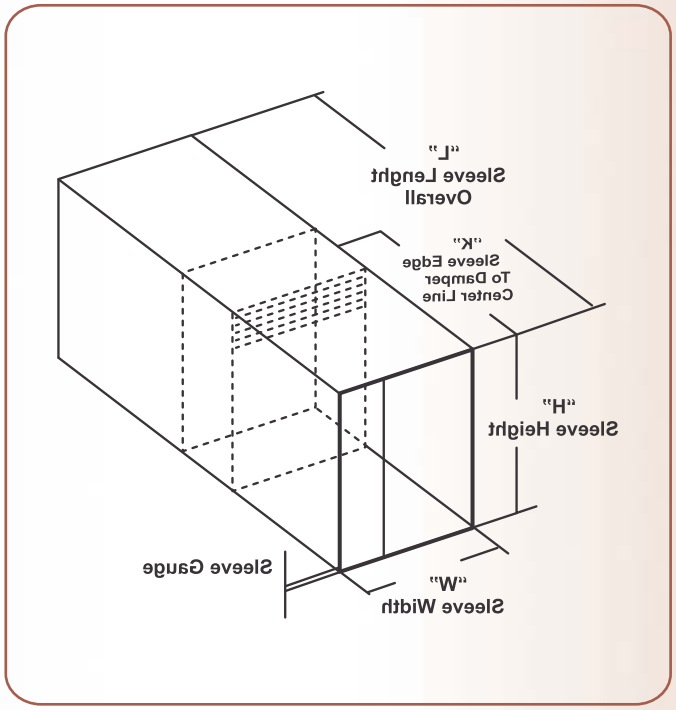
1. Dampers and sleeves are always priced and ordered by W × H or dimension as shown . The types C, and D both require the damper to be oversized .
   Actual overall dimensions can be determined by adding sleeve material thickness to the basic damper dimensions (after allowing for the standard 1/4" damper under sizing) .
2. "K" distance may be ordered at any dimension up to the sleeve length less one half her damper frame width . If "K" dimension is not specified, "K" dimension will be provided as sleeve length (L/2). (Damper on center line)

SLEEVE FOR CURTAIN FIRE DAMPERS:

TYPE A (AFA STANDARD)
TYPE B (AFA & AFA-B FLANGED STD)
TYPE C (AFA& AFA-B STANDARD)
TYPE B (AFA-B MIN . DUCTING)

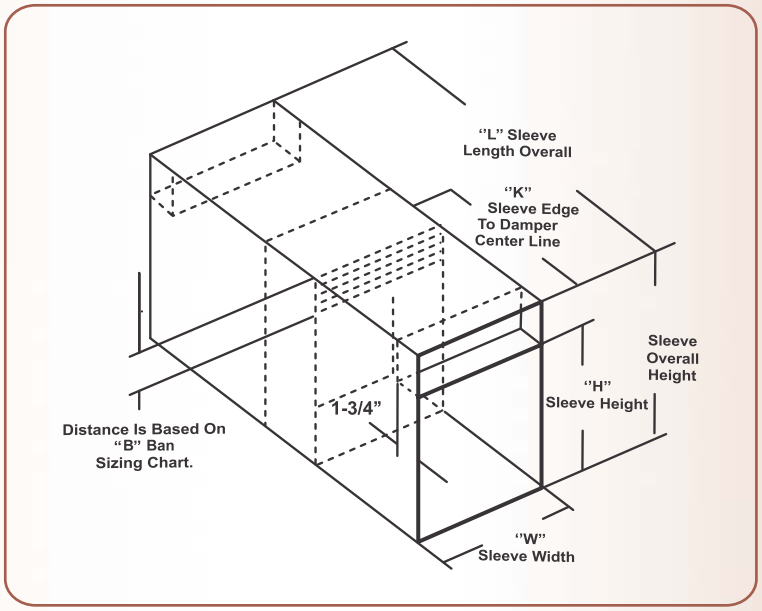
SLEEVE TYPE "A" STANDARD :

When ordering specify : width × height × length × gauge + ("K" dimension). When not specified dampers will be provided centered in sleeve length (L/2



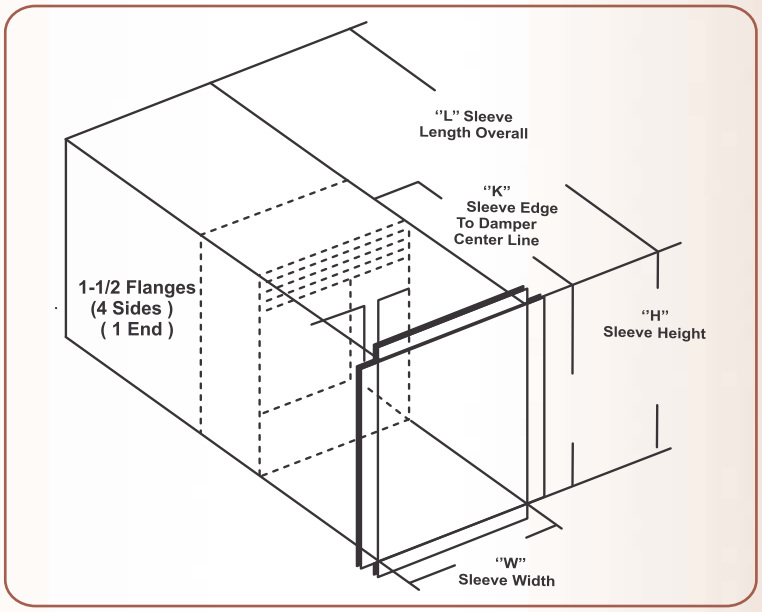
SLEEVE TYPE "B" :

When ordering specify : width × height × length × gauge + ("K" dimension). When not specified dampers will be provided centered in sleeve length (L/2) .



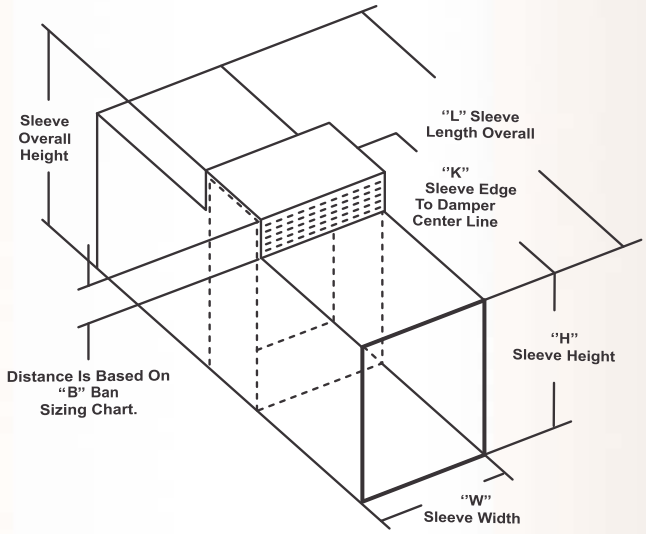
SLEEVE TYPE "C" :

When ordering specify : width × height × length × gauge + ("K" dimension) and specify flange side if order with one side flange . When not specified dampers will be provided centered in sleeve length (L/2) and flange will be provided air flow in left side .



SLEEVE TYPE "D":

When ordering specify : width × height × length × gauge + ("K" dimension). When not specified dampers will be provided centered in sleeve length (L/2) .



SLEEVE

1. Dampers and sleeves are always priced and ordered by W × H or dimension as
shown . The types E, F, and G all require the damper to be oversized .
Actual overall dimensions can be determined by adding sleeve material thickness to
the basic damper dimensions (after allowing for the standard 1/4" damper under
sizing) .

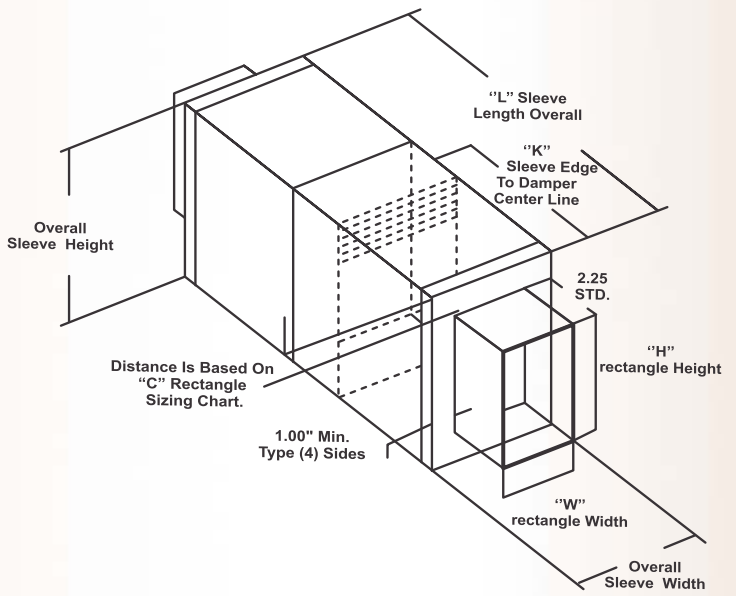
2. "K" distance may be ordered at any dimension up to the sleeve length less one half
her damper frame width . If "K" dimension is not specified, "K" dimension will be
provided as sleeve length (L/2). (Damper on center line).

SLEEVE FOR CURTAIN FIRE DAMPER :

TYPE E (RECTANGLE)
TYPE F (ROUND)
TYPE G (OVAL) .

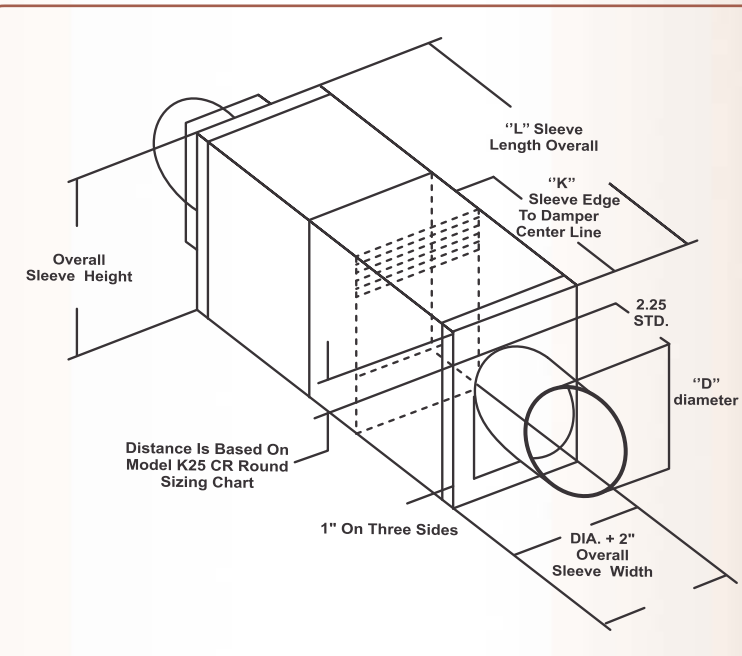
TYPE "E" RECTANGLE SLEEVE :

When ordering specify : rectangle width × rectangle height × length × gauge + ("K" dimension). When not specified, dampers will be provided centered in sleeve length (L/2).



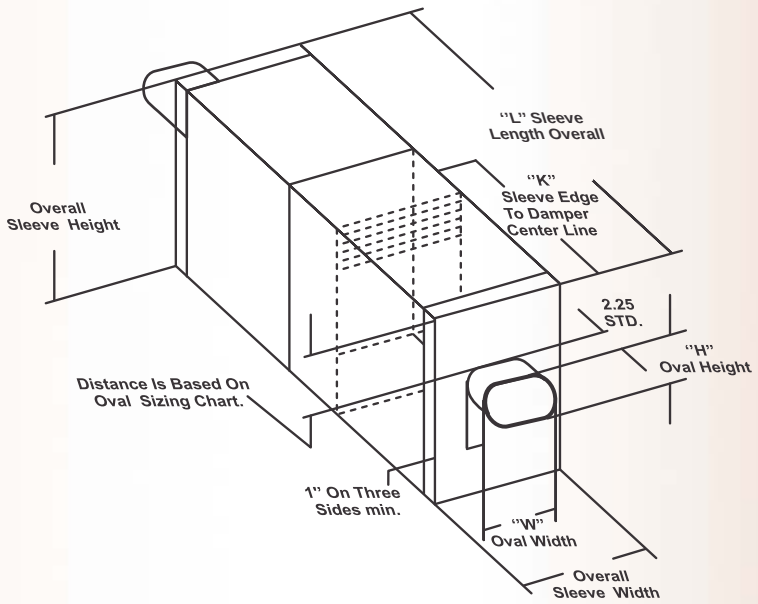
TYPE "F" ROUND SLEEVE:

When ordering specify : collar diameter × length × gauge + ("K" dimension). When not specified, dampers will be provided centered in sleeve length (L/2).



TYPE "G" OVAL SLEEVE :

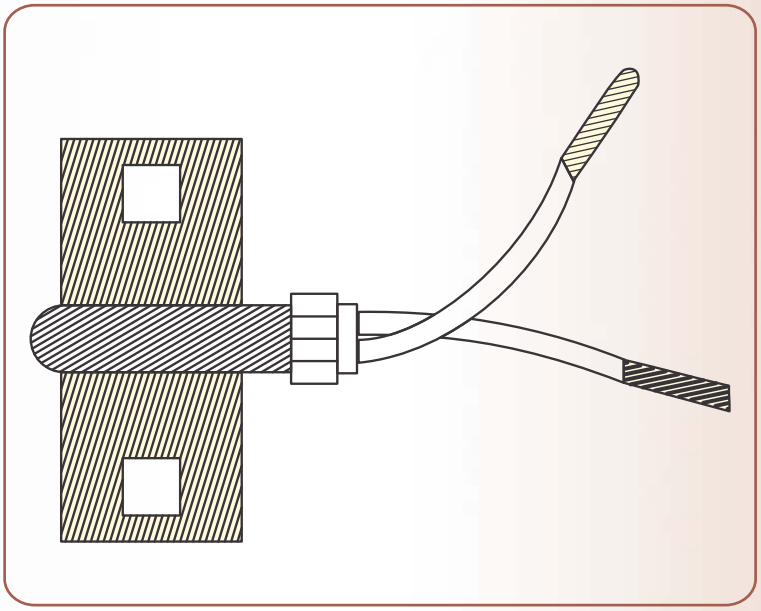
When ordering specify : oval width × oval height × length × gauge + ("K" dimension). When not specified, dampers will be provided centered in sleeve length (L/2).



ETL

ELECTRO – THERMAL LINK

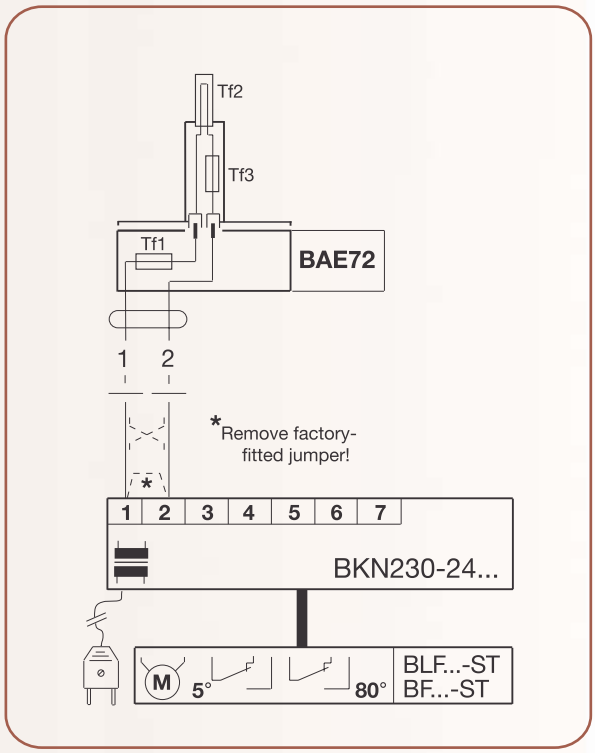
The electro thermal link (ETL) is a multipurpose dual responsive fusible link which reacts (melts) when subjected to :
1- local heat (165° f) exactly the same as on ordinary link .
2- External electrical impulse of low and a short duration
It is specifically designed to substitute for ordinary links and / or other actuators in existing and new installations of : Fire dampers . fire & smoke roof hatches , fire extinguishers , sprinklers , smoke towers , and gas or chemical automatic release systems .
The substitution should be made in every installation of the above devices where it is desirable for those devices to respond to :

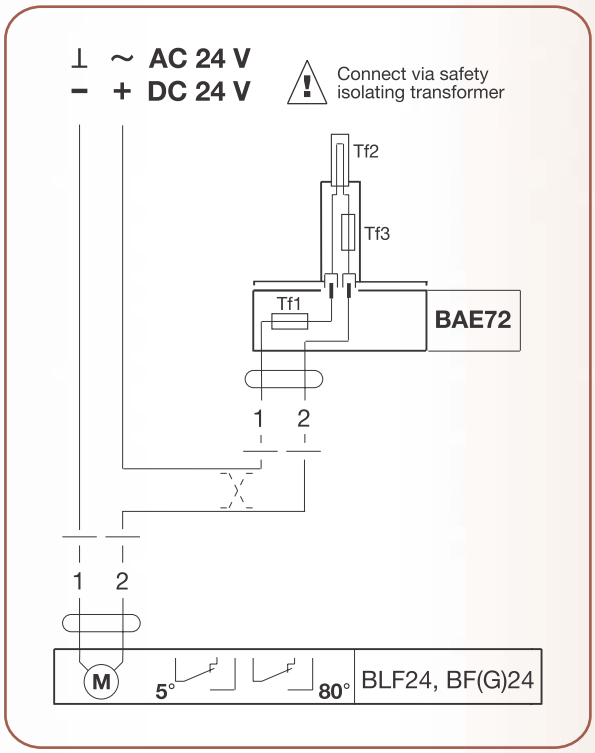


Smoke , in the early form of invisible products of combustion through ionization detectors , or fire , at the earlier stage than ordinary links thru the use of rate of rise or maximum temperature devices.
The ETL"s electro - response is the unique feature.
it is not smoke responsive of itself , but its power requirement is so low that it can be released with an electrical impulse from any smoke detector 's power source .
It is compatible with every smoke detector on the market in the middle east today .
The operating range is 6 to 30 VAC or DC , less than 0.2 ampere of trip current required and 1/2 millisecond (0005 sec) response at 24 v .
The electrical response is a trigger for the chemical heating of the center element which is self- contained exothermic reactor , yielding no noise , smoke or gas . just quick heat to open the link in 7 second.
The ETL's thermal response is identical to that of ordinary fusible link of identical temperature (165 f) and strength (40 #) rating.
In its capacity of converting a fire safety device into a fire / smoke safety device, the ETL can be substituted for both an ordinary link and motor, or link and electromagnetic operator with advantages of simplicity, operational reliability, wide acceptability and economy .
With its dual responsiveness , the ETL can be substituted for two other devices at a saving in first cost as well as operating cost and maintenance .
The ETL is built to zero defect standards and to last at least fifty years and then still react properly – only on fire or smoke emergency .
It is independent of power failures since it draws power from the detector standby source if needed the ETL is listed by underwriters laboratories inc .
As a fusible link, and also has become the basis test procedure for electro-chemical servo mechanisms .

ETL
THERMOELECTRIC TRIPING DEVICE

Wiring diagram





Dimensions / Drilling template